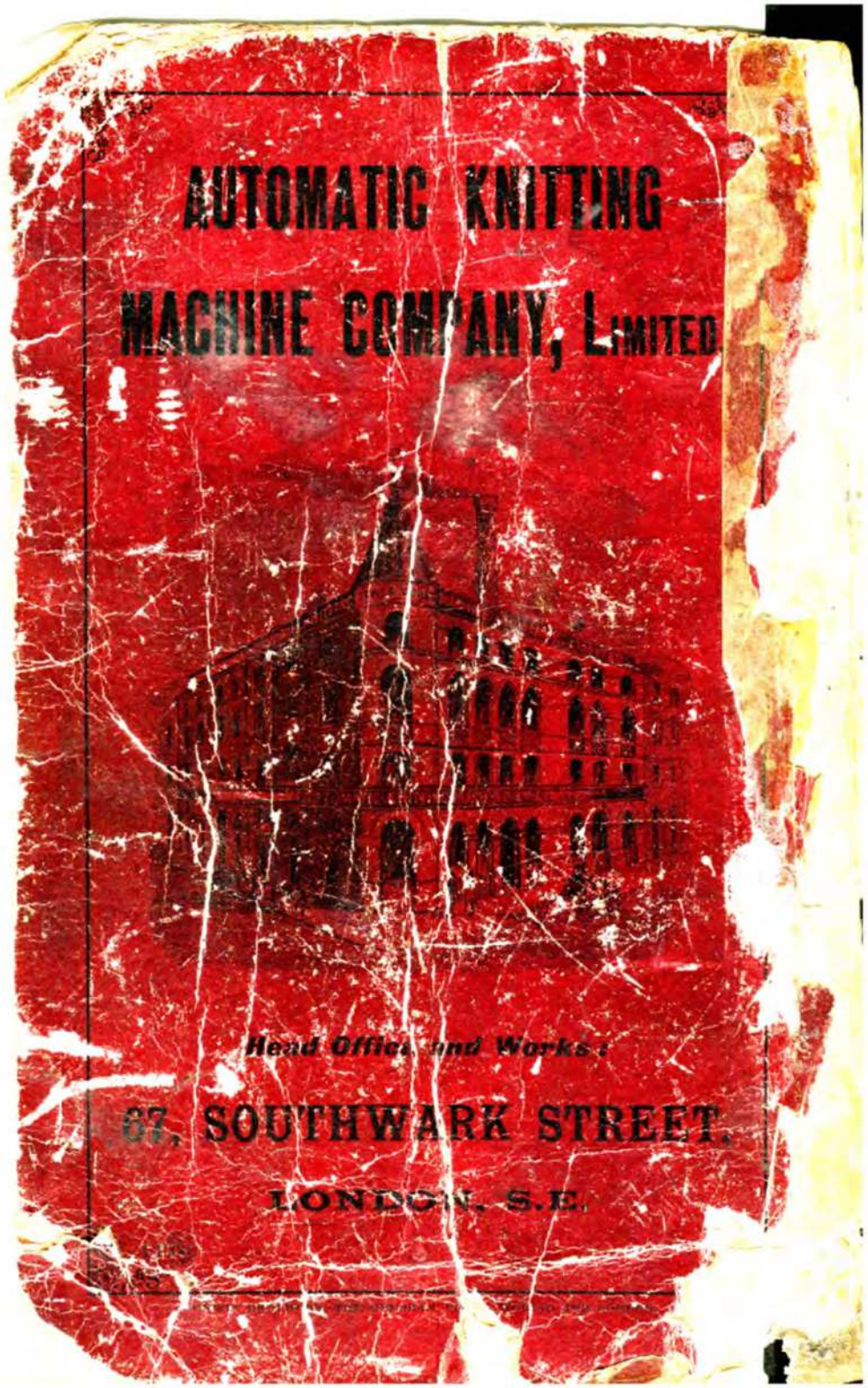
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AUTOMATIC KNITTING
MACHINE COMPANY, LIMITED

67, SOUTHWARK STREET,
LONDON, S.E.

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41 Weldon's Knitter	10th
42 Weldon's Crochet	8th
43 Weldon's Tatting	1st
44 Weldon's Smocking	3rd
45 Weldon's Mountmellick Work	1st
46 Weldon's Knitter	11th
47 Weldon's Mountmellick Work	2nd
48 Weldon's Crochet	9th
49 Weldon's Knitter	12th
50 Weldon's Mountmellick Work	3rd
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52 Weldon's Drawn Thread Work	1st
53 Weldon's Drawn Thread Work	2nd
54 Weldon's Knitter	13th
55 Weldon's Knitter (Laces)	14th
56 Weldon's Crochet	11th
57 Weldon's Netting	4th
58 Weldon's Drawn Thread Work	3rd
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95 Weldon's Crochet	20th
96 Weldon's Knitter	24th
97 Weldon's Crochet	21st
98 Weldon's Plain Needlework	1st
99 Weldon's Stocking Knitter	4th
100 Weldon's Mountmellick Embroidery	7th
101 Weldon's Knitter	25th
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123 Weldon's Knitter	30th
124 Weldon's Torchon Lace	1st
125 Weldon's Knitter	31st
126 Weldon's Macrame and Bead Work	1st
127 Weldon's Stocking Knitter	5th
128 Weldon's Crochet	29th
129 Weldon's Point Lace	2nd
130 Weldon's Knitter	32nd
131 Weldon's Crochet	30th
132 Weldon's Knitter	33rd
133 Weldon's Crochet	31st
134 Weldon's Stocking Knitter	6th
135 Weldon's Mountmellick Embroidery	8th
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139 Weldon's Smocking	4th
140 Weldon's Knitter	34th
141 Weldon's Crochet	33rd
142 Weldon's Knitter	35th
143 Weldon's Crochet	34th
144 Weldon's Crochet (D'Oyley's)	35th
145 Weldon's Knitter	36th
146 Weldon's Knitter	37th
147 Weldon's Crochet (Fourche Work)	36th
148 Weldon's Crochet (Edgings)	37th
149 Weldon's Crochet (D'Oyleys)	38th
150 Weldon's Knitter	38th
151 Weldon's Crochet (Edgings)	39th
152 Weldon's Knitter	39th
153 Weldon's Honiton Lace	1st
154 Weldon's Crochet (D'Oyley's)	40th
155 Weldon's Stocking Knitter	7th
156 Weldon's Knitter	40th
157 Weldon's Crochet (D'Oyleys)	41st
158 Weldon's Knitter (Stocking Tops)	41st
159 Weldon's Crochet (D'Oyleys)	42nd
160 Weldon's Crochet	43rd
161 Weldon's Knitter	42nd
162 Weldon's Knitter	43rd
163 Weldon's Crochet (Quilts and Borders)	44th
164 Weldon's Crochet	45th
165 Weldon's Knitter	44th
166 Weldon's Knitter	45th
167 Weldon's Knitter	46th
168 Weldon's Crochet	46th

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For " How to Order " and Prices, see inside front cover and pages 100 to 103.

A supply of Needles, and a few spare Bobbins.

The 4½ inch diameter 60 Cylinder and 30 Dial with " Medium " Needles (same as are used with the 84 Cylinder and 42 Dial), for small *seamless* hosiery of ordinary yarns —or, with " Coarse " Needles for Adults' *seamless* hosiery of heavy Wheeling (Alloa), &c., yarns.

The 4½ inch diameter 72 Cylinder and 36 Dial with " Medium " Needles are recommended for medium sized *seamless* hosiery, &c., of ordinary yarns, or, with Coarse Needles they are suitable for knitting Adults' *seamless* hosiery of heavy Wheeling (Alloa), &c., yarns, wider than can be made on the 60 Cylinder and 30 dial.

The 4½ inch diameter 108 Cylinder and 54 Dial with fine needles are specially useful for Adults' *seamless* hosiery of fine yarns. And the 3¾ inch diameter 96 Cylinder and Dial with fine needles are the best for Children's *seamless* hosiery of fine yarns.

For choice of Cylinders, see pages 100 and 104.

HINTS TO BUYERS OF YARNS.

We strongly advise knitters to avoid very low priced yarns. They are usually of short staple, harsh, fibrous, and commonly not all wool. As a rule they are dear at any price, because the hosiery produced from them gives such poor satisfaction both in the quality, and length of wear. So well is this known to us, that we do not keep any low grade yarns in stock.

We can highly recommend our " M " 4 ply Fingering Yarn (medium quality) at 3/4 per lb., or 19/- per spindle of about 6 lbs. This yarn is specially spun for our Knitting Machine ; it has a long staple, is soft, and runs out well ; the hosiery made of it has, for years, given the greatest satisfaction.

The best 3, 4 and 5 ply Fingering Yarns are at the time of issuing this Book from 5/6 per lb.

Yarns of almost every description (in small or large parcels) quoted for, and supplied to order.

Note.—Prices of yarns vary according to the state of the market.

WARNING.

TO BEGINNERS.

Do not turn the handle until you are told by the Instruction Book, or you will bend the latches of needles.

When the machine is received there is a natural desire to turn the handle. If this is done carelessly and quickly, before the yarn loops are set on the needles, many of the latches of the needles will get bent, that is to say, the latches without yarn upon them, jump up and are struck by the latch-opener.

Now, when you work with bent or stiff latches, you will find that the yarn will accumulate upon the needles instead of making regular stitches each time the yarn-guide revolves, as is done by the needles when latches are in faultless order. Those bent latches will also make holes in the fabric, and the driving handle will be hard to turn.

The remedy is to straighten all bent latches **at once** until they open and close **FREELY and FULLY,** then the above difficulties will disappear. (The straightening can be done by the finger and thumb whilst the needle is in the cylinder.)

When you understand how to work machine you can turn the handle freely if the yarn is being supplied to the needles (and you hold the work down, &c., as directed in the Instruction Book) BUT VERY SLOWLY INDEED IF THERE IS NO YARN.

Screws.—Do not interfere with any screws or nuts unless you are told to do so by the Instruction Book.

Yarn.—Beginners are strongly advised to use light coloured yarns for learning the working of the machine, as they are easier to knit than dark yarns.

Oil.—On no account use any other than good machine oil, such as is supplied with the machine, and only a drop now and again; but see "Oiling" in the Instruction Book. Unsuitable oil as Linseed, Castor, Colza, Olive, &c., clogs the machine.

Cleaning.—Do not take the machine to pieces to clean it unless you feel sure that it really needs cleaning through the use it has had.

For Index to Contents see end of Book.

INSTRUCTION BOOK.

CAUTION.

Until the Knitter is fully acquainted with the Machine, no Screws or Tension-pointers should be interfered with, unless directions are given. The Machine is thoroughly tested, and as it is sent out with the parts fitted together, all Screws and the Tension-pointers are adjusted ready for working.

DO NOT TURN THE HANDLE UNLESS DIRECTED.—*See* **"WARNING"** *(page facing Cover).*

ACCESSORIES SENT WITH THE "ORDINARY" MACHINE.

1 Instruction book.
1 Needle-cover to protect the cylinder needles.
1 Set-up for rough selvedge (Fig. 14, No. 78).
1 Buckle to carry the weights (in place of set-up), when the work almost touches the ground, &c. (Fig. 3, No. 85).
1 Winder-wheel (Fig. 12, D).
1 Button, to go between the screw of the winder and the table.
1 Swift-holder (Fig. 12, C).
1 Swift (Fig. 12A).
2 Bobbins (Fig. 12, F^1 and F^2).
1 Weight-holder for attaching to set-up or buckle (Fig 3, No. 82).
1 Set of weights, 2 to a set (Fig. 3, No. 83).
1 Heel-weight holder for attaching to heel-wire.
1 Heel-weight.
1 Needle-lifter (Fig 1, below).
1 Heel-wire for holding down the corners of Heel and Toe when making Socks or Stockings, and articles with similar shaping. (Fig. 2).
6 Cylinder needles and 6 dial needles extra.
1 Oiler.
1 Bottle of oil.
1 Screwdriver-spanner.
1 Sock-block.
1 Sample sock.

ACCESSORIES SENT WITH A "COMPOUND" MACHINE.

The list as above, and in addition:
1 Small sock-block.
6 Extra "compound" cylinder needles.
6 ,, dial needles.

EXTRA PARTS SENT WITH A "COMPOUND" MACHINE.

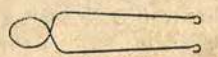
1 3¾ inch diameter "compound" cylinder.
1 Set of needles for 3¾ inch dia. cyl.
1 3¾ inch "compound" clasp-ring.
1 3¾ inch diameter dial, for ribber.
1 Set of needles for 3¾ in. dia. dial do.
1 3¾ inch cam-plate complete, do.

Fig. 1.



NEEDLE-LIFTER.

Fig. 2.



HEEL-WIRE.

Fig. 3 is an Illustration of the Automatic Knitting Machine (with Ribber) fixed to a Table, and knitting a ribbed sock commenced at the Toe, but the usual and better method for a beginner is to commence at the Top.

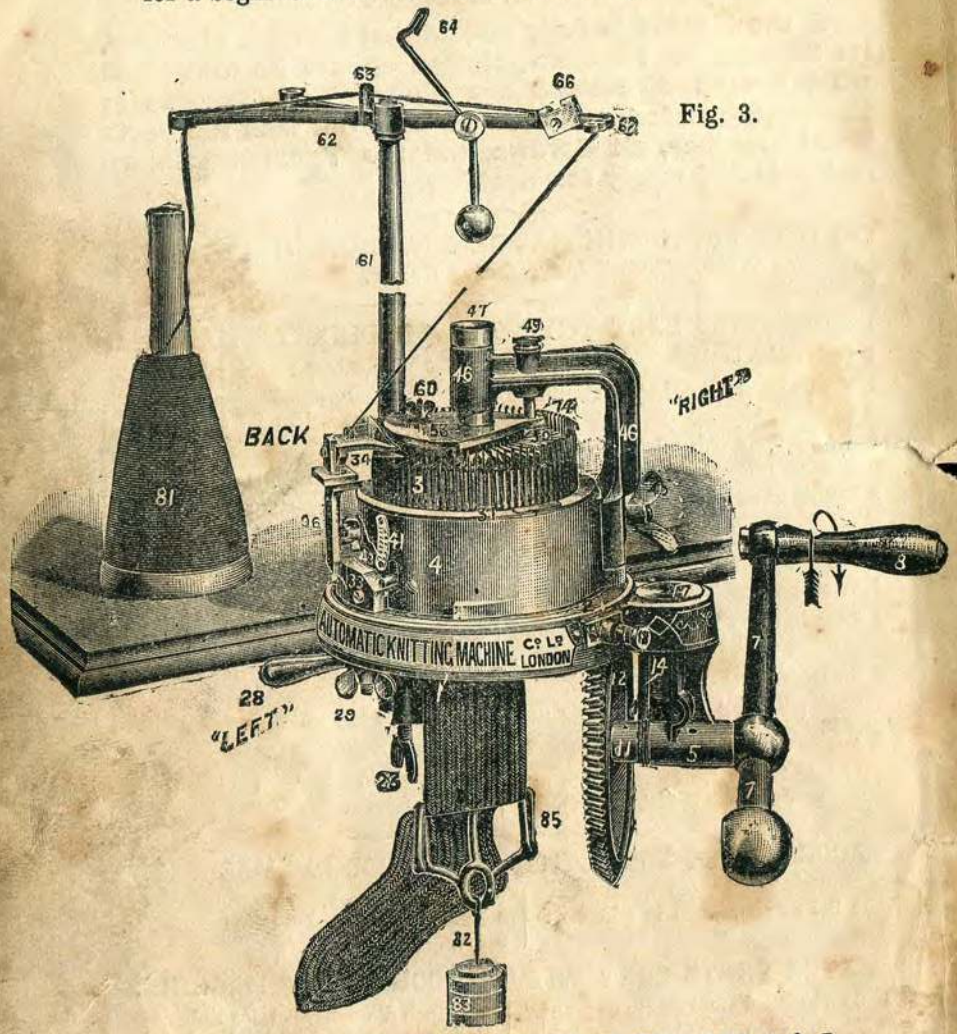


Fig. 3.

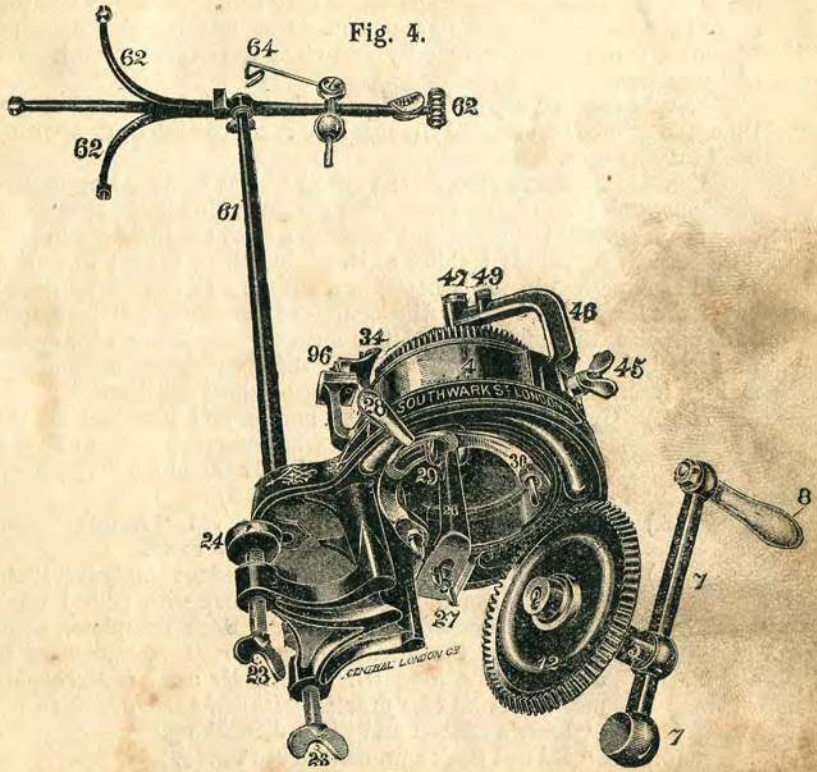
NAMES OF PARTS OF MACHINE IN FIGURES 3 & 4.

1. Base.
2. Geared-ring.
3. Cylinder ("Ordinary" 4½ in. diameter).
4. Shell.
5. Driving-wheel-bracket.
7. Crank.
8. Driving-handle.
11. Counter-worm.
12. Driving-wheel.
14. Counter-shaft.
17. Counter.

(*Continued on page 3.*)

Illustration of the Automatic Knitting Machine on its side, showing more particularly the Lever (28) for Adjusting Cylinder, and the Base Roller-bracket (26).

Fig. 4.



NAMES OF PARTS OF MACHINE IN FIGS. 3 & 4 (*continued*).

18. Stop-action.*
23. Thumb-screws of cramp.
24. Do. Button.
26. Base roller-bracket.
27. Wing-nut for fixing roller-bracket.
28. Lever for adjusting cylinder.
29. Wing-nut for fixing lever.
30. Cylinder screws (2).

(See Fig. 4.)

31. Clasp-ring.
33. 2 screws for fixing yarn-guide to geared-ring.
34. Latch-opener.
41. Degrees of plain tension.
43. Tension-pointer, and wing-nut for fixing same (plain mac.).
45. Wing-nut for fixing ribber-arm to shell.
46. Ribber-arm.
47. Ribber-spindle.
49. Ribber driving-pin.
50. Dial.
53. Cam-plate.
60. Wing-nut for fixing ribber tension-pointer.
61. Column.
62. Yarn-cross.
64. Take-up.
66. Shield.
74. Plain (or cylinder) needles.
81. Bobbin, with yarn wound upon it.
85. Buckle.
96. Yarn-guide (compound adjustable pattern).

* This stop-action has been discontinued in recent machines.

GENERAL REMARKS.

This Instruction Book contains all that the Knitter requires to know. The instruction is given at length, and with minuteness of detail in the most important parts, so that there should be no difficulty in understanding the proper mode of working the Knitting Machine, and producing thereby first-class hosiery, &c., with ease and pleasure.

Should another copy of the Instruction Book be wanted at any time, the number on base of the machine must be stated, or a wrong book may be sent.

Learners Please Note.—If you do not at first reading understand any one part of the instruction given in this book, read same over again several times. Some learners expect the machine to produce hosiery by simply looking at it, while others expect to knit a ribbed sock perfect in all its parts, at a sitting. It cannot be done; but if the learner will follow the course of lessons given hereafter, and practise the instructions many times, mastering each point properly before proceeding to another, there will be no difficulty in making faultless hosiery rapidly, and after a short application.

(1.) Get acquainted with the names and positions of the parts of the Machine, for which purpose refer to Figs. 3 and 4, and read "How to fix Machine" (page 4), and "Brief Description" (page 5).

(2.) Wind yarn on bobbin (p. 8); set "Rough" and "Correct" Selvedges; knit a few rows.

(3.) Set "Rough" and "Correct" Selvedges and knit "Plain Sock" (page 9); then "Plain Sock with ribbed top" only; afterwards, a "Ribbed Sock complete, commenced at the top." (*Beginner is recommended to always use a loose stitch until the work is thoroughly mastered, and also practise with light coloured yarn.*)

(4.) A "Lady's Ribbed and Shaped Stocking."

(5.) A "Ribbed Sock commenced at the toe."

HOW TO UNPACK AND FIX MACHINE.

Caution.—(1) UNTIL THE KNITTER IS FULLY ACQUAINTED WITH THE MACHINE, NO SCREWS OR TENSION-POINTERS SHOULD BE INTERFERED WITH, UNLESS DIRECTIONS ARE GIVEN. (For illustrations, position, and names of the chief parts of machine, see pages 2 and 3.)

(2) DO NOT TURN THE HANDLE OF THE MACHINE UNTIL DIRECTED, OR YOU MAY CAUSE THE LATCH-OPENER TO BEND OR STRAIN THE LATCHES OF NEEDLES. (If any latches are accidentally bent, straighten them at once. See page 64, "Faults and Remedies." C. 7. Bent latches cause holes to be made in the fabric, and the yarn to gather round the needles and make the machine hard to work.)

Unpacking.—The Automatic Knitting Machine is sent out very carefully packed in such a manner that it can easily be taken out of the box.

On opening the box, first remove the swift, column, bobbins, yarn-cross, &c., so as to expose the machine. Now unscrew slightly the two thumb-screws which hold the base of the machine to the partition in the box, then lift machine, and slip it on to a solid table or bracket, sufficiently strong to bear the whole weight of it when put together; fix to the table by the thumb-screws (23); but use the fingers only, and not the spanner (or any other form of mechanical lever), to screw up firmly the thumb-screws, for if too much force is used the cramp of base may snap off.

Fixing Machine.—(Refer to illustration, page 2.) Screw column (61) into the hole on base at **"Back"** of machine; place the three-armed yarn-cross (62) upon the column with the one arm (which has three holes close together at its end), directly over the centre of the cylinder; then secure the yarn-cross to the column by the small thumb-screw, which will be found at the side of the hole, near its centre. See that the yarn-cross is correctly fixed as shown by Fig. 3 (page 2), with the take-up ball pointing downwards, and with the shield at the top of the arm. Lift cover off the cylinder. The brass stopper (18)* on **"Front"** of base (of Pattern 8 machine only), should be drawn back and turned, to release geared-ring (2) and so have machine free for action. The machine is now ready for use.

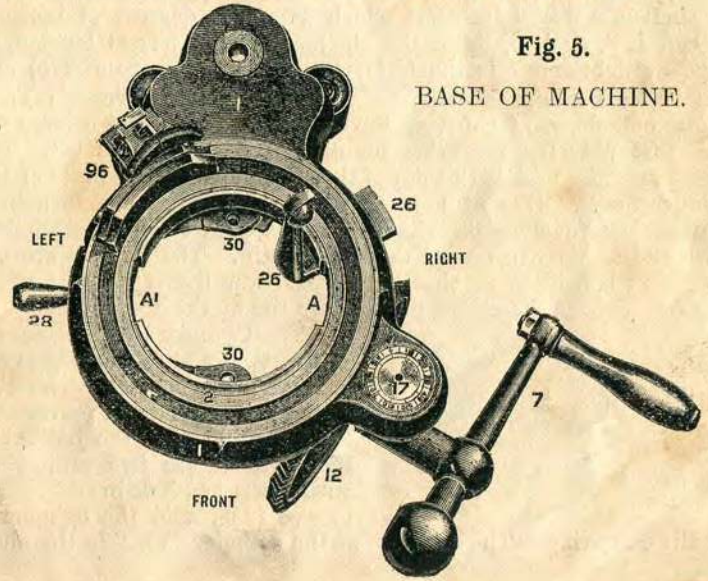
* This Stopper has been discontinued in recent machines.

Note.—To take machine to pieces, and change, or replace parts, refer to pages 69 to 72.

A BRIEF DESCRIPTION OF THE CHIEF PARTS OF THE PLAIN AUTOMATIC KNITTING MACHINE.

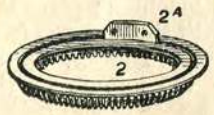
Fig. 5.

BASE OF MACHINE.



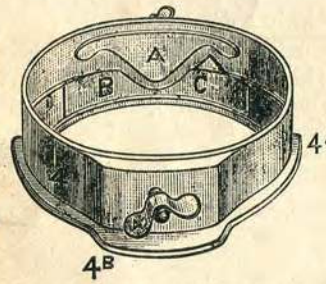
The Base (1) has at its back a cramp for fixing to a table. Above the cramp is a screwed hole for the column (61) on top of which is placed the yarn-cross (62). The bracket (5) carries the driving shaft, the driving crank and handle (7) with the driving wheel (12); the counter (17) which records the number of rows knitted, is revolved by a spindle geared into a worm on the driving shaft. At the "Left," passing under the base, is the lever (28) for adjusting the cylinder, and at the "Right" is the base roller-bracket (26) which stands up inside the base. The lever and the roller-bracket are held to the base by wing-nuts.

Fig. 6. GEARED-RING.



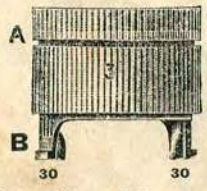
The Geared-ring (2) works in the groove at the top of the base, when its cogs fit between the cogs of the driving-wheel (12). The projection (2A) on smooth side of the ring is for driving the shell by its lugs (4A), and it also holds the yarn-guide.

Fig. 7. SHELL.



The Shell is the chief part of the machine, as it contains the steel cams (A B C Fig. 7) which actuate the cylinder (or plain) needles. It rests upon the base just clear of the geared-ring, and is kept in position by the cylinder, round which it revolves. The stitch-cam (A) is adjustable, upward or downward, for short or long stitches, and is held to the shell by the small wing-nut outside. Between this wing-nut and the shell is a finger (pointer) which points to degrees of tension, marked 1, 2, 3, 4, 5, 6, on the shell. 6 is the *loosest* tension, or longest stitch, and 1 is the *tightest*. The large wing-nut (45) and stud is for holding the ribber. The two lugs or corners (4A) at bottom outside, are for driving the shell. One lug is for driving the shell FORWARDS, the other for driving it BACKWARDS. The ledge round the middle (inside) of the shell supports the butts of the cylinder needles (74A of Fig. 10) when the needles are in action. As the shell revolves the (butts) needles pass off the ledge, then down and up the cams on to the ledge again. The needles are out of action when lifted so that butts pass over the top of the stich-cam A. Behind the side-cams B C are the up-throw-cams.

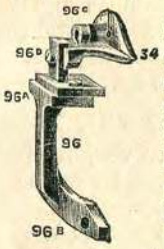
Fig. 8. CYLINDER.



The Cylinder (3) has grooves (cut vertically at regular intervals) to receive the needles. The divisions between the grooves are termed posts. At the bottom of the cylinder are two projections with a screwed hole in each. The groove (A) round the cylinder is for the clasp-ring. The position of the cylinder is inside the shell,

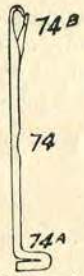
with the bottom of the posts (B) resting on the top step of the machine base (Fig. 5). The cylinder is self-fitting, and is held on the machine base by means of ledges at the bottom of the projections (30). Thumbscrews pass first through the cylinder lever (28) and then into the holes of the projections. The lever is to adjust and hold the cylinder at any given point for various forms of ribbed work.

Fig. 9. COMPOUND YARN-GUIDE.



The Yarn-guide (compound) is screwed firmly to projection (2A) on the smooth side of the geared-ring. The guide carries the yarn from the yarn-cross (62) and feeds it from the tube (96c) into the hooks of the needles. The crescent (34) near the top of the guide is known as the latch-opener, and its object is to prevent the latches from closing when needles are in action (that is, when needles are making stitches). The tube in the latch-opener conveys the yarn, or thread, to the needles.

Fig. 10. CYLINDER NEEDLE.



Cylinder or plain Needles have on their front side butts at the lower ends, and hooks with latches at the upper ends. The needles fit into the grooves of the cylinder with the butts extending towards the inner side of the shell. After taking off the clasp-ring, needles can be placed into, or taken out of all the cylinder grooves excepting those opposite the cams; the shell is advanced to get the needles into, or out of the cams.

Fig. 11. CLASP-RING.



The Clasp-ring is placed into the groove (A of Fig. 8) round the cylinder, to keep needles in their grooves. The clasp-ring should never pinch the needles to the cylinder but hold them loosely in the grooves.

ACTION OF THE MACHINE.

The driving-wheel is turned by its crank or handle (7). This causes the geared-ring to revolve, and the geared-ring takes the shell round with it. Turn the handle once round *very slowly* and notice the up and down movement of the needles.

Let us now suppose the work has been set, and that there is a row of loops on the needles, and that the yarn-guide is feeding the hooks of the needles with the thread. It will be seen, that, as the shell revolves, there are several needles in action, that is, being lowered or raised by the cams.

In that action the needles are first slightly raised so that the loops already on the needles pass below the latches; then immediately the new thread feeds into the hooks, and is drawn down through the loops, after which those loops close the latches upon the hooks and pass off the needles in the form of stitches to the inside of the cylinder; now the needles rise to their regular level, and in so doing the new loops open the latches and thus leave the hooks free to receive a fresh supply of thread. The thread last supplied is now left in the form of loops upon the needles. In this way stitches and loops are formed as the shell is revolved.

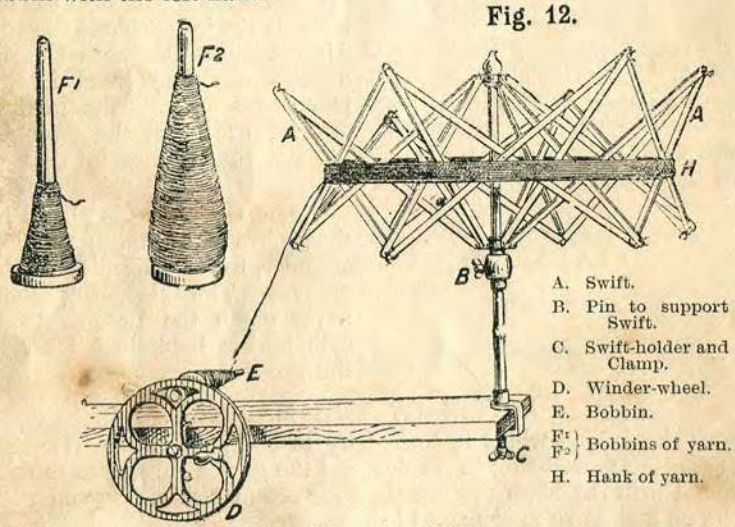
WINDING THE YARN ON TO THE BOBBIN (see Fig. 12).

It is important to wind the yarn very carefully on to the Bobbin, for, if it be not wound evenly, it will make the Machine work hard, and cause the loops to jump off the Needles.

Fix the Winder-wheel (D) and Swift (A) to a table, or bracket, and place Bobbin (E) on the spindle of Winder-wheel. The most convenient position for the Swift is at the left, and the Winder at the right, that is, just the reverse position to that shown by Fig. 12.

Place the hank of yarn (H) upon the Swift; extend Swift so that yarn lies loosely upon it, and then support the Swift by the small pin (B), which must be inserted into the hole in shaft just below the socket. Now tie the end of the yarn on to the Bobbin, then, with the right hand turn the Winder-wheel and guide the yarn on to the Bobbin with the left hand.

Fig. 12.



A. Swift.
B. Pin to support Swift.
C. Swift-holder and Clamp.
D. Winder-wheel.
E. Bobbin.
F^1 / F^2 Bobbins of yarn.
H. Hank of yarn.

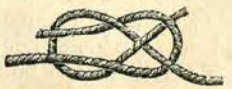
☛ Be very careful in filling the Bobbin to commence at the bottom and wind in the form of a cone, filling the lower or base end first in a short even slant, as in Fig. 12, F^1 and F^2. Coarse yarns, or silk, should be wound tightly, and fine or soft yarns loosely, but all of them smoothly and regularly.

To soften hard yarns, hold an oily rag in the left hand, and let the yarn run through this when guiding it on to the bobbin. The oil will make the yarn much easier to knit, as it softens dark colours, such as black, navy blue, brown, &c., which are generally from gritty dyes.

The beginner is strongly advised to practise with light coloured yarns at first.

JOINING THE YARN.

Fig. 13.



WEAVER'S KNOT.

When winding or knitting, the ends of yarns can be best joined to one another by a weaver's knot (see Fig. 13). This knot is the most suitable for the purpose, but others can be made.

PLAIN SOCK, commenced at the TOP (Circular Web).

ADVICE TO LEARNERS:—DO NOT BE AFRAID, BUT GO TO WORK WITH CONFIDENCE, AND NEVER MIND A FAILURE OR TWO.

NOTE.— The following instructions to page 17 *refer to knitting with the plain Mac. alone, that is, without the ribber being attached to it. Instructions for working the ribber will be found on pages* 21 *and* 22, *but the learner is strongly advised not to attempt to work the ribber until some knowledge has been gained in plain work, and in working the plain Mac.*

CAUTION.—1. On no account alter any screws or tension-pointers unless instructed to do so.

2. Only turn the handle very slowly, when the needles have no loop upon them, as otherwise the latches may jump up and be struck by the latch-opener. If the latches are bent they will not act, and the yarn will gather about the hooks and thus cause the fabric to be full of holes, and make the machine very difficult to work. If there should be by chance any bent or stiff latch, straighten it with the finger and thumb at once (without taking it out of the cylinder) so that it opens and closes FREELY AND FULLY.

ABBREVIATIONS.

Mac. = Machine.
Y.G. = Yarn-guide.
N. = Needle.
Ns. = Needles.
Cyl. = Cylinder.
C.R. = Clasp-ring.
S.U. = Set-up.

(1.) ROUGH SELVEDGE.
When making hosiery, &c., a "Rough Selvedge" is employed to avoid the irregular loops which would otherwise appear if the work was started direct from the S.U. It should be of a different coloured yarn from that used for the actual sock, &c., as, after the article is knitted, the "Rough Selvedge" is unravelled, or cut away, and the division can in this way be easily distinguished. Thus it is not necessary that S.U. should have same number of hooks as there are grooves in Cyl.

SETTING WORK ON MACHINE.

(ROUGH SELVEDGE) FOR CIRCULAR WEB.
(See Margin 1.)

Ns. to be in all the Cyl. grooves. Employ light-coloured odd or old yarn (see Margin 2).

TENSION-POINTER to be at about "5" for 3 or 4 ply Fingering yarn (see Margin 3).

Turn handle FORWARDS (see Margin 4) slowly once round until Y.G. is at **"Back"** (see Margin 5). Place a bobbin of odd yarn on the table directly under one of the holes in the forked end of yarn-cross (as shown in Fig. **3**, page 2); take end of yarn and pass it upwards through that hole, onwards through the hole in centre of yarn-cross, then underneath small tension-shield (near

(2.) WHERE TO BEGIN SETTING "ROUGH SELVEDGE" FOR CIRCULAR WEB. This can be commenced at any point on the Cyl., as the Y.G. will travel the entire circumference of the Cyl.

(3.) TENSION OR LENGTH OF STITCH. Learners should always work Mac. with a loose tension until experience has been gained. The loosest tension is "6." Never put tension at "1" or "2" excepting for knitting very fine yarns upon fine Cyls.

The tensions given in the following pages are simply to guide the beginner. A skilled knitter decides by experience which tensions are most suitable for the several parts of a sock, &c.

(4.) MOTION and SPEED OF MAC. The plain Mac. will knit when handle is turned in either direction, but in Circular Web it is more convenient to turn the handle so that the Y.G. moves FORWARDS, that is to say, the Y.G. moves FORWARDS if it travels in opposite direction to the hands of a clock, and BACKWARDS if it travels in the same direction as the hands. Thus, supposing the handle is in the position shown by Fig. 3, page 2, and you press it downwards and continue the revolution, that would be FORWARDS.

(The driving-handle must never be turned BACKWARDS when the ribber **is in action.**)

When work is set on the Mac., the revolutions of the driving-handle may be about 75 per minute, or faster, in the hands of an expert knitter.

(5.) Definition of **"FRONT," "RIGHT," "BACK," "LEFT."**

"RIGHT" (see Fig. 3, page 2). —On the Right side of the Cyl. you will find one of the posts (division between the grooves) filed off at the top; this post is the "Right half mark" and will in the following be called "Right."

"LEFT."—Likewise on the Left side of Cyl. there is a post filed off at its top, and will in the following be called "Left."

"FRONT." — The word "Front" signifies the Cyl. post which is midway between the "Left" and "Right" (really the post nearest the operator).

"Front half" is that part of Cyl. which is nearest the operator, and extends from "Left" to "Right" half marks.

"BACK."—The word "Back" signifies the Cyl. post which is the farthest from the operator, and midway between "Right" and "Left."

"Back half" is that part of Cyl. which is farthest from operator, and extends from "Right" to "Left" half marks.

Right half is the part of Cyl. from "Front" to "Back" at the right of the operator.

"Left half" is the part from the "Front" to the "Back" at the left of the operator.

(6.) LOOPS & STITCHES. —A loop is the portion of thread hanging round the N.; a Stitch is the loop which has passed off the N.

(7.) Yarn may be looped once or several times under any hook in S.U., so long as the hook is nearest to the N. being looped, and hooks must be passed if they are not wanted.

(8.) Latch of N. is OPEN when the cup at end of latch points downwards and rests upon the stem.

Latch of N. is CLOSED when the cupped end rests upon the hook. **Latch should open and close freely—if stiff or bent, straighten with finger and thumb, and whilst in Cyl. Bent or Stiff latches cause holes to be made in the fabric, and make Mac. difficult to work.**

(9.) If the yarn should rise or be loose round the Ns. when working Mac. this may be due to insufficient weight, or too tight a tension for the yarn used. First apply more weight by pulling down S.U. with left hand, then lower tension for a looser stitch if necessary, but be sure to screw up the wing-nut firmly after having altered the tension. After the first row of loops is laid on the Ns. (as instructed for "Rough Selvedge"), the Mac. will form its own loops over each N.; but if by accident two adjacent Ns. have been missed, raise one of the Ns. fully out of action, knit twice round, then depress that raised N. and continue knitting, when a loop will be formed upon each N. This only refers to "Rough Selvedge." **(When Knitting hosiery, if there should by accident be any dropped stitches, they must be picked up as directed on page 17.)**

(10.) From this point the **learner** should continue knitting a number of rows for practice, or run work off Mac. for the purpose of setting "Rough Selvedge" again.

But before running the work off the machine, first see if the Ns. have all made regular stitches in the last rows, which you can readily observe by the end of arm with the three holes), down through the centre hole of the three, down to and through the hole in Y.G., to the hooks of Ns. in Cyl.

Then drag loose through the Y.G. into the Cyl. about $1\frac{1}{2}$ yards of the yarn for setting work; put S.U. inside the Cyl. with large centre hook pointing downwards; hold it by its large hook with the left hand underneath Mac., so that its small hooks are just a little below top inside edge of Cyl. (see Fig. **14**). No notice need be taken of the base roller-bracket as the S.U. hooks will adjust themselves round it. With right hand take hold of the loose yarn near to the Y.G., pass it direct from Y.G., and between the two Ns. which are nearest to Y.G.; loop (see Margin 6) yarn to nearest hook in S.U. (Fig. **14**), then round the second N. FORWARDS, back to the nearest hook in S.U. (see Margin 7), and so on, working FORWARDS in this way, that is, missing a N., and looping yarn to every second N., and back from each second N., to the hook in S.U. that happens to be nearest to each alternate N.; **continue looping only until you reach the depressed Ns.**

Now hang weight-holder with two or three weights on to the centre hook of S.U.; **see that latches of Ns. are all open** (see Margin 8); assist to pull S.U. down by pressing the left hand slightly upon the weight-holder underneath the Mac.; then, turn handle FORWARDS so as to bring Y.G. round to **"Front"** (in same direction as looping was done), and stop there. This will cause the depressed Ns. to rise level with those already looped. Continue looping the yarn as before, round the alternate Ns. that are now raised, and the hooks of S.U. When the last N. is looped, the unused end of loose yarn can be looped round **each** of the next two or more Ns., upon which you commenced, to keep the looping of the last Ns. firm; lay unused end of yarn inside S.U. **See that all latches of Ns. are open;** pull S.U. well down with left hand pressed upon weight-holder;

For Abbreviations of Words, see Margin, page 9.

turn FORWARDS, until about 6 rows have been knitted (see Margin 9), then stop Y.G. at **"Front"** (see Margin 10), and proceed.

TO SET CORRECT SELVEDGE (for Circular Web).

First, raise plain (Cyl.) Ns. out of action thus:—(see Margin 11) take N. lifter and with it begin at **"Right"** half mark (see Margin 5) and raise fully out of action all **"Back"** half of Ns.; turn handle and send Y.G. FORWARDS to **"Back"**; raise out of action all **"Front"** half of Ns. Break

Fig. 14.



This figure shows the direction the yarn should be taken in setting "Rough Selvedge." Some of the odd yarn is first drawn through the Y.G. (96) for looping, then it is passed from the Y.G. under nearest hook of S.U. (78) and round each alternate N. FORWARDS.

For Abbreviations of Words, see Margin, page 9.

glancing your eye round the work. If there is any irregular line of stitches down the work, you may be sure the latch of N. is bent or stiff—straighten it until it opens and closes freely and fully. Then knit a few rows more and satisfy yourself that all the Ns. are in good order. After which you can continue knitting for a time, and then make a Heel, as directed on pages 14 and 15, from "Heel narrowing," to end of "Heel widening." Now run work off as follows:—Break yarn just before the yarn-guide (C of Fig. 14), hold weights with left hand to prevent their falling to the floor; turn handle once or twice, when the work will leave Ns.

Practise the "Setting of work," knitting and making the "Heel" until somewhat proficient.

It should be noted here that if the yarn runs out or breaks, or if you want to join another yarn, it is not necessary to set the work again if there are loops still on the Ns., but simply to tie it to the existing yarn or lay it direct from the Y.G. into the hooks of the Ns., commencing with the N. which made the last stitch. Be careful, however, to see that the yarn does not lie loosely between the Y.G. and Ns. or it may not feed into the hooks of the Ns., and as a consequence the loops will run off the latter. To avoid this, draw any loose yarn back through Y.G. or, in other words, see that the yarn always passes in a direct line from Y.G. to the N. next to the one which is to receive it. If any loops should drop, you can pick them up with a spare N. and replace them on their own Ns.

(11.) To raise plain Ns. out of action is to lift them in the Cyl. grooves as far as they can be raised, when butts will touch underside of C.R., and in this position the butts will escape the cams. The raised Ns. should be level with one another.

(12.) "Back of N." faces inside of Cyl.; "Front of N." is the hook and latch side, and faces outwards.

the yarn near the Ns. and place loose end inside S.U.

Remove bobbin of odd yarn; put in its place (directly under the hole in yarn-cross), the bobbin of new yarn to be used for the sock. The beginner should use a light-coloured yarn.

Thread yarn-cross and Y.G. with the new yarn as before, and pull about a yard of it through the Y.G.

Take the end of this new yarn and fold, or turn about two inches round, so that it is double, and so forms a loop (do not tie a knot); hold this loop between the thumb and forefinger of the right hand; place the loop over the N. which made the last stitch at **"Right"** half mark; keep this loop in its place by a finger of the left hand, pressing it upon the Cyl. and back of N. (see Margin 12, and Fig. **15**); then take the yarn (which will now be double for a few Ns. by reason of the loop) across the **back** of the next N. FORWARDS, round its right side, across its front, in at its left side, across its back; on to the next N. FORWARDS, across its back, round its right side, across its front, round its left side, across its back; on to the next N.; and so continue in the same manner, really twisting or winding the yarn once round each N. If this is done correctly, the **thread connecting each N. will be at back of Ns.**

The yarn will thus be drawn off as required for laying on the "Correct Selvedge," through the Y.G., and yarn-cross, from the bobbin. The last N. to be looped (twisted) with the new yarn for the "Correct Selvedge" is **next to the N.** on which the last stitch of "Rough Selvedge" was knitted. The yarn should be twisted in the manner described above, round that last N., and passed between it and the first N., direct to Y.G. (see Fig. **16**). See that the Ns. are **all fully up** and even all round.

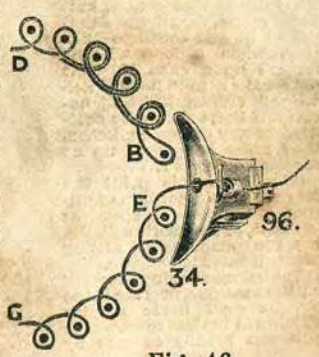


Fig. 16.

Hold with the fingers excess of new yarn away from Ns.; turn handle and send Y.G. slowly FORWARDS to **"Front"**; now push down into action the first N. upon which the "Correct Selvedge" was commenced, and continue in the same direction as Selvedge was done to put down into action all the **"Back"**

Fig. 16 illustrates more clearly the direction in which the yarn is looped round the Ns. at the beginning and end only of the "Correct Selvedge."

B. represents the N. on which the last "Rough Selvedge" stitch was made and on which the looping for the "Correct Selvedge" is commenced. It must be understood that, although Fig. 16 does not show it, the looping is continued (from D to G) in the same manner and direction, round all the Ns. in the Cyl. and without breaking the yarn.

It is very important to notice, after all the looping has been completed, and back half of needles have been put down into action and the Y.G. is sent FORWARDS until it is opposite the first Ns. in action, that the loose yarn must be pulled back to the bobbin so that the thread passes from the last N. looped (E) direct to the Y.G., that is to say, the thread must not lie loosely between the Ns. and the Y.G.

(13.) After "Setting Correct Selvedge" there are two loops on every N. (that is, the last loop of the "Rough Selvedge," and the first loop of the "Correct Selvedge") and in knitting round that first row, more force is required than when there is only one loop on each N.

For that first row of "Correct Selvedge" it is a good plan to gently move the shell forward a few Ns. at a time by little jerks or thrusts of the handle.

(14.) The instruction up to this point is the same for a sock or a stocking, &c., commenced at the top. But for practice only, the learner will do well to continue knitting a few rows, then run this work off the Mac., and expose the "Correct Selvedge," thus:—Knit say thirty rows; then break yarn between the Y.G. and yarn-cross; hold weights by left hand, and turn the handle until the fabric leaves the Ns.; then, to expose "Correct" Selvedge (after running fabric off Mac.) remove S.U., place damp cloth upon Selvedge, press with hot iron; cut "Rough Selvedge" through with scissors; unravel. Afterwards repeat several times the

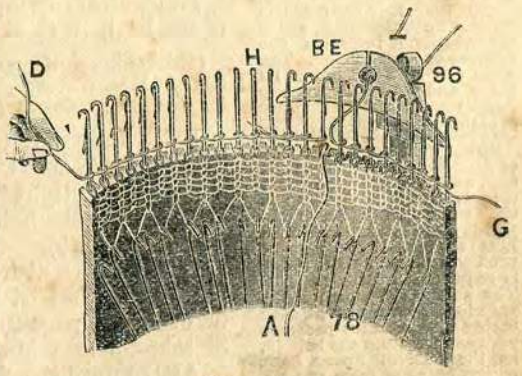


Fig. 15.

Fig. 15. This illustration shows a section of the Cyl. and Ns. with the "Correct Selvedge" commenced on the last N. which made the last "Rough Selvedge" stitch.
A. is the end of the old yarn.
B. is the N. on which the first loop of the new yarn is placed. E. is the last N. looped.

half of Ns.; **see that all latches are open.** Still hold away from Ns. the excess of new yarn, and drive FORWARDS until Y.G. is opposite the first N. in action; then draw back excess yarn to bobbin, and see that yarn passes direct to Y.G. from the last N. round which it was twisted, that is, the yarn must pass between the Ns. E. B., as shown in Figs. **15** and **16**. Keep S.U. well pulled down by assisting it with the left hand; now be careful to see that yarn feeds into the first N. in action, and knit FORWARDS until Y.G. is at **"Back"** (see Margin 13); put down **"Front"** half of Ns. and knit FORWARDS to **"Left"** half mark (see Margin 14).

A

Top of Sock. Tighten the tension 1 degree; set the counter to 0 (see Margin 15); and knit FORWARDS about 50 rows.

Leg. Loosen the tension 1 degree; set

whole "Correct Selvedge" operation from "Setting Work on Mac." (page 9). Try to be quicker each time. Repetition in this as in other parts of the work is strongly advised. There need be no waste of yarn —you can unravel and wind again the yarn already used.

(15.) Each Mac. has fitted on its base a counter-plate, which revolves and indicates the number of rows knitted. The plate can be lifted out of its place and adjusted to any point required. The Counter is only used for Circular Web.

(16.) "Take-up" is the part of yarn-cross with hook at one end, and ball near the other (Fig. 3, 64). **The Take-up is used when working Y.G. Backwards and Forwards, as for a heel or toe. It can also be used when a very tight stitch is required in Circular Web.** The shield (65) pinches the yarn to the yarn-cross at each taking up, and thus prevents yarn coming from the bobbin, as the take-up draws back excess of yarn from the Ns. The ball is adjustable when required to give more or less weight, for coarse or fine yarns.

(17.) When knitting on part of the Ns., such as the half, and working the Y.G. BACKWARDS and FORWARDS as for narrowing and widening to make the heel and toe, or for Flat Web work, the Y.G. should be sent to the **"Back"** each time across (FORWARDS or BACKWARDS), as this will ensure that the last N. in action at either side makes its stitch and rises level with the others. As the Ns. are raised out of action for the narrowing, the Y.G. must not be sent so far to the **"Back"** each time, because the Y.G. will draw off more yarn than can be pulled back by the take-up; in which case when the Y.G. is returned, the yarn would lie loosely between the Y.G. and Ns.; and in all probability it would not feed into the end Ns. and they would slip their loops. If at any time the take-up does not pull back all the excess of yarn, before you knit catch hold of yarn with the hand, just by the bobbin, and draw it back.

(18.) **Heel-wire and weight.** After having raised a few Ns. on each side for narrowing the fabric (as in making the heel or toe), the weights will be found to pull unevenly upon the fabric, and the loops will rise about the Ns. This can be prevented in two ways, thus:—

(*a*) Grasp the fabric with left hand from under the Cyl. and press it in the opposite direction to which the Y.G. is travelling, so as to ensure extra pressure to pull the loops well down upon the Cyl., or

(*b*) Instead of the hand, hook heel-wire into the fabric 7 or 8 rows below the top of Cyl., and hang on to the heel-wire the other weight-holder, with one spare weight. The hooks of the heel-wire should be extended and placed, say at about the fourth N. within the end Ns. in action on either side of the heel, and should be shifted up the fabric—say at every fourth row—and at each grip, the hooks brought closer together as the knitting advances.

Sometimes when working the heel, **the end N.** will be found not to knit, which is caused by the fabric not being pulled down sufficiently. This can be remedied by putting the hand underneath the Cyl. and pulling the fabric from side to side, and in that way press it **from** the Y.G. If a stitch has been missed, the C.R. must be opened, the N. taken out, and the stitch caught in the hook and knitted up before raising the N. (see page 17, "How to pick up dropped plain stitches").

The fabric, particularly at the end Ns., will be faulty when working the heel (or toe) **if the yarn lies loosely between the Ns. and Y.G.** This arises generally through sending the Y.G. too far beyond the last N. in action and in that way drawing off more yarn than can be pulled back by the take-up; or it is caused by the take-up not acting properly, **not drawing the excess yarn back fully,** and so allowing the yarn to lie loosely between the Y.G. and the Ns. (see Margin 17); or, if the take-up is acting all right, the shield does not pinch the yarn on to the yarn-cross, and so does not prevent it coming from the bobbin at each take-up. The cause of this may be that the ball needs adjusting, to give take-up more leverage and quicker action. Lower ball towards the end of the rod.

(19.) The reason for putting the yarn behind the (2) Ns. each side of the half mark is to prevent a small hole at the corner of the heel (B of Fig. 17). **The yarn is not put behind the two Ns. at the end of Toe-Widening.**

(20.) The four rows are really extra rows, and will be unravelled for the "Mending Stitch."

the counter; and knit FORWARDS 55 to 60 rows.

Ankle. Tighten the tension 1 degree; set the counter; knit FORWARDS 30 rows, and stop Y.G. at **"Front."**

Heel—Narrowing. This is the portion of the heel, B. C. E. on Fig. **17** (page 17).

(Thickening yarn can now be joined and worked to end of "Heel Widening"; loosen tension one degree for this. See "Knitting with two yarns" (page 44).

Raise fully out of action the **"Back"** half of Ns. (a small piece is filed off top of a post on **"Right"** and **"Left"** side of Cyl. to mark the half, and so save counting —see Margin 5).

Lift the yarn at front of small shield on yarn-cross (that is, lift it between 66 and 62 of Fig. **3**, page 2), and put it into hook of take-up (see Margin 16). Knit FORWARDS until the Y.G. is at **"Back."**

✱ Then lift fully out of action the **"Right"** end N. (that is, the first N. in action on the **"Right"** side, next those already raised out of action); knit BACKWARDS until the last N. in action on **"Left"** has made stitch (see Margin 17). Lift fully up the **"Left"** end N. and knit FORWARDS to **"Back"** until last N. in action on **"Right"** has made stitch; now lift out of action at the **"Right,"** the N. next to the one last raised and knit BACKWARDS to **"Back"**; raise the last in action on **"Left"** and knit FORWARDS to **"Back"**; insert heel-wire and attach to it the other weight-holder with a spare weight (see Margin 18); continue raising a N. (the last N. in action) every row across, and knitting BACKWARDS or FORWARDS until only 14 or 16 Ns. remain in action at **"Front"** of Mac. (the last N. to be raised will be at **"Left,"** then knit FORWARDS to **"Right"**).

(*If it should happen at any time, that the weights, through the long length of knitting, almost touch the ground, take off the S.U. with the holder and weights attached to it then fix the buckle on the work close up to the Cyl.* (85 *in Fig.* **3**) *and transfer the holder and weights to the buckle. See that the weights never touch the ground when working Mac., or the loops will rise up the Ns. and cause the yarn to gather about the Ns. instead of knitting.*)

Heel—Widening. This is the portion of the Heel B. E. F. of Fig. **17** (page 17).

Y.G. will be between **"Right" "Back"**; now at that **"Right"** side depress the N. last raised (which is next to those in action); lift the yarn from the front or hook side and put it behind that N., so that the yarn comes out from between the N. just depressed and the next raised N., direct to Y.G.; (**see that latch of N. is open, or stitch will drop**); knit BACKWARDS to **"Left"** until last N. in action has made stitch, and risen level with others in action; then depress the corresponding end N. on **"Left"** side; place yarn behind it as before; knit FORWARDS; repeat, depressing one N. at same side as Y.G. is at rest, every row across (and always put the yarn behind the N. that is depressed each time, and see that latch is open), until you come to the first N. raised for the narrowing on the **"Right"** (which is next to the **"Right"** half mark on Cyl.), and instead of putting the yarn behind that N. alone, put it also behind the next N. to it, that is, the first N. of the **"Back"** half (see Margin 19); depress the one N. as usual and knit BACKWARDS to **"Back"**; place the yarn behind the two corresponding Ns. at **"Left"**; depress the one as usual, and knit FORWARDS stopping Y.G. at **"Front."** ⋕ Lift yarn from take-up; put down into action all **"Back"** half of Ns.; break thickening yarn at Ns.

Foot.—Set the counter to 0; knit FORWARDS about 65 rows, and stop Y.G. at **"Front."**

Toe—Narrowing. H to K of Fig. **17.** Thickening yarn can now be joined if desired.

Proceed as directed for "Heel-Narrowing" above, until there are 14 Ns. only left in action.

Toe—Widening. K to L of Fig. **17.**

Proceed as directed for "Heel-Widening" above, except that when you come to the last N. to be depressed each side, put the

yarn behind that one N. alone (at the end), instead of placing it behind the two Ns.; after depressing and putting yarn behind the end N. at "**Left,**" knit to "**Front**" and depress the "**Back**" half of Ns.; lift yarn out of take-up (and break thickening yarn at Ns.); knit FORWARDS 4 rows round (see Margins 20 and 27, pages 19 and 24); break yarn at Ns.; remove all weights; hold down fabric with left hand and turn handle for one or two rows round, when work will leave the Ns.; remove S.U. (or buckle) from the fabric.

Joining the Toe. Place damp cloth upon the toe, and well press with hot iron, and sew up with the "Mending Stitch."

Mending Stitch. Take the end of the yarn and draw it to unravel the extra rows, but do not break the yarn; thread a small darning N. with the unravelled yarn and sew toe across as follows (see Fig. **18**, page 17) :—

Care should be taken not to draw the stitch tighter than the knitted web, and not to sew through or split the thread of yarn, or miss a loop.

Take the first and second loops at the corner of the opening **on one side,** and pass the N. clean through them (in the first and out of the second loop), draw the yarn through them; then in exactly the same way pass N. through first and second loops **on the other side;** now return to **the one side,** take the second and third loops, pass N. through them (in the second loop and out of the third); proceed to the other side and do likewise, that is, taking one new loop each time—first passing N. in the centre of last loop and out of the new loop. With very little practice, and if done as here directed, the joining, when finished, will appear the same as the other stitches in the work.

Finishing the Sock. Separate the "Rough" from the "Correct Selvedge" thus :—

Take hold of the end of the rough yarn which was placed inside the sock before commencing "Correct Selvedge," and draw it out until it breaks, when the selvedges will separate; or, the "Rough Selvedge" may be cut through and the odd yarn unravelled.

Now place the sock-block inside the sock; put damp cloth first upon one side of the sock, and well press with hot iron, and then do same on the other side, and so finish.

ILLUSTRATION of a SOCK (commenced at the top) as it leaves the machine, after unravelling "Rough Selvedge" and four rows at the toe.

Fig. 17.

For beginners, this form of sock (Fig. 17) with the opening at the toe is the simplest. The toe, when closed by hand as directed, should show no join; the "Mending Stitches" will be the same as the Knitted Stitches.

Experienced knitters finish the toe on the Machine hand-knit fashion, as directed elsewhere, or they make socks and stockings completely "Commencing from the toe."

Fig. 18.

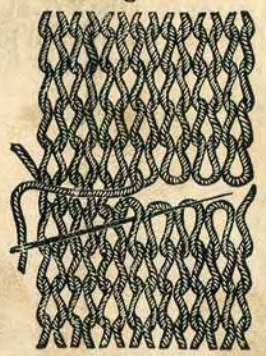




Fig. 17.

EXPLANATION.

Fig. **17** shows the sock after the four extra rows are unravelled at A (see pages 15 and 16) and ready for joining.

Fig. **18** shows the "Mending Stitch" or the mode of joining at A.

DROPPED PLAIN STITCHES—TO PICK UP.

Take off C.R.; lift weights of the fabric; hold or push the fabric up so as to have the dropped stitch above the top of the Cyl.; take out the N. where stitch has dropped; then crochet the stitch up as follows :—

Pass hook of the N. over the top of Cyl. and then between the fabric at the dropped loop, and catch the loop into hook of N.; push the N. forward so that the loop goes beyond or over the latch; catch into the hook the cross thread (which connects the stitches of the rows on both sides of the dropped stitch); then draw the N. back until loop passes off the hook. Continue, until you have the stitch fully knitted, and then place the N. back into its groove in Cyl. with the loop below the latch, and see that latch is open; put on C.R.; attach weights, and resume knitting.

Observe. Dropped stitches in plain work may be due to one of several causes, for which see pages 67 & 68 ("FAULTS & REMEDIES," E. 24, 25, 28, 29).

PLAIN SOCK with Imitation RIBBED TOP. (Ribber not to be used.)

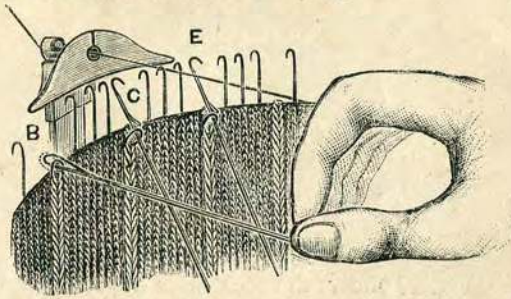
The tension to be as tight as will work easily, say at 4½.

Arrange all Ns. in the Cyl. in groups of 3, with one empty groove between each group (3 in and 1 out) all round; put on C.R. Set "Rough" and "Correct Selvedges" as directed on pages 11 to 16; knit FORWARDS 40 rows of imitation rib; take off C.R., put Ns. into all the empty grooves, first catching into the hook of each N. a loop from the side of the last stitch made at back of nearest N. (turn handle FORWARDS a little to advance shell and allow Ns. to be inserted where the cams lie); put on C.R.; loosen the tension one degree (but screw up wing-nut firmly afterwards); knit FORWARDS 50 rows plain; then, to reduce the size of the ankle a little, put tension one degree tighter, and knit 30 rows more; stop the Y.G. at "**Front.**"

Complete HEEL, FOOT and TOE as for "Plain Sock," pp. 13 to 16.

The above may be varied by leaving out every 4th or 6th N.

PURL RIB WITHOUT RIBBER. Fig. 7a.



Place Ns. in all Cyl. grooves; set Rough and Correct Selvedges for circular or flat web; take out every 3rd N. with its loop, and turn it inside Cyl.; draw the N. so that its loop is near, or under, the latch, its hook to rest over the empty groove and to point upwards as illustrated;—or

You can place the Ns. in groups of 3, 4 or 6, with an empty groove after each group; set the selvedges and knit 1 row; then take a spare Cyl. N. to use for the purl rib, and from the inside of Cyl. pass it under the Correct Selvedge thread which is over the empty grooves until it is beyond the open latch; now catch into its hook the thread above; draw N. until the selvedge thread closes the latch and passes off the N., when a purl stitch will be made. Leave the N., with the new loop beyond the latch and the hook uppermost, ready to receive the yarn from the Y.G.; do this all round; knit about two-thirds round, or knit across, and this will leave a line of yarn over the latch (or in the hook) of each purl N., as represented at E. This yarn must be knitted into a loop by drawing back each purl N. with the thumb and finger, as represented at B, and pushing it forward into a position to receive again the yarn from the Y.G. at the next round. Knit thus about two-thirds of a round at a time, stopping to knit in the purl loops, until the required length of web has been knitted. To change to plain work, turn each purl N. round and insert in its proper groove; and knit in the usual manner.

DESCRIPTION OF THE RIBBER.

(Refer to Figs. 3, 4, 19, 20, 21, 22, and 23, on pages 2, 3, 19, 20.)

The ribber consists of the arm (46), spindle (47), cam-plate (53), dial (50), driving-pin (49), hexagon-nut (48), and dial Ns. (Fig. 22).

The arm carries the whole of the above-mentioned fittings, and when the ribber is to be used, it is fixed by the wing-nut (45) to the shell (4).

The spindle passes through the cylindrical head of the arm and sustains the dial, which is held on the spindle by means of the hexagon-nut (48). The dial is grooved to take the rib Ns., and usually has just half the number of grooves that there are in the

Cyl. At the under side of the dial will be found the ball-roller (98), which works against the base bracket-roller (97) and by which the dial is held loosely in one regular position (without revolving with the arm and cam-plate) when handle of Mac. is turned. (*The number of grooves in a dial is stamped on its under side.*)

Fig. 19.

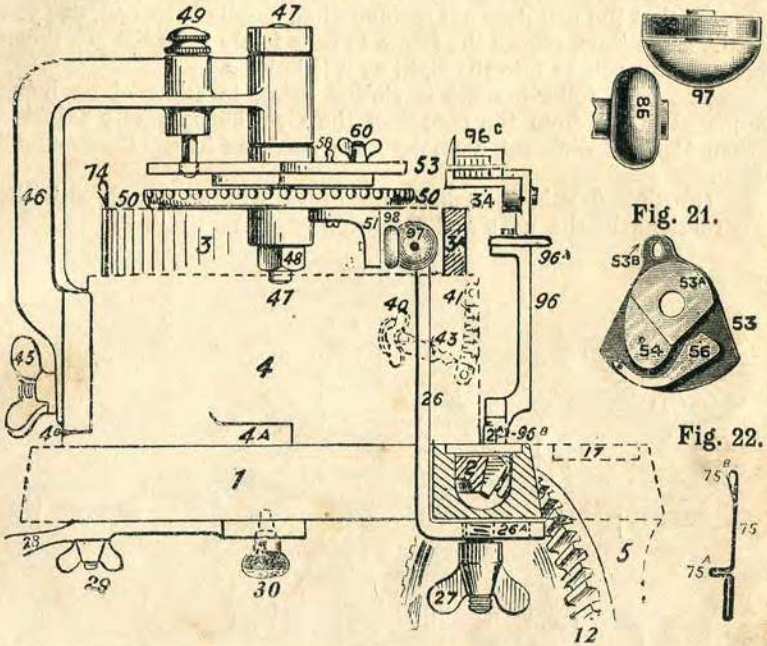


Fig. 20.

Fig. 21.

Fig. 22.

Fig. 19 shows the ribber in position on the Mac., with the dial-roller (98) pressing loosely against the base bracket-roller (97), and with the arm (46) resting on the shell ledge (4B) and fixed to the skell (4) by the wing-nut (45).

Fig. 19a shows the dial and its roller (98).

Fig. 20 shows more clearly the position of the dial-roller (98) in relation to the base bracket-roller (97); the space between the rollers (see Margin, 21) represents the thickness of the fabric as it passes between the rollers.

Fig. 21 shows the cams (54 and 56) on the cam-plate (53), the spindle-hole (53A), and the lug with driving-pin hole (53B). The tension-pointer is connected with the inthrow or ribber stitch cam (56).

Fig. 22 is a dial or ribbing needle (75), showing the butt (75A), and hook and latch (75B).

The cam-plate (Fig. 21) revolves round the spindle above the dial, with the two cams (54 and 56) which actuate the Ns., in the grooves. On the top of the cam-plate is the tension-pointer (58), and wing-nut (60), for the ribber-tension (to regulate or adjust the length of the rib stitch).

The dial N. has its butt nearly at its middle, and the N. is shorter than the Cyl. N. (See Figs. 22 and 30.)

The driving-pin passes first through the small hole in the top of the ribber-arm (near its head), then the point of it passes into the hole provided for it in the lug, or tail-piece, of the cam-plate. The

pin connects the arm to the cam-plate, and by this means the cam-plate is made to revolve with the arm.

The base roller-bracket (26) is stationary, and is held to the underside of the base of the Mac. by means of the stud and wing-nut (27). On the top of the bracket will be found the roller (97). When the ribber is fixed and in position the ball-roller under the dial (98) **presses loosely** against this bracket-roller (97), and so secures that the dial does not revolve when handle is turned, and yet, at the same time, allows the fabric to pass freely from the Ns. down between the rollers into the Cyl., as it is knitted.

The base roller-bracket is slotted (26A), to allow of its being adjusted to and from the centre of the Cyl., but it is only adjusted when Cyls. of different diameters are used, as in a "Compound" Mac.

(Further details regarding the ribber will be found with the instructions in the next and following pages.)

Dial 23b.



Fig. 23.

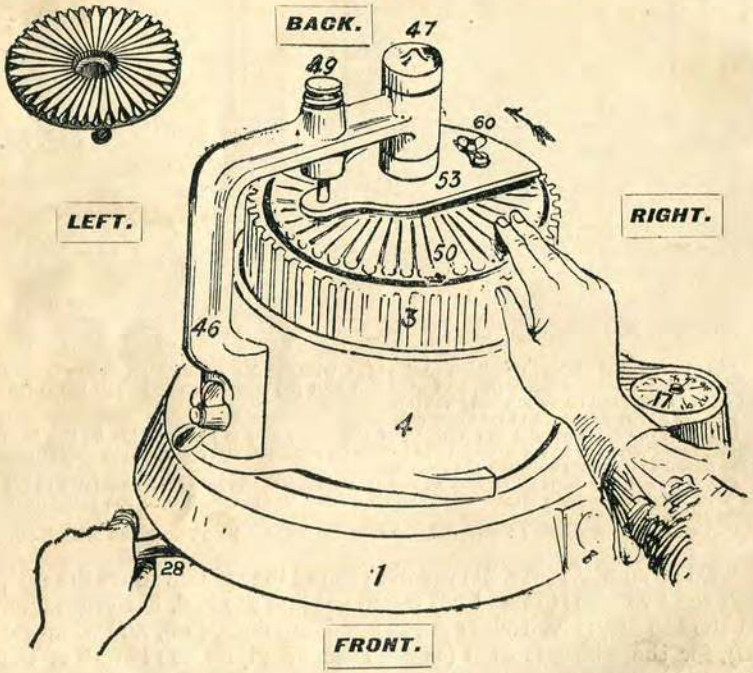


Fig. 23 shows the mode of adjusting the Cyl. (3) to the dial (50) after the ribber has been fixed. The right hand is placed on "**Right**" side of dial, and dial pressed to "**Back,**" as shown by the arrow; then, at the same time, **and whilst pressing dial,** unscrew wing-nut (29) of lever with left hand, and slightly press or pull lever (28) until the grooves in dial are directly opposite the Cyl. posts or grooves for the rib required (see Margin 23, and "Table to produce certain ribs," p. 37). Release right hand, without moving dial, and screw up wing-nut (29) firmly, to hold lever (28) to the point adjusted; lever should be left about midway of its adjustment, and never pulled or pushed to the extreme ends of the slot.

PLAIN SOCK with RIBBED TOP (commenced at the Top).

Before commencing to work see page 71, "Yarn-Guide and Latch-Opener."

Mac. with 4½ in. dia. 72 or 84 Cyls. and Dials to match. 4 or 5-ply Merino, 4-ply Fingering, or similar yarns. Plain tension at 5. Ribber tension at 4½. Top: 60 rows, 1 plain to 1 rib. Leg: 50 rows, plain. Ankle: 30 rows, plain. Foot: 65 to 70 rows, plain, according to length required.

Fig. 23c.



The following instructions will also apply to the 3¾ or 4⅛ in. dia. Cyls. and Dials, excepting that the number of rows would be less for the smaller hosiery. Plain tension at 4½. Ribber tension at 4½. Top: 40 rows, 1 plain to 1 rib. Leg: 30 rows, plain. Ankle: 20 rows, plain. Foot: 40 rows, plain.

(21.) The object of the rollers is to provide that the dial shall be held regularly in one position without revolving with the shell and ribber-arm, and, at the same time, to allow the fabric as made to pass freely (see page 18, Fig. 20, and explanation on pages 19 and 20).

(22.) It sometimes happens through interference that the dial-roller overlaps the bracket-roller so that it bears against the centre of the bracket-roller. This would have a tendency to retard the passage of the fabric, through one of the rollers not revolving. To remedy such a difficulty, very slightly loosen the wing-nut which holds the bracket to the base of Mac., and put bracket nearer to the Cyl., that is, adjust the bracket so that when it is fixed by its wing-nut the top of the bracket is close up to but not pressing against the Cyl.; screw up wing-nut firmly, then try the ribber again. The correct position of the rollers is shown by Fig. 20.

(23.) The Cyl. can be adjusted so that dial Ns. will work either over the posts or the grooves of Cyl., to make other forms of ribbed fabric. (For further particulars, see "Table of Ns. to produce certain ribs," p. 38.)

Selvedges. Ns. to be in all the Cyl. grooves; ribber off the Mac. Set "Rough" and "Correct Selvedges," as directed on pages 9 to 13 up to and including "Knit FORWARDS to '**Right**' half mark (A., page 13).

Ribber—To fix it upon the Machine.

Refer to Figs. 19 and 23.

First see that there are no Ns. in dial grooves, then notice the ball-roller (98) under the dial, and also notice the roller (97) at top of bracket (26), which stands up from the base (1) inside Cyl. (3). The dial-roller should press loosely against the bracket-roller (see Margin 21) when ribber is properly fixed to Mac. as follows:

Take hold of the head of the ribber-arm (46 of Fig. 23a) with the left hand; place the slotted end over the large projecting screw on the shell; press slotted end of arm well down on to ledge (4A) of shell; screw up wing-nut (45) with

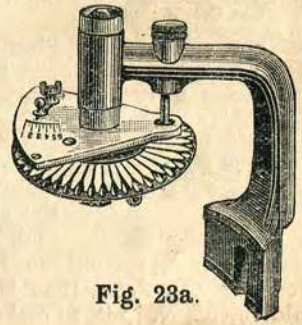


Fig. 23a.

the fingers to hold ribber-arm firmly to shell. Now place fingers of right hand on right side of dial and push it FORWARDS until it will revolve no further—that is, until the two rollers meet (see Fig. 20, and read Margin 22).

(24.) The object of placing the fingers upon the "**Right**" side of dial and pressing it from you, is to ensure the dial being in its normal or regular working position—that is to say, pushed FORWARD as far as the rollers will allow it to go. Unless this is done at the same moment the Cyl. is adjusted, it will be found that the dial will work out of place, and in some cases cause the dial Ns. to rub against the Cyl. Ns. and cut the yarn, or push out and damage the Cyl. Ns. **If the wing-nut holding lever has not been screwed up firmly, the same troubles will happen.**

(25.) To transfer loop from Cyl. N. to a dial N., first see that Cyl. and dial are in position as directed for "Adjusting Cyl. to dial," then take off C.R.; put a dial N. into that "**Right**" dial groove; draw out the Cyl. N. when loop will go beyond the latch; hold it by its butt and place (link) its hook into hook of dial N.; tilt it, so that the loop closes the latch and slips off the Cyl. N. **into the hook** of dial N.; see that loop does not go below the latch of dial N.; leave Cyl. groove empty. Continue FORWARDS to transfer, but after inserting a few dial Ns. into the dial, it will be necessary to turn handle, and advance the Y.G. a little, then transfer a few loops and advance Y.G. from time to time, so as to have the grooves free for placing the Ns. into them; the object of advancing the Y.G. a little each time, is to move the cams (54 and 56 of Fig. 21) out of the way for the Ns. to pass well into the dial grooves.

(26.) To transfer loop from dial N. to Cyl. N.:—put hook of an unemployed Cyl. N. into hook of dial N. and pull the dial N. out of dial until loop goes well beyond (over) latch, then lift dial N. until loop passes on to Cyl. N.; place Cyl. N. in corresponding Cyl. groove. It is of no consequence if the loop goes below or under the latch in this transfer so long as the latch is open to allow the yarn to feed into the hooks when you knit. The dial Ns. in the cams cannot be drawn out until the handle has been turned, and the Y.G. advanced a few Ns. at a time.

Adjusting Cylinder to Dial.

After fixing the ribber and revolving the dial to its position, as stated above, it may be necessary to adjust the Cyl. The dial Ns. must work directly over the centre of Cyl. grooves to make one plain stitch to one rib stitch for the top of the sock (see Margin 23). Notice the Cyl. lever (28 of Figs. 19 and 23) passing underneath the base at "**Left,**" and notice the wing-nut (29) holding the lever to the base. The lever adjusts the Cyl. (3). Loosen that wing-nut very slightly and move lever to and fro to its extreme limits, then leave it at *about half way* of its adjustment (so as to allow room for Cyl. to be adjusted in either direction); screw up wing-nut firmly. Now place your right hand on "**Right**" side of dial (see Margin 24 and Fig. 23), *press dial from you* and see if every alternate, or second, N. in Cyl. is exactly opposite the grooves in dial. If not exactly opposite, *continue to press dial from you with your right hand; at the same time,* with the left hand loosen the wing-nut which holds the lever, and move lever slightly to and fro until every alternate, or second, Cyl. N. is opposite a dial groove. When correctly adjusted, screw up the wing-nut firmly to hold lever (Cyl.) in position, and release the right hand, but do not move the dial (see also page 71).

Placing Ns. into dial and to transfer Loops from Cyl. Ns. to Dial Ns.

Take off C.R. Begin at "**Right**" half mark and place a rib N. into the dial groove and transfer loop from Cyl. N. to dial N. Care should be taken to transfer the stitch from the Cylinder needle to the dial needle which is *directly* opposite it (see Margin 25); continue in the same direction as "Correct Selvedge" was done, that is, FORWARDS. Each dial groove should have a N. in it, to make the fabric one plain and one rib all round. Put on C.R.; **see that N. latches are all open.**

Top of Sock.—Set the counter to "0"; plain tension at 4 to 5, and ribber tension at 4½, for medium 3 or 4 ply fingering yarns; hold the work well down and knit about 60 rows; stop Y.G. at "**Back.**"

Leg.—Take off C.R.; transfer loop of every dial N. to Cyl. Ns. (see Margin 26); as the loop is transferred, put each Cyl. N. into corresponding Cyl. groove to make the fabric plain all round. Put on C.R.; take off ribber; **see that latches are all open;** set the counter; knit FORWARDS 50 rows.

For **Ankle, Heel, Foot, Toe,** &c., see pages 14, 15 and 16.

RIBBED SOCK COMPLETE (commenced at the Top).



Fig. 23d.

Fig. 23e.

Machine with 4½ inch diameter, 84 Ns. Cyl. and ribber dial to match.

(The following instructions will also apply to other 4½ inch diameter Cyls. and dials and to the 3¾ and 4⅛ inch diameter (compound) Cyls., &c., excepting that the number of rows would be varied for the hosiery which such Cyls. would make.)

Plain tension-pointer to be at 5, ribber tension at 4½ for 3 or 4-ply Fingering, 5-ply Merino, or similar yarns.

Top: 60 rows,—1 plain and 1 rib.
Leg: 80 rows,—3 ,, ,, 1 ,,
Foot: 65 to 70 rows,— { top, 3 plain and 1 rib. / bottom, plain.

Ns. to be in all the Cyl. grooves; ribber off the Mac.

Selvedges. Set "Rough" and "Correct Selvedges (as directed on pages 9 to 13), up to and including FORWARDS, and knit to "Left" half mark (**A** of page 13).

Ribber. Fix ribber upon Mac. as directed on pages 21 and 22.

Adjust Cylinder to Dial as directed on page 22, so that dial grooves are directly over the middle of Cyl. grooves, to knit one rib stitch to one plain stitch (see Margin 23, page 21); after adjusting Cyl. see that wing-nut is screwed up firmly to hold lever (Cyl.) in position.

Top of Sock. Set the counter to 0; plain tension at 5; ribber tension at 4½ (for 3 or 4-ply yarns); hold fabric well down and knit about 60 rows; stop Y.G. at "**Back.**"

Leg. Take off C.R.; transfer every second rib loop on to Cyl. Ns. (see Margin 26), and as the loop is transferred, put each Cyl. N. into corresponding Cyl. groove, to make 3 plain to 1 rib all round; put on C.R.; **see that all latches are open.** Tighten the plain tension 1 degree; set the counter to 0; knit about 80 rows, and stop Y.G. at "**Right.**"

If desired, complete with the "Hand-knitted or Scotch Fashioned, Heel, Foot and Toe" as instructed on pages 41 to 44 (see "Note," page 24).

† **Heel** (for High heels refer to pages 40 and 41). Take off C.R.; then transfer loops from all dial Ns. to Cyl. Ns. in quarter lots, thus:—transfer "**Left**" to "**Front**"; advance Y.G. to "**Back**" and transfer "**Front**" to "**Right**"; advance Y.G. to "**Left**" and transfer "**Right**" to "**Back**"; advance Y.G. to "**Front**" and transfer "**Back**" to "**Left.**" Now that all dial loops are transferred take off ribber; put on C.R.

Heel—Narrowing. Proceed as directed for "Heel Narrowing," on page 14.

Heel—Widening. Proceed as directed for "Heel Widening," on page 15.

Foot. Take off C.R.; put on ribber; the Cyl. will not need adjusting, but place right hand on right side of dial and press it from you to ensure that the dial is in its working position, and whilst doing so replace the dial Ns. in "**Back**" **half only**; the same loops to be re-transferred from "**Back**" half Cyl. to dial Ns. to continue the same rib (as in the leg) for the top of the foot, thus leaving the bottom of the foot plain. The dial loops can easily be distinguished by pressing the plain Ns. slightly outward to expose the fabric.

(27.) If it is intended to make a number of socks the setting of "Rough Selvedge" each time can be saved as follows, but this does not apply to hosiery commenced at the Toe, or the Toe knitted Scotch fashion:—

Instead of running the work off the Mac. after knitting the 4 extra rows for "Mending Stitch" of each sock, break yarn at bobbin and join ordinary sewing cotton or odd yarn to it, and then knit 2 or 3 rows round. Leave Y.G. at "Front"; raise "Back" half of Ns. out of action; knit **FORWARDS**; raise remaining Ns.; break cotton at bobbin and place unused end of cotton inside Cyl. Set "Correct Selvedge." (The cotton will serve as the "Rough Selvedge" and be a guide in parting, or cutting one sock from the other, and thus save injuring the yarn. The cotton can be cut, or drawn out of the fabric by the fingers.)

Now commence the "Correct Selvedge" upon the cotton (Rough) Selvedge; put on ribber and knit another sock as directed.

When the required number of socks has been knitted, break yarn at Ns.; run work off Mac. by turning the handle as usual; place clean damp cloth upon and press with hot iron across the "Rough Selvedge" of each sock, then cut through the "Rough Selvedge" unravel, and sew with "Mending Stitch" across Toe, as directed on page 16.

✲ In order that the foot shall not be too wide, put an extra dial N. at each side in the dial to continue the same form of rib (that is to say, place dial N. next those which are already in action), and transfer corresponding loop of Cyl. N. to each of those two Ns.; leave those two Cyl. grooves empty as usual. Put on C.R.; set counter to 0: **see that all latches are open**; then knit round for the foot about 70 rows; stop Y.G. at "**Front**"; take off C.R.; transfer all the dial loops on to Cyl. Ns. and so have Ns. in all Cyl. grooves; take off ribber.

Toe—Narrowing. H to K of Fig. 17. Proceed as directed for "Toe Narrowing," page 17.

Toe—Widening. Proceed as directed for "Toe Widening," pages 15 and 16, and read Margin 27.

Joining the Toe. Mending Stitch. Finishing. Proceed as directed on page 16.

NOTE. It is not necessary to take off the ribber to make a heel, excepting for the "Hand-knitted" or "Scotch Fashioned" heel, but at first it is better to do so, because the learner can watch the work and prevent the knitted fabric

rising up the Ns., and also see better where to attach the heel-wire (see Margin 18). When experience has been gained, the heel can be made with the ribber on the Mac., then substitute the following from "Heel," page 24 (marked †) thus:—

Heel. Knit to "**Back**"; take off C.R.; transfer the loops from "**Front**" **half only** of dial Ns. to Cyl. Ns., and put the Cyl. Ns. into corresponding Cyl. grooves; put on C.R.; **see that latches are open**; knit to "**Front**"; take out driving-pin.

Heel—Narrowing. As directed on page 14.

Heel—Widening. As directed on page 15.

Foot. Insert driving-pin and proceed from the paragraph above marked ✲ "In order that the foot shall not be too wide."

STOCKING FOR A LADY—Ribbed & Shaped, of Medium Yarns (commenced at the Top).

OBSERVE. The following instruction for knitting a stocking is not given in detail, as the various operations are much the same as for "Ribbed Sock commenced at the Top," which the Knitter is supposed to have practised well before making this stocking.

Full Size Stockings.	Fingering.	Merino.
Top and Leg...4 & 1 rib.	about 180 rows.	about 220 rows.
Leg, shape to 3 & 1 rib.	„ 50 „	„ 50 „
Ankle.....3 & 1 rib.	„ 50 „	„ 55 „
Foot { top of, 3 & 1 rib. bottom of, all plain.	„ 60 „	„ 65 „



Fig. 23f.

Fig. 23g.

Set "Rough" and "Correct Selvedges" and knit to "**Left**" half mark (page 9 to **A** page 13); put on the ribber (see "Ribber, to fix," page 21); after which adjust Cyl. (page 22) so that the posts of Cyl. are exactly opposite grooves in dial to allow fabric to be made 4 plain and 1 rib. (The top of the leg can be "Scolloped" (page 40), or knitted like the "Top" of a "Ribbed Sock" in which case the number of rows would be 100 instead of 150 stated above.) The learner should first practise the following, which includes a "Top" of the same rib as the "Leg."

Leg. Commence at "**Right**" and place a dial N. into every second groove in dial, picking up with each dial N. a loop from the plain stitch of the **last row knitted** (not from the loop on the Cyl. N.). Loosen tension of plain stitch 1 degree, and knit as per table above 180 to 220 rows, according to size required and quality of yarn used; stop Y.G. at "**Back.**"

Leg—First method of shaping, also the best. If the weights touch the floor, remove S.U., and attach the buckle well up the work; hang weights to buckle. Take off C.R.; tighten the plain

tension about 1 degree. Now decide which dial N. is nearest the "**Front**," then take out the second Cyl. N. at the "**Left**" side of that "**Front**" dial N., and transfer its loop on to the third Cyl. N. and remove the first Cyl. N. into the empty (second) groove; knit 5 rows. Adjust Cyl. FORWARDS so that dial Ns. will **almost** work over the Cyl. grooves (see "Adjusting Cyl.," page 22); take out the fifth N. (counting the Ns. *actually* in the Cyl.) on the "**Left**" of the "**Front**" dial N., and transfer its loop to the sixth Cyl. N., remove the fourth N. into the empty (fifth) groove; now at the "**Right**" side, take the third Cyl. N. from the "**Front**" empty Cyl. groove, and transfer its loop on to the second Cyl. N.; remove the fourth N. into the empty (third) groove; knit 5 rows; repeat the decreasing in like manner **on both sides** and then knitting 5 rows, until the Ns. are all changed to 3 plain and 1 rib. Next adjust the Cyl. FORWARDS so that the dial Ns. will work over the empty grooves in Cyl.; put on C.R.; knit 50 rows for the ankle and stop Y.G. at "**Right**"; complete heel, foot, and toe, as for a "Ribbed Sock commenced at the Top" on pages 23 and 24; or, if Ribber is not to be removed proceed as directed after "Note," page 24.

Leg—Second method of shaping. Take off C.R.; tighten plain tension about 1 degree; then take centre Cyl. N. "**Front**" and transfer the loop on to the nearest dial N.; adjust Cyl. FORWARDS so that dial Ns. will **almost** work over Cyl. grooves (see "Adjusting Cyl.") ; knit 5 rows round; then take the fourth N. **each side** of the N. just removed, and transfer each loop on to the nearest dial Ns.; knit 6 rows; continue in like manner decreasing one N. each side and knitting 6 rows, until all the Ns. are changed to 3 plain and 1 rib; then adjust Cyl. FORWARDS so that the dial Ns. work over the empty grooves in the Cyl. Knit 50 rows for the ankle and stop Y.G. at "**Right**"; complete heel, foot, and toe, in the same way as for "Ribbed Sock commenced at the Top" on pages 23 and 24, or from "Note," page 24.

For making the above with Heel and Toe as Hand-knit, see pages 40 and 41.

RIBBED SOCK or STOCKING (commenced at the Toe).

ABBREVIATIONS.

Mac. = Machine.
Cyl. = Cylinder.
N. = Needle.
Ns. = Needles.
Y.G. = Yarn-guide.
C.R. = Clasp-ring.
S.U. = Set-up.

Mac. with $4\frac{1}{2}$ inch diameter Cyl. and dial to match.

(The following instructions will also apply to the $3\frac{3}{4}$ inch diameter "Compound" Cyls., and dials, but the number of rows would be less for the smaller hosiery.)

Before commencing to knit Socks and Stockings from the TOE, the Knitter is expected to know how to make Socks and Stockings "Commenced at the Top" (pages 9 to 26), as the instruction is given in greater detail than the following.

Commence without the ribber upon the Mac.

Plain Tension at about $3\frac{1}{2}$, for 3-ply Fingering.
" " " $4\frac{1}{2}$, for 4-ply Fingering.

Toe—Setting work for. Y.G. to be at "**Back.**" Take off C.R.; place Ns. in the "**Front**" half of Cyl. (that is 42 if an 84 Cyl.); put on C.R.

Place a bobbin of yarn **to be used for the sock** directly under the hole in one of the arms of yarn-cross, and with it thread yarn-cross and Y.G. in the usual way. Tie end of yarn to a hook of S.U., and put S.U. into Cyl. from the top, with that hook next to the first N. on "**Left**" side. With the left hand underneath base of Mac., hold S.U. by its large hook so that its small hooks are slightly below the top edge of Cyl. (as shown by Fig. **14**).

Now loop (not twist, wind, or cross) the yarn round the Ns. in the same manner as shown by Fig. **14**, excepting that **all the Ns.** are looped instead of every alternate N.

Commence with the first N. on "**Left**" (the yarn to be drawn off through the Y.G. as required), thus :—Pass yarn direct from the hook of the S.U. to which it is tied—round the front of that first N.—then between it and the second N., direct to and round nearest hook of S.U. (see Margin 28), back to second N., round its front, between second and third Ns., round nearest hook of S.U.; back to third N., round its front and on to nearest hook of S.U.; so continue in the same way to loop the yarn round **all the Ns.** and the hooks of the S.U. nearest to them; after looping the last N. on the "**Right,**" the yarn should pass round hook of S.U. (as usual) and thence direct to the Y.G. Lift the yarn in front of shield and place it in hook of take-up (see Margin 16, page 14); turn handle to send Y.G. BACKWARDS, and stop it almost opposite the first N. in action at "**Right**"; draw slack yarn back to bobbin; attach weight-holder with two weights to large hook of S.U.; **see that the latches of Ns. are all open;** with left hand upon weights pull S.U. down, **and at the same time also press it from you to tighten all the loops;** knit slowly BACKWARDS the first row, and see that yarn passes from Y.G. into the hooks of the first Ns. on "**Right**"; stop Y.G. at "**Back**" (see Margin 17, page 14); knit FORWARDS to "**Back**" (second row), and see that yarn feeds into first N. at "**Left**"; knit BACKWARDS to "**Back,**" and FORWARDS to "**Back,**" to make four complete rows in all (see Margin 29); join thickening yarn (see page 44).

(28.) A hook of S.U. may be used for one or more loops if convenient. You use the hook nearest the N. you are looping. Only about one half of the hooks of a S.U. are employed when a sock or stocking is commenced at the TOE.

(29.) For fine yarn six rows are necessary.

Toe—Narrowing. Raise first (end) N. out of action on "**Right,**" knit BACKWARDS to "**Back**"; raise end N. on "**Left**" and knit FORWARDS to "**Back**"; raise second N. on "**Right,**" knit BACKWARDS; raise second N. on "**Left,**" knit FORWARDS; continue in like manner raising a N. on each side and knitting, and

using heel-wire (see Margin 18, page 14), until there are 14 Ns. only left in action; now raise heel-wire and insert its hooks into the fourth row from the row last knitted, with about 10 Ns. between the two hooks.

Toe—Widening. Depress into action the last N. raised on the "**Right**"; put yarn on the other side of it (that is, you lift the yarn over the N. just depressed and so let it pass between the N. just depressed and the next raised N., direct to Y.G.; this is done each time a N. is depressed); knit BACKWARDS to "**Back**"; depress last N. raised on "**Left,**" put yarn on the other side of it; knit FORWARDS to "**Back**"; so continue, each side depressing a N., placing yarn behind it and knitting until all Ns. of "**Front**" half are in action. After depressing the last N., which will be on the "**Left,**" knit four complete rows and stop Y.G. at "**Back**"; then knit half a row and stop Y.G. at "**Front**"; take off from S.U. weight-holders with weights, and remove heel-wire; break thickening yarn. Now carefully take the loops off S.U. (but do not pull the S.U., or the loops may be drawn out), hold the S.U. with one hand, and pass the loops off the hooks with the other hand.

Toe—Transferring Stitches. Take off C.R.; place Ns. (40 for an 84 Cyl.) into "**Back**" half of Cyl., leaving one empty groove each side next the half mark (the two Ns. will be placed into the empty grooves presently); put on C.R.

(30.) If the new loop now placed upon the Ns. goes below or under the latches of Ns., the work will slip off the Ns. when drawing out the S.U. loops. Therefore be most careful to see that the loop does not go below the latch until you have drawn out S.U. loop.

Now, take hold of the first two S.U. loops at "**Right,**" and place the **first stitch** formed, on to the first N. of the "**Back**" half (the first N. will be next the empty groove); leave stitch (now become a loop) **in the hook at top of N.** (see Margin 30), and let the S.U. loops hang outside Cyl.; take the third S.U. loop and place its first stitch **into the hook of second N.** in same way; continue this until all the "**Back**" half of Ns. (excepting the two omitted) have loops upon them. There will be one stitch more than the number of Ns., and this stitch should be put into the hook of the end N. at "**Left.**" Take the end of the yarn at "**Left,**" and pull it so as to draw out the S.U. loops; after drawing out the last loop at "**Right,**" break yarn and leave an end of about the length of two loops; fasten off the end by crocheting it through two or three stitches of the fabric. Hook heel-wire into the fabric at the point of the toe; or, the better plan is to take a piece of string twice the length of the heel-wire, tie the two ends together so as to form a sling; with a N. draw one end of the sling upward through the fabric at one corner of the toe point, and downwards through the other corner; then attach the weight-holder and weights to the two ends of the sling to keep work down.

Toe—Joining the Halves. Take off C.R.; take a spare Cyl. N. and crochet the halves together on the "**Right,**" commencing with

the selvedge stitches nearest the point of the toe, thus:—Catch into the hook of that N. one (the lowest) selvedge stitch of "**Front**" half and one (the lowest) selvedge stitch of "**Back**" half; push N. forwards until the **first stitch only** is behind the latch; then draw the N. back, when the latch will close and the first stitch pass off the N., leaving the "**Back**" stitch in the hook; catch into the hook the next selvedge stitch of the "**Front**" half; push N. forwards so that the "**Back**" stitch (which was left in the hook) is behind the latch; draw N. back as before, when the stitch will pass off; catch the next selvedge stitch of "**Back**" half, and continue working upwards until all the selvedge stitches have been crocheted; then place the N. into the empty Cyl. groove with the last stitch upon it, and below the latch. Close the halves on the "**Left**" in like manner.

Ribber must now be fixed as directed on pages 21 and 22; then,

Adjust Cylinder to Dial as directed on page 22, so that the dial grooves are directly over the centre of Cyl. grooves.

Foot—Transferring Loops from Cyl. Ns. to Dial Ns. that the latches of Ns. are all open. Now transfer some of the loops from "**Back**" half of Cyl. Ns. to dial Ns., as follows:—Put a dial N. into the dial groove which is over the second Cyl. groove from the "**Right**" half mark, and transfer loop of that second Cyl. N. to the dial N. If it is desired to knit top of foot, 3 plain stitches to 1 rib, transfer every fourth Cyl. N. loop to dial Ns., which must be placed into the dial grooves exactly over the loops to be transferred of "**Back**" half only. After placing three or four Ns. into the dial and transferring the loops, it will be necessary to knit FORWARDS until Y.G. is at "**Right**" half mark, so as to move the ribber-arm out of the way; transfer a few more loops and knit again until Y.G. is at "**Back**"; finish the transferring of loops to the "**Left**" half mark, when there will be Ns. in every second groove of dial "**Back**" half; then, if it is desired to make the foot narrower, one or two extra dial Ns. may be placed into the dial each side of "**Front**" half of Ns., and loops transferred to them; the extra Ns. would be placed "**Right**" and "**Left,**" and next to those already in the dial, to continue the same rib; put on C.R.; lift yarn off take-up; draw slack yarn back to bobbin; set the counter to 0; knit FORWARDS about 70 rows; stop Y.G. at "**Back**"; take off C.R.; take out the **extra** dial Ns. in "**Front**" half, and transfer loop of each to Cyl. Ns., which place into the corresponding Cyl. grooves; put on C.R.; knit to "**Front.**"

Heel. Lift out driving-pin; raise "**Back**" half of Cyl. Ns.; lift yarn from front of shield into hook of take-up; knit to "**Back**"; join thickening yarn.

Heel—Narrowing. Proceed to narrow on "**Front**" half of Cyl. Ns. as instructed for "Heel Narrowing" (page 14, commencing at ✸) but there must be 16 Ns. left in action, if an 84 or 96 Cyl. is being used.

Heel—Widening. Proceed as instructed for "Heel Widening" (page 15, to the mark ⋕ on page 15).

Then, if it is desired to have a deeper heel, knit to "**Back**"; raise out of action that last N. just depressed on "**Right**"; knit BACKWARDS to "**Back**"; raise last N. depressed on "**Left**"; knit FORWARDS to "**Back**"; and so continue to raise a N. each side and knit, until three Ns. have been raised on each side, but after raising the third N. at "**Left,**" knit FORWARDS to "**Front**" only; break thickening yarn at Ns.

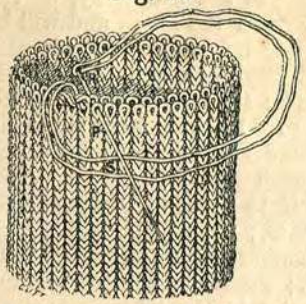
Put driving-pin into action; depress all Cyl. Ns.; **see latches of all Ns. are open;** lift yarn off take-up; draw slack yarn back to bobbin; knit to "**Back.**"

Leg of Sock. Take off C.R.; commence at "**Left**" and place dial Ns. into "**Front**" half of dial to match "**Back**" half, and transfer loops from Cyl. Ns. (leaving Cyl. grooves empty as before), and so continue same rib; put on C.R.; set counter to 0; knit FORWARDS about 80 rows; stop Y.G. at "**Front**"; loosen tension of plain stitch 1 degree; take off C.R.

Top of Sock. Commence at "**Right**" to put dial Ns. into remaining empty dial grooves, and transfer loops from Cyl. Ns. to them, and thus make the fabric one plain and one rib all round; put on C.R.; set counter to 0; knit about 50 rows; break yarn at Ns.; lift off weight-holder with all weights; hold fabric down with left hand and knit FORWARDS, when fabric will leave Mac. Tighten plain tension 1 degree, to commence another sock.

Stitching Top of Sock. Place damp cloth upon the top and press with hot iron; unravel about 3 rows for the finishing; thread a darning N. with the unravelled yarn; leave yarn double (see Fig. 24). Commence at the next stitch to be unravelled and work in the contrary direction to which the unravelling was done, and finish off top by the usual buttonhole stitch, taking two loops with the N. each time; **do not draw the stitch too tightly.**

Fig. 24.



(31.) That you may the more easily pick up a loop, take off C.R. and press the N. from the Cyl. to open the stitch, and at the same time pass the hook of a spare Cyl. N. upwards through the loop which last passed off the N. (not the loop on the N.); then, to ensure a regular shaping, you must on each side of the Cyl. press the corresponding N., that is, always pick up from the same side of the empty groove, either the N. before the groove or the N, after it.

Leg of Stocking.—Ankle. Take off C.R.; commence at "**Left,**" and place dial Ns. into "**Front**" half of dial to match "**Back**" half; transfer loops from Cyl. Ns. (leave Cyl. grooves empty as before), and so continue the same rib; put on C.R.; set counter to 0; knit about 50 rows and stop Y.G. at "**Right**" half mark.

Leg of Stocking.—Shaping. In this instance the shaping is done by altering the 3 plain to 4 plain all round; first catch a loop on a spare N. and place in the one empty Cyl. groove at "**Back**"; knit 5 rows; then in like manner fill the next empty Cyl. groove on each side of that "**Back**" groove; knit 5 rows; repeat each time until all the grooves are filled. Proceed as follows:—

Take off C.R.; adjust Cyl. as instructed on page 22, so that dial Ns. will **almost** work over the posts of Cyl. (and do not fail here and at all times to observe Margin 24, when adjusting Cyl.). After the shaping is completed, the Cyl. should be adjusted again, so that dial Ns. will work **directly** over Cyl. posts to make 4 plain to one rib.

(It may happen some time during the shaping, that owing to the great length of the fabric, the weights will touch the ground, in which case take off all weights and heel-wire; take buckle and pass the fabric through it until buckle is close up to the Mac.; attach to buckle one weight-holder with 2 weights; assist to hold fabric down with the hand as usual.)

Now shape the leg single (one N. only), commencing at the "**Back**" empty Cyl. groove thus:—Press the N. (see Margin 31), next the empty groove, away from the Cyl. to expose the stitch last made, then take a spare Cyl. N. and catch a loop upon it; insert that Cyl. N. (with the loop upon it) into the "**Back**" groove (see that the loop is not twisted and that latch of the N. is open); knit round 5 rows and stop Y.G. "**Right.**" Shape double (two Ns.) in the same way thus:—With a spare Cyl. N. pick up loop from the stitch at back of Cyl. N. (see Margin 31) next the empty groove, that is, the next empty groove on one side of that "**Back**" groove; place N. with loop upon it into the empty Cyl. groove; then take another N., pick up loop upon it from the N. next the empty groove on the other side of that "**Back**" groove; place N. into empty Cyl. groove; knit 5 rows and stop Y.G. "**Right.**" Shape double again in exactly the same way, and place the Ns. into empty grooves next to those last done; knit 5 rows; stop Y.G. "**Front.**" So continue shaping each side, but observe the following:—

It will be noticed after the shaping has reached the half marks, that if the Y.G. is stopped at "**Right,**" the cams in the shell will not allow the shaping Ns. to go down on the "**Left,**" and to meet this difficulty the shaping should be done first on the "**Right**" side, the Y.G. advanced a little to clear the grooves on the "**Left**" side, then shape on the "**Left,**" and so complete the shaping by picking up a loop and inserting one N. each side, and knitting 5 rows after each double shaping until all the empty Cyl. grooves have Ns. in them.

After the last shaping has been done, put on C.R.; loosen the plain tension 1 degree; set the counter to 0; knit the number of rows required (generally 200 for the leg of a stocking); break yarn at Ns.; take off weights; hold fabric down with left hand and knit, when fabric will leave the Ns.

Stitching Top of Stocking. Proceed as for "Stitching Top of Sock" (see page 30).

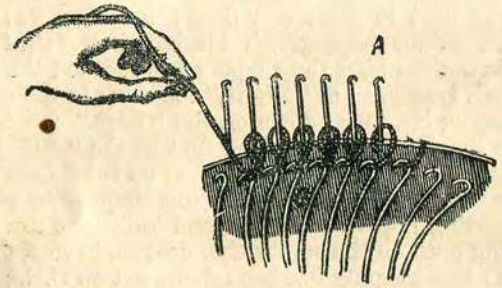
ANOTHER METHOD of FORMING the CORRECT SELVEDGE.

For thick Yarns.

When Socks or Stockings are to be made from Wheeling, or very coarse yarns, a "Rough Selvedge" is not necessary, as the "Correct Selvedge" can be set directly upon the Mac., and will be found sufficiently smooth and tight. It is necessary first, to raise out of action those Ns. which are within the cams, behind the Y.G. To do this, turn Y.G. slowly to **"Back"**; then raise with the N. lifter 20 Ns. from **"Right"** half mark to **"Back"**; hold them up and advance the Y.G. until the cams are under those raised Ns.; then depress all Ns. which can be depressed each side of the cams. Now thread yarn-cross and Y.G., and draw off 1½ yards of the yarn; tie the end of the yarn on to a hook of S.U.; place S.U. inside Cyl. with that hook opposite the first N. in action at **"Back"**—hooks of S.U. to be just below top edge of Cyl.; then loop the yarn round that first N. from left to right as shown at A in Fig. 25.

Continue working FORWARDS, and looping yarn round hooks of S.U. (a hook of the S.U. may be used for the loops of two or more Ns., if it should be abreast of them), and **round each N. until all the Ns. are looped.** When the last N. has been looped, the yarn should pass under hook of S.U. as usual, and thence between the first N. in action and the raised N. next to it, direct to Y.G. (as shown by Fig. 16, page 12). Draw slack yarn back to bobbin; hang weight-holder and weights on S.U.; knit FORWARDS to **"Left"** half mark, and depress the raised Ns.; see latches are open. Now knit a "Plain Sock," commencing from "Top of Sock" (page 13); or a "Ribbed Sock," commencing from **"Ribber"** (page 21).

Fig. 25.



RIBBED SOCK OF THICK YARNS—(commenced at the Top).

5 and 6 ply Fingering, Wheeling (Alloa), or similar yarns.
Knit upon 4½ inch diameter 60 or 72 Ns. Cyl. and dial to match.
Loosest tension (or stitch) must be used.

REMARKS:—

(1) The coarsest Ns. are best suited for these heavy yarns.

(2) When knitting circular work with such heavy yarns as the above, do not pass yarn under the small shield, except when making the heel or toe.

Set "Correct Selvedge" direct (page 32), and then proceed in the same manner as for "Ribbed Sock" (page 21), commencing from **"Ribber."**

* Top	.....	1 plain	and 1 rib	.....	40 rows.
Leg	.....	3 ,,	,, 1 ,,	.....	65 ,,
Foot { top	.....	3 ,,	,, 1 ,,	.....	60 ,,
Foot { bottom, plain.					

* We do not recommend that a Top of 1 plain and 1 rib be made with *very* thick yarn upon the 60 Cyl. Top and Leg in such cases are better when made throughout in one form, say 3 plain and 1 rib, with a tension slightly lighter for the "Top" portion of 40 rows than for the "Leg."

STOCKINGS—GENT'S KNICKERBOCKER—full sized with TURNED DOWN TOP (of thick yarns).

Knit upon 4½ inch diameter 60 or 72 Ns. Cyl. and dial to match. (Before proceeding to knit, read "Remarks" under "Ribbed Sock of Thick Yarns" (page 32).

Knit with loosest tension.

Turned Down Top	4 and	1 rib	45 rows.		
Leg	4 ,,	1 ,,	80 ,,		
Shape to	3 ,,	1 ,,	35 ,,		on a 60 Cyl.
			45 ,,		on a 72 Cyl.
Ankle	3 ,,	1 ,,	50 ,,		
Foot { Top	3 ,,	1 ,,	60 ,,		
Foot { Bottom, plain.					

Fig. 25a.



* **Turned Down Top.** For this kind of top set "Rough Selvedge" and knit about 30 rows of it; then set "Correct Selvedge," and knit to **"Left"** half mark (pages 9 to 13); put on ribber and adjust Cyl. so that Cyl. posts are opposite dial grooves, as directed on page 22.

* The turned down tops can be knitted in a large variety of fancy patterns. Refer to pages 97 and 98 for instructions on various forms of Fancy Tops.

Commence at **"Right"** and place dial Ns. into every second dial groove, picking up with each dial N. a loop from the plain stitch of the last row knitted (not the loop on the Cyl. N.); knit 45 rows of 4 plain and 1 rib; take off C.R.; transfer ribbing loops on to plain Ns.; take off ribber; break yarn just before Y.G.; remove weights and set-up. Take the fabric out of the Cyl. with the loops at butts of the Ns.; turn the fabric outside in; send Y.G. to **"Back"** and insert Ns. again first into **"Front"** half of Cyl.; join yarn to

first N. in action at "**Left**" side; hold fabric down and knit to "**Front**"; insert the remaining Ns. into "**Back**" of Cyl.; attach buckle and weights; put on ribber, and (if necessary) adjust Cyl.; to make 4 plain and 1 rib again.

Knit the Leg, and Shape as directed on pages 25 and 26.

Knit 50 rows for the Ankle, and complete Heel, Foot, and Toe, as instructed for "Ribbed Sock commenced at the Top," pages 23 and 24.

STOCKING—GENT'S full sized RIBBED (commenced at the Top).

4 or 5 ply Fingering, or similar yarn.

Knitted upon 4½ inch diameter 84 Ns. Cyl. with dial to match.

Knit in precisely the same way as for a "Stocking—Lady's Ribbed and Shaped" (page 25), but the number of rows are to be as follows:—Plain tension to be at about 5, and ribber tension at 4½ for the leg; then tighten both ½ a degree for the shaping, and ½ a degree for the ankle. But much depends on the quality and ply of the yarn used, so that the tensions should be determined by actual experience.

Leg	..... 4 and 1 rib	.....	180 rows.
Shape to	..... 3 ,, 1 ,,	.....	50 ,,
Ankle	..... 3 ,, 1 ,,	.....	55 ,,
Foot	Top ..... 3 ,, 1 ,,	.....	70 ,,
	Bottom, plain.		

PLAIN TENSION. To tighten, or loosen, the Plain (or Cyl.) Stitch. (See below for Ribber Stitch.)

To Loosen Plain Stitch. Loosen the wing-nut on the shell that holds the tension-pointer in its position, depress pointer downwards (the further down it is put, the looser the stitch), **then screw wing-nut tightly, to hold pointer.**

To Tighten Plain Stitch. Loosen the wing-nut on the shell that holds the tension-pointer in its position, push pointer upward (the higher it is put, the tighter, or closer, the stitch), **then screw up wing-nut tightly, to hold pointer there.** (See observation 2, below.)

OBSERVATIONS:—

1.—Work with a looser tension for dark coloured, or hard yarns, than would be used for light coloured, or soft yarns. (To soften yarns see page 9.) The learner should practise with light coloured yarns.

2.—In the ordinary way it would be better to commence with a loose tension—say at "5"—which could be tightened as may be found necessary. Never put the tension higher than "3," excepting for fine yarns on fine Cyls.

3.—A tight stitch requires more weight to keep the fabric down and the loops on the Cyl. (If the loops are allowed to climb the Ns. through insufficient weight, the work will be faulty.)

RIBBER TENSION. To Tighten, or Loosen, the Ribbing Stitch.

For medium yarns, such as 3 or 4-ply Fingering, the tension should be at about 4 or 5. 1 represents the tightest stitch, but pointer is seldom ever put tighter than 2 for the finest silks, &c.

To Tighten Ribbing Stitch. Loosen the wing-nut which holds pointer on cam-plate, and draw pointer back a degree *from centre* of cam-plate; screw wing-nut *tightly* to hold pointer in new position.

To Loosen Ribbing Stitch. Loosen the wing-nut which holds pointer on cam-plate, and push pointer a degree *towards centre* of cam-plate; screw wing-nut *tightly* to hold pointer in the new position.

TENSIONS to USE. ROWS to ONE INCH of FABRIC. HOSIERY LENGTHS by MEASUREMENT, &c.

The Macs. with 4½ inch dia., 60, 72, 84 and 108 Ns. Cyls. (and dials to match), are more largely used than Macs. with a variety of other Cyls. and dials, and the following general information is given with respect to the tensions to be used for a particular yarn, and the number of rows obtained therefrom per inch of fabric.

Neither of these 60, 72 or 84 Cyls. are suitable for knitting Fine yarns, much less very Fine (that is to say, **thin** yarns); the **4½ inch** diameter Cyls. 60, 72 and 84 are adapted for knitting **Medium** yarns. **Coarse** (or heavy) kinds should be knitted on the 60 and 72, **but not on the 84.** The 3¾ inch diameter Compound Cyls., with same number of grooves, are suitable for the Medium yarns **only (not for Coarse or heavy kinds).** The 108 Cyl., 4½ or 3¾ inch diameter, is suitable for Fine yarns only.

Tensions to Use.—For Medium yarns, never put tension-pointers at the tightest (such as from "2½" up to "1"). That tight tension is for use with thin (or Fine) yarns upon fine Cyls. and dials; thus, for 108 Cyl. the pointer would be at about "2."

For Medium yarns such as:—

3-ply Fingering (or similar), put	plain	tension-pointer	about 3.
	ribber	,, ,,	4½.
4 ,, ,, ,,	plain	,, ,,	4½.
	ribber	,, ,,	5.
5 ,, ,, ,,	plain	,, ,,	5½.
	ribber	,, ,,	5.

For Coarse, or Heavy Yarns, such as Wheeling (Alloa), put both

tension-pointers to their loosest (using 4½ inch 60 or 72 Cyls. and dials to match).

NOTE.—These tensions are merely approximate, and must not be taken as absolutely correct. The colour of the yarn used would in itself cause a difference. For instance, a looser tension is required for hard, or dark-dyed yarns, such as blacks, browns, scarlets, &c., than you would use for soft, or light colours (such as light greys, salmon-pink, white, &c.). These latter are the best to practise with, being easier to knit. Always oil all dark, or hard yarns while winding (see page 9).

Always screw up wing-nut **tightly** with the finger and thumb after shifting either of the tension-pointers. (This remark applies to all wing-nuts on the machine.)

Rows to One Inch of Fabric.—If in doubt at any time where to place tension-pointers for any particular yarn you may wish to knit, put the pointers at the loosest, and knit a few inches of fabric; then make tension a little tighter (observing position of the pointers when fixed), and knit another few inches. If it can still bear being knitted closer, tighten tension a little more (again **observing and remembering the position of the pointers when fixed**); knit another few inches and run the fabric off Mac. Examine the fabric and decide which of the tensions you prefer, and fix pointer (or pointers) accordingly.

At the same time the Knitter should examine the piece of fabric, and compare the plain stitch with the ribbing stitch. See if they are as loose, or tight, as one another, and if not, set the pointers to meet any variations.

In that small piece of knitting you can count the rows that there are in one inch, of each tension. (Record for future reference the number of rows to the inch that a certain tension gives in a certain yarn—it will be useful from time to time.)

With the TENSION-POINTER at about 1½ on a **4½ in. dia.** 120 Cyl.:
2-ply Fingering gives about 15 rows to 1 inch.

With a MEDIUM TENSION on a **4½ inch dia.** 84 Cyl.;—
3-ply Fingering gives about 14 rows to 1 inch.
4 ,, ,, ,, 12 ,, 1 ,,
5 ,, ,, ,, 10 ,, 1 ,,

With a LOOSE TENSION on a **4½ inch dia.** 60 Cyl.:—
Heavy Wheeling (Alloa) gives about 8 rows to 1 inch.

Hosiery by Measurement:—
Stocking for a Lady (medium sized)...27 inches in leg, including heel.
9½ ,, foot.
Sock, Man's (medium sized) ... ...14½ ,, leg, including heel.
10½ ,, foot.

TABULATED (ROWS) GUIDE.

Before the knitter makes any use of this, read "Tensions to Use," &c. (page 35).

YARNS. Although there are only a few kinds mentioned here, a variety of other yarns can also be knitted (if they are of similar thickness). Never use too coarse a yarn upon a fine Cyl. and dial—nor too fine a yarn upon a coarse Cyl. and dial.

Top. (See remarks after "Leg.")

Leg. In the instances where "Top" rows are not quoted separately, the undermentioned figures in "Leg" count from the very top, to the beginning of the shaping, the rib being the same from the commencement (hence no reference to a "Top" in some columns). But if preferred, a band-like top (such as 1 plain and 1 rib) can equally well be done without in any way altering the number of rows here quoted for "Leg." (A fabric of 1 plain and 1 rib is not suitable for thick or heavy yarns.)

Shaping (or Intake) Rows. These cannot conveniently be quoted in such a table as this, for the total number depends entirely on the particular rib in "Leg," and also on the particular Cyl. used, &c. After the "Leg" rows, knit and count the "Shaping" rows, to the beginning of the "Ankle."

The undermentioned figures are merely approximate to aid the learner.

Grooves and diameter, &c. of Cyl.		Description of Yarns.	The grade of Ns.	Sizes of Hosiery.	Children's Stockings.			Youth's or Men's Socks.			Youth's or Men's Stockings.			Women's Stockings.		
Ord. 4½ in. dia.	Com. 3¾ in. dia.				Leg to beginning of Shaping.	Ankle.	Foot.	Top.	Leg.	Foot.	Leg to beginning of Shaping.	Ankle.	Foot.	Leg to beginning of Shaping.	Ankle.	Foot.
52		Heavy (or thick) such as Wheeling (Alloa) &c.	Coarsest	Small					95	45	110	45	45			
56				Medium					105	50	120	50	50	110	50	50
60				Large					110	60	130	55	60			
60	52	3, 4, or 5-ply Fingering, or 5-ply Merino, &c.	Medium	Small	90	35	30									
	56			Medium	110	40	35									
	60			Large	110	40	40									
72		Heavy (or thick) such as Wheeling (Alloa) &c.	Coarsest	Small				40	65	50	120	45	50			
				Medium				40	70	60	125	50	60			
				Large				40	75	65	130	55	65			
72		3, 4, or 5-ply Fingering, or 5-ply Merino, &c.	Medium	Small	110	40	45	45	70	65				140	50	60
				Medium	120	45	50	50	75	70				150	55	65
				Large	130	50	55	50	80	75				150	60	70
	72	3 or 4-ply Fing., 5-ply Merino, &c.	Medium	Small	160	45	50									
				Medium	180	50	55									
				Large	200	55	60									
84	84	3-ply Fing., or 5-ply Merino, &c.	Medium	Small				60	80	70	160	50	70	200	50	60
				Medium				60	90	80	180	60	80	200	55	70
				Large				60	100	90	190	70	90	200	60	80
84		4 or 5-ply Fing., 5-ply Merino, &c.	Medium	Small				60	70	60	150	55	60	220	50	55
				Medium				60	80	70	160	60	70	220	55	60
				Large				60	90	80	170	65	75	220	60	65
96	96	3 or 4-ply Fing., 4 or 5-ply Mer., &c.	Medium	Small				70	70	65	170	50	60	220	50	60
				Medium				70	80	70	180	60	70	220	55	65
				Large				70	85	80	190	70	80	220	60	70
108	108	2-ply Fingering, Cashmere, Andalusian, Silk, &c.	Fine	Small				90	90	80	220	70	80	300	60	70
120				Medium				90	100	90	230	70	90	300	65	80
				Large				90	110	100	240	75	100	300	70	90
132		Very fine Wool, Silk, &c., Yarns.	Extra fine	Small				90	120	110	240	70	110	320	70	85
144				Medium				90	135	120	250	80	120	320	75	90
				Large				90	150	130	260	90	130	320	80	95

Shrinkage (of woollen hosiery) in the washing is very common. As a rule, the softer the kind of yarn used (such as Merino) the greater is the shrinkage. So that when knitting, allowance for the probable shrinkage should be made.

The fact should be borne in mind that hosiery which fits the foot very closely (like a glove), no matter the kind of yarn, will not wear so long as that which fits loosely (not **very** loose), for the simple reason that the former is strained upon the foot and kept in one regular position, and the several parts, which are subjected to **constant** friction, are readily worn through. Whereas, with hosiery which is a loose fit (that is to say, full large when new), there is a shifting of position and the friction is spread over a varying surface.

New hosiery should be washed before being worn, as this thickens it and keeps it in shape.

A good way to wash hosiery is to dissolve a little soap in boiling water and allow this to cool until lukewarm; turn the hosiery inside out and wash on that side; rinse in tepid water; then, without any wringing or squeezing, at once hang in the open air to drain and dry.

Cotton hosiery can be washed and boiled as is usual with all ordinary cotton materials.

TABLE OF NEEDLES TO PRODUCE CERTAIN RIBS.

NOTE.—The Needles are not arranged, as stated below, in either the Cyl. or dial, before the work is commenced, but afterwards, and as instructed in the several sections of the book.

FORM OF WEB.	CYLINDER NEEDLES.	DIAL NEEDLES.
1 plain and 1 rib.	Out of every 2nd groove.	In every groove (to work over Cyl. grooves).
2 ,, ,, 1 ,,	In every groove.	In every groove (to work over Cyl. posts).
3 ,, ,, 1 ,,	Out of every 4th groove.	In every 2nd groove (to work over Cyl. grooves).
4 ,, ,, 1 ,,	In every groove.	In every 2nd groove (to work over Cyl. posts).

Some dials will allow of other forms of ribbed fabric, such as, 5 & 1, 6 & 1, 7 & 1, 11 & 1. Thus a 72 Cyl. and 36 dial will produce 6 plain to 1 rib, by placing needles in every third dial groove to work over the Cyl. posts; the same Cyl. will produce 5 plain to 1 rib, by placing needles in every third dial groove, to work over Cyl. grooves.

2 plain and 2 rib can be formed on all machines, but this requires

a special dial for each Cyl. The dial contains just half the number of grooves of a Cyl. but arranged differently from the usual dials.

OILING MACHINES.

Caution.—Never employ on the Mac. domestic oils such as castor, salad (olive), colza and others, or even inferior machine oils, as they will clog the action of the Mac. and will make it most difficult to work.

It depends wholly on the use the Mac. gets, as to how often oiling should be done, and only the best machinery oil, such as good sperm (with very little paraffin added) should be used. Suitable oil can always be obtained from any of the Company's depôts.

To prevent rust, all bright parts, such as the Ns., Cyl., Shell, and Cam-plate, should be smeared with oil from an oiled rag, particularly when Mac. is not to be used for a time; it should also be covered by a cloth or replaced in its box.

The following **working** parts should be oiled occasionally **but only very slightly**:—

Driving-shaft.—(*a*) Where it passes through the bracket, and in the hole in the centre of the bracket. (*b*) At the sides of the worm which works the indicator-spindle.

Indicator-spindle.—At the small bracket which supports the spindle.

Geared-Ring.—Round both outer and inner edges (close to the shell).

Cylinder.—Take off clasp-ring and run the nose of the oil-can round the grooves at this point; avoid oiling from the top of the cylinder grooves.

Shell.—Between the shell and Cyl. (remove C.R.).

Ribber-spindle.—Where it joins ribber-arm, and in the hole in the top of spindle.

Cam-plate and Dial Grooves.—On the butts of the ribber Ns. when in the grooves, and on the face of the dial close to the cam-plate, and at the joint of the cam-plate with the ribber-arm.

Take-up and Shield.—Where they join the yarn-cross.

The Mac. should be kept clean, but if it goes stiffly **without work upon it,** even if oiled with good oil, it may be due to much fluff and grit from the yarn clogging it; in which case remove Cyl., shell,

and geared-ring, as directed elsewhere, and clean all parts, but this need only be done at rare intervals, as a little fluff will not affect the action. (See "To Remove Parts," pages 69 to 72.)

SCOLLOPED TOP for SOCKS, STOCKINGS, &c.

(See Illustration, page 25.)

Plain tension at 4½; Ribber tension at 4, for 3 or 4-ply Fingering.

Arrange Ns. in Cyl. in groups of 3 with one empty groove after each group. Set **"Rough"** and **"Correct Selvedges"** as directed on pages 9 to 13; knit 1¾ rows in addition to the one row after setting **"Correct Selvedge"**—that is, 2¾ rows in all, and stop Y.G. at **"Front"**; put on ribber without any Ns. in dial, and adjust Cyl. so that dial grooves are over empty Cyl. grooves, as directed on page 22.

Take a dial N., and pick up with its hook the threads (including the "Correct Selvedge" thread) which lie across the empty Cyl. groove nearest the **"Right"** half mark; place the dial N. into the corresponding dial groove. Continue FORWARDS, picking up the threads and placing Ns. into dial over the other empty grooves; but after placing into dial a few Ns., see that the threads are in the hooks of dial Ns., and the latches are open; then knit FORWARDS a few Ns. so as to allow more Ns. to be placed into the dial, and in that way complete the picking up.

Now knit the number of rows required for the Top of Sock or Stocking.

NOTE.—The scollop may be varied by knitting more, or less, rows after setting **"Correct Selvedge."**

The scollop may also be made with all the Ns. in the Cyl., and Ns. in every second dial groove; in which case the Cyl. must be adjusted so that the posts of Cyl. are opposite dial grooves, and then the threads over every fourth Cyl. post should be picked up.

HEEL, FOOT, and FINISHED TOE

(AS HAND-KNIT, OR SCOTCH FASHION—See Fig. 26).

ABBREVIATIONS.

Mac.	=	Machine.
Cyl.	=	Cylinder.
Y.G.	=	Yarn-guide.
N.	=	Needle.
Ns.	=	Needles.
C.R.	=	Clasp-ring.
S.U.	=	Set-up.

Knitted on 84 Ns. Cyl. and 42 Ns. dial. (For other Cyls. see Margin 32, p. 41.) This Scotch Heel, &c., would follow in place of the Heel, &c., in the several instructions for Socks or Stockings, "Commenced at the Top" only.

Heel.—Take off C.R.; transfer loops (see Margin 26, page 22) from the **"Front"** half of dial Ns. (that is, from the marked Cyl.

post on **"Left"** side, to the marked post on **"Right"** side) on to Cyl. Ns., and put the Cyl. Ns. into corresponding Cyl. grooves. Advance Y.G. to **"Front."** Transfer all remaining ribbing stitches on to Cyl. Ns.; loosen wing-nut of ribber and take the ribber off Mac.; put on C.R.

(32.) The Scotch Heel is always made upon half the Ns. of a Cyl. and so 42 Ns. would be employed if the Cyl. has 84 grooves. The half of the Cyl. Ns. is divided into 3 equal parts, thus:—42 being the half, 14 Ns. would be a third of 42. Now, if the Cyl. has more or less Ns. than 84, the operator should observe the following:—If a 60 Cyl. read 10 Ns. instead of 14 Ns. here given; if a

72 Cyl. read 12 Ns. instead of 14 Ns.
96 Cyl. read 16 Ns. instead of 14 Ns.
108 Cyl. read 18 Ns. instead of 14 Ns.

For the Scotch Toe the variation is just the same.

Heel.—(Plain work).—With N. lifter raise fully up out of action the **"Back"** half of Cyl. Ns.; lift yarn at front of small shield on yarn-cross, and place it into hook of take-up. Knit FORWARDS and stop Y.G. at **"Back."** Now begin to knit BACKWARDS and FORWARDS 33 rows, and send the Y.G. to **"Back"** each row across (keeping the fabric pulled down at **"Front"** only). After a few rows the work will begin to rise about the Cyl. Ns., when insert heel-wire and attach heel-weight to keep it down (see Margins 17 and 18, page 14). **"Right"** side of work to be kept firmly down with left hand whilst knitting. Stop Y.G. about **"Left"** side; take off C.R.; take off heel-wire and weight.

Fig. 26.



At the **"Right"** side lift 14 Ns. out of Cyl. with the loops at butts, and place them inside of sock in a hanging position; knit to the **"Right"** side; at the **"Left"** side lift out 14 Ns. and place them inside the sock in the same way; put on C.R.; put heel-wire (with weight) into work at **"Front."**

Lift the first inside hanging N. of the **"Right"** group of Ns. (that is, the N. next to those in action), and pass it under the thread and transfer its loop on to the **"Right"** end N. of the 14 that are in action in **"Front"** of Cyl.; do same with the first hanging N. of **"Left"** group, and transfer its loop on to the **"Left"** end N. of the 14 in action **"Front"** of Cyl.; then knit BACKWARDS one row across. Repeat the same operation and transfer in same order one loop from the **"Right"** and one from **"Left"** group of hanging Ns., on to end **"Right"** and **"Left"** group of the 14 in **"Front"** of Cyl.; knit across. Continue this operation until all the hanging N. loops are transferred; stop with Y.G. at the **"Left."**

Take off the C.R.; take 14 Cyl. Ns. (that are not in use), and with their hooks pick up at "**Right**" side 14 loops of flat web knitted for heel, and put these Ns. back into the Cyl. grooves that you recently took them from. At "**Back**" depress the raised Ns. into action; (taking care **not to knit** past first dial N. at the "**Right**" half Cyl. mark) knit across to the "**Right**" side and stop Y.G. there. With other 14 Cyl. Ns. (that are not in use) pick up 14 selvedge loops at "**Left**" side, and insert Ns. in Cyl.; lift yarn off take-up. Then put on ribber as directed on page 21, and put ribbing needles into dial as directed on page 22, being careful to re-transfer ribbing stitch to continue the rib up the front of foot.

Foot.—Now put on ribber, and see that Cyl. is adjusted to dial (as directed on page 22). Knit very carefully (and see that latches do not close in the first row, or ribbing loops will drop) five rows in all; stop Y.G. at "**Back.**"

Foot—to Narrow.—Counting from the extreme "**Right**" and "**Left**" dial Ns., transfer the loop from the fourth Cyl. N. on to a dial N. at each side; push dial Ns. into dial; put on C.R.; keep work well pulled down with the heel-wire, and at "**Back,**" knit 70 rows and stop Y.G. at "**Front**"; take off C.R. Transfer all the dial loops on to Cyl. Ns., and take off ribber; put on C.R. and knit to "**Back.**"

Toe.—(Plain Work). Raise fully out of action the "**Front**" half of Cyl. Ns., and advance Y.G. to "**Front.**" Put the yarn on take-up; raise **fully** out of action the "**Left**" end N.; knit across from "**Left**" and stop Y.G. at "**Front**"; raise "**Right**" end N. and knit across to "**Front**"; raise another N. at "**Left**" side, and (with the left hand under the Cyl.) keep the work well held down from the "**Back,**" continue knitting BACKWARDS and FORWARDS, and always raise the last N. that knitted each row, until there are only 14 Ns. left in action; knit to the "**Left**" (across these 14 Ns.) and stop with the Y.G. at "**Front.**" About 2 inches from the last N. that knitted break the yarn. Take off all the heavy weights, leaving on only the heel-wire and weight; take off C.R. Throw out into a hanging position and **outside** the Sock or Stocking (with the loops at the N. butts), the "**Back**" half of the plain Ns. and let them hang **between the Sock and Cyl.**; turn Y.G. to "**Back**" of Mac. and depress the "**Front**" half of Ns. into action.

Take in at "**Right**" side thus:—Transfer 3rd loop on to 4th N. in Cyl., and 1st loop on to 2nd N.; fill up empty 3rd groove by bringing end N. forward. Lift up 1st inside hanging N. and put it into Cyl. next the end one. Now thread the Y.G., and guide yarn to knit into end N. at the "**Right,**" leaving an end about 2 inches; knit across to the "**Left**" and stop with Y.G. at "**Back.**" Take in at the "**Left**" side (same as at "**Right**" side) and leave the thread of yarn at "**Back**" of the end N.; knit FORWARD to the "**Right,**" and repeat the taking in, and in knitting across this time, knit in the

end of yarn that you left. Continue taking in every row same side as yarn is at, until you have only 14 Ns. in action, and 14 hanging ones; when knitting last row, knit in end of yarn at "**Left**" side. Taking care not to cross them, transfer the 14 loops from the hanging Ns. on to the 14 in Cyl.

Toe.—To close end. First see that the loops are *below* the latches; take "**Right**" end Cyl. N. and using it in the same manner as an ordinary crotchet N., put the yarn in its hook, then pull the N. down so that the two loops will pass off it, and thus form a new loop with the yarn in its hook; now transfer the new loop to next N. Keep repeating this till all the Ns. are out but one. Take off heel-weight, break yarn, and give last loop two crotchets (instead of one) for finish; draw the ends of the yarn in and out the fabric once or twice, and cut off unused ends.

Cut and ravel off the "**Rough Selvedge,**" and with a damp cloth placed on top of sock, press well with a hot iron for final finish.

HIGH HEEL for SOCK or STOCKING (commenced at the Top).

The object of this is to provide for thickening the back of the heel (above C to M of Fig. 17, page 17) for the hard wear at that point, also to give the heel a better shape.

Refer to "**Leg**" (page 23), last line, and continue from "Stop Y.G. at '**Right.**'" Knit to "**Back,**" take off C.R.; transfer loops from "**Front**" half of dial Ns. to Cyl. Ns.; knit to "**Front**"; transfer loops from "**Back**" half of dial Ns. to Cyl. Ns. and take off ribber (or, instead of "transfer loops of back half of dial Ns. to Cyl. Ns. and take off ribber," take out ribber driving-pin only and leave ribber on Mac.); thread yarn-cross with the thickening yarn, and tie it to the other yarn at about the middle of the yarn-cross; put both yarns into hook of take-up; loosen tension 1 degree, put on C.R.; raise out of action "**Back**" half of Cyl. Ns., and also **next to them on each side,** the first, second, and third Ns. of the "**Front**" half, from the marked posts (that is, raise 3 extra Ns. of "**Front**" half on "**Right**" side, and 3 on "**Left**" side); knit FORWARDS to "**Back**"; depress that extra third N. on "**Right**" side of "**Front**" half (that is, the raised N. next to those in action), and put yarn at back of it and also of next N. out of action; knit BACKWARDS to "**Back**"; depress the corresponding N. on the "**Left**" side, put yarn at back of it and also next N. out of action; knit FORWARDS to "**Back**"; depress that extra second N. on "**Right,**" and put yarn at back; knit BACKWARDS to "**Back**"; depress the corresponding N. at "**Left,**" and put yarn at back; knit FORWARDS to "**Back**"; depress the first extra N. at "**Right**"; put yarn at back of it, and also at the back of the raised N. next to it (first N. of "**Back**" half); knit BACKWARDS to "**Back**"; depress the first extra N. at "**Left,**" put yarn at back of it, and also at the back of the raised N. next to it (first N. of "**Back**" half); knit FORWARDS and stop Y.G. at "**Front.**" Now continue

"**Heel Narrowing**" (page 14), commencing after "Lift the yarn at front of small shield on yarn-cross, and put it into hook of take-up."

KNITTING with TWO YARNS.

To Thicken (or Double) Heels, Toes, &c.

(See "Caution" below.)

It is always necessary when knitting with two yarns to loosen the stitch 1 or 2 degrees, to prevent the fabric being too close.

Place the extra bobbin on the table, exactly under a vacant hole in the arm of yarn-cross. Pass the yarn through that hole, and bring the two yarns together in centre hole of the yarn-cross, then under shield, and through the Y.G. as usual. When commencing a heel, or toe, the splicing yarn can be tied loosely to the end N., or tightly to the yarn already in use; and put it into hook of take-up with the other yarn. Break splicing yarn at the Ns. when the part to be thickened is finished. The splicing or thickening thread for heel or toes should be finer than the yarn used in the other part of the sock or stocking.

CAUTION.—For work on cylinders of 84 or over double 3-ply yarn should never be used. A 3 and a 2-ply is recommended, but a 3 and a 1 or a 4 and a 1 can be used. For 108 cylinders or over it is inadvisable to combine yarn thicker than 1-ply, with the yarn being used for the body of the sock or stocking. Do not knit with too tight a stitch or tension. A looser tension should be used for dark, or heavy yarns, than should be used for light coloured and fine yarns.

MODE of FORMING CORRECT SELVEDGE with RIBBER on MACHINE.

Set "**Rough Selvedge**"; put on ribber; adjust Cyl. so that dial Ns. will work over the Cyl. grooves; transfer the loops to make one plain and one rib: knit one row round with a tight plain stitch, stopping with the Y.G. at "**Front**"; take out the driving-pin; knit 3 rows round without the pin, and stop Y.G. at "**Front**"; loosen plain stitch; then put in the driving-pin, and knit the number of rows required.

PLAIN SOCK, or STOCKING—

TO SHAPE the LEG & FOOT with RIBBER on MACHINE.

Set "**Rough**" and "**Correct Selvedges**" for a plain sock; put on ribber and knit the top; adjust Cyl. so that dial Ns. work over Cyl. grooves; use only one dial N., which place into dial groove exactly in the centre at "**Front**" of Mac.; transfer the one plain loop to dial N. This one dial N. will make a seam stitch down the leg of the sock. After knitting the leg, take out dial N. and transfer loop to plain N., in the usual way. After the heel is formed,

put one dial N. in groove of dial at "**Right**" half mark, and one at "**Left**" half mark. This will reduce the width and make the foot a better shape. After completing the foot, transfer dial loops to plain Ns., and remove ribber.

The shaping of the leg and foot might be varied in several ways by using 2 *dial Ns. instead of* 1, *&c.*

TO UNRAVEL PLAIN KNITTING without REMOVING FABRIC from MACHINE.

This unravelling is sometimes used when there is faulty work, and also when re-footing.

Remove all weights, and support the fabric with the left hand, under the Cyl.; then knit once across if a Flat Web, or once round if a Circular Web; this should bring all the loops above the latches and into the hooks of the Ns.; take hold of the yarn between the Y.G. and the Ns., and pull it gently, moving the hand slightly up and down on a level with the tops of the Ns., and thus cause the previous row of stitches to pass over the hooks of the Ns. With a little practice you can ravel back as far as desirable without losing a stitch. After completing the unravelling, draw slack yarn back to bobbin. In tubular work, if there be any difficulty in passing the Ns. which are below the top of the Cyl., place the hands *upon the shell only*, and move it a little to the right or left.

TO FINISH with a SELVEDGE.

If ribber is on Mac., transfer all ribbing loops to plain Ns. and remove ribber.

Knit once round, and stop Y.G. at "**Front**"; commence at "**Right**" to raise all the Ns. out of action; advance Y.G. until at "**Back**"; take off C.R.; remove all weights, weight-holder and set-up (or buckle); then break the yarn, leaving an end about 1½ yards in length; take out the N. which knitted the last stitch; leave the loop just below the latch, and catch the yarn into hook like crocheting; draw the N. so that loop passes off the N. and leaves the yarn in the form of a loop upon the N.; this loop must be long enough to reach the top of the next N.; then transfer this loop on to the next N., and draw the yarn to tighten the loop to its usual size; there will then be two loops on that next N.; now take out that N. and place yarn in the hook as before, and draw a loop through the two loops which are upon it, and place the new loop made upon the next N. Repeat this all round (or across, if flat web), drawing the yarn completely **through the last** single loop to make it secure. Break off the spare yarn to within about an inch of the last loop, and then knit the end into the fabric, by hand. This selvedge will be exactly like the usual closing by hand.

CAUTION.—Great care must be taken not to hold the Iron too tightly when finishing off.

FLAT WEB.

(The Ribber is not used for Flat Web.)

Observations.

1. For Flat Web, it is an advantage to have about four dozen extra plain Ns. for the parts which require increasing or widening.

In absence of extra Ns., and where Ns. are removed from partially completed work, pass a thread of yarn through the loops to prevent their unravelling.

2. Flat Web is knitted upon a Cyl. by the FORWARD and BACKWARD movement of the Y.G. For example, we will suppose that Ns. are placed into all the grooves of "**Front**" half of Cyl.; the Y.G. would then be made to travel to and fro, far enough to allow the end Ns. to make their stitches each time across. The Y.G. would probably be taken some 20 grooves beyond each end N. before it has made its stitches each time across. That length of 20 grooves represents the space occupied by the cams in the shell. Now, if it is desired to make a Flat Web with all the Ns. in the Cyl. the movement would be BACKWARD and FORWARD just the same, but it would be necessary, each row across, to raise 20 Ns. out of action, first one side of "**Back**" half mark and then 20 on the other side, as follows:—

FLAT WEB with 20 NEEDLES (or more), out of CYLINDER.

Rough Selvedge for Flat Web must be commenced at one or the other end of the Ns.—that is to say, a section of the Cyl. should have Ns. in the grooves sufficient for the required width of the Flat Web, and these Ns. must be placed together in "**Front,**" leaving the "**Back**" grooves empty. The looping of the Ns. is done exactly the same as in the "**Rough Selvedge**" for Circular Work. The hooks of S.U. opposite that section of Ns. are used only, but any one of those hooks may be used more than once. Proceed as follows:—

Turn handle slowly FORWARDS and stop when Y.G. is about opposite the sixth empty groove from the first N. in action on the "**Left.**" Thread the Y.G. with the odd yarn as directed in "**Rough Selvedge for Circular Work,**" draw off about a yard of yarn through Y.G., pass yarn direct from Y.G. outside the end (or first N.) at "**Left,**" under hook in S.U.; then round that first N., under hook in S.U., round the third N., back to S.U.; so continue missing a N. each time. (See Fig. 14, page 11.) When the last N. is reached, pass yarn round it, and back to a hook of S.U., just as with the others, even though the N. before it has been looped; secure the yarn by twisting it round a hook of S.U. twice or thrice. Attach holder and weights to large hook of S.U. Pick up yarn in front of the shield and put it in hook of take-up; draw slack yarn back to bobbin. **See that latches of Ns. are open;** then knit FORWARDS, sending Y.G. beyond the end N. at "**Right**" until that N. has made stitch (that is, rises out of its groove and is level with the others); knit

BACKWARDS until end N. at "**Left**" has made stitch; continue knitting FORWARDS and BACKWARDS as many times as required, four rows will be sufficient if a "**Correct Selvedge**" is to be commenced; in that case, knit the last row BACKWARDS and send Y.G. to the "**Back,**" and stop. (The object of sending Y.G. to the "**Back**" is to take the cams out of the way, and so allow the Ns. to be raised out of action.)

Correct Selvedge for Flat Web, with 20 Ns. (or more) out of the Cyl.—All Ns. to be raised out of action; break yarn at the bobbin; remove bobbin and put in its place (on the table and under the hole in yarn-cross) a bobbin of new yarn to be used for the work; join and then take hold of yarn at the Ns. and drag it until new yarn is through Y.G.; break new yarn at the knot and lay "Rough Selvedge" end inside S.U. Draw off yarn through Y.G. as may be required for "Correct Selvedge." Take the end of the new yarn and make a loop (do not tie a knot); commence at the "**Left**" end N. to set "Correct Selvedge" the same way as directed on pages 11 and 12. When last N. at the "**Right**" is reached, see that yarn is twisted round it in the usual way, and then passes at the back and round the outside direct to the Y.G. See that latches are open; hold slack yarn away from Ns.; then turn handle FORWARDS until Y.G. is about 20 grooves **beyond** the end N. at "**Right.**" Place yarn from front of shield into hook of take-up; depress all Ns. into action; turn handle BACKWARDS until Y.G. is opposite end N. at "**Right**" side; draw slack yarn back to bobbin, and knit BACKWARDS and FORWARDS, sending Y.G. to the "**Back**" each time, so that end Ns. may make their stitches; knit as many rows as may be required for work in hand.

FLAT WEB with NEEDLES IN ALL (or nearly all) of the CYLINDER GROOVES.

Rough Selvedge can be set and worked as for Circular Web (see page 9); knit four rows **round;** stop Y.G. almost at "**Back**" (so as to bring the cams within the quarter lot of Ns. from "**Right**" half mark to "**Back**"). Commencing at the N. directly at "**Back,**" raise out of action quarter of the Ns., that would be to "**Left**" half mark; then raise "**Front**" half of Ns.; send Y.G. FORWARDS to "**Front**"; raise quarter lot of Ns. "**Back**" to "**Right.**"

Correct Selvedge for Flat Web, with all (or nearly all) the Ns. in Cyl., proceed as directed on page 11, commencing with the N. first raised at "**Back.**" When the last N. is reached, the yarn should be twisted round that N. as usual, and passed between that last N. and the N. on which "Correct Selvedge" was commenced, direct to Y.G.; hold yarn away from Ns. and send Y.G. BACKWARDS, and stop almost opposite that last N.; depress Ns. from "**Back**" to "**Right**" on to "**Left**" half mark, and thus leave the quarter lot of Ns. raised from "**Left**" to "**Back**"; put yarn on take-up; draw slack yarn back and see that it passes **direct** from Ns. through Y.G. to bobbin; **see that all latches are open;** assist to hold work down with

left hand, and watch that yarn feeds into the end Ns. Knit BACKWARDS almost to "**Left**"; depress quarter lot of Ns. from "**Left**" to "**Back**," and raise quarter lot of Ns. from "**Back**" to "**Right**"; knit BACKWARDS to "**Right**"; knit FORWARDS almost to "**Right**"; depress Ns. "**Right**" to "**Back**"; raise Ns. "**Back**" to "**Left**"; knit FORWARDS to "**Left**"; knit BACKWARDS almost to "**Left,**" and continue in like manner, depressing and raising Ns. and knitting, for as many rows as are required.

To run work off Mac., break yarn at Ns., and turn handle **round** once or twice. Press, with hot iron upon damp cloth; cut away "Rough Selvedge," unravel and finish off with Button Hole Stitch.

WIDENING and NARROWING FLAT WEB.

Widening.—A flat web may be widened on one, or both sides. Take off C.R., take a spare N., and catch into its hook a loop from the last stitch made at back of the end N., and place the increasing N. in the next empty groove.

Or, the end N. (with the loop on it) may be transferred to the next empty groove, and a spare N. placed in the groove from which the end N. was taken; but first catch on the spare N. a loop from the stitch of next (Right or Left) N. Knit one row, or more, between each increase.

Narrowing.—A flat web may be narrowed by removing a N. on one, or both sides. Take off C.R.; take out end N., and put the loop over the adjoining N.

Or, you may remove the fourth N., and place its loop over the fifth N.; then transfer the first three Ns. forward one groove, and so fill up the empty groove and have all Ns. together in one continuous line. Knit one row, or more, between each narrowing.

JOINING STRIPS of FLAT WEB.

This is usually accomplished by hand with the crotchet stitch, but it can also be done on the Mac. Supposing one piece of flat web has been knitted and that another piece has been set up in the usual way on "**Front**" of Mac., see that Y.G. is at "**Right**" "**Back**" ready to knit BACKWARDS, then take the first piece of web and place the "**Right**" end selvedge loop over the end N. at "**Left**"; knit BACKWARDS and FORWARDS; place the next loop of the side selvedge over the end N., knit BACKWARDS and FORWARDS; place the next loop over the end N., knit BACKWARDS and FORWARDS; continue in like manner until the second piece of web is as long as the first. The joined strips can now be joined to a third, and so on.

PLAIN SOCK OR STOCKING FOR A CHILD.

Use Plain Mac. only with 4½ inch diameter 84 Ns. Cyl. and knit as for Flat Web.

(Cyls. with more or less Ns. can be used, but the instructions must be varied accordingly.)

The tension should be varied according to size and quality of the yarn used.

OBSERVE.—Small *seamless* (plain or ribbed), socks and stockings are more readily and neatly knitted on 3¾ inch diameter Cyls., such as are supplied in a "Compound" Mac. Small ribbed socks, &c., can also be made *seamless* on the 4½ inch diameter 56 or 60 Cyls. with dial to match (although not quite so neatly shaped as when knitted on 3¾ inch diameter Cyls.). But if medium yarns are to be used on any of the other 4½ inch diameter Cyls. (72, 84, &c.), the smaller sizes of socks, or stockings, for children would be made with seams, and after a little practice, can be very readily knitted by the instructions below. The seams can be over-sewn as usual, or finished by a fancy stitch, and in that way the socks, &c., may be made very pretty.

Top—Imitation Rib.—Turn handle *slowly* FORWARDS, and stop when Y.G. is midway of "**Left**" and "**Back.**" Place in "**Front**" of Cyl. (working "**Right**" and "**Left**") 45 Ns. in groups of three, with an empty groove after each group, for an imitation ribbed top. (More or less groups may be arranged, if larger or smaller socks are required.) Set "**Rough**" and "**Correct Selvedges**" for Flat Web, as directed on pages 46 and 47. Be careful to have the yarn on take-up, and always watch the end Ns. to see they make stitches. Knit BACKWARDS and FORWARDS ten times in all, to make 20 rows (*but see that the last row is always knitted FORWARDS*), and stop Y.G. between "**Left Back.**"

Leg.—Take off C.R.; then take a spare N., catch into its hook a loop from the side of the stitch last made by the N. next an empty groove, and place N. into that empty groove; in the same way catch loops and place Ns. into all the other empty grooves, including the empty groove beyond the end N. at "**Right**" (and so make 60 Ns. in one line without an empty groove between them); put on C.R; **see latches are open;** knit 20 rows for a sock, or 70 rows for a stocking, and stop Y.G. midway of "**Left**" and "**Back**"; take off C.R.

Another Method.—The top of plain sock or stocking can also be made as follows:—

Set up "**Rough**" and "**Correct Selvedge**" as directed on pages 46 and 47 for flat web; be sure to have yarn on take-up spring. Knit one row after "**Correct Selvedge**"; take off clasp-ring, put on ribber, and transfer stitches from Cyl. to dial Ns. for either 1 and 1 or 3 and 1 rib; put on Clasp-ring. Knit FORWARDS across machine one row with driving-pin in its place; remove driving-pin, and knit one row BACKWARDS; replace driving-pin, and knit a row FORWARDS (taking care that the end stitches always catch the wool). Continue for number of rows required, then transfer dial stitches to Cyl. Ns.; put on Clasp-ring, see latches are open, knit 20 rows for a sock, &c.

This rib makes a good stitch for vests, &c.

To Shape (or Decrease) the Leg.—Take out the second N. on

the "**Right**" side, and transfer the loop to the third N. (next to it); lift the first N. into the empty (second N.) groove; then take the second N. on the "**Left**" side, and decrease on that side in the same way; knit five rows; continue the decreasing and knitting as above, **on both sides,** until four Ns. have been taken out each side; put on C.R.; then knit without decreasing 20 rows for the ankle and stop Y.G. at "**Left Back**"; take off C.R.

Foot—Top of.—Take out (with the loops upon them) the 13 Ns. at the end on the opposite side to Ns. last knitted (which would be at "**Left**" side if the last row was knitted FORWARDS); tie them together and place them inside Cyl.; knit across the remaining Ns.; take out 13 Ns. at the end on the other side; tie together and place inside Cyl. This will leave 26 Ns. in action at the "**Front**" of Mac.; on these, knit 30 rows; stop Y.G. at "**Back.**" **To keep the work down at the corners use Heel-Wire and Weight.** (Read Margin 18, page 14.)

Top of Toe.—Narrowing.—Take the second N. on **each side,** and transfer the loops on to the third Ns.; put the first Ns. into the empty (second N.) grooves (in the same manner as decreasing for the leg); knit two rows; continue the narrowing and knitting in like manner, until there are ten Ns. only in action; then, without narrowing, knit two or three extra rows, and break yarn at the Ns.; take off weights; hold fabric down with left hand; turn handle to run loops off the ten Ns.; take out of Mac. the ten empty Ns.; leave Y.G. at "**Back.**"

(If desired, the Scotch or hand-knitted Heel, or Toe, can be worked from this point. Follow *only* the instructions for "Heel (Plain Work)" and "Toe (Plain Work)," pages 41 & 42.)

Heel.—Take the two lots of 13 Ns. which were hanging inside Cyl., and place them in one continuous line in the "**Front**" of Cyl., being very careful to bring together the two selvedge edges of the leg of the sock or stocking; see that the Ns. do not cross one another; put on C.R.; thread Y.G., and leave a piece of yarn about 12 inches long, this being the best and neatest method to recommence the work and sew up the sides of the foot; attach to the fabric heel-wire with weight; knit heel in the usual way (as for "Plain Sock") decreasing to 10, and then increasing to the 26 Ns.

Bottom of Foot.—Knit 30 rows; stop Y.G. at "**Back.**"

Bottom of Toe.—Take off C.R. and proceed as instructed above for "Top of Toe."

Finish.—Place damp cloth upon the fabric; press with hot iron; sew up back of leg and sides of foot; unravel the extra rows on each half of toe, and close the halves with "Mending Stitch" (see p. 16).

NOTE.—The above can be altered in working, and the instruction given for "Stocking—plain-shaped" (page 51) can be followed from "Foot—top of," excepting that the number of rows would vary.

STOCKING—PLAIN SHAPED (commenced at the Top).

Use medium yarns, and knit on 4½-inch diameter Cyls., to which the following directions particularly refer.

(The 3¾-inch diameter Cyls., such as the 72, 84, or 96, will also make useful plain stockings.)

4½ inch Cylinder.	**3¾ inch Cylinder.**
Approximate Number of Rows.	Approximate Number of Rows.
Leg: 180 rows.	Leg: 120 rows.
Leg: Shaping, 30 rows (or more).	Leg: Shaping, 20 rows (or more).
Ankle: 50 rows.	Ankle: 40 rows.
Foot: Top, 75 rows.	Foot: Top, 60 rows.
Foot: Bottom, 65 rows.	Foot: Bottom, 50 rows.

Tension will vary according to the size and quality of yarn used.

Set "**Rough**" and "**Correct**" Selvedges, and, knit FORWARDS to "**Left**" half mark, as directed on pages 9 to 13.

Leg—Top.—Tighten tension half a degree; set the counter to 0, and knit FORWARDS 150 to 180 (120 for 3¾ Cyl.) rows for the top portion of the leg; stop Y.G. at "**Left**" half mark. If the weights touch the ground, remove S.U. and put on buckle with weights attached (85 of Fig. 3), and lift the buckle as the work advances.

Leg—Shaping.—(See Margin 33.) Commence with the N. in centre of the "**Front**" half (that is one of the two Ns. directly in "**Front**") and raise out of action the quarter lot of Ns. to "**Right**" half mark (so as to avoid their making stitches). **Advance Y.G. slowly FORWARDS to the "Right" until last N. in "Front" (next to those raised out of action) has made its stitch and risen to its place, then stop.** (Care must be taken not to send the Y.G. beyond the raised Ns. each time.)

(33.) If only a slight shaping is required, instead of following the directions from this point to the end of the section, you may tighten the plain tension one degree; knit round about 15 rows; tighten tension one degree more and knit round another 15 rows to complete the shaping; then knit round 50 rows for the ankle, and complete heel, foot, and toe, as directed for "Plain Sock."

Decreasing—1st Row.—Take off C.R.; take the N. next to the one which made the last stitch, and lift it out of Cyl., and transfer loop on the next N. in action on its left, and advance Y.G. slowly until it is at the back of the machine. Then transfer into the empty groove the first N. on its right (that is, the one N. next the raised Ns.), leaving its loop upon it; the empty groove is thus between those Ns. in action on the "**Left**" and the Ns. raised out of action to the "**Right**"; put on C.R.; **see that latches are open;** put yarn on take-up; knit BACKWARDS until Y.G. is at "**Back**"; depress all the Ns. raised out of action "**Front**" to **Right,**" and (commencing with N. **next to** that "**Front**" empty groove) raise the quarter lot of Ns. "**Front**" to "**Left.**" Take off C.R.

Now, take out second N. on the "**Right**" side of the "**Front**" empty groove, then transfer loop on to third N., and place the first N. into the empty (second N.) groove, so leaving all empty grooves together in "**Front**"; put on C.R.; **see latches are open;** knit BACKWARDS until Y.G. is opposite half mark on "**Left**" side (so that all the Ns. up to the empty grooves at "**Front**" shall have made stitches and risen level with others in action).

2nd Row.—Knit FORWARDS until Y.G. is at "**Back**"; depress Ns. on "**Left**" "**Front,**" and raise others on "**Right**" "**Front**"; knit FORWARDS until Y.G. is at "**Right**" half-mark.

3rd Row.—Knit BACKWARDS until Y.G. is at "**Back**"; depress "**Right**" "**Front**" Ns., and raise "**Left**" "**Front**" Ns. as before; knit BACKWARDS until Y.G. is at "**Left**" half-mark.

4th Row.—Knit FORWARDS to "**Back**"; depress "**Left**" "**Front**" Ns., and raise "**Right**" "**Front**" Ns., as before; knit FORWARDS until Y.G. is at "**Right**" half-mark.

5th Row.—Knit BACKWARDS to "**Back**"; depress Ns. on "**Right**" "**Front,**" and raise Ns. on "**Left**" "**Front**"; knit BACKWARDS to "**Left**" half-mark.

Decreasing Row.—Take off C.R.; decrease again by transferring loop from second to third N. in action on "**Right,**" and place first N. with loop on it in the empty (second N.) groove (next to Ns. in action); put on C.R. Knit FORWARDS to "**Back**"; depress "**Left**" "**Front**" and raise "**Right**" "**Front**" Ns.; take off C.R. Decrease on "**Left**" (as before) and then knit FORWARDS to "**Right**" half-mark.

Now knit 4 rows without decreasing (as 2nd, 3rd, 4th and 5th rows mentioned above); then decrease, and knit in like manner, until there are about 6 Ns. (3 for $3\frac{3}{4}$ Cyl.) on each side out, thus leaving 12 empty grooves in "**Front.**"

SECOND METHOD.

Ankle.—Knit without decreasing, BACKWARDS and FORWARDS, about 50 (40 for $3\frac{3}{4}$ Cyl.) rows for the ankle, and continue raising and depressing (as before) each time across, the Ns. in action up to the "**Right**" or "**Left**" half-mark.

The last row must be formed by knitting BACKWARDS, and then stop when Y.G. is at "**Back.**"

Parting Needles.—Part Ns. into three lots, thus:—Supposing it is an 84 Cyl. in use, and that 12 Ns. have been taken out for the decreasing, there will be left 72 Ns., which divide as follows: 18 on "**Right**" side—18 on "**Left**" side—and 36 at "**Back.**" Take off C.R.; lift out of Cyl. the 18 Ns. at "**Right**" with the loops drawn down to the butts, and tie into one lot, and place inside Cyl.; lift out of Cyl. the 18 Ns. at "**Left,**" and tie into one lot, and place inside Cyl.; put on C.R.; knit BACKWARDS to "**Front,**" to complete the row.

(34.) To knit a Heel with a Gore, as in Fig. 27, proceed from this point as follows:—
Knit FORWARDS and BACKWARDS 25 rows, **taking care to see that first and second Ns. on "Left" and "Right" receive yarn from Y.G.,** otherwise stitch will run off.
HEEL—NARROWING.—(Continue as directed on page 52.)
HEEL—WIDENING.—(Continue as directed on page 54.)
FOOT—BOTTOM OF.—Stop Y.G. at "Front" and take off C.R.; take 13 Cyl. Ns., and with their hooks pick up 13 loops of selvedge at "Right" side, and insert Ns. (with selvedge loop upon each) into Cyl. Knit FORWARDS until Y.G. is at "Back"; with other 13 Ns. repeat the above at "Left" side. Narrow on each side of the Y.G. every row across, by transferring loop from 3rd to 4th N., and moving the two end Ns. forward one groove, until only 40 Ns. remain. Then knit for bottom of foot 65 rows (including those rows that were knitted for the Gore.)
TOE.—(Continue as directed on page 54.)

Foot—Top of.—Knit FORWARDS and BACKWARDS about 75 (60 for $3\frac{3}{4}$ Cyl.) rows on the 36 Ns.; take off weights, and attach heel-wire with weight, to keep work down, and raise it as work advances (see Margin 18, page 14); break yarn at Y.G. Take off weights, and in place of them apply the left hand to hold fabric down; then turn handle, and work will leave the 36 Ns.; stop Y.G. "**Front**"; take off C.R.; remove the 36 Ns. from Cyl.; turn Y.G. to "**Back.**"

Heel.—Follow the instructions as on page 48 referring to "Heel," but use 18 Ns. instead of 13. **See that latches are open;** put yarn on take-up; attach heel-wire with weight (for "Gored Heel," see Margin 33); knit FORWARDS and BACKWARDS five rows, **taking care to see that first and second Ns. on "Left" and "Right" receive yarn from Y.G.,** otherwise the stitches will run off.

(If desired, Scotch or Hand-knit Heel and Toe can be worked from this point, commencing from "HEEL—PLAIN WORK," page 41.)

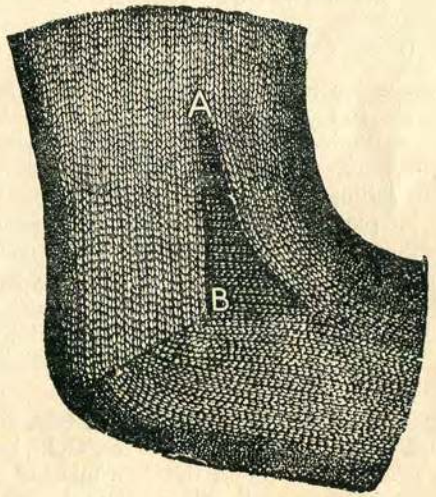


Fig. 27.

Heel—Narrowing.—Lift fully up out of action the "**Right**" end N.; knit BACKWARDS to "**Back**"; raise "**Left**" end N.; knit FORWARDS to "**Back**"; so continue, raising a N. on one side, and a N. on the other side, and knitting after each raising, until there are only 14 Ns. in action at "**Front**"; attach heel-wire with weight to keep work down; the last N. to be raised will be at "**Left,**" then knit FORWARDS to "**Back.**"

Heel—Widening.—Depress the last N. raised on "**Right**"; put yarn behind it so that it passes out *direct* to Y.G. from between the N. just depressed and the next raised N.; knit BACKWARDS to "**Back**"; depress the last N. raised on "**Left**"; put yarn behind it; knit FORWARDS to "**Back**"; so continue, depressing the next raised N. to those in action, putting yarn behind it, and knitting each time, until all the Ns. are depressed.

Foot—Bottom of.—Knit without raising Ns., BACKWARDS and FORWARDS 65 rows (50 for a 3¾ Cyl.) on the 36 Ns.

Toe.—Knit toe (narrow and widen) as instructed for "Heel" above; then knit 5 or 6 rows extra for the joining; break yarn at Ns.; take off weights, and hold fabric down by left hand; then turn handle, when work will leave the Ns. Place damp cloth on the seams, and press with hot iron. Oversew seams, and finish toe with "Mending Stitch" (see page 16).

TO RE-FOOT HOSIERY.

REMARKS.

(*First read Remark 5, page 55.*)

1. If there are too many stitches (loops) in a **Plain** Sock, or Stocking, for the Ns. in Cyl. (thus 84 stitches, and only 60 Ns. Cyl.) arrange that the extra loops shall be somewhat equally distributed round the Cyl., but not placed on the Ns. until the unravelling is done. After unravelling the rows from the tops of the Ns., the extra loops can be placed on the Ns., so that in some places there would be two loops on one N. Then proceed as directed on page 55.

2. If there are too many stitches (loops) in a **Ribbed** Sock, or Stocking, for the Cyl., the extra ribbed loops must be distributed over the Cyl., and worked into plain stitches. But do not place the extra, or any, ribbed loops upon the Cyl. Ns. until the unravelling has been done on the Cyl.

3. If there are less stitches (loops) in a **Plain** Sock than there are Ns. in the Cyl. (say 60 stitches and 84 Ns. Cyl.), keep all the Ns. in the Cyl., and place the loops on the Ns., missing a N. here and there, so that the loops are equally placed over the whole of the Cyl. Now unravel the rows from the tops of the Ns. Afterwards, make loops for the empty Ns. This is done by picking up with a N. the **cross** stitch which is under the loop on nearest N., and placing it on the next empty N., or take out the empty N., pick up the loop, and replace the N. in the groove. Then proceed as directed on page 55.

4. If there are less stitches (loops) in a **Ribbed** Sock than Ns. in Cyl. after the unravelling on the Cyl. has been done, pick up ribbing loops from the side of the **plain stitches,** and so form extra ribs to meet the requirements of the Cyl.

5. If a Sock, or Stocking, is commenced from the Toe, it cannot be unravelled as directed, but after cutting off the foot above the heel, the loops must be exposed one by one, until a clear row has been obtained, then those loops should be placed upon the Ns. as usual, with shaping (if any) at "**Front**"; Y.G. to be at "**Back.**" Raise "**Front**" half Ns.; advance Y. G. to "**Front**"; thread yarn-cross and Y.G., from bobbin, and tie end of new yarn at first N. in action "**Right**"; advance Y.G. to that first N. in action at "**Right**"; draw slack yarn back to bobbin, attach weights, &c.

Re-footing Plain Sock, or Stocking (commenced at the Top).

(Read "REMARKS" 1, 3, and 5, pages 54 and 55.)

After the foot is cut off just above heel, unravel a few rows to get the loops clear; break yarn leaving a short end; then see that Ns. are in all the Cyl. grooves, and that the latches are open; put on C.R.; drive Mac. slowly, and stop Y.G. at "**Front.**" Place the sock inside the Cyl., with the unravelled end uppermost, and near the tops of the Ns. (If a stocking, arrange that the back, or shaping, is placed "**Front.**") Commence at the "**Right**" half-mark, and with a spare N., pick up, and transfer loops on to hooks of Ns. (but be very careful not to let the loops go below the latches of the Ns., as this would cause the work to run off Mac.) After having transferred the loops on to the "**Back**" half of Ns. **support the fabric,** from underneath Mac., with the left hand, (so as to prevent loops going below latches when turning handle); advance Y.G. to "**Back.**" Now transfer in like manner the "**Front**" half of loops to Ns. When all the loops are on the Ns., do not attach weight, but support fabric with left hand; now unravel about two rows to ensure that the loops are clear upon the Ns. (if the loops are clear, the unravelling is not necessary). This is done by taking the short end of the yarn (already unravelled) and drawing it out at the tops of the Ns., but it will be necessary, in order to unravel the yarn from the Ns. behind the Y.G., to move the *shell only* FORWARDS and BACKWARDS slightly, **but do not move the Y.G.** When the loops are all clear, stop unravelling on the **first N.** next to the N. on which you commenced to transfer loops at "**Right**" half-mark.

Now raise "**Front**" half of Ns. out of action; still support work and advance Y.G. to "**Front**"; attach buckle (or tie a piece of string round work, to form a sling), and hang it to weight-holder, and weights, to keep work down. With the unravelled yarn, thread Y.G., and yarn-cross *backwards* (that is, in the *contrary direction* described on page 9, for "**Rough Selvedge**"), and join the end to the new yarn, (a

bobbin of which should be already on the table, under one hole of yarn-cross). **See latches are open;** advance Y.G. until it is opposite the first N. in action at the "**Right**" side; draw slack yarn back to bobbin; knit FORWARDS to "**Back,**" and watch that the yarn feeds into the hook of the first N. in action. Depress "**Front**" half of Ns., and knit the number of rows required; knit "**Heel,**" &c., as directed for a sock, or stocking.

Re-footing Ribbed Sock, or Stocking (commenced at the Top).

(Read "REMARKS" 2, 4, and 5, pages 54 and 55, and "Re-footing Plain Sock.").

Place Ns. in all the Cyl. grooves, and put on C. R. Proceed in much the same way as for "Re-footing Plain Sock," excepting that, after cutting the sock, and unravelling one or two rows, *the plain loops only* of a ribbed sock must first be put on the plain, or Cyl. Ns., leaving the ribbing loops free, and a Cyl. N. free in front of each ribbing loop. Commence at "**Right**" half-mark, and place plain loops on the Ns., and see that the loops are **in the hooks of the Ns.;** do not attach weights, but support sock; unravel two rows on the Ns., stopping at the N. next to the "**Right**" half-mark. Then pick up each ribbing loop (knit it up, with a spare plain N. if it should be unknitted beyond the plain loop), and place the rib loop on the empty Cyl. N. left for it. Keep the loops in the hooks of Ns., and, if necessary, support the sock with the left hand; turn the handle and stop when Y.G. is at "**Back.**" Commencing at the N. next to the one on which the last stitch was unravelled, raise "**Front**" half of Ns. fully out of action; hold slack yarn away from Ns.; turn handle slowly FORWARDS, until Y.G. is at "**Front**"; with the unravelled yarn, thread Y.G. and yarn-cross **from the sock** (that is, in the *contrary direction* to that when commencing new work); tie yarn to (bobbin of) new yarn; attach buckle, and weights, as directed for "Re-footing Plain Sock;" and put on Ribber; adjust Cyl. for the required rib (see page 22); take off C.R.; insert Ns. into dial as may be required. (The ribbing loops can be seen by simply pressing the Ns. slightly from the Cyl.). Lift out the first Cyl. N. in action at "**Right**" side **with the ribbing loop upon it,** and transfer that loop to dial N.; see that loop passes into the hook of the dial N. **See that latches** of **Ns. are open;** then hold slack yarn away from Ns., and turn handle until Y.G. is opposite the first N. in action at "**Right**" side; continue to transfer ribbing loops, pull back slack yarn to bobbin, and advance Y.G., step by step, until Y.G. is at "**Back**" of Mac.; depress "**Front**" half of Ns., and continue transferring ribbing loops, and knitting, until all the ribbing loops are transferred; knit the number of rows required. Knit "**Heel,**" "**Foot,**" and "**Toe**" as for a "Ribbed Sock."

CYLINDERS.

ORDINARY ($4\frac{1}{2}$ **inch diameter,**) and **COMPOUND** ($3\frac{3}{4}$ **inch diameter.**)

NOTE.—It will be seen from the illustrations of the "Ordinary" and "Compound" Cylinders, below (Figs. 28 and 29) that the diameters are different at the top only—that is to say, the "Ordinary" measures $4\frac{1}{2}$ inches and the "Compound" $3\frac{3}{4}$ inches.

These measurements are taken from the bottom of the groove on one side, across to the bottom of the groove on the opposite side (that is to say, if 2 Cyl. Ns. are placed in opposite grooves the diameter would be taken from the back of one N. to the back of the other N.)

All $4\frac{1}{2}$ in. diameter Cyls. of different grooves are interchangeable in the "Ordinary Machine."

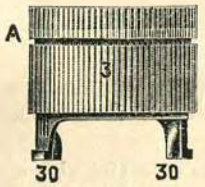
All $4\frac{1}{2}$ in. diameter as well as $3\frac{3}{4}$ in. Cyls. of different grooves are interchangeable in the "Compound Machine."

The $84/4\frac{1}{2}$ inch diameter Cyls. and the $72/3\frac{3}{4}$ inch diameter Cyls. ($60/3\frac{3}{4}$ for Scotland) with dials to match, will do the greatest variety of work, such as would be required for Temperate climates. Hot climates would require finer Cyls. (96, 108, or 120, $4\frac{1}{2}$ inches diameter) for fine yarns. Cold climates require coarse Cyls. (60, 68, or 72, $4\frac{1}{2}$ inches diameter) for thick yarns.

The following Cyls. are recommended as the most suitable for the several yarns mentioned. The table will also serve as a guide in selecting Cyls. for different makes of yarn.

To knit ribbed work each Cyl. requires a dial (see further under "**Dials,**" page 58).

When sending an order for extra Cyl., dial and Ns., the number of the Mac. should be given, also the diameter of the Cyl. and other necessary particulars. (See inside front cover, and price list of parts.)





ORDINARY.		COMPOUND.
$4\frac{1}{2}$ in. dia. Cyl. with 60 Ns.	For thick (Alloa) Wheeling and double yarns, &c., "Coarse" Ns. to be used. It is also adapted for the same yarns as are worked on the 84 Cyl. Use "Medium" Ns. (same as in 84).	$3\frac{3}{4}$ in. dia. Cyl. with 72 Ns. also ,, ,, ,, 60 Ns.
,, ,, 72 Ns.	For 5-ply Fingering, and Wheeling yarns, &c. Use "Coarse" Ns. It is also adapted for the same yarns as are worked upon the 84 Cyl., but use "Medium" Ns.	,, ,, 72 Ns.

ORDINARY.				COMPOUND.		
4½ in. dia. Cyl. with 84 Ns.			For 3, 4, or 5-ply Fingering, 5-ply Merino, and nearly all kinds of yarns that are similar in thickness, but no thicker than 5-ply Fingering. Use "Medium" Ns.	3¾ in. dia. Cyl. with 84 Ns.		
,,	,,	96 Ns.	Same yarns as for 84, but this Cyl. is used chiefly for wider socks and stockings than are made on the 84 Cyl. Use "Medium" Ns.			
,,	,,	108 Ns.	For fine Merino, Cashmere, Fingering, Andalusian, Eider, Cotton and Silk, &c. yarns. Use "Fine" Ns.	,,	,,	96 Ns.
,,	,,	120 Ns.		,,	,,	108 Ns.
,,	,,	132 Ns.				
,,	,,	144 Ns.				

Heavy Wheeling (Alloa), or such-like heavy yarns, should be kept out of the shield at end of yarn-cross (excepting when forming flat web, a heel, or toe) when knitting on 60 or 72 4½ inch diameter Cyl. (None of the 3¾ inch diameter "Compound" Cyls and dials are suitable for these heavy yarns, excepting the 48 Cyl. and 24 dial, which are only used for small sizes of hosiery.)

The number of grooves in each Cyl. is stamped on the bottom of it; and the halves are shown by a piece filed off the top of a post at each side.

TO CHANGE CYL. of "Ordinary" Mac. see "To Remove Parts" (page 70).

TO CHANGE CYL. of "Compound" Mac. see "Compound Machines" (page 61).

DIALS.

A dial can only be used when Mac. has ribbing attachment supplied with it.

The dial for the "Ordinary" Mc. Cyl. is 4½ inches in diameter; and for the "Compound" 3¾ inches.

Dials with different grooves, but of the same diameter, are interchangeable on the "Ordinary" Machine. Both 4½ in. and 3¾ in. are interchangeable on the "Compound" Mac.

A dial has generally half the number of grooves of a Cyl. (thus, an 84 Cyl. requires a 42 dial).

Some dials, which have not exactly the half, can be used on some Cyls. Thus, a 28 dial will act on an 84 Cyl. (with Ns. in every groove to work over the posts of Cyl.). See elsewhere "Table of Ns. to produce certain ribs" (page 38).

The number of grooves in each dial is stamped on the bottom of it.

TO CHANGE DIAL of "Ordinary" Mac., see "To Remove Parts—Ribber" (page 69).

TO CHANGE DIAL of "Compound" Mac., see "Compound Machines" (page 61).

NEEDLES.—These are of two forms—Cylinder and Dial.

Fig. 30.

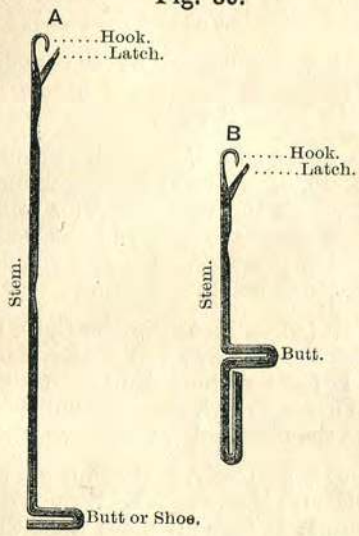
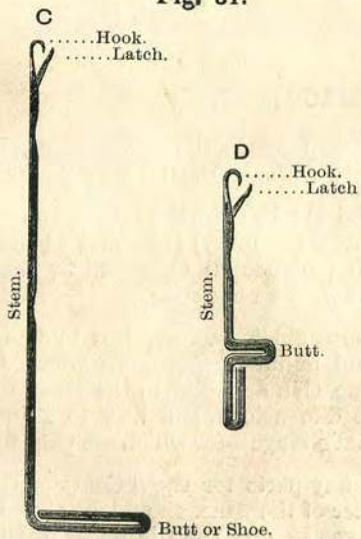


Fig. 31.



The above are actual size.

Cyl. Ns. and dial Ns. are divided into two kinds, thus:—

"Ordinary" (4½ in.) Cyl. (Fig. 30A).
,, ,, dial (Fig. 30B).
"Compound" (3¾ in.) Cyl (Fig. 31C).
,, ,, dial (Fig. 31D).

"Ordinary" Cyl. Ns. have short butts. **"Compound"** Cyl. Ns. have long butts. The 4½ inch dial Ns. are longer, but have same butts as 3¾ dial Ns.

It must be particularly noted that **"Ordinary"** (Cyl. or dial) Ns. cannot be used in place of **"Compound,"** nor *vice versâ*.

The above four kinds of Ns. are supplied in four grades; and are known as "Coarse," "Medium," "Fine," and "Extra Fine"; and are supplied for Cyls. and dials as stated below.

"COARSE" Ns. have large hooks for heavy yarns, and are always supplied in Macs. with Cyls. having 72 or less number of grooves. (Coarse Ns. can be used in 84 or 96 grooved Cyls., but as we do not recommend them for Medium yarns, they must be specially ordered.)

"MEDIUM" Ns. have smaller hooks than the "Coarse," and are supplied in Macs. with Cyls. having 84 or 96 grooves. These Ns. can also be used in the 72, or coarser Cyls. (but Medium yarns must be used with them and not the heavy Wheeling yarns), as the only difference is in the size of the hooks.

"FINE" Ns. have smaller hooks than the "Medium," and are suitable for 108, 120, 132, or 144 grooved Cyls.

"EXTRA FINE" Ns. have the smallest hooks for 132 or 144 Cyls., but are only supplied to order.

See under "Cylinders" (page 57), as to yarns suitable for the different Cyls.

NOTE.—Needles not in use should be oiled, wrapped in an oiled paper, and kept in a dry place.

When ordering Ns. it is necessary to send a sample—or, in the absence of samples, state the number of grooves in, and the diameter of Cyl., or dial, for which they are required, also the number of the Mac. (But see inside front cover, and price list at end of Book).

CAUTION.—Bent latches of Ns. are caused by the latch-opener striking them, which most frequently happens if handle is turned quickly when there are no loops on the Ns.

If the latches get bent they will be stiff, but can be readily straightened and loosened with pincers, or with the forefinger and thumb, and without removing the N. from the Cyl. Bent (or stiff) latches would cause the yarn to gather about the Ns., and the work to be full of holes, and sometimes stop the Mac. Latches should open and close **freely** and **fully** upon their hooks and stems.

If a latch, or butt, breaks off a N. (when in use in the Cyl.), it may fall between the cams, and block the N. way; and if the Mac. refuses to move, and you attempt to force motion, damage may be done in consequence. Lift out, and examine Cyl. grooves, and shell (as directed on page 65), and remove the obstruction; replace Cyl.

If a N. stem gets bent, it will not work freely, or perhaps not at all, in Cyl. or dial groove, and so will cause Mac. to stick. Straighten it with the fingers, and to make sure it is straight place it in the Cyl. (or dial, if a ribbing N.), and see that it moves freely in the groove.

COMPOUND MACHINES.

All the instructions in this book refer to the above Macs. in precisely the same way as they apply to the "ORDINARY" Macs.

A "Compound" Mac. is adapted to take more than one diameter of Cyl. and dial—thus $4\frac{1}{2}$ inch diameter (ordinary) Cyls. and $4\frac{1}{2}$ inch diameter (ordinary) dials, or $3\frac{3}{4}$ inch (compound) Cyls. and $3\frac{3}{4}$ inch (compound) dials, can be used *alternately* on one Mac.

All that a knitter with a "Compound" Mac. requires to know (over and above what is clearly and minutely stated elsewhere in this book), is how to change the one Cyl. and dial in the Mac., for the other Cyl. and dial of different dimensions, and how to adjust the parts on the Mac. itself to suit that change—for which see page 61.

NOTE.—When ordering any parts for the "Compound" Mac., it is important that the number of the Mac. should be stated; **also mention the number of grooves in, and the diameter of the Cyl. and dial** (see inside front cover).

Always send a pattern N. if any of these are required, or send the above particulars.

COMPOUND MACHINES.—To change Cylinder, Dial, Cam-plate, and to adjust Base-roller, Bracket, and Yarn-guide.

Refer to Figs. 3 to 11, and pages 5, 6 and 7; and also to "Replacing Parts of Mac.," pages 69 to 72.

TO CHANGE FROM "ORDINARY" $4\frac{1}{2}$ inch dia. Cyl., &c. to "COMPOUND" $3\frac{3}{4}$ inch dia. Cyl., &c.	*TO CHANGE FROM* "COMPOUND" $3\frac{3}{4}$ inch dia. Cyl., &c. to "ORDINARY" $4\frac{1}{2}$ inch dia. Cyl., &c.
1. Remove Ribber from Mac. (see page 21, "Ribber, how to fix"); take off C.R.; lift out all Cyl. Ns. (the depressed Ns. which are in the cams can be taken out, if Y.G. is moved round in usual way); loosen wing-nut that holds Cyl. lever; take out the two screws under the Cyl. which pass through the lever, and which hold Cyl. to Mac. base; grasp Cyl. at the top and turn it FORWARDS until the **"Right"** and **"Left"** half-marks are **"Back"** and **"Front"**; then lift out Cyl.	1. Follow all directions as given in paragraph 1, opposite, excepting that **top part of Y.G. must be put back** to allow of Compound Cyl. being lifted out of the shell.
2. To allow narrower Cyl. to pass down to its place on the base, loosen (one revolution only) wing-nut which holds roller-bracket under base of Mac.; advance bracket as far as it will go towards centre of Mac.	2. Loosen (one revolution only) wing-nut under base and which holds roller-bracket.
3. Place into the shell, the $3\frac{3}{4}$ inch dia. (Compound) Cyl. with the half-marks pointing **"Back"** and **"Front"**; then when Cyl. is **fully down** on the base, turn it BACKWARDS with your hand until the half marks are **"Right"** and **"Left"**; secure Cyl. by the two screws passing through ends of lever, and test if Cyl. is in its place as instructed for "Replacing Parts" (page 69).	3. Place into the shell, the $4\frac{1}{2}$ inch dia. (Ordinary) Cyl., as directed in paragraph 3, opposite.

4. Adjust base-roller bracket and bring it close to Cyl. so that its top **almost** touches inside of Cyl. ; fix it in position by the wing-nut (underneath base).*	**4.** Adjust base-roller bracket and follow all directions as in paragraph 4, opposite.
5. Adjust Y.G. thus : loosen (one revolution) the screw which holds the top part to the lower part ; advance top part the full length of the slot, so that the edge of latch-opener is in a line with the outer edge of Cyl. ; tighten the screw to hold Y.G. in its new position. Refer to Y.G. and latch-opener (page 71), also figure page, for the correct position of the latch-opener.	**5.** Secure top of Y.G. by its screw, and see that the outer edge of latch-opener is in a line with the outer edge of Cyl. See paragraph 5, opposite.
6. Put into Cyl. "Compound" plain Ns., and move shell round to get Ns. into the cams ; put on the $3\frac{3}{4}$ inch diameter C.R.	**6.** Put into Cyl. "Ordinary" plain Ns., and move shell round to get Ns. into the cams ; put on $4\frac{1}{2}$ inch diameter C.R.
7. Ribber must have $3\frac{3}{4}$ cam-plate and dial, which can be fitted as instructed for "Replacing Parts" (page 69).	**7.** Ribber must have $4\frac{1}{2}$ cam-plate and dial, which can be fitted as instructed for "Replacing Parts" (page 69).
8. Use the $3\frac{3}{4}$ inch ribbing Ns.	**8.** Use the $4\frac{1}{2}$ inch ribbing Ns.

If there should be any difficulty in working Mac. after making either of the above changes, read above again, and also refer to "Replacing Parts" (pages 69 to 72), for remedy.

* ***When the Wing-Nut is screwed-up firmly by the fingers the top of the base roller-bracket should not press on the Cylinder, but just touch it. At the same time the top should not be away from the Cylinder, as the work might get behind it.***

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FAULTS, IRREGULARITIES, and DIFFICULTIES in WORKING MACHINE, and REMEDIES for same.

TO KNITTERS.

First read under "FAULTS" the sections (in dark type) marked A, B, C, D, E, F, and ascertain which refers to your difficulty, next read the numbered "FAULTS" under the section, to trace the cause of the difficulty, and then apply the remedy opposite.

IMPORTANT COMMON FAULTS.	REMEDIES.
Bent or stiff latches of Ns. are common faults with beginners. If latches are bent or stiff these cause Mac. to be hard to work and holes in fabric. Apply remedy. See B. 7, page 64.	
Tension pointer too tight is another common fault. See 8, page 65.	
A. If the Yarn gathers, and lies loosely outside the Ns. when knitting circular web—the fault may be due to—	
1. Too tight a stitch (tension), or	1. Loosen stitch by lowering plain tension-pointer, and screw up its wing-nut **firmly**. If ribber is used, loosen its stitch also, and screw up wing-nut **firmly.** (It is best for the inexperienced to commence working Mac. with a loose tension, say at "5" on shell ; "4" on cam-plate. If 5-ply or thick yarns be used, put both tensions at loosest.)
2. Insufficient weight, or	2. Apply more weight, or pull fabric down with the left hand under Mac.
3. Too coarse a yarn for the Cyl., or	3. See pages 57 & 58 for the kind of yarns suitable for the different Cyls.
4. Roller under dial pinching the fabric on to the EDGE of the roller, which is at the top of bracket, inside Cyl. (The roller should just overlap. See Fig. 20, for position.)	4. Pull down more firmly the fabric at that side by the rollers, and see "Faults and Remedies" C 7 and 19.

FAULTS AND REMEDIES—*continued.*

B. If the Yarn gathers in loops loosely outside the end Ns. in action when making heel, toe, or flat web, the fault may be due to the yarn not passing direct (straight) from Ns. to Y.G.; (that is, the yarn lies loosely between the Ns. and Y.G.)

5. The cause of this may be that the take-up does not draw back loose yarn; or shield does not act; or the counterpoise-ball is too near the centre to take-up, or,	5. See that the take-up has yarn in its hook (from front of shield), so that, at each row across, the yarn drawn off in excess of the Ns. in action, **is entirely drawn back.** Y.G. must not be taken too far beyond the last N. in action, or more yarn will be drawn off than can be pulled back by the take-up. Should this occur occasionally, take hold of the yarn near the bobbin and pull it back by the hand. See that the shield pinches the yarn on to the yarn-cross, and so prevents the yarn coming from bobbin, whilst excess is being taken up. If more weight is required to make action of take-up quicker, ball should be moved towards the end of the wire. To adjust the ball, release the small screw (which holds the ball to the wire), adjust ball, and refix screw.
6. Fabric not having been held down properly at the end Ns. in action.	6. Use heel-wire with weight, as directed on page 15; or pull fabric down at the end N. with the hand. It is a good plan to pull, and press fabric **away from** Y.G. as it travels across each time.
7. Latches of needles are bent or stiff, or Ns. are bent.	7. Straighten bent latches with finger and thumb, so that the latches open and close freely and fully upon the stem and hook. Straighten bent Ns. with the fingers. (The Ns. need not be taken out of Cyl. or dial when straightening the latches.)

FAULTS AND REMEDIES—*continued.*

C. If the driving-handle is hard to turn, it may be that:

8. The work is not held down sufficiently, or only on one side.	8. Grasp weights, or the fabric, with left hand close underneath Mac., and press down whilst knitting. **See that work is held down evenly all round.**
9. Stitch (or tension) is too tight; or yarn is too harsh. (Dark yarns require more weight than light, or soft yarns. Dark yarns are usually harsh through the gritty dyes employed in them.)	9. Loosen stitch, and screw up pointer's wing-nut *firmly;* and soften yarn by passing it through an oiled cloth, when winding on to bobbin (see p. 8).
10. There are two loops on each N. when knitting the first row of Selvedge. (In the ordinary way each N. has only one loop upon it.)	10. Selvedge requires more power to drive Mac.
10A. Wing-nut of either plain or ribbing tension is not screwed up tightly, and so stitch-cam has shifted.	10A. Shift the pointer to the required tension, and screw up wing-nut **firmly** to hold pointer in its place.
11. Mac. is dry in its working parts.	11. Apply a drop of good machinery oil to parts subjected to friction. (See "Oiling," page 39.)
12. Mac. in long use is clogged with dust and fluff off the yarn, or from using unsuitable oil. Inferior machine oils, also castor, salad (olive), colza, and other domestic oils, if used upon the Mac. get like glue (after a short time), and usually cause much trouble.	12. If unsuitable oils have been used, the working parts should be cleansed with paraffin. Take out screws which hold Cyl., lift out Cyl. and clean N. grooves; lift off shell and clean cams and N. way; clean geared-ring, also the ledges on base of Mac. (where geared-ring works); unscrew nut under dial; take off dial and cam-plate; clean dial and cams of ribber; oil all parts with pure machine oil (such as good sewing machine oil, or fine sperm, with a slight proportion of paraffin added), and replace as directed on pages 69 to 71.
13. The cams in shell are hacked, or worn; or some other parts damaged by long wear.	13. Have cams refaced, or replaced; and replace all worn parts.

FAULTS AND REMEDIES—*continued.*

14. Some small obstruction, such as the latch or butt off a N. has got fixed in the cams, or between the posts of the Cyl. (This very seldom happens and is usually seen at once, as N. fails to act.)

14. Examine the Ns.; if any are without latches or butts and much force is required to revolve shell, take out Cyl. and remove the obstruction; replace Cyls. as directed on page 69.

15. The plain Ns. are worn out through long use, and therefore do not pass the cams, or Cyl. posts, smoothly. Worn Ns. have the butts deeply cut, and cause damage to Cyl. posts.

15. Supply sound Ns. in place of worn ones. If Mac. has been long in use, new Ns. would not at first work smoothly with worn cams. N.B. — When ordering Ns. send pattern.

16. The cams in shell are bearing against the Cyl. through the screws, which hold them, not having been fully screwed up after cleaning, &c., or the Cyl. is not in its correct position, and held by the screws passing through the lever, but rises on one side, and at each revolution presses on the shell. This will also cause the fabric to be in holes if ribber is in use, because the fabric is pinched between Cyl. and dial.; or it may cause shell and geared-ring to rise out of their places, and thus put Mac. out of gear.

16. See that the cams are in position with their backs against the shell. Then screw up fully (but not too firmly) one or both screws of each cam. Test if Cyl. is in position and properly secured to the lever, as directed for "Replacing parts" (page 69 and 70.)

17. Dial Ns. are cutting the loops on the Cyl. Ns., or pushing out the Cyl. Ns. because—

The dial was not adjusted at the same moment the Cyl. was adjusted, or—

Lever of Cyl. has shifted.

17. Follow instructions "Adjusting Cyl. to dial" (page 22) and observe that at the same moment you adjust Cyl., you must place your fingers on "**Right**" side of dial and push dial FORWARDS (that is from "**Right**" to "**Back**").

After adjusting Cyl., see that the wing-nut holding Cyl. lever is screwed up *firmly* with finger and thumb.

18. Ribber-arm and dial do not work truly, but rise on one side at each revolution because—

The arm itself is not fully down on the ledge of the shell.

18. First see that the dial is close against the cam-plate, and the cam-plate close against the ribber-arm—that is to say, the dial and cam-plate must not be away from the ribber-arm, but close to it and held there by the nut underneath the dial. (See "Ribber" fig. 23, page 20, and pages 69 to 72.) Then see that the ribber-arm is well down on the ledge, and held firmly to the shell by its wing-nut.

FAULTS AND REMEDIES—*continued.*

19. Or, the roller underneath dial is only just bearing on the edge of the roller at top of the bracket inside Cyl., and thus pinches the fabric as it passes down.

19. Apply more pressure to the fabric on the roller side of the dial, and afterwards adjust the base-bracket, so that the rollers overlap each other—that is, **the one roller within the other,** as shown by Fig. 20, page 19. (See margin 21 and 22, page 19.)

D. If Handle of Machine cannot be moved round—

20. The brass stopper* on front of base has accidentally been put into action, and has locked the Mac.

20. Pull out stopper and turn to **right** (**or left**) until the small pin, which prevents the locking, is in the small shallow hole intended for it.

* **This Brass Stopper is not on all Macs.**

21. One (or more) of the plain Ns. has not been lifted **fully** out of action when raising them. (Ns. can only be kept raised when there is one, or more, rows of knitting upon them.)

21. Lift Ns. as far as possible, so that the butts escape the cams. (The Ns. should be raised until the butts touch under side of C.R.)

22. One (or more) of the posts in Cyl. is hacked through bad Ns., and so Ns. stick against that roughness, and stop the action of the Mac.

22. Get the Cyl. repaired if not too much damaged; if much damaged, or worn, get a new one.

23. Wing-nut which holds ribber-arm to shell is unscrewed too far, and so strikes the column when Mac. is in motion.

23. Screw up that wing-nut.

E. Holes in the fabric arise from—

24. Latches of Ns not being open.

24. Always see latches are open after setting work, or after transferring loops.

FAULTS AND REMEDIES—*continued.*

25. See "Faults and Remedies." (See B. 7, page 64.)	25. Bent latches of Ns.
26. See "Faults and Remedies," C. 17.	26. Ribbing Ns. cutting the plain stitches.
27. See "Faults and Remedies," C. 18 and 19.	27. Rollers pinching the fabric, or ribber-arm not working truly.
28. See that screws are holding quite securely Y.G. to geared-ring, and, if the Y.G. is a "Compound" form, see that upper part of Y.G. is firm, and held in position by its screw. (See Faults and Remedies E. 29.)	28. Y.G. being loose.
29. Latch-opener of an "Ordinary" Y.G. being too high above the ribbing Ns.	29. Adjust (lower) latch-opener of either a "Compound" or "Ordinary" Y.G., so that its under side just passes over the hooks of the ribbing Ns. (See Fig. 27a, page 71, for correct position of latch-opener in relation to the Cyl. and Dial.)
Or, latch-opener of a "Compound" Y.G. being either too high, or too far away from ribbing Ns.	Or, if a "Compound" Y.G., advance latch-opener towards the Cyl. until its edge is just in a line with the OUTER edge of Cyl. (See "Latch-opener," page 71.)
30. Cyl. not fully down on base.	30. See "Faults and Remedies," C. 16.

F. Irregular stitches, or crossed stitches, are formed by two or three loops collecting on a N. before it knits—that is, a N. makes a stitch now and again only, whereas it should make a stitch every time Y.G. passes it. Such faulty stitches are caused by—

31. Bent latches of Ns.	31. See "Faults and Remedies," E. 25.
32. The fabric rising about the Ns.	32. See "Faults and Remedies," A. 1, 2, 3, 4.
33. Too tight a tension, or stitch, for the yarn used.	33. See "Faults and Remedies," A. 1, 3.

TO REMOVE and REPLACE, or CHANGE, PARTS of "ORDINARY" or "COMPOUND" AUTOMATIC KNITTING MACHINE.

NOTE.—The following instruction is given at length and each simple act fully detailed, so that the novice should have no difficulty, but the whole work can be performed by the experienced in a few minutes, at most.

Refer to Figs. 3, 4, and 19.

Read "A Brief Description of the Plain Machine," pages 5, 6, 7.

Read "Description of the Ribber," pages 18, 19, 20 and 21.

Read "Compound Machines—To change Cyl., &c." pages 60, 61 and 62.

TO REMOVE THE CHIEF PARTS OF THE MACHINE.—Take off the Ribber; take off the C.R. and lift out all the Cyl. Ns.; if the "Compound" ($3\frac{3}{4}$ inch diameter) Cyl. is upon the base, loosen the screw which holds top part of Y.G. and put back that top part, so that Cyl. can be lifted out of the shell; then loosen wing-nut which holds the lever (28); take out the two thumb-screws (30) which pass through the lever underneath the Mac., and which hold the lever to Cyl., take hold of the top of the Cyl. and turn it round (FORWARDS) by your hands, until the **"Right"** and **"Left"** half-marks are **"Back"** and **"Front,"** when the projections (30 of Fig. 8, page 6) will be opposite the recesses in the Mac. base (A and A^1 of Fig. 5, page 5); lift out the Cyl.; after which, lift off the shell (4) and geared-ring (2).

TO REMOVE PARTS FROM THE RIBBER.—Take out driving-pin; hold the ribber-arm on a table with the forked end pointing upwards; then grasp the dial (50) with one hand, and unscrew the nut (48 of Fig. 19) with the spanner; now, with the left hand grasp the head of ribber-arm close to dial, and with the right hand pull dial off spindle (47). If the dial fits tightly on the spindle, and cannot be pulled off by the hand, strike the screwed end of the spindle with a piece of hard wood, to drive it out. (*On no account use metal to strike the spindle, as you may bruise its end so much that the nut will not fit, and never strike the dial, or you will injure it*); now pull off the cam-plate (53), and take out the spindle (47).

TO REPLACE PARTS OF THE PLAIN MACHINE.—Turn handle (8) of Mac., until the crank is at its lowest point when the ball end will be pointing upwards, and will be next to the counter (17).

THE GEARED-RING must now be placed into the groove of the Mac. base, with the Y.G. (which is held by 2 screws to the projection on the smooth side of the geared-ring) next to the counter. See that the cogs on the geared-ring fit into the cogs of the driving-wheel. Test this by giving the driving-handle one revolution, when the geared-ring should revolve freely with the driving-wheel. (*If*

there is a stopper (18), on the front of the base, and it interferes with the freedom of the geared-ring, it must be drawn back, and turned slightly to one side or the other.)

THE SHELL is next placed round the top step of Mac. base (above the inner edge of geared-ring), with the two driving-lugs (4a), (which are at its outer bottom edge) on either side of the Y.G. projection—that is to say, 2A of Fig. 6 is *between* the 2 lugs (4A) of Fig. 7—one lug on one side of the projection (2A), and one on the other side. The shell, when in position, rests upon the base of Mac. and almost touches the geared-ring. It is made to revolve BACKWARDS or FORWARDS by means of the projection of the geared-ring pressing upon one or the other of the lugs (4A of Fig. 7). Turn the handle BACKWARDS and FORWARDS to see that that is so.

CYLINDER.—First loosen wing-nut (27 of Fig. 19) under the Mac. base, and which holds base-roller bracket (26) ; advance that bracket as far as it will go *towards centre* of Mac. Then take the Cyl., and notice the ledge at the bottom of the two projections (30). When the Cyl. is placed in position as directed below, these ledges pass under the Mac. base, and so hold Cyl. on the base. Now put Cyl. inside the shell, with the **"Right"** and **"Left"** half-marks **"Back"** and **"Front"** (thus, the projections from the bottom of the Cyl. will be **"Right"** and **"Left"**). See that the projections (30 of Fig. 8, page 6) pass down the recesses (A and A^1 of Fig. 5, page 5) at **"Right"** and **"Left"** of the Mac. base, until the Cyl. is fully down, when the bottom of the posts (B of Fig. 8, page 6) will be resting upon the top step of the Mac. base. With the hands, turn the Cyl. round (BACKWARDS) until the projections are over the ends of the Cyl. lever, that is, the "half-marks" will be **"Right"** and **"Left"** ; then screw up **fully** with the finger and thumb—use no mechanical means—the two Cyl. screws which should pass through the ends of the lever, and into the Cyl., until the heads of the screws press against the lever. (The Cyl. screws will be properly fixed if the worms of the screws pass into the projections of the Cyl., and if the plain part, next the worm, is within the holes at the ends of the lever, and the heads press against the lever.)

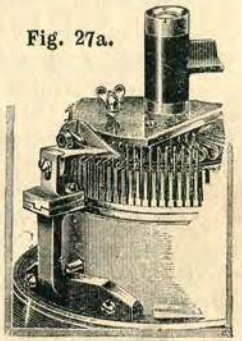
Try the lever :—Loosen the wing-nut (29) which fixes lever to the base, and move the lever to and fro. If it can be moved freely, leave it *midway* of its adjustment; screw up wing-nut firmly, to secure lever in that position. Now give the handle a turn to see if the shell revolves freely round the Cyl. Then push base roller-bracket (26) towards inside of Cyl., until the bracket at its top **almost** touches the Cyl. ; screw up wing-nut firmly (to hold it there), and when you have fixed it, see that the top of the bracket is not quite touching, or barely touches, the Cyl. If the top of the bracket *bears hard against* the Cyl., it will press the Cyl. out of position, and you will not be able to adjust it by its lever.

Cyl. Ns. can now be placed into all the grooves of the Cyl., excepting those grooves behind the cams ; but turn the handle to advance the shell, and then you can put Ns. into the remaining grooves.

CLASP-RING should then be placed round Cyl.—$4\frac{1}{2}$ inch diameter for the "Ordinary" Cyl., or $3\frac{3}{4}$ inch diameter for the "Compound" Cyl.

YARN-GUIDE AND LATCH-OPENER.—In the "Compound" Mac. the top part of the Y.G. is adjustable, and the correct position of that top part is when the curved edge of the latch-opener is in a line with the outer edge of the Cyl., that is to say, if you look over the top of the Y.G. you will see that the edge of the latch-opener forms the same curve with, but is immediately above the outer edge of the Cyl. When properly adjusted, secure the top part of the Y.G. to the bottom part, by the screw on the slide. The latch-opener itself, can also be adjusted, up or down, in both "Compound" and "Ordinary" Macs., and its true position is, when the under side of it just nicely escapes the hooks of the dial Ns. *If the latch-opener is too high, when knitting, ribbing stitches will drop.*

Fig. 27a.



This Illustration shows the correct position of the Latch-Opener and Yarn-Guide, in relation to the Cylinder and Dial Ns., and applies equally to the "Ordinary" or "Compound" Cylinders.

RIBBER.—Put the spindle into the cylindrical head of the arm, with the screwed end of the spindle pointing in the same direction as the forked end of the arm. Slip the cam-plate on to the spindle, with the collar of the cam-plate touching the arm. Now notice that the little key in the hole of dial passes into the groove at the screwed end of the spindle, and then slip the dial on the spindle, with the grooves next to the cams. If dial goes on stiffly, *on no account hammer it on*, but turn ribber-arm upside down (with dial uppermost and in position upon the end of spindle), and then, with a wooden mallet give *the head of the spindle* a few sharp taps *upwards*, when dial should at once move downward and lie against cam-plate. Put the nut on the spindle, and screw it up with the aid of the spanner, until it makes the dial touch the cam-plate, and the cam-plate touch the ribber-arm ; the nut should not be screwed too tightly, but just sufficiently to secure that the several parts are lying compactly together. Grasp the arm with one hand and take hold of the dial with the other, and lift the dial to see if the spindle can be moved up or down the head of the arm. If there is any movement, the nut must be screwed up a little more. At the same time, see that the cam-plate revolves freely and independently of the dial, or ribber-

arm. If it does not revolve without using force, the nut must be loosened very slightly to free the cam-plate. Put the driving-pin through the hole in the ribber-arm, and see that the end of it passes into the hole at the end of the cam-plate—when ribber will be complete. (For full description of Ribber see pages 18 to 20.)

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INSTRUCTION BOOK—PART II.

FOR

GARMENTS, USEFUL ARTICLES, AND FANCY PATTERNS.

ABBREVIATIONS.
Mac. = Machine.
Cyl. = Cylinder.
N. = Needle.
Ns. = Needles.
Y.G. = Yarn-guide.
C.R. = Clasp-ring.
S.U. = Set-up.

NOTES—

1. **Cylinder to Use.**—The following instructions are drafted for the 4½-inch dia. Cyl. 84 Ns., and for 4 or 5-ply fingering yarn, unless stated otherwise. If the Knitter wishes to work a Cyl. with more or less Ns., suitable yarn should be used and the instruction (so far as the number of rows, &c., are concerned) must be varied accordingly.

2. **Extra Needles.**—It is a great advantage to have an extra set of plain Ns. when knitting large garments, as with them time is saved. In the absence of extra N., and when told 'to lift Ns. out with their loops upon them, and place them inside Cyl.' you must remove those Ns. from the loops of the partly completed work, one by one, and as you do so draw a spare thread of yarn through each loop to prevent the fabric unravelling.

VARIATION OF FANCY PATTERNS.—The fancy patterns given in this book do not exhaust the possibilities of the Machine by any means, but much is left to the ingenious Knitter, who will be able to work out many other designs. It may be an aid to the Knitter to know that all the fancy patterns can be made more open, and for some articles more attractive, by leaving out every second or every third N., and removing the loops across the open spaces. Thus, in forming the diagonal, cross-bar and herring-bone patterns, every fourth N. may be left out, and the loops removed across the open spaces. But a more pleasing effect may be produced by judicious intermingling of fancy patterns with a few rows of plain knitting.

The fancy patterns may be knitted all round the Cyl. as for Circular Web, or across as for Flat Web.

Many of the rules laid down in hand-knitting books may be adapted to the Mac. Attractive antimacassars and other fancy articles are knitted more quickly and evenly on the Mac. than by hand.

CHILD'S COMBINATION (about 22 inches long).

Knitted in 6 *pieces, including sleeves.* (Read above NOTES.



Note.—This garment can also be knitted on the 4½-inch dia. 72 or 60 Cyl. Mac. and ribber, almost as satisfactorily as on the 4½-inch dia. 84 Cyl. Mac. and ribber. The difference, however, is more marked in the 60 Cyl. (the Ns. are further apart) as the fabric will be more open, unless coarser yarns than 4 or 5-ply fingering yarn be used.

Leg—Back Left Half.—Ns. in all the Cyl. grooves; tension at about 4½; set Rough and Correct Selvedges as for Circular Web; put on ribber; adjust Cyl. for 3 plain to 1 rib; place Ns. in dial grooves and transfer loops; knit 30 rows and stop Y.G. at **"Back"**; transfer ribbing loops back to Cyl. Ns.; advance Y.G. to **"Front"** and take off ribber. Lift out of Cyl. the **"Back"** half of Ns. with their loops at the butts and place the Ns. inside Cyl.; put tension-pointer to its loosest; put yarn on take-up; knit to **"Back"**; then increase at **"Right"** thus:—Remove the two end Ns. (with the loops upon them), forward one groove; take a spare N., pick up in its hook a loop from the last stitch made at back of the second N. just removed, and place that N. into the empty groove; knit BACKWARDS and FORWARDS; increase at **"Right"** side 1 N. every row and knit in the same manner, until there are 56 Ns. in the Cyl.; knit 60 rows without increasing.

Body.—Now, for the overlap, cast off the loops of 8 Ns. at "**Right.**" (See "Lady's Combination," page 76, for fuller instructions on this and other parts.)

To shape the side, decrease at "**Left**" 1 N. every 3rd row by putting 3rd loop over 4th N. and removing the 2nd and 1st Ns. forward 1 groove, until 42 Ns. only remain in Cyl.; then knit 90 rows without decreasing.

Neck.—Finish with a Selvedge the loops of 22 Ns. at "**Right**" side. Remove bobbin; tie on piece of odd yarn and knit 6 rows; break yarn and run work off the Mac. Take all Ns. out of Cyl.; Y.G. to be at "**Back.**"

Leg—Front Left Half.—Insert hanging Ns. in "**Front**" of Cyl.; join yarn at "**Right**"; put yarn on take-up; attach weights; knit BACKWARDS to "**Back**"; then increase at "**Left**" side 1 N. every row, and knit in the same manner until there are 56 Ns. in the Cyl.; then knit 60 rows, but while doing so take in gradually at left side 8 loops.

Body.—Now knit and decrease 1 N. every 3rd row at "**Right**" side until 42 Ns. remain; knit 90 rows without decreasing.

Neck.—Finish with a Selvedge the loops of 22 loops at "**Left**" side this time; then proceed as above for "Neck."

These 2 pieces when joined will form the **Left** Half of the Combination.

Knit 2 pieces for the **Right** Half in the same way, but reversing the sides from the foregoing for the increasing and decreasing.

Sleeves.—Set Rough and Correct Selvedges as for Circular Web; put on ribber; adjust Cyl. for 3 plain and 1 rib; tension at 4½; knit 20 rows; transfer ribbing loops on to plain Ns.; remove ribber; loosen tension and knit 40 rows plain, and finish with a selvedge (see page 45).

Join the four pieces neatly together; sew across the shoulders with the Mending Stitch, leaving spaces for sleeve; finish neck with a crochet stitch.

LADY'S OR CHILD'S UNDER-SKIRT. Fig. 32.



Knit as for Flat Web, in two parts, or more; the parts to be sewn or crocheted together by some fancy stitch.

To shape a skirt nicely, knit the upper part of each breadth in Imitation Rib (page 18).

Very pretty effect may be produced by using yarns of different colours—especially if one or other of the Fancy Patterns be worked, such as the Shell Pattern.

BOY'S KNICKERBOCKERS.

Knitted in six parts and joined together.



Leg.—Set work as for Flat Web (page 46) with 54 Ns. in Cyl.; knit 44 rows; increase one N. on the "**Left**"; knit 8 rows, and so continue to increase one N. every eighth row, until 76 Ns. are in the Cyl.; knit without increasing 48 rows. Then decrease one N. on the "**Left,**" and knit 8 rows; so continue decreasing until there are only 56 Ns. in action; finish with a selvedge (page 45).

Knit another piece in the same way.

Then knit two pieces in the same manner as above, but increase and decrease on the "**Right**" instead of the "**Left.**"

Join the four pieces and make a hem round the top and bottom of legs.

Gusset.—Knit as on page 76, but use 20 Ns. and knit 30 rows only.

Button Piece.—Set up 24 Ns.; knit a few rows and make a buttonhole (see page 80); knit 12 rows more and then make another hole; continue in this way until the piece is the length required; finish with 12 rows and a selvedge. Sew the piece on to the front of the knickerbockers and double it back, so that the buttonholes may be as near the edge as possible.

BOY'S JERSEY (First Method).

Knitted in four parts, including sleeves, and sewn together.

(See NOTES 1 and 2, page 73.)

Body.—Use loose tension. Place 82 Ns. in Cyl., leaving two empty grooves in "**Front.**" Set Rough and Correct Selvedges as for Flat Web with Ns. in all the Cyl. grooves (page 46, to which refer). Knit about 200 rows; now raise all the Ns. out of action excepting 20 from "**Front**" to "**Right**"; remove yarn and tie on a piece of odd yarn; knit across 5 or 6 rows with it (these 5 or 6 rows are to prevent the fabric unravelling at that point, but will be drawn out when joining the shoulders); break yarn and run work off these 20 Ns., and take out the 20 Ns. from Cyl. Next put down into action 20 Ns. from "**Front**" to "**Left**"; tie odd yarn to end N.; then knit 5 or 6 rows; break yarn; run work off Ns. and remove them as on "**Right**" side; now take the remaining 42 Ns. out of the Cyl. and tie them in one lot, or draw a thread of yarn through the loops if the Ns. are required for use.

Knit another piece in the same way, but after taking out the 20 Ns. on each side, do not remove the 42 Ns. left in the Cyl. grooves, but insert the 42 Ns. that are in the centre of the piece done first. Put on ribber; adjust Cyl. to make the fabric 2 plain and 1 rib, and insert all the ribbing Ns. in the dial, first picking up a loop with each N. from the stitch last made (at the back of the nearest plain N.).

Collar.—Knit round about 30 rows and finish with a selvedge (page 45); turn collar half down.

Join across the shoulders with the Mending Stitch (page 16), and sew the seams down each side, but leave room for the sleeves.

Sleeves.—Place 74 Ns. in Cyl. and set Rough and Correct Selvedges for Flat Web, as before; knit 50 rows; decrease one N. on both sides and knit 6 rows; continue decreasing both sides and knitting 6 rows each time until there are only 54 Ns. in Cyl.; knit 55 rows without decreasing; then decrease and knit as before until 48 Ns. are left; knit 20 rows without decreasing. Now take the 48 Ns. out of Cyl. with their loops upon them, and place them equally round the Cyl.; put on ribber and adjust Cyl. for 1 plain and 1 rib; place ribbing Ns. in all dial grooves, but first pick up on each a loop from the last stitch made, as before; knit 40 rows; finish with a selvedge.

Knit the other sleeve in the same way.

Sew in the sleeves. The cuff may be folded back if desired.

BOY'S JERSEY (Second Method).

Mac. with 84 Ns. Cyl. (If a 96 Cyl. is used, 8 rows must be knitted for the shoulder each side, but instead of picking up and placing two loops over each empty N. and the end N. next to them, pick up and place loops on the empty Ns. alone and not on the end Ns.)

Body.—Medium tension. Place 65 Ns. in "**Back**" part of Cyl., leaving the empty grooves in "**Front.**" Set Rough and Correct Selvedges (page 47), and knit to and fro the required length (about 300 rows), thus forming the front right half of the jersey. Now, for the front right half of neck, lift out of Cyl. 20 Ns. at "**Left,**" with loops drawn to butts; tie together and place inside Cyl.; then for the shoulder knit 6 rows on the 45 Ns.; raise the 45 Ns. out of action. Insert 20 spare Ns. in place of those just removed; put the S.U. inside Cyl. and set Rough Selvedge and knit 2 rows across on the 20 Ns.; depress the 45 Ns., and knit on the 65 Ns. about 300 rows as before; finish with a selvedge (page 45), and thus complete the back right half of jersey.

Knit another piece the same size, but for the neck lift out of Cyl. the 20 Ns. at the "**Right,**" and insert the 20 fresh Ns. at "**Right.**" When both pieces are finished, sew them neatly together and make a hem round the bottom.

Collar.—Turn jersey outside in; see that 20 Ns. are in the loops of each of the four sections for the collar; place the 40 Ns. of one half of jersey into the "**Front**" and the 40 Ns. of the other half into the "**Back**" of Cyl., leaving equal numbers of empty grooves at "**Right**" and "**Left**"; now place empty Ns. into the empty grooves "**Right**" and "**Left**"; then, with a spare N. pick up loops from the 6 selvedge rows knitted for the shoulder, and place 2 loops on each of the empty Ns. and 1 loop on each of the end Ns. next to them. Put on ribber; adjust Cyl. for 2 plain and 1 rib; place ribbing Ns. into dial, but first pick up on each a loop from the plain stitch last knitted; put tension at its loosest; knit 25 rows; re-transfer rib loops to plain Ns. and take off ribber; finish with a selvedge.

Sleeves.—To make these about 15 inches long, put in all the Cyl. Ns.; set Rough and Correct Selvedges for Circular Web (page 9); put on ribber; adjust Cyl. for 1 plain and 1 rib; place ribbing Ns. in all dial grooves, and transfer every second plain loop; knit 40 rows; transfer rib loops to plain, and remove ribber; then knit about 130 rows plain, and finish with a selvedge.

LADY'S PANTS—CLOSED BACK AND FRONT.

Knitted in six pieces, including a gore and a gusset.

Leg—Back Right Half.—Place Ns. in all the Cyl. grooves; use medium tension. Set Rough and Correct Selvedges for Circular Web; put on ribber; adjust Cyl. for 1 plain to 1 rib; place Ns. in all dial grooves and transfer loops; knit 75 rows; re-transfer loops to Cyl. Ns., and take off ribber. Lift out "**Back**" half of Ns., tie together and place them inside Cyl. hanging to their loops; knit 3 rows; then increase 1 N. on the "**Left**" thus:—Take a spare Cyl. N. and pick up in its hook a loop from the last stitch made (not the loop which is on the N.) behind the end N., and place the spare N. in the first empty groove at "**Left**"; knit 3 rows and increase as before; repeat the knitting and increasing until all the Ns. are in the Cyl. Now knit without increasing 170 rows.

Band.—Put on ribber, and transfer loops to dial Ns. for 1 and 1 as before, but leave out 1 dial N. between the first and last N. of the BACKWARD and FORWARD rows, above the edge of the Flat Web, to show cutting line; knit 40 rows; finish with a selvedge. Sew over each side of cutting line to prevent unravelling, and then cut the band through at the line.

Leg—Front Right Half.—Place the hanging Ns. into "**Front**" of Cyl. and knit another piece with Band in exactly the same way as the foregoing, but increase on the "**Right.**"

Leg—Back Left Half, and Front Left Half.—Knit the two pieces with Band in the same way as the foregoing.

Gore.—Place 16 Ns. in "**Front**" of Cyl.; set Rough and Correct Selvedges; knit 5 rows; then increase 1 N. each side as directed above for "**Leg—Back Right Half**"; knit 3 rows and increase again until all the Ns. are in Cyl.; raise out of action the "**Left**" half of Ns.; knit 7 rows across the "**Right**" half; now decrease 1 N. at "**Front**" thus:—Take out the 3rd N. from the end of those in action; transfer its loop to the 4th N., fill up the empty groove by moving the 2nd and 1st Ns. next to the Ns. in action; knit 7 rows and decrease again; repeat four times in all, and then decrease in the same manner at "**Back**"; knit 7 rows, decrease both sides and knit 7 rows between, until all Ns. on the "**Right**" are out of Cyl.

Depress "**Left**" half of Ns. and knit in same manner.

Gusset.—Place 42 Ns. in "**Front**" of Cyl.; set Rough and Correct Selvedges; knit 50 rows; finish with a selvedge.

Join the parts neatly together, and sew the two narrow ends of gore into the increasing parts of legs (leaving about 10 inches open at sides if desired); crochet a fancy edging to the top of band and bottom of legs.

The manner of increasing for the pants is different from the instruction given on page 77, but either can be followed.

If a longer leg is required, increase every 4 or 5 rows instead of 3, also knit 8 rows between each increase for the gore.

LADY'S COMBINATION (FULL SIZE).

(Read NOTES 1 and 2, page 73.)

Knitted in 6 pieces including sleeves.

Leg—Back Left Half Leg. Ns. in all the Cyl. grooves. Set Rough and Correct Selvedges; put on ribber; adjust Cyl. for 4 plain and 1 rib; place ribbing N. into every second dial groove, but first pick up on each a loop from the last stitch made at back of plain N. With a medium tension knit 40 rows and stop Y.G. "**Left**"; then commencing at "**Left**" "**Front**" transfer all ribbing loops to plain Ns.; leave Y.G. "**Front.**" Take off ribber. Lift out the "**Back**" half of Ns. and place inside Cyl. with the loops at their butts; put tension to its lowest; put yarn on the take-up; knit to "**Back**"; then remove the two end Ns. at "**Right**" (with their loops upon them), forward one groove and so leave an empty groove between the second and third Ns.; now take a spare Cyl. N., pick up with its hook a loop from the last stitch made at back of the second N., and place the N. into that empty groove. Knit BACKWARDS and FORWARDS and increase in this manner until there are 65 Ns. in Cyl.; knit BACKWARDS and stop Y.G. "**Front.**"

From this point it will be necessary to raise some of the end Ns. out of action to prevent their knitting each row across, thus:—Raise at first about 8 Ns. at the "**Right**" to "**Back**" side; knit BACKWARDS and FORWARDS and stop at "**Front**"; depress those 8 Ns. at "**Right**" (always see that latches are open), and raise about 8 on the "**Left**" side. Knit FORWARDS and BACKWARDS to "**Front,**" and repeat raising and depressing every row; also continue increasing the Ns. every two rows until 80 Ns. are in Cyl. Attach heel-wire and weight to increasing side to keep the fabric down there; knit to and fro 120 rows without increasing and stop Y.G. "**Front.**"

Body.—For the overlap, cast off 10 Ns., thus:—Lift out of Cyl. the end N. at "**Right**"; catch into its hook a thread of spare yarn and draw the yarn through its loop to prevent it unravelling; lay that empty N. aside; lift out the next N., and draw the spare yarn through its loop; do the same with the next and following Ns. until 10 Ns. have been removed.

To shape the sides, knit 5 rows and at "**Left**" and decrease 1 N. by putting loop of 3rd N. from the end, over 4th N., and removing the 1st and 2nd Ns. forward to fill the empty groove; repeat until 58 Ns. are left in Cyl. Now knit 140 rows without decreasing; then increase 1 N. at "**Left**" every 4th row until 68 Ns. are in Cyl. for shoulder; knit 20 rows without increasing.

Neck.—Finish with a selvedge (see page 45) 26 loops at "**Right**" side (leaving 42 for shoulder); knit 2 rows. Now remove the bobbin of yarn and put in its place a bobbin of odd yarn; knit a few (5) rows to and fro; break yarn and run the work off Mac.; stop Y.G. "**Back**" and remove all Ns.

Leg—Front Left Half. Insert the hanging Ns. with their loops into "**Front**" of Cyl.; attach weights to fabric; join the yarn from bobbin to end N. "**Right**"; put the yarn on take-up; increase and knit to and fro as before, but this time at the "**Left**" side; as no overlap is required in this part, take in gradually at the "**Left**" side 10 loops whilst knitting the 120 rows in leg.

Body.—For shaping the side, take in at the "**Right**" side this time, and also increase at "**Right**" side for shoulder.

Neck.—Finish with a selvedge at "**Left,**" and complete as for **Neck** above.

These two pieces will form one side of the Combination.

Knit two pieces for the other side in the same way, but be careful to reverse the increasing and decreasing sides (that is to say, for "**Right** side" read "**Left** side," and "**Left** side" read "**Right** side").

Sleeves.—Put Ns. in all Cyl. grooves. Set Rough and Correct Selvedges; put on ribber; adjust Cyl. for 3 and 1 rib; knit 20 rows; transfer ribbing loops to plain Ns., and take off ribber. Knit 80 rows, and finish with a selvedge.

The whole should be neatly put together, and having unravelled the extra rows, sew shoulder across with the Mending Stitch (see page 16), leaving space for sleeves. Finish neck with a crochet stitch. Then damp and iron (as for socks) to give proper finish.

LADY'S SEMMIT OR VEST.

(Read NOTES 1 and 2, page 73.)

Knitted in 4 pieces, including sleeves, and sewn neatly together.

Body—Back. Loose tension. Place 65 Ns. in "**Front**" of Cyl.; set Rough and Correct Selvedges for Flat Web (page 47); knit across 2 rows; then knit Imitation Rib, to do which, lift out every 4th N. and transfer the loop of each on to the next N., leave the Cyl. groove empty; knit 20 rows. Replace the Ns. just removed, but first pick up on each a loop from the side of the stitch last made by the next N. (or, take out every 4th N. and place it hanging to its loop, inside Cyl.; knit 20 rows "Purl Rib," page 18; replace the hanging Ns. into the grooves with their loops upon them); then knit the number of rows required, about 100.

Then to shape the sides decrease 6 Ns. at the "**Left**" side, one N. every 3 rows, by putting loop of 3rd N. on to the 4th N. from the end and remove the 2 end Ns. forwards. Knit 140 rows, cast off 26 Ns. for the Neck; knit 2 or 3 rows and run work off the Mac. with odd yarn. Knit another piece same as this, only for "**Left**" read "**Right.**"

This completes the 2 "**Back**" halves.

The 2 "**Front**" pieces are made precisely the same, but so as to make "**Front**" not so high in the Neck as the "**Back.**" After knitting 128 rows for Body, cast off 10 Ns. for the Neck. Knit to and fro and cast off 2 loops every 2 rows until you have decreased 26 Ns.

Neck.—Lift out at "**Left**" 25 Ns. and place them, hanging to their loops, inside Cyl.; knit 20 rows for the shoulder; raise the 40 Ns. out of action and break the yarn. Take 25 spare Ns. and place them into the grooves from which you removed the 25 hanging Ns.; put S.U. inside Cyl. and set on the 25 spare Ns. Rough Selvedge, working from the raised Ns.; depress the 40 Ns.

Body—Front. Knit on the 65 Ns. about 245 rows (being 15 rows less than stated above, to make the neck lower at front). Now knit Imitation or Purl Rib as directed above, and finish with a selvedge (page 45).

This completes one side.

Knit another piece in the same way as above, but take out the 25 Ns. and insert 25 other Ns. Join the pieces, leaving space for the sleeves. The Neck must be finished by hand with a fancy pattern.

Sleeves.—Place Ns. in all the Cyl. grooves, and set Rough and Correct Selvedges as for Circular Web; put on ribber and adjust Cyl. for 3 plain to 1 rib; transfer plain loops to the rib, and knit round 15 rows; re-transfer ribbing loops to plain Ns., and remove ribber; knit round 40 rows plain; finish with a selvedge (page 45).

LADY'S DRAWERS.

(Read NOTES 1 and 2, page 73, also directions for making Gent's Drawers.)

Knitted in 7 pieces including waist-band.

Leg—Back Left Half. Loose tension. Ns. in all the Cyl. grooves, set Rough and Correct Selvedges as for Circular Web; put on ribber and adjust Cyl. to make the fabric 2 plain and 1 rib; place ribbing Ns. into all dial grooves, but first pick up with each a loop from the last stitch made at back of nearest plain N. (the fabric can be made narrower if knitted 3 plain to 1 rib, in which case place ribbing Ns. into dial and transfer plain loops to them); knit 50 rows; then transfer rib loops to plain Ns., and remove ribber; Y.G. to be at "**Front**"; lift out, with their loops upon them, "**Back**" half of Ns. and place them inside Cyl.; put yarn on take-up; knit FORWARDS and BACKWARDS (2 rows), increasing 1 N. at the "**Right**" side by removing 2 Ns. forward, and inserting one empty N. into the empty groove, first picking up with it a loop from the last stitch made at the back of the next N.; continue to knit 2 rows and increase 1 N. each time, until about 65 Ns. are in Cyl. In the FORWARD movement stop Y.G. at "**Right**"; raise at first about 8 Ns. at "**Left**"; knit FORWARDS to "**Front**" and stop. Now knit BACKWARDS to "**Front,**" and depress these 8 Ns., and raise about 8 on the "**Left**"; repeat raising and depressing Ns. every row. Continue increasing the Ns. from this point (and as you do so it will be necessary to raise and depress more Ns. each side) until all the Ns. are in Cyl. Knit BACKWARDS and FORWARDS without increasing the required length

(about 15 inches, or about 180 rows), and finish with a selvedge. This finishes the **Back** part of one leg.

Leg—Front Left Half. Take out empty Ns.; Y.G. to be at "**Back**"; insert the hanging Ns. into the "**Front**" of Cyl.; join the yarn; knit BACKWARDS and FORWARDS and increase the breadth same as before, but at the "**Left**" side this time, until all the Ns. are in Cyl.; knit 80 rows without increasing; then decrease 1 N. at the "**Left**" (that is, the same side as was increased) by putting 3rd N. loop over the 4th N. and removing the 2 Ns. forward to fill the empty groove; knit 4 rows; repeat decreasing 1 N. and knitting 4 rows every time until 64 Ns. are in Cyl.; finish with a selvedge. This finishes **Front** part of one leg.

For the other leg, knit two pieces the same way, but increase and decrease on the reverse sides from the foregoing.

Gores.—Insert 42 Ns. in "**Front**" of Cyl. and set Rough and Correct Selvedges as for Flat Web; knit 120 rows; decrease as for Flat Web 1 N. from the "**Left**" end N. every row, until all Ns. are out of Cyl.

Knit another Gore the same way, but decrease on the "**Right**" instead of the "**Left.**"

Waist Band.—Insert 30 Ns. into "**Front**" of Cyl., and set Rough and Correct Selvedges as for Flat Web; knit BACKWARDS and FORWARDS until the half of the length required for the band is knitted. Raise out of action the "**Left**" end N.; knit across; raise the next N. to the one just raised; knit across and repeat raising one N. at the "**Left**" until 26 Ns. are raised. Knit once across and stop Y.G. at "**Left**"; depress the N. last raised and put yarn behind it; knit across, and repeat depressing 1 N. at the "**Left**" and putting yarn behind each N. every row across, until all the Ns. are depressed. Now knit the other half of band and finish with a selvedge.

Join the 7 pieces neatly together.

SHELL PATTERN. Fig. 33.



First Row.—Commence and end with whole shells.
Second Row.—Commence and end with half-shells.

If 2 shades of yarn in good contrast are used for the rows of shells a prettier effect is produced than with one only.

Set Rough and Correct Selvedges for Flat Web with Ns. in all Cyl. grooves (page 47), and knit twice across (that is BACKWARDS and FORWARDS); stop Y.G. at "**Left.**"

First Row.

1.—Raise out of action all the Ns. but 7 on the "**Left**"; knit across these 7; at opposite side from the N. last knitted, raise 5 Ns. of the 7; knit across the remaining 2.

2.—Depress 1 N. at the opposite side to the N. last knitted, and knit across the 3; depress 1 N. at opposite side to N. last knitted, and knit across the 4 Ns., and so continue after each knitting across to depress 1 N. at opposite side to the one which last knitted, until 12 Ns. are depressed.

3.—Now depress 7 Ns. to the "**Left**" of the 12, and knit across the 19 Ns.; raise 17 Ns. at the opposite side to the N. last knitted, and knit across the 2; depress 1 N. and continue as in paragraph 2 till 12 Ns. are depressed; repeat above 7 times in all.

This completes 1 *row of* 7 *whole shells.*

Y.G. to be at "**Left**"; begin at "**Back,**" and depress all the Ns.; knit one row BACKWARDS.

Second Row.—Raise all the Ns. excepting 2 at the "**Left**"; knit once across these 2, and depress 1 N. next to the N. last knitted, putting the yarn at the back of it; knit twice across the 3 Ns., and again similarly depress, and put yarn at back of 1 N.; then knit twice across the 4 Ns.; and so continue depressing 1 N. and knitting, until 6 are depressed; stop Y.G. at "**Right.**" *This completes the half-shell at the commencement of the 2nd row.*

Y.G. to be "**Right.**" Depress at once 7 Ns. in continuation of the last N. depressed, and knit across; raise 11 Ns. at the opposite side from the N. last knitted; knit across the 2 Ns., and now continue depressing 1 N. at opposite side, as directed above in paragraph 2, until 12 Ns. are depressed; depress 7 Ns. on opposite side, &c., as in paragraphs 3 and 2 above, until 6 shells in all are completed.

Then for the half-shell at the end of the 2nd row, depress 7 Ns. to the "**Left**" of the 12; knit across the 19 Ns.; raise 17 Ns. at the opposite side to the N. last knitted; knit across the 2 Ns.; depress 1 N. on the same side of the one already knitted, and place yarn at back of it; knit across the 3 Ns.; depress 1 N. on the same side, &c., and knit in the same manner until 6 Ns. in all are depressed; knit one row.

Petticoat.—If it is desired to make a petticoat, knit as many rows as are required, commencing the row with a half or whole shell alternately; 13 rows of shells make a large sized skirt.

Having completed the necessary number of rows of shells for each piece depress all Ns., and then transfer the loop of every 4th N. on to the 3rd N., so as to have Ns. in groups of 3, that is, with an empty groove after each 3 Ns. see that yarn is on the take-up; with a medium tension, knit 90 rows; finish with a selvedge.

BRACES.

This is simply Flat Web work, which needs no special explanation, as the width and length of web can be varied by the operator to suit requirements. The braces, and also buckle pieces, are usually commenced with 2 Ns. in the Cyl., and after knitting 2 rows across increase 1 N. each side, until say 12 Ns. are in action, then knit and decrease the length required. The buckle pieces have button-holes at both ends, and are usually a web 10 stitches wide between the button-holes. Instruction for making button-holes will be found below.

BUTTONHOLES.

After knitting the length and width required to the buttonhole, lift out of action all the Ns. to the "**Left**" of the buttonhole, and knit BACKWARDS and FORWARDS on the remaining Ns. the required length for the hole; then lift

out of action the Ns. on the "**Right,**" and depress those on the "**Left**"; knit in the same manner a similar length; depress all the Ns. and knit to the next hole; continue as above.

Fig. 34.



CARDIGAN JACKET.

Knitted in 4 *pieces double Berlin Wool.*

Knitter should refer to "Gent's Vest" if more detailed instruction is required than follows here.

Loose Tension.—Place in "**Front**" of Cyl. 30 Ns., 1 in and 1 out (that is, with an empty groove next each N.); knit 40 rows; increase "**Right**" side 8 Ns. 1 in and 1 out, knitting 5 rows between each increase; knit 50 rows plain without increasing; finish with a selvedge.

Knit another piece in the same way. Then knit 2 pieces in the same way, but increased on the "**Left.**"

Join the pieces together; make a deep hem round the bottom, and small hem round the sleeves. Finish off with Ruching. For button-holes, see page 80.

GENT'S DRAWERS. (Full Size.)

(Read Notes 1 and 2, page 73.)

Knitted in 5 *pieces.*

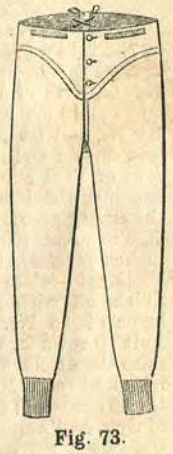


Fig. 73.

Leg.—Commence working from the ankle. Place Ns. into all Cyl. grooves; put tension-pointer to, say 4½; set Rough and Correct Selvedges as for Circular Web; put on ribber; and adjust Cyl. for 1 plain and 1 rib; transfer every second plain loop to ribbing N. and place the ribbing Ns. into dial; knit 50 rows and stop Y.G. at "**Back**" take off C.R.; re-transfer ribbing loops on to the plain Ns.; knit to "**Front**"; take off ribber; knit 6 rows round and stop Y.G. "**Front.**" Lift out with their loops upon them "**Back**" half of Ns., and place inside Cyl.; then knit to "**Back.**"

Loosen tension and put yarn on take-up; knit FORWARDS and BACKWARDS 6 rows; increase at the "**Right**" side one N., by removing the two end Ns. one groove towards "**Back,**" and then take a spare N. and with it pick up at back of the 3rd N. a loop from the last stitch that was knitted, place N. into that empty groove (which is between the 2nd and 3rd Ns.); knit 6 rows; increase and knit in like manner, until 52 Ns. are in the Cyl.; then without increasing knit 50 rows.

Begin to increase again, but at every 5th row, until 65 Ns. are in Cyl. and stop Y.G. at "**Front.**"

From this point it will be necessary to raise a few Ns. out of action each side (raising them is to prevent their knitting the excess (or slack) of the yarn as the Y.G passes them from the opposite side). Commence at the extreme end on the "**Right**" (or increasing side) raise 12 Ns. out of action, but as the Ns. are increased from 65 it will be found necessary to raise and depress more than 12 at a time. Knit BACKWARDS and then FORWARDS to "**Front.**" Depress the raised Ns. (on the "**Right**" side) and raise in same way corresponding number on the "**Left**" side. Knit FORWARDS and BACKWARDS to "**Front**" and so continue the alternate raising and depressing of Ns. every row, also increasing every 5th row until all the 84 Ns. are in the Cyl.

Knit 30 rows to and fro (where gusset is to be sewn); stop Y.G. "**Front,**" then decrease 1 N. at "**Right**" side by putting 3rd N. loop over 4th N. and removing the two end Ns. to fill empty groove; knit 4 rows and decrease on the same side as before, and so continue to knit 4 rows and decrease 1 N., until there are 68 Ns. in Cyl.

Knit 40 rows; then decrease at "**Left**" side 3 loops; knit 2 rows and decrease 3 loops, and so continue until there are 20 Ns. in the Cyl., then finish with a selvedge. This finishes the back half of one leg.

Insert the hanging Ns. into "**Front**" of Cyl. and increase the breadth all as before (but at the "**Left**" instead of the "**Right**"); knit to and fro until all the 84 Ns. are in the Cyl. Knit 30 rows (where gusset is to be sewn); then at the "**Right**" side (that is, on the opposite side from the increased one) decrease 1 N. every 6th row until 68 Ns. are left in Cyl.; then knit 10 rows and finish with a selvedge. This finishes the front half of one leg.

For the other leg knit 2 pieces the same way, but be careful to reverse the increasing and the decreasing of the sides. (That is to say for "**Right** side" read "**Left** side," and for "**Left** side" read "**Right** side.")

Gusset.—Place 28 Ns. into Cyl. and set Rough and Correct Selvedges as for Flat Web (page 47); then knit 34 rows, and finish with a selvedge.

Buttonholes and binding to be supplied in linen, silk, &c., as may be desired.

GENT'S SEMMIT OR VEST.

Knitted in 6 pieces (including Sleeves and Gusset), and joined neatly together.

Body—Front. Use loose tension; place 66 Ns. into "**Front**" of Cyl.; set Rough and Correct Selvedges as for Flat Web (page 47); knit 26 rows of Imitation Rib, as explained on page 18 (or take out every 4th N., and let it hang to its loop inside Cyl., and knit 26 rows of Purl Rib, see page 18, and turn the hanging Ns. into the empty grooves); knit some 300 rows of plain (about 30 inches for full size vest).

Neck.—Cast off (that is, finish off with selvedge) the loops of 25 Ns. at "**Left**"; knit 10 rows for the shoulder; raise the 41 Ns. out of action; insert 25 spare Ns. in place of the 25 removed; put S.U. inside of Cyl., and commencing next the raised Ns. set Rough and Correct Selvedges on the 25 Ns.



Fig. 74.

Body—Back. Depress the 41 Ns., and knit some 300 rows (about 30 inches) as before. Take out every 4th N. and knit 26 rows of Imitation, or Purl Rib, as at the beginning; finish off with a selvedge.

Knit another piece in the same way as the above, but at the neck cast off 25 loops, and insert 25 other Ns. at the "**Right.**"

Sleeves.—Proceed as for Sleeves in Lady's Vest (page 78) excepting that the cuff should be 1 plain to 1 rib, and 50 rows long; then tighten tension and knit about 170 of plain; loosen tension and knit Flat Web 60 rows; finish with a selvedge.

Gusset. Make as on page 76, but use 60 Ns. and knit 50 rows.

Join the pieces, leaving spaces for the sleeves and for the opening at neck. Bind the neck and opening with silk or linen, and make buttonholes and supply buttons. Sew in the gussets and so finish.

If a 60 Cyl. Mac. and coarse yarns be used, work Flat Web upon 60 Ns. (instead of 66) for the body, knit 20 rows Purl Rib and about 300 rows of plain; for the neck remove 20 Ns.; knit 25 rows for shoulders: 10 rows for gusset.

CHILD'S CAP.

Knitted Flat Web in 2 pieces with Tassel.

Make a strip of Lace Pattern (see Fig. 47) of the length required for the head, then a strip of plain Flat Web the same length; join one long side of the lace to a long side of the plain; fold so that one end of the lace is against the other end of the lace, and plain against plain, then join the ends with the Mending Stitch; double up the lace to form a border; pleat the plain, and so close with tassel for top.

The cap is much prettier if the border is of a contrasting colour to the top (plain) portion.

CHILD'S OR FISHERBOY'S PLAIN CAP.

Knitted in 1 piece with a Tassel.

Loose tension. Turn handle slowly until Y.G. is at "**Right**"; commence at "**Right**" half mark and set a selvedge **on all the Ns.** much the same as the Rough Selvedge (pages 9 and 10); knit 50 rows and stop Y.G. "**Right**"; lift off weights, and carefully remove set-up so as not to draw out the loops.

Next form the brim thus:—Double the fabric by turning the end with the set-up loops inside, and lifting it until the loops are level with the tops of the Ns. Now be careful to have the first set-up loop opposite the N. at "**Right**" half-mark; then transfer to the hook of that "**Right**" N. the first loop formed on that set-up loop. Continue to transfer to hooks of all the Ns. the first loop formed on the remaining set-up loops as far as to the depressed Ns. Unravel the set-up loops of the part transferred up to "**Left**" half-mark; advance Y.G. to "**Back.**" Complete the transfer of the first loops as before, and then complete the unravelling. Break the unravelled yarn at about an inch from the Ns., and work that inch into the fabric either by a spare N., or by placing it round the Ns. in Cyl. There will now be 2 loops on each N. Grasp the fabric from underneath the Cyl. by the left hand and hold it well down; knit 50 rows; tighten the tension half a degree; knit 50 rows; then break yarn at Ns. and still hold fabric down; then turn handle and run work off Mac. Press with hot iron with damp cloth between; unravel 3 rows; thread a darning N. with the unravelled yarn; double it and pass same through all the loops in the contrary direction to the unravelling; draw the loops together to close the top; turn cap inside out; pass from inside the first knob only of tassel (see page 84 for tassel) through hole at top; draw the loops closely round, and sew tassel to cap.

FISHERMAN'S CAP.

Knitted in 2 pieces with a Tassel.

First Method.

Y.G. at "**Back.**" Place 54 Ns. in "**Front**" part of Cyl., leaving grooves empty at "**Back.**" Set a selvedge like Rough Selvedge *but on every N.*; put yarn on take-up; knit BACKWARDS and FORWARDS 20 rows and turn up the hem (as directed in "Fisherboy's Cap"); knit 90 rows; then decrease the second N. (see "**Tam-o'-Shanter Cap**") each side every 5th row, until 24 Ns. remain in Cyl.; then decrease every 2nd row until all the Ns. are out of the Cyl. Knit another piece in the same manner, and join together neatly. Finish with tassel.

The cap has a prettier effect if the border, crown, and tassel are of different colours.

Second Method.

Set plain work all round the Cyl. as for "**Fisherboy's Cap**"; knit one row and attach the ribber to work 2 plain and 1 rib; knit 60 rows; transfer the ribbing loops to the plain Ns. and put back the ribbing Ns. in their places in dial with latches open; knit 30 rows; transfer ribbing loops to plain Ns., and take off ribber; knit about 80 rows of plain; unravel as directed in "**Fisherboy's Cap.**" Turn back the 60 rows and make a border.

Close the top, and add tassel.

TAM O' SHANTER CAP.

Knitted in 6 or 8 sections. Double Berlin Wool, or Double Fingering.



Fig. 75.

Loose tension. Y.G. at "**Back.**" Place 16 Ns. in "**Front**" half of Cyl. with an empty groove between each N.; set a selvedge like the Rough Selvedge, *but on every N.*; put yarn on take-up. Knit BACKWARDS and FORWARDS 20 rows; then remove the weights and also the set-up; lift the end of the fabric with the set-up loops, and place the first row of loops, after the set-up loops over the hooks of Ns. in Cyl.; unravel set-up loops, then fix in heel-wire to hold the fabric down; knit three rows; increase one N. each side with an empty groove between each as at the beginning; knit 3 or 5 rows; then continue to increase each side and knit as before, until there are 31 Ns. at work. Decrease the second N. on both sides by transferring its loop on to third N. and moving the first N. into the second N. groove; knit 3 rows; continue to decrease and knit until all Ns. are out of Cyl.

Join the sections, and insert tassel, &c., as may be desired.

TASSEL.

Wind yarn round a book, or board, according to the length and thickness of tassel required; then cut yarn through in one place and afterwards tie in centre tightly; double or bring the ends together and bind a thread of yarn round the doubled centre, and so form a knob; then wind yarn to form a second knob close to the other. Cut ends of tassel to make them even with one another.

BABY'S BOOTS.

Knit Flat Web same as "Plain Sock for a Child" (pages 48 and 49), but in some fancy pattern such as the Honey-comb.

Commence with 5 rows of small looped ruching; trim to taste.

BED SOCKS.

Use light soft yarn.



Fig. 77.

Knit Circular Web and as an ordinary plain sock (page 9) or in a fancy pattern such as Lace or Honeycomb.

SLIPPERS.

Place Ns. in "**Front**" half of Cyl. and knit a toe as in a "Sock commenced at the Toe"; then knit round, either plain or ribbed, 25 rows; remove ribber if used; for the instep take out and decrease at "**Back**" two Ns., crossing their loops, that is, placing the loop of the "**Left**" N. over the first N. in action at "**Right**" side, and the loop of the "**Right**" N. over the "**Left**" N.; knit across as for Flat Web 2 rows; now decrease (without crossing) 2 Ns., and knit 2 rows after each decrease until 12 Ns. are out; knit 15 rows without decreasing, and stop Y.G. at "**Front**"; raise out of action 15 Ns. each side from the empty grooves. Knit a heel on the remaining Ns.; depress the 2 lots of 15 Ns. and knit 20 rows; finish with a selvedge.

The sock can be lined and trimmed, and have a light sole sewn to it.

If a 72 Cyl. is used, decrease 8 Ns. for the instep.

MUFFLERS.

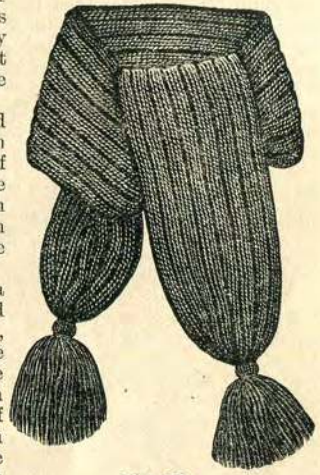


Fig. 78.

Mufflers are knitted very rapidly in Flat or Tubular Web, and in a great variety of styles and sizes. They can also be knitted with any of the fancy patterns, and a careful arrangement of the patterns, monograms, &c., at or near the ends, will have a very pleasing effect.

All the Ns. may be used; or every second one; or 2 in and 2 out; 3 in and 3 out; 2 in and 4 out; or any way suggested by the taste of the operator. Sometimes the muffler may be turned inside out, and the ends finished with fringe, or tassels. Those knitted with 2 Ns. in and 4 out, all round the Cyl., then turned inside out, are called shell work, and are very pretty.

A very good arrangement for a Muffler, or a cloud, is to knit it plain, and having completed the length required, take out every second, third, or fourth N. with its loop, and place it inside Cyl.; then break yarn and run work off the remaining Ns. and ravel out the loops of each of those remaining Ns. for the whole length of the fabric, and thus make a handsome open network. Turn fabric inside out, secure the loops of the hanging Ns., and close the ends with a tassel, &c.

Another fancy pattern can be made by knitting the fabric in courses, say 6 rows with the loosest tension, and 6 rows with the tension as tight as can be worked. Or a good effect can be obtained from courses of plain knitting, and one, or more, of the fancy patterns.

GAITERS.



Fig. 79.

Knit the top Circular Web, like the top of a sock (pages 21 to 23); knit the calf plain, or preferably in some fancy pattern; now part Ns. (page 52), and knit back of gaiter from A to B of Fig. 27 (page 53), but increase 1 N. both sides, each row across; then finish with a selvedge.

Place hanging Ns. into Cyl.; knit and narrow instep, and finish with a selvedge. Join back to instep, or the joining can be avoided if the side selvedges are worked on the end Ns. when knitting instep, as in joining strips of Flat Web.

HOOD.

Knit plain, or a fancy pattern, in strips of varying lengths. Crochet or sew together and work a fancy edging by hand.

A child's hood can be made of ruching in any pleasing design, and finished with trimming in colours to suit the taste.



Fig. 80.

CUFFS.

These can be knitted as in Circular Web, plain or ribbed, with or without one of the fancy patterns. Commence with Rough and Correct Selvedges, and finish with a selvedge.

KNEE-CAP.

Use 3, 4 or 5-ply Fingering Yarn.

Place all the Ns. in Cyl., set Rough and Correct Selvedges (see pages 11 and 13); then put on the ribber and adjust Cyl. to dial for 4 plain and 1 rib.

Place ribbing Ns. into every 2nd groove in dial, first picking up with each a loop from the last stitch made (at back of every 4th plain N.), but do not take out plain Ns. or remove the loops from them; knit round 60 rows and stop with Y.G. "**Front**"; take off C.R. and transfer the ribbing loops at "**Back**" half to plain Ns.; knit FORWARDS, and stop Y.G. "**Back**"; transfer remainder of ribbing loops and remove ribber; put on C.R. Raise 11 Ns. directly in "**Front,**" and at "**Right**" side of these raised Ns. raise 9 others next to them (to allow Y.G. to pass freely without knitting, as for Flat Web); put yarn on take-up; knit FORWARDS to the "**Front**" until end N. on "**Left**" has made stitch, that is, see that Y.G. passes far enough to the "**Front**" each time so that end Ns. in action make stitches and rise level with the others in action; then raise that end N. for the decreasing, and knit BACKWARDS to "**Back**"; depress the 9 Ns. on "**Right**" and raise 8 on the "**Left**" of the 11 Ns. (the number of Ns. to be raised each side will be less each time of decreasing); knit BACKWARDS to "**Front,**" raise end N. on "**Right**" for the decreasing, and knit FORWARDS to "**Back**"; depress the 8 Ns. on the "**Left,**" and raise 8 on the "**Right**"; knit to "**Front**" and continue in like manner decreasing one N. each row until there are 17 Ns. only in action at "**Back**"; attach heel-wire with weight-holder and one weight to keep the fabric down.



Fig. 76.

After raising the last N., which will be on "**Right,**" knit FORWARD and stop with Y.G. at "**Back.**" Lift yarn out of take-up.

Now put down into action all the Ns. and knit round to the "**Front**"; put on the ribber; take out every 4th plain N. and transfer loop on to a ribbing N. (to make 3 plain and 1 rib); knit round 60 rows, and stop with Y.G. at "**Front**"; transfer all the ribbing loops back on to plain Ns.; take off the ribber; raise all the Ns. out of action, and finish with a selvedge as directed on page 45, or, knit 4 extra rows; then break yarn at Ns.; turn handle to run fabric off Ns. and finish top, as directed for "Top of Sock—commenced at the Toe."

If a plain Mac. only is used, Imitation Rib can be made as directed on page 18.

MITTENS.

Make a Cuff and continue knitting for the length required, but at the opening for the thumb, work Flat Web, and afterwards resume the Circular Web; finish with a selvedge.

The thumb-piece can be knitted Flat Web; commence and finish with a selvedge; join, and sew to mitten.

GLOVES.

First Method.

Knit the tops ribbed, or in some fancy pattern; then knit plain the necessary length: narrow the end and close up like the toe of a stocking; then cut crosswise the mitten 18 stitches for the thumb; allowing the greater number of the stitches for the inside of the hand. The thumb must be made separately by setting up rough selvedge only on 28 Ns., and increasing 4 times with 2 rows between; make up length of thumb required on 36 Ns. Sew the thumb across the top down the side, and attach thumb to glove with mending stitch (page 17, Fig. 18).

Second Method.

Knit Flat Web thus:—Set 50 Ns. Rough and Correct Selvedges; knit 15 rows with one of the Diagonals or some fancy pattern; then knit across 40 rows of plain, and widen every fourth row on both sides, which will increase the Ns. to 70 in action; stop Y.G. at the "**Back**"; raise out of action all but 10 Ns.; knit one half of the thumb 20 rows long, then narrow 6 times on the inside, that is, the side nearest the Ns. out of action; break yarn and run work off Mac., and remove the remaining Ns. in action; depress 10 Ns. on opposite side, and knit the other half of the thumb in the same manner; depress the 50 remaining Ns.; knit without narrowing 35 rows; raise out of action half of the remaining Ns., and with the others round off, as in forming half of the toe of a sock. Narrow the other half in the same way, and sew up.

TOILET GLOVES.

The best washing gloves are made of cotton, knitted single, if coarse, or double, if fine. Wools are very unsuitable in many respects, and particularly because of the difficulty of cleansing them.



Fig. 81.

Proceed as for a "Sock commenced at the Toe," up to, and including "Toe-Joining the Halves" (pages 27 to 29); do not put on ribber, but knit plain—50 rows; put on ribber; adjust Cyl. for 3 plain to 1 rib; transfer loops; then knit 30 rows and finish as for "Stitching Top of Sock" (page 30).

If preferred the glove can be knitted all plain, and finished with a selvedge.



Fig. 38.

COSY FOR TEAPOT.

Set work upon 56 Ns., and knit four triangles similar to those in the Mat in sections (see Fig. 39), and close by hand with a spare N. Or, to make the two-sided Cosy, knit 2 pieces of fancy work, cut to shape, and finish with a cord.

LAMP, OR BUREAU MAT.

Knit cord, about a yard each of two different coloured yarns, say magenta and white; fasten one end of each to the centre of a piece of canvas cut in the form of a circle; wind the two pieces of cord round side by side in the form of a spiral; sew them to the canvas; the circle should be covered to within $\frac{3}{4}$ of an inch of the circumference, which space is left for the border. For the border use a strip of the single or double fringe, ruching, imitation moss or shell pattern.

In place of two different colours you may use shaded yarn, but knit 2 yards.

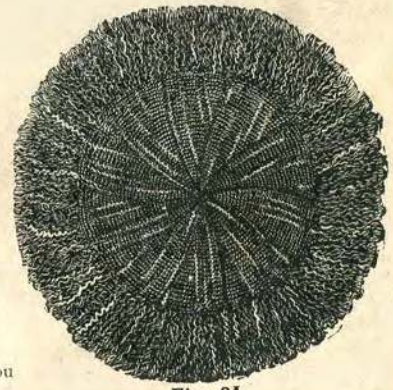


Fig. 84.

ANTIMACASSARS, BLANKETS, SPREADS, &c.

Antimacassars can be knitted Circular or Flat Web in strips laid flat and crocheted, sewn or put together with knitted cord. The strips of Flat Web can be knitted togther on the Mac. or by hand.

The strips may be knitted partly plain, and partly with a fancy pattern; or, one strip may be plain, and the next a fancy pattern; or they may be made in squares or diamonds of various fancy patterns, and sewn or crocheted together. Finish with a fringe, or narrow the end of each strip, and finish with balls, or tassels.



Fig. 82.

All kinds of blankets and spreads, piano and table covers, rugs, &c., are knitted in a similar way. (See Fancy Patterns.)

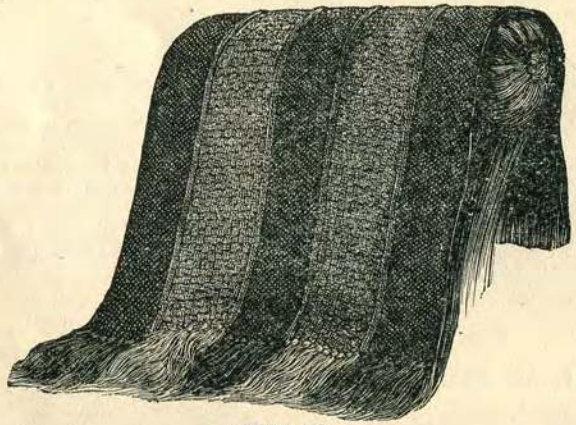


Fig. 83.

CORD.

In making cord, 1, 2, 3, 4, or 5 Ns. can be used; 1 will make a chain; 2 a square; 3 a round; 4 a square; 5 round on one side and flat on the other. Put the Ns. required in the **"Front."** Set work, using hook of weight-holder as a set-up; put yarn on take-up, and knit round as in Circular Web. If two or more different coloured yarns or silks are used, the cord will be very pretty.



Fig. 85.

This cord can be used for pictures, curtains, lamp mats, or the edges of hassocks, and also as trimming for a variety of articles.

MAT IN SECTIONS.

Mat with Six Sections.—Place Ns. in Cyl. equal to half of the diameter of the mat required. Set Rough Selvedge for Flat Web, but on each N.; put yarn on take-up; knit to and fro, raising a N. on the **"Left"** side each row across, until only 3 or 4 Ns. remain; stop with Y.G. at **"Right"**; now depress all the Ns.; change the yarn for that of another colour, and knit another section in the same manner. Repeat the operation until there are 6 such triangular sections; unravel Rough Selvedge of the first section; then break yarn and run work off Mac.; close by Mending Stitch (page 16) that first section to the last one, leaving the 3 or 4 outside loops still unclosed. Place damp cloth upon the mat and press with a hot iron; cut and ravel out the 3 or 4 outside rows to form a fringe; or, trim with a ruching.

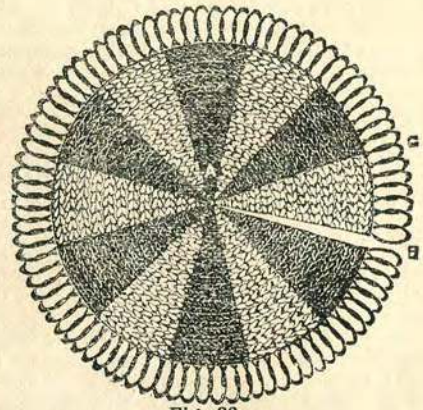


Fig. 39.

For mats of 12 or 24 sections, raise 2 or 4 Ns. each time.

The shell, and some of the other fancy patterns make pretty mats. White cotton knitted in this way makes a neat toilet mat.

RUGS MADE OF CLOTH (odd pieces), OR YARN.

Place 16 Ns. in the **"Front"** half of Cyl., leaving 1 or 2 empty grooves between each N.; use thick, soft cotton or yarn, and work with a loose tension; knit 2 rows. Have the cloth or odd yarn cut to the length required, and place 1 piece of cloth, or some 6 lengths of yarn across each empty groove space, holding the pieces from inside the Cyl. Knit 2 rows, and place another row of pieces as before, and repeat this every 2nd row until the required length is knitted; change the colours as desired.

IMITATION MOSS.

Use clouded green, or brown wool. Knit a Flat Web the required width, on about 12 Ns. Wet the web and press with a warm iron; ravel out all except 2 or 3 rows of stitches on one side of the strip. This will give a beautiful imitation of moss suitable for the borders of lamp mats, &c.

FRINGE.

Use from 2 to 30 Ns., according to the width of heading desired; place the Ns. in the **"Front"** of Cyl.; set the work as usual; then place a single N. in the **"Back"** of Cyl., or on the **"Right"** if a shorter fringe is wanted; raise that N. out of action (to hold that single N. up, tie a thread of yarn round Cyl. in place of the C.R.). Pressing the yarn down so that it will feed into the hook of the 1st N. each time, knit round until this single N. is full; then lift the loops off the single N., or cut them open. Repeat until you have as long a strip of fringe as required. Now tie from 4 to 6 of these ends together, being particular to knot them close to the heading.

For fringe half this length use Ns. both in **"Front"** and **"Back"** of Cyl.; work as for Circular Web; when the length is knitted, run the fringe off the Mac. and cut the threads **"Right"** and **"Left."**

One or more colours may be used from separate bobbins, passing all the yarns over the yarn-cross and through the Y.G.; or, one colour may be knitted several times round, then another the same number of times, cutting the yarn off at the single N., beginning there each time.

FRINGE WITH A SINGLE HEADING.

Set work at "**Front**" of Cyl., as for Flat Web; place a single N. out of action at the "**Back,**" or at the "**Right,**" according to the length of fringe required; knit to and fro, lifting the yarn over the single N. each time, and depressing it so that it will feed into the 1st N. on the "**Right.**"

By using silk, and knitting any one of the fancy patterns, a nice serviceable fringe can be made.

BALMORAL, OR STRIPED PATTERN.

Use yarns of different colours, winding each on a separate bobbin.

Knit the required number of rows from one bobbin and stop with the Y.G. at "**Back**"; unthread Y.G. and cross, and place second bobbin of yarn inside Cyl., and rethread Y.G. and cross with yarn of first bobbin whilst the second coloured yarn is being used; join on the different coloured yarn; knit a similar number of rows; unthread Y.G. and cross; break yarn; so continue, always stopping with Y.G. at "**Back,**" and breaking yarn at the place stated, as this will ensure that the joins of the different yarns are in one regular place.

If more than two colours are to be used wind the yarn into balls. Care should be taken when working from balls to see they unwind freely.



Fig. 86.

BRIOCHE, OR CARDIGAN PATTERN.

This pattern can only be worked after the operator has learnt the Purl Rib (page 18).

Place Ns. in every second Cyl. groove, 1 in and 1 out; set Rough Selvedge with, or without a Correct Selvedge either for Circular or Flat Web. Having knit once round, or across, arrange the Ns. as described for the Purl Rib. Do not move the Y.G., but draw yarn through it with the left hand; feed the yarn to the purl Ns. and form a stitch with each purl N. in succession, when the thread of yarn will be left unknit in front of each Cyl. N. Now knit round, or across, with Mac. to knit the thread of yarn in front of the Cyl. Ns., this will leave a thread over the purl Ns.; then draw and feed the yarn by the left hand and knit with the purl Ns. as before, and continue knitting one time with the purl Ns. and the next time with the Mac. The stitch should not be too tight, or the work will not have the proper elasticity.

CROSS-BAR (SINGLE), OR IMITATION RIBBED PATTERN.

Place Ns. in Cyl. in groups of 3 with an empty groove after each group; set work in the usual way; knit twice round, or across; lift out of action every alternate group of 3 Ns.; knit once round, or across; depress the sets that are out of action; and lift up the alternate groups, and thus continue to knit with alternate groups of Ns. each time round, or across.

The stitch may be varied by using alternate groups of 2 Ns., or 4 Ns., instead of 3.

CROSS-BAR (DOUBLE), OR IMITATION RIBBED PATTERN.

This is knitted like the single cross-bar, excepting that the Ns. are raised and depressed after knitting 2 rows each time of raising and depressing Ns.

CROCHET PATTERN.

Place Ns. in "**Front**" of Cyl. in groups of 3, with 2 empty grooves after each group; set work as usual; raise out of action all but 3 Ns. at the end on the "**Left**"; knit once across the 3 Ns.; raise the "**Left**" end N.; knit once across the 2 Ns.; depress the N. next to the 3; knit back again; raise the end N. in action, and thus continue to advance towards the "**Right,**" 1 N. every second row. Having reached the "**Right**" end N., reverse the process, and raise that

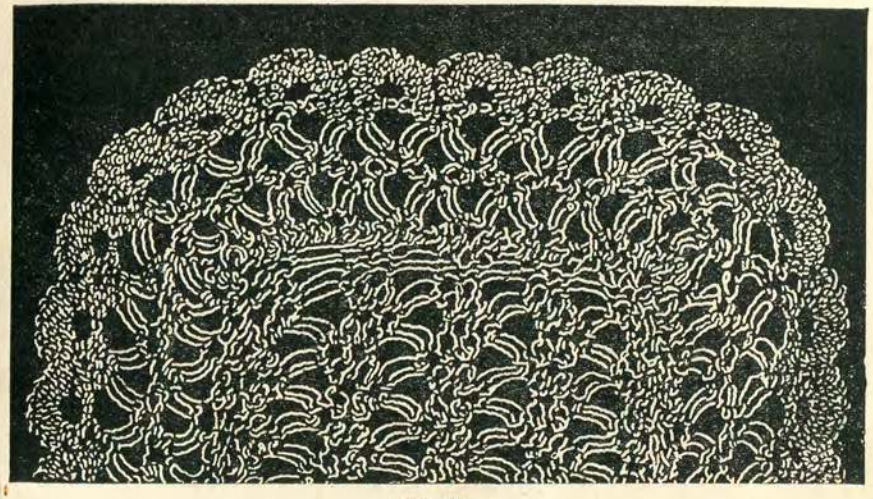


Fig. 40.

end N. on the "**Right,**" and depress towards the "**Left,**" advancing by 1 N. each second row; continue to knit in the same way for the length required.

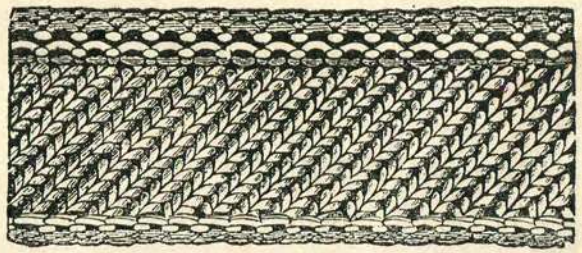
If a scolloped edging is desired, as represented in Fig. 40, continue to advance across each side, until only 2 Ns. are left in action, before returning the contrary way.

The pattern may be varied by arranging the Ns. in groups of 2 with 2 empty grooves after each group, or 2 in and 4 out, &c.

This pattern is very suitable for cotton antimacassars.

DIAGONAL PATTERN—RIGHT.

Fig. 41.



Set work as usual, knit across twice; lift out of action all but six Ns. on the "**Left**" side; knit once across the six Ns.; lift out of action the extreme "**Left**" N.; knit across the five remaining Ns.; depress the N. next on the "**Right**"; knit again, and thus continue to advance towards the "**Right,**" one N. every second row.

DIAGONAL PATTERN—LEFT.

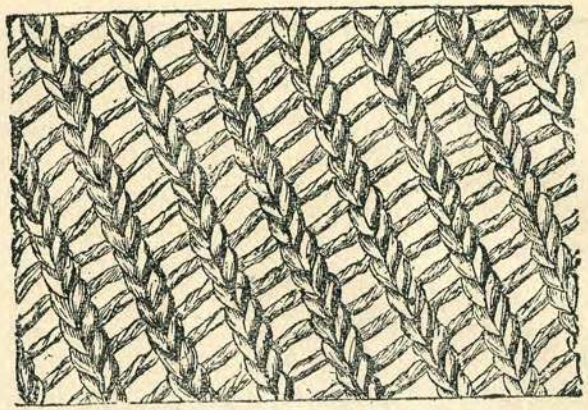
This is knitted like the right diagonal, excepting that the work is commenced at the "**Right**" side and advances towards the "**Left.**"

By knitting the right diagonal, and then knitting across 2 rows with another colour before commencing with the left diagonal, the effect is more striking.

DIAGONAL CROSS-BAR PATTERN.

Set work as usual and knit a few rows; transfer the loop of every 2nd N. to

Fig. 42.



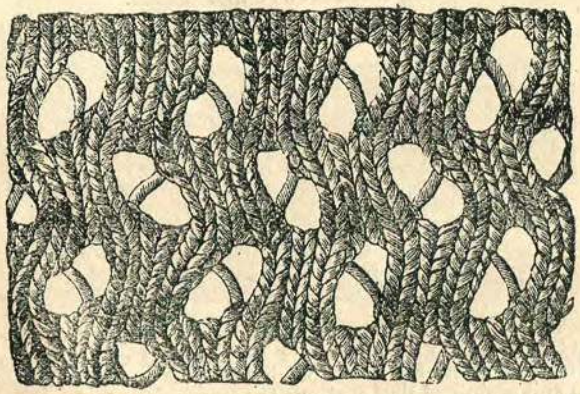
the next N. FORWARDS, and replace empty N.; knit 1 row; repeat the transfer and knitting 1 row, for the length required.

DIAMOND PATTERN.

Set work as usual and knit a few rows; transfer the loop of every 2nd N. on to the next N. FORWARDS, and replace the empty N. in its groove; do this all the way round, or across, or as far as the pattern is required; knit 2 rows (by knitting not less than twice round, or across, new loops are formed on the empty Ns.); repeat the transfer and knitting for the length required.

FILET PATTERN.

Fig. 43.



Place Ns. in front of Cyl.; set work either for Circular or Flat Web; knit 3 or 4 rows but stop Y.G. at **"Right"**; raise out of action all but 5 Ns.; knit 5 rows across these 5 Ns.; depress the 5 Ns. next to them; knit across the 10 Ns.; raise out of action the first 5 Ns.; knit 5 rows across the 5 Ns. just depressed; now depress the next 5 Ns.; knit across the 10 Ns., and thus keep advancing by 5 Ns. until entirely round, or across the Cyl.

In order that the holes in the pattern may be altered in position (as shown by Fig. 43) for the next row, commence to knit upon 2 only of the first lot of 5 Ns. if Flat Web (or, if Circular Web, 2 of the first 5 Ns. and 3 of the last 5); then take the 5 Ns. next to the 2, and so on as before.

The Filet Pattern can also be varied, thus:—Raise out of action all but 4 Ns. at **"Right"**; knit BACKWARDS and FORWARDS 4 rows; depress the 4 Ns. next to those in action and knit 1 row; raise the first 4 Ns. and knit 1 row; depress the next 4 Ns. and knit 3 rows; raise the second 4 Ns. and knit 1 row; and so continue across. Now start with 2 Ns. on the **"Left,"** as this will secure that holes are not opposite.

This pattern being such an open one, it is suitable for Satchels and Satchels, which should be lined with a yarn of a contrasting colour. Make a strip about 26 inches long, double, and then sew the sides or draw in at the top.

HONEY-COMB OR CELLULAR PATTERN.

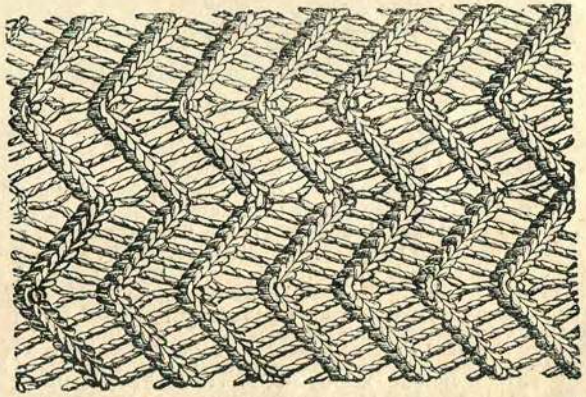
This pattern can be worked in Circular Web for hosiery, &c., or in Flat Web for antimacassars, &c., when the several strips can be joined by hand or by the machine.

Put Ns. into every second groove of the Cyl., leaving one groove empty next each N.; set up and knit 1 row; raise every other N. out of action; knit 2 rows; depress the Ns. that are out of action, and raise the others; knit 2 rows; continue depressing one set and raising the other set of alternate Ns., and knitting 2 rows each time.

The above can be varied by knitting 3 rows, and if greater effect is desired use different coloured yarns.

HERRING-BONE PATTERN.

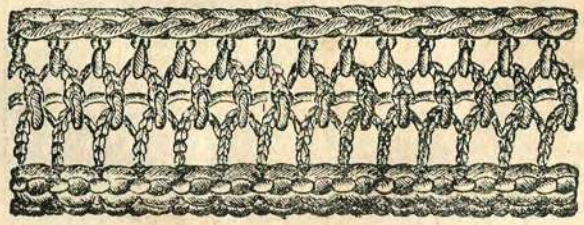
Fig. 44.



Set work as usual and knit a few rows; transfer loop of every 2nd N. on to the next N. FORWARDS, and replace empty N. in its groove; knit 1 or 2 rows; repeat three or four times in all; then transfer BACKWARDS, &c., three or four times in all. Continue in like manner to transfer three or four times each way and knitting after each transfer until the fabric is the length required.

INSERTION PATTERN.

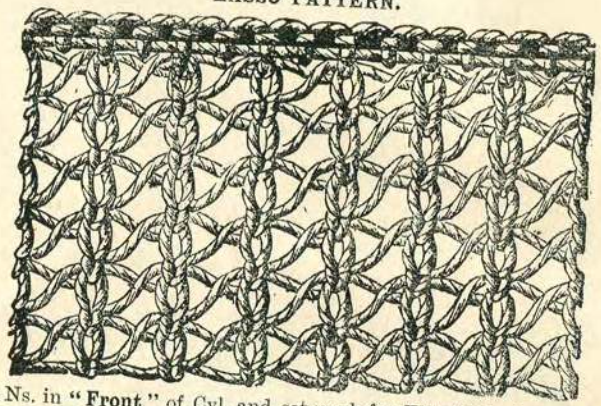
Fig. 45.



Set work and knit round, or across, several times, plain or fancy patterns. Lift all the Ns. excepting one, out of action; knit four times across this 1 N. (holding the work down on the N. with the hand under Cyl.); lift this one N. out of action, and depress the next N. to the "**Right**"; knit four times across it and lift it out of action; then depress the next one, and so on, completely round, or across; knit a row plain, and repeat the above; after which, continue the plain, or fancy knitting. (See Fig. 45.)

LASSO PATTERN.

Fig. 46.



Place Ns. in "**Front**" of Cyl. and set work for Flat Web; knit a few rows. Commence at "**Right**" and transfer the loop of every 2nd N. to the next N. (that is, put the 2nd N. on the 1st, the 4th on the 3rd, and so on); replace the empty Ns.; knit 2 rows to form loops on the empty Ns.

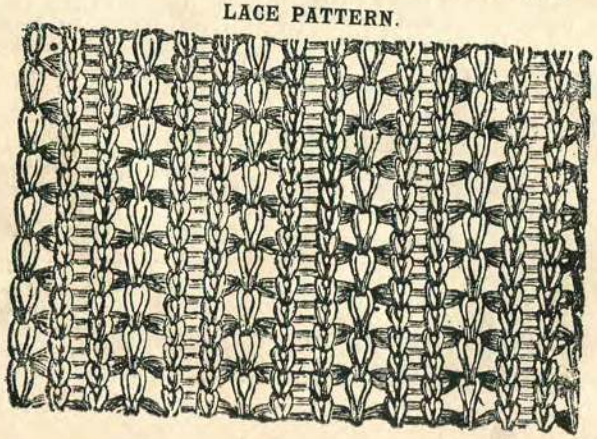
Then transfer the loop of the 2nd N. on to the 1st; the 4th and 6th on to the 5th N., 8th and 10th on to the 9th N.; continue in like manner transferring one 2nd N. loop to the "**Right**" and one to the "**Left**"; knit 2 rows. Now, transfer the loops again, but in the opposite direction, that is, put the 2nd and 4th on the 3rd N., the 6th and 8th on the 7th N., and so on; knit 2 rows; repeat the transfer of the loops (reversing the direction every time and being careful to start each time on the same N.) and knitting for the length required.

The following is a variation of this pattern:—

Transfer loops of the 2nd and 4th Ns. to 3rd N., 8th and 10th Ns. to 9th N., and so continue across, transferring to every 6th N. the loops of the next N. each side of it, and thus leaving groups of 3 Ns. untouched. Knit 2 rows; then transfer loops of the 3rd and 5th Ns. to the 4th N., 9th and 11th Ns. to the 10th, and continue across; knit 2 rows.

LACE PATTERN.

Fig. 47.



Set work either with Ns. in all the grooves, or every second one out, according to the openness of the fabric desired; raise every third N. out of action; knit three times round, or across; depress the Ns. and knit once. Raise the same Ns. and knit three times as before, and so on, raising and depressing Ns. until the required length is knitted. (See Fig. 47.)

This Lace pattern can be varied, thus:—Raise out of action every 2nd N.; knit 2 rows; depress all raised Ns.; knit 1 row; then raise the other Ns.; knit 2 rows; depress all Ns.; knit 1 row, now again raise every 2nd N., &c., as before.

OPEN WORK PATTERN.

Set work as usual and knit a few rows; transfer the loop of every 2nd N. on to the next N. FORWARDS, and replace the empty N. in its groove; do this all the way round, or across, or as far as the pattern is required; knit 3 rows or more; repeat the transfer and knitting for the length required.

PINEAPPLE PATTERN.

Set work as usual and knit a few rows; transfer the loop of every 2nd N. on to the next N. (as instructed in the first paragraph for "Lasso Pattern"); knit 1 row to form half loops; then transfer the loop of the 2nd N. to the 1st N., and the 4th on the 5th, 8th on the 7th, 10th on the 11th, and continue in like manner across, putting the loop of one 2nd N. to the "**Right**" and one to the "**Left**"; knit 1 row, or 2 rows; repeat the transfer, and knit 3 times in all. Now reverse the transfer and put loop of the 2nd N. on the 3rd, 6th on the 5th, 8th on the 9th, 12th on the 11th, and so on; knit once across; repeat this 3 times in all. Continue placing loops as above, 3 times one way, and 3 times the other way, being careful that you start on the same N. every time.

PLAIT, OR BASKET PATTERN.

The effect of the plait pattern is very striking if blocks are prepared in different coloured yarns (or coarse cottons). It is suitable for hosiery and fancy articles, also for the tops of Turned Down Knickerbocker Stockings.

Set up for Circular or Flat Web the number of Ns. required; knit 3 or more rows, round or across; stop with Y.G. at "**Front**"; take off clasp-ring; then commencing at "**Right**," take out alternate groups of 3 Ns., and let them hang upon their own loops inside Cyl. (this will leave 3 Ns. in action, and 3 out); knit 3 rows round or across; replace the hanging Ns.; knit 3 rows across; now leave the hanging Ns. in the Cyl., and take out the other groups of 3 Ns. Knit 3 rows, and continue as above. The illustration (Fig. 48) will explain itself.

The knitter will see that this pattern is capable of many variations—thus, the same group of 3 Ns. may be removed each time, or 2 rows may be knitted upon 1 group, and 4 on the other, or 2 Ns. can be treated in the same way.

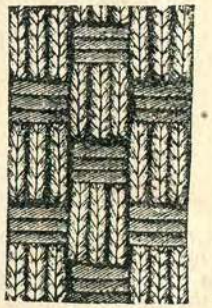
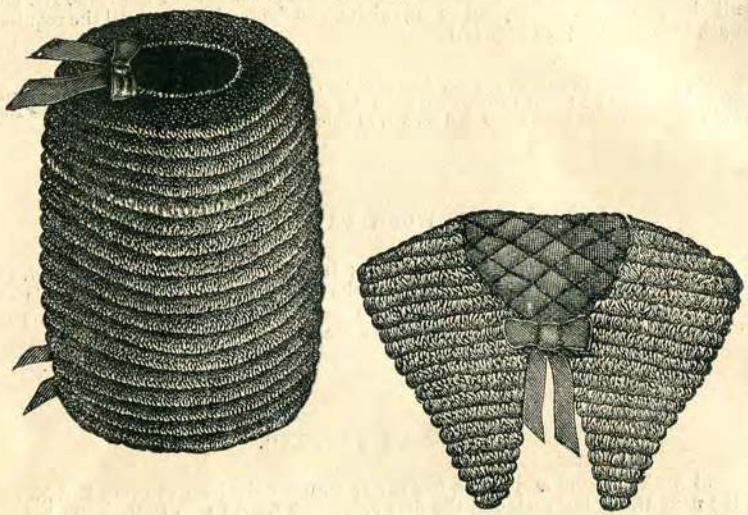


Fig. 48.

RUCHING, OR TUFTED WORK. Figs. 49-52.



Place Ns. (say 10) in **"Front"** of Cyl.; set work; knit some 2 or 3 rows and stop with Y.G. at **"Left"**; draw yarn from the Y.G. and loop it over the 2nd N. at **"Left,"** then round your finger, which hold at back of Ns. below the hooks (a stick, or the heel-wire bent to the shape of the inside of Cyl. can be used as a tufter in place of the finger); now loop yarn over the 3rd N. and your finger again, and so on for all the Ns. excepting the last or end N. at **"Right"**; turn Y.G. via **"Back"** to **"Right"**; draw slack yarn back to bobbin; hold the finger, or tufter, well down (so as to have the loops go below the latches of Ns. when knitting); knit BACKWARDS to bind in the loops; remove the tufter from the loops, and repeat for the length required.

To secure the loops, stitch them by hand to the fabric.

The loops can be made long or short according to the size of the tufter and the distance it is held from the Ns. The yarn may be looped over the Ns. and the tufter 2 or 3 times, or only over every 2nd or 3rd N. You can also form diamonds, squares, monograms or other fancy patterns.

Another Method is to set the work and knit with yarn of one shade and make the loops for ruching with yarn of another shade, in which case the knitting can be done to and fro, instead of BACKWARDS only.

Strips of ruching or tufted work can be used to trim cloaks, coats, dresses, or anything for which astrachan or fur would be employed; or they can be made into muffs, collars, cuffs, caps, &c. Children's muffs, however, can be knitted round the Cyl. instead of Flat Web. Carriage rugs, also carriage, door, and hearth mats, can be made from strips of ruching. This ruching with a fringe attached is very suitable for trimmings.

PATTERNS FOR FANCY TOPS.

Rope Pattern.—Set up Mac. 4 and 1 rib, knit 15 rounds on medium tension, 1 round on loosest tension Mac.; then twist the Ns. between each rib, the 2 on the **"Left"** to replace the 2 on the **"Right,"** and 2 on **"Right"** to replace 2 on **"Left."** Tighten tension and knit 5 rows. Repeat pattern as many times as desired. (See Fig. 87.)

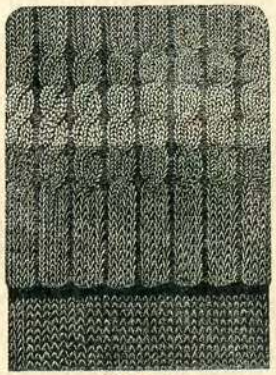


Fig. 87.



Fig. 88.

Circular Cords.—Set up Mac., rib 5 rows, change to plain, divide Ns. into equal parts, say 6, knit 5 rounds and draw up thread from 3 rows below Ns., and place it upon Ns. immediately above it. Take up 2 threads, and put on Ns. side by side; this will give 12 Ns. with 2 threads (in 6 places round the Mac.); knit 1 round, and take threads from 3 rows as before, on next 2 Ns. to those last used. It is most convenient to work towards the **"Right."** (See Fig. 88.)

Raised Points.—These are made as circular cords, but only 10 rows knitted, working cords to **"Right,"** next 10 rows working cords to **"Left,"** repeating until pattern is complete. (See Fig. 89.)



Fig. 89.



Fig. 90.

Half Diamond and Lines.—Follow instructions given in 1st and 3rd lines of large diamonds, but with one plain row knitted between them, knit 3 rows plain, change yarn, and raise alternate Ns., knit 1 row, change yarn, and reverse Ns. (those in action, last row, to be out of action this), knit 1 row, work again

from $, change yarn, knit 6 rows, change yarn, knit another row, making 5 rows in all of alternate colours; knit 10 rows and run work from Mac. (See Fig. 90.)

LARGE DIAMONDS.

Large Diamonds.—Set Rough and Correct Selvedge, put on ribber and form 4 and 1; then knit 5 rounds ribbing; change all ribbers to plain Ns., take off ribber, knit 3 plain rounds, 3 of contrasting colour, and 1 round of same coloured wool as at first used, and stop Y.G. in **"Front"** of Mac., raise out of action all but 12 Ns., put yarn on take-up; raise one N. and knit BACKWARDS across the 11 Ns. remaining down; raise another and knit FORWARDS, always raising end N. at same side of Mac. as unknitted yarn; continue raising Ns., one each row, until all are out of action; depress 18 Ns. on **"Right"** side of Mac., beginning next the stitch last knitted, work across the N. depressed from **"Left"** to **"Right,"** and raise out of action 6 Ns. on **"Left"** of Mac. Proceed to knit second half diamond in same manner as first, continue these all round Mac., 5 for 60 Cyl. and 7 for 84 Cyl. Change colour of yarn, depress 7 Ns. from **"Left"** to **"Right,"** not including the stitch last knitted; knit across from **"Left"** to **"Right"** $ and raise out of action all but 2 Ns. on **"Right"** side of Mac., depress one N. on **"Right"** side of Mac. and put yarn behind it, knit a row BACKWARDS and depress another N. on **"Left,"** knit another row FORWARD, continue until 12 Ns. are down, then raise one N. each row until all are raised, depress 13 Ns., not including one last knitted, and make second diamond, beginning again at $ until all diamonds are knitted; change colour of yarn and knit last row of half diamonds, depress 7 Ns. on **"Right"** side of Mac., knit across from **"Left"** to **"Right"** $$ and raise out of action all but 2 Ns. on **"Right"** side of Mac.; depress 1 N. on **"Right"** side of Mac., and knit BACKWARDS; continue depressing Ns. until 12 are down; depress 7 more on **"Right"** and knit across; 19 Ns. down, raise all but 2 and begin again from $$. When circle is completed, knit about 10 rounds and run work from Mac.



Fig. 91.



Fig. 92

SMALL DIAMONDS.

Small Diamonds.—These are made in same manner as large using 6 Ns. instead of 12.

HALF DIAMONDS.

Half Diamonds.—Are made as first and third row of large diamond pattern.

SPIRAL PATTERN.

Set work as usual and knit a few rows; transfer loop of every second N. on to the next N. FORWARDS; replace empty N. in its groove; knit two rows; then transfer the loops of these next Ns. back to the second Ns.; knit two rows; repeat the transfer first one way and then the other and knitting after each transfer.

When you have the length required knit a few plain rows, without any transferring.

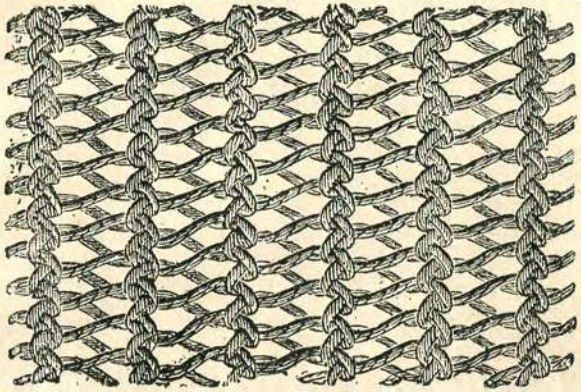


Fig. 53.



Fig. 54.

The Spiral pattern may be varied, thus:—Transfer every second loop to the next N.; knit two rows; then transfer the loop of every second N. partly to the next N., that is, the second N. loop will be round the two Ns.; knit two rows and repeat.

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(The Number preceding the part refers to the illustrations on page 105.)

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*Needles in less quantities than one dozen .. each	0	2
74.*Needles for 4½ in. Cylinder, per doz.	1	3
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per hundred	10	6
75.*Needles for Dial 4½ in., or 3¾ in. ditto per doz.	1	3
per hundred	8	4

*Postage—1d. per 100.

Sets of Needles, when supplied with extra Cylinder and Dial, are charged at special prices (see pages 102 and 103).

A "Set" includes 6 extra Needles over and above the number of grooves in a Cylinder or Dial; thus a 60 Cylinder would have a Set of 66 Needles; a 30 Dial, a set of 36.

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24. Button	0	2			
27. Wing-nut for Base Roller-bracket ..	0	9			
Screwed Stud for do.	0	6			
29. Wing-nut for Cylinder-lever ..	0	9			
Screwed Stud for do.	0	6			
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18. Stop-motion Bracket 1/-; 2 Screws, 4d. 21. Spiral Spring, 2d. 20. Stud with Milled Head, 8d.	2	2			
			0	7	0
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98. Roller	0	9			
99. Pin or Screw.. ..	0	2			
			0	3	5
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2. Geared-ring			0	7	6

† *See also Fig. 26 for pat. 7 and 8 Mac.*

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5. Base-bracket only for Driving-shaft				0	2	6
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15. Indicator - spindle Bracket	0	6			
16. Screw for ditto ..	0	2			
11. Indicator-worm ..	1	6			
7. Balanced - handle and Driving-shaft	3	9			
9. Pin for Quill or Handle	0	10			
10. Nut for ditto.. ..	0	4			
8. Quill or Handle ..	0	8			
12. Geared Driving-wheel	3	6			
13. Cotter-pin for ditto	0	2			
13A. Feather-screw ,,	0	2			
6. Two Bracket-screws	0	4			
			0	14	2

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65. Take-up Stud ..	0	6			
64. Stud-plate	0	9			
64. Ball..	0	9			
Ball-screw	0	2			
64. Straight Rod for ditto	0	6			
64. Hooked Rod	0	8			
			0	4	0

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For Illustrations see page 105.

YARN-GUIDE & FITTINGS.

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32. Yarn-guide "Ordinary pat." 7 and 8	4	9			
33. Two Screws for fixing Yarn-guide to Geared-ring ..	0	4			
34. Latch-opener, pat. 7 and 8	2	6			
35. Screw for ditto ..	0	2			
			0	7	9
Yarn-guide "Compound" Adjustable complete (Figs. 96, 96E, 96D, 34, 96H,) ..					
96. Bottom part only..	3	0			
96E. Top part only ..	3	0			
96D. Screw for same ..	0	2			
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			0	9	6

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4. Shell with Index only		0	12	6
Shell complete with Fittings		1	10	0
41. Index plate	0	9		
42. Two Screws for ditto	0	4		
Stud for Ribber-arm	1	0		
45. Wing-nut for ditto	1	6		
36. Two Side Cams ..	5	0		
37. Four Screws for ditto	0	8		
38. Two Up-throw Cams and Pins	3	3		
39. Stitch Cam with Guide and Stud	5	6		
40. Wing-nut for ditto	0	9		
43. Tension-pointer ..	0	9		
44. Screw for ditto ..	0	2		
Tension-washer ..	0	2		
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59. Screw for ditto ..	0	2		
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	0	3

Pages 102 & 103

See pages 102 and 103.

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Ditto, ditto 1 gallon	0	14
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The following prices are for Hire with option of Purchase.

When Needles alone are ordered the prices are nett.

For the yarns most suitable for the Cyls., &c., and sizes of hosiery they make, see pages 57, 58, and 105 of this Instruction Book.

Number of N. grooves in Cyl.	4½ inch Cyl. **A**	4½ in. Dial to match Cyl. **B**	Set Cyl. Ns.	Set Dial Ns.	Grade or size of Ns. *	Total cost of Cyl., Dial & Set of Ns. for each.
						£ s. d.
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84	21/-	14/-	7/6	4/-	Medium	2 6 6
96	22/6	15/-	8/6	4/6	Medium	2 10 6
108	25/-	16/-	9/6	5/-	Fine	2 15 6
120	27/-	17/-	10/6	5/6	Fine	3 0 0
132	29/-	18/-	11/6	6/-	Fine or Ex. Fine ‡	3 4 6
144	31/-	19/-	12/6	6/6		3 9 0

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* **Unless ordered otherwise, Coarse Needles will be sent for all Cylinders up to and including 72; Medium Needles for 84 and 96 Cyls.; Fine Needles for Cyls. 108 to 144.**

† State if Coarse or Medium Needles are wanted (see Note 1 below).

‡ State if Fine or Extra Fine Needles are wanted.

NOTE 1.—*Coarse Needles are only recommended for use with heavy (thick) yarns, such as heavy Wheeling (Alloa), &c. Medium Needles should be used for ordinary yarns, such as 3, 4 and 5-ply Fingering, &c.*

The following **4½ inch diameter Cyls.** (with dials to match) are recommended:—56, 60 grooves for Adult's Hosiery in heavy Wheeling, or Alloa Yarns, using our Coarsest Ns. The 60 is also suitable for Children's Hosiery in 3, 4, or 5-ply Fingering and similar yarns, using Medium Ns. (the same as are used in 84 Cyl. and dial). The 72 Cyl. is suitable for Medium-sized Children's and Youth's Hosiery from ordinary yarns; and if "Coarse" Ns. be used, the 72 Cyl. with 36 dial is suitable for extra large-sized Adult's Hosiery in heavy Wheeling (Alloa) and such-like yarns (wider than can be made on 60 Cyl. and 30 dial). The 84 and 96 for 3, 4, or 5-ply Fingering, Merino and all similar yarns. The 48 Cyl. with 24 dial and Coarsest Ns. is suitable for knitting Children's stockings in heavy, or coarse yarns, such as Wheeling, &c.

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For Illustrations see page 105.

PRICES OF
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To knit ribbed work, see "Remark" above.

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Number of N. grooves in Cyl.	3¾ inch Comp. Cyl.	3¾ inch Dial.	Set Comp. Cyl. Ns.	Set Comp. Dial Ns.	Grade or size of Ns.	Total cost of Cyl. Dial & Set of Ns. for each.
						£ s. d.
48, 56 or 60	20/-	12/-	7/-	3/-	Medium	2 2 0
72	24/-	13/-	8/-	3/6	Medium	2 8 6
84	28/-	14/-	9/6	4/-	Medium	2 15 6
96	30/-	15/-	10/6	4/6	Fine	3 0 0
108	33/6	16/-	12/-	5/-	Fine	3 6 6

NOTE 2.—*None of the "Compound" (3¾ inch) Cylinders and Dials (excepting the 48 Cyl. and 24 Dial), are suitable for knitting very thick or heavy yarns, such as Wheeling (Alloa), and so "Coarse" Needles are not supplied for these Cylinders.*

(See reference to 4½ inch Cylinders at foot of page 102.

"Compound" Cyl. or dial Ns. will not work in "Ordinary" Cyls. or dials.

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4½ inches diameter

"Ordinary" Cylinder.

For ribbed work, each Cylinder requires a Dial to match (see "Remark," pages 102 and 103.

Needles in Cyl.	Grade of Needles.	Yarns suitable.	Hosiery sizes (see below).
52 56 60	Coarse	Heavy (or thick) such as Wheeling (Alloa), &c.	**E.H.**
56 60	Medium	3, 4, or 5-ply Fingering, or 4-ply Merino, &c.	**C.D.**
72	Coarse	Heavy (or thick) such as Wheeling (Alloa), &c.	**D.H.**
72	Medium	3, 4, or 5-ply Fingering, or 4-ply Merino, &c.	**D.E.H.**
84	Medium	4 or 5-ply Fingering, 4-ply Merino, &c.	**D.E.H.**
96	Medium	3 or 4-ply Fingering, 4-ply Merino, &c.	**D.E.H.**
108 120	Fine	2-ply Fingering, Cashmere, Andalusian, Silk, &c.	**E.H.**
132 144	Extra fine	Very fine Wool, Silk, &c.	**E.H.**

3¾ inches diameter

"Compound" Cylinder.

For ribbed work, each Cylinder requires a Dial to match (see "Remark," pages 102 and 103.

Needle Grooves in Cyl.	Grade of Needles.	Yarns suitable.	Hosiery sizes (see below).
48 52	Medium	4 and 5-ply Fingering.	**C.**
52 56 60	Medium	3, 4, or 5-ply Fingering, or 4-ply Merino, &c.	**C.**
72	Medium	3 or 4-ply Fingering, 4-ply Merino, &c.	**C.D.**
84	Medium	3-ply Fingering, or 4-ply Merino, &c.	**D.E.H.**
96	Fine	3-ply Fingering, 4-ply Merino, &c.	**D.E.H.**
108	Fine	2-ply Fingering Cashmere, Andalusian, Silk, &c.	**D.E.H.**

C. Children's Hosiery. **E.** Ladies' Hosiery.
D. {Youths' ,, **H.** Gent's ,,
{Small Ladies' ,,

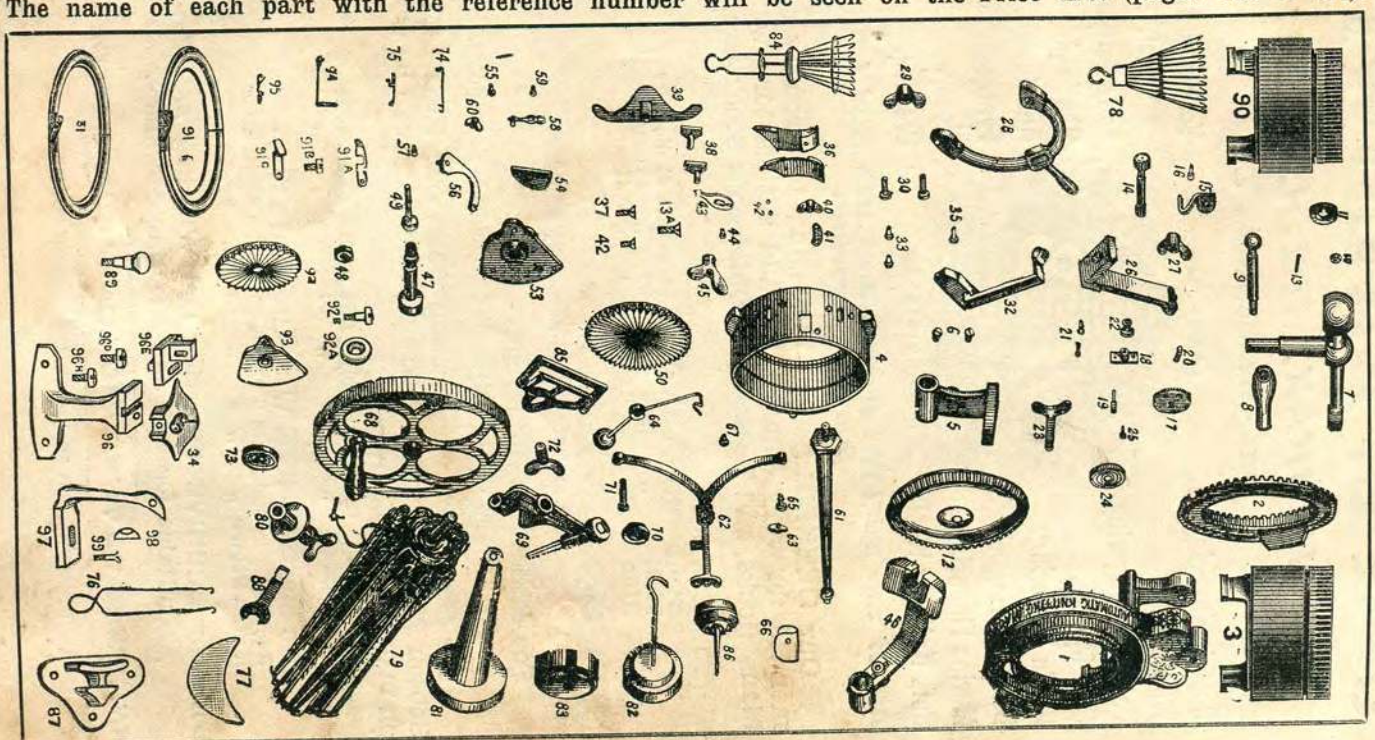
* With these Cylinders and Dials, socks and stockings are knitted seamless. Large goods (such as underclothing) are knitted flat, in sections, and sewn up with "Mending Stitch."

FOR PRICES, SEE PAGES 102 and 103.

TABLES or STANDS, very suitable for Machines (and other purposes) are 25/- each.
These have gold and black ornamented iron standards, with moulded and polished solid walnut-wood tops fitted with neat drawer.

PARTS of the AUTOMATIC KNITTING MACHINE and ACCESSORIES.

The name of each part with the reference number will be seen on the Price List (pages 100 to 104).



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Our **BEEHIVE** Scotch Fingering is strongly recommended for very comfortable and satisfactory wear, in **Mens'** Socks, and **Ladies'** and **Children's** Stockings.

For **Men's**—

Stout	Socks, use	4	ply on	84	needles	4½	diameter
Medium	,,	,, 3	,,	96	,,	4½	,,
Fine	,,	,, 2	,,	108	,,	4½	,,

For **Ladies'** Stockings—

Use 3 ply on 84 needles 4½ diameter

For **Children's** Stockings—

Use 2 or 3 ply on 96 and 84 needles, according to size required.

For Socks for very **strong** wear, our **RED LETTER** Scotch Fingering cannot be surpassed, and can be worked on machines as below—

Stout	Socks, use	4	ply on	84	needles	4½	diameter
Medium	,,	,, 3	,,	96	,,	4½	,,

Also our **BEEHIVE** Wheeling Yarn for—

Stout	Socks, use	2	ply on	72	needles	4½	diameter
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Both our BEEHIVE Fingering and Wheeling are especially suitable for Golf and Shooting Stockings.

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