Top of Toe—Narrowing.—Take the second needle on each side, and transfer the loops on to the third needles, put the first needles into the empty second needle 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 needles only in action, then, without narrowing, knit two or three extra rows and break yarn at the needles, take off weights, hold fabric down with left hand, turn handle to run loops off the ten needles, take out of machine the ten empty needles, leave yarn-guide 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 37 and 38.

Heel.—Take the two lots of 13 needles which were hanging inside cylinder, and place them in one continuous line in the Front of cylinder, see that the needles do not cross one another, put on belt, tie on yarn to end needle, 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 26 needles.

Bottom of Foot.—Knit 30 rows, stop yarn-guide at Back.

Bottom of Toe.—Take off belt 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 page 17).

NOTE.—The above can be altered in working, and the instructions given below for “Stocking—plain-shaped” can be followed from “Foot—top of,” excepting that the number of rows would vary.

STOCKING—PLAIN SHAPED (COMMENCE AT TOP).

Employ medium yarns.

4½ Inch Cylinder.—Approximate Number of Rows: Leg, 180 rows. Leg, Shaping, 30 rows, or more. Ankle, 50 rows. Foot, top, 75 rows. Foot, bottom, 65 rows. Tension to be at 6.

Set up machine and make Welt, and knit Forwards to Left half mark, as directed on pages 12 to 14.

Leg—Top.—Tighten tension half a degree, set the counter to 100, and knit Forwards 150 to 180 rows for the top portion of the leg, stop yarn-guide at Left half mark. If the weights touch the ground, remove set-up and put on buckle with weights attached, and lift the buckle as the work advances.

Leg—Shaping.—See note 26. Commence with the needle middle of the Front half, that is, one of the two needles directly in Front, and raise out of action the quarter lot of needles to
Right half mark, so as to avoid their making stitches. Advance yarn-guide slowly Forwards to the Right until last needle 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 yarn-guide beyond the raised needles each time.

Decreasing — 1st Row.— Take off belt, take the needle next to the one which made the last stitch, and lift it out of cylinder, and transfer loop on to the next needle in action on its left. Then transfer into the empty groove the first needle on its right, that is, the one needle next the raised needles, leaving its loop upon it, the empty groove is thus between the needles in action on the Left, and the needles raised out of action to the Right, put on belt, see that latches are open, put yarn on take-up, knit Backwards until yarn-guide is at Back, depress all the needles raised out of action Front to Right and commencing with needle next to Front empty groove, raise the quarter lot of needles Front to Left. Take off belt. Now, take out second needle on the Right side of the Front empty groove, then transfer loop on to third needle, and place the first needle into the empty second needle groove, so leaving all empty grooves together in Front, put on belt, see latches are open, knit Backwards until yarn-guide is opposite half mark on the Left side, so that all the needles up to the empty grooves at Front shall have made stitches and risen level with those in action.

2nd Row.—Knit Forwards until yarn-guide is at Back, depress needles on Left Front, and raise others on Right Front; knit Forwards until yarn-guide is at Right half mark.

3rd Row.—Knit Backwards until yarn-guide is at Back depress Right Front needles, and raise Left Front needles as before, knit Backwards until yarn-guide is at Left half mark.

26. 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."
4th Row.—Knit Forwards to Back, depress Left Front needles and raise Right Front needles as before, knit Forwards until yarn-guide is at Right half mark.

5th Row.—Knit Backwards to Back, depress needles on Right Front, and raise needles on Left Front, knit Backwards to Left half mark.

Decreasing Row.—Take off belt, decrease again by transferring loop from second to third needle in action on Right, and place first needle with loop on it in the empty second needle groove, next to needles in action, put on belt. Knit Forwards to Back, depress Left Front and raise Right Front needles, take off belt. 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 needles on each side taken out, thus leaving 12 empty grooves in Front.

Ankle.—Knit without decreasing, Backwards and Forwards about 50 rows for the ankle, and continue raising and depressing, as before each time across the needles in action up to the Right or Left half mark.

The last row must be formed by knitting Backwards, and then stop when yarn-guide is at Back.

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

Foot—Top of.—Knit Forwards and Backwards about 75 rows on the 36 needles, take off weights, and attach heel-wire with weight to keep work down, and raise it as work advances (see note 15, page 16), break yarn at yarn-guide. 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 needles, stop yarn-guide Front, take off belt, remove the 36 needles from cylinder, turn yarn-guide to Back.

Heel.—Take the two lots of 18 needles, with the loops upon them, and place them together in the same order as they were before, in one continuous line, without any empty grooves between, in Front of cylinder, thus making 36 needles for working the heel; see that each needle is in its correct position, and not crossing another needle, put on belt, and see that all needles are
depressed ready for action. Thread yarn-guide and twist, not tie, yarn round first needle on Left, see that the latches are open, put yarn on take-up, attach heel-wire with weight (for "Gored Heel" see note 27), knit Forwards and Backwards five rows, taking care to see that first and second needles on Left and Right receive yarn from yarn-guide, otherwise the stitches will run off.

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

Heel—Widening.—Depress the last needle raised on Right, put yarn behind it so that it passes out direct to yarn-guide from between the needle just depressed and the next raised needle, knit Backwards to Back, depress the last needle raised on Left, put yarn behind it, knit Forwards to Back; so continue, depressing the next raised needle to those in action, putting yarn behind it, and knitting each time until all the needles are depressed.

Foot—Bottom of.—Knit without raising needles, Backwards and Forwards, 65 rows, on the 36 needles.

Toe.—Knit toe, narrow and widen as instructed for heel above, then knit 5 or 6 rows extra for joining, break yarn at needles, take off weights, and hold fabric down by left hand then turn handle, when work will leave the needles. Place damp cloth on the seams, and press with hot iron. Oversew seams, and finish toe with "Mending Stitch" (see page 17).

27.—To knit a heel with a gore, as in Fig. 22, proceed from this point as follows:—
Knit Forwards and Backwards 25 rows, taking care to see that first and second needles on Left and Right receive yarn from yarn-guide, otherwise stitch will run off.

Heel—Narrowing.—(Continue as directed on page 49).

Heel—Widening.—(Continue as directed on page 49).

Foot—Bottom of.—Stop yarn-guide at Front and take off belt; take 13 cylinder needles, and with their hooks pick up 13 loops of selvedge at Right side, and insert needles (with selvedge loop upon each) into cylinder. Knit Forwards until yarn-guide is at Back; with other 13 needles repeat the above at Left side. Narrow on each side of the yarn-guide every row across, by transferring loop from third to fourth needle, and moving the two end needles forward one groove, until only 40 needles remain. Then knit for bottom of foot 65 rows (including those rows that were knitted for the gore).

Toe.—Continue as directed on page 49.
TO RE-FOOT HOSIERY.

Remarks.
1.—If there are too many stitches (loops) in a Plain sock or stocking for the needles in cylinder, thus 84 stitches and only 60 needles cylinder, arrange that the extra loops shall be about equally distributed round the cylinder, but not placed on the needles until the unravelling is done. After unravelling the rows from the tops of the needles, the extra loops can be placed on the needles, so that in some places there would be two loops on one needle. Then proceed as directed on page 50.

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

3.—If there are less stitches (loops) in a Plain sock than there are needles in the cylinder, say 60 stitches and 84 needles cylinder, keep all the needles in the cylinder, and place the loops on the needles, missing a needle here and there, so that the loops are equally placed over the whole of the cylinder. Now unravel the rows from the tops of the needles. Afterwards make loops for the empty needles. This is done by picking up with a needle the cross stitch which is under the loop on nearest needle, and placing it on the next empty needle, or take out the empty needle, pick up the loop, and replace the needle in the groove. Then proceed as directed on page 50 below.

3.—If there are less stitches (loops) in a Plain sock than needles in cylinder after the unravelling on the cylinder 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 cylinder.

RE-FOOTING PLAIN SOCK OR STOCKING.
Commenced at the Top. (Read "Remarks" 1 and 3, above.)

First Method.

After the foot is cut off just above the heel, unravel a few rows to get the loops clear, break yarn, leaving a short end, then see that needles are in all the cylinder grooves and that the latches are open, put on belt, drive machine slowly, and stop yarn-guide at Front. Place the sock inside the cylinder with the unravelled end uppermost, and near the tops of the needles. If a stocking, arrange that the back, or shaping, is placed Front. Commence at the Right half mark, and with a spare needle pick up, and transfer loops on to hooks of needles, but be very careful not to let the loops go below the latches of the needles, as this would cause the work to run off machine. After having transferred the loops on to the Back half of needles, support the fabric from underneath the machine with the left hand, so as to prevent loops going below latches when turning handle, advance yarn-guide to Back. Now transfer in like manner the Front half
of loops to needles. When all the loops are on the needles, do not attach weight, but support fabric with left hand, now unravel about two rows to ensure that the loops are clear upon the needles. 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 needles, but it will be necessary, in order to unravel the yarn from the needles behind the yarn-guide, to move the shell only forwards and backwards slightly, but do not move the yarn-guide. When the loops are all clear, stop unravelling on the first needle next to the needle on which you commenced to transfer loops at right half mark.

Now raise Front half of needles out of action, still support work and advance yarn-guide 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 yarn-guide and yarn-bracket backwards, that is, in the opposite direction described on page 12, for casting on, and join the end to new yarn, a bobbin of which should be already on the table, under one hole of yarn-bracket. See that all latches are open, advance yarn-guide until it is opposite the first needle 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 needle in action. Depress Front half of needles and knit the number of rows required, knit Heel, etc., as directed for a sock or stocking.

RE-FOOTING PLAIN SOCK OR STOCKING.
Commenced at the Top.

Second Method.
Cut off foot just above heel, and unravel one or two rows to get the loops clear. Take the cylinder needles out of machine and insert them into the loops down to the feet, feet to be outside of work. If a stocking, arrange that the back or shaping is placed in Front, yarn-guide to be at Back. Put the sock or stocking inside cylinder from the top, holding all the needles in the right hand, and at Left begin with the needle next unravelled yarn, and insert Front half of needles. Now, with the unravelled yarn, thread yarn-guide and yarn-bracket backwards, that is, in the opposite direction described on page 12, for casting on, and join to the new yarn at bobbin. See that all latches of needles are open. Hold fabric down with the left hand. Draw slack yarn back to bobbin, advance yarn-guide to Left, and watch that the yarn feeds into the hook of the first needle in action. Hold fabric down with left hand, and advance yarn-guide to Front and stop. Now turn the remaining needles inside sock or stocking, and after doing so, finish the inserting of needles into cylinder. Put on belt, attach to the fabric buckle and weights, see that all latches of needles are open, and knit the required rows.
Knit Heel, Foot, and Toe in same manner as if knitting a complete sock or stocking.
RE-FOOTING RIBBED SOCK OR STOCKING.

Commenced at Top.

(Read Remarks 2 and 4, page 50, Re-Footi ng Plain Sock.

**First Method.**

Place needles in all the cylinder grooves, and put on belt. 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 cylinder needles, leaving the ribbing loops free, and a cylinder needle free in front of each ribbing loop. Commence at Right half mark, and place plain loops on the needles, and see that the loops are in the hooks of the needles; do not attach weights but support sock, unravel two rows on the needles stopping at the needle next to the Right half mark. Then pick up each ribbing loop, knit it up with a spare plain needle if it should be unknitted beyond the plain loop, and place the rib loop on the empty cylinder needle left for it. Keep the loops in the hooks of needles, and, if necessary, support the sock with the left hand; turn the handle and stop when yarn-guide is at Back. Commencing at the needle next to the one on which the last stitch was unravelled, raise Front half of needles fully out of action, hold slack yarn away from needles, turn handle slowly. Forwards until yarn-guide is at Front; with the unravelled yarn, thread yarn-guide and yarn-bracket 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 dial for the required rib (see page 22), take off belt, insert needles into dial as may be required. The ribbing loops can be seen by simply pressing the needles slightly from the cylinder. Lift out the first cylinder needle in action at Right side with the ribbing loop upon it and transfer that loop to dial needle, see that loop passes into the hook of the dial needle. See that latches of needles are open, then hold slack yarn away from needles, and turn handle until yarn-guide is opposite the first needle in action at Right side, continue to transfer ribbing loops, pull back slack yarn to bobbin and advance yarn-guide step by step, until yarn-guide is at Back of machine, depress Front half of needles, 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."

**Second Method.**

Proceed in much the same way as for "Re-footing a Plain Sock," second method, excepting that after having inserted into cylinder the Front half of needles, put on belt, and lift out of action the needles just inserted in cylinder. Advance yarn-
guide to **Front**, now turn the remaining needles inside sock, open belt at **Back**, and insert these needles into cylinder, and shut belt. Attach to the fabric, buckle and weights. Raise the remaining needles out of action. Advance yarn-guide to **Back**. With the unravelled yarn, thread yarn-guide and yarn-bracket backwards, that is, in the contrary direction described on page 12, for "Casting on," and join to the new yarn at bobbin. Depress **Front** half of cylinder needles, put on ribber and adjust dial, as directed on page 22, to suit the required rib in sock or stocking, take off belt. Commence at **Left** and transfer the ribbing loops that are on the cylinder needles on to dial needles, and put them into grooves in dial. After transferring the loops from the **Front** half of needles, draw slack yarn back to bobbin, see that all latches are open, advance yarn-guide to **Front**, and watch that the yarn feeds into the hook of the first needle in action. Depress the **Back** half of cylinder needles, and transfer the remainder of ribbing loops, put on belt, and knit the required rows.

Knit **Heel**, **Foot**, and **Toe** in same manner as if knitting a complete sock or stocking.

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**For Instructions for Garment Knitting and Fancy Work see Part II.**

**CYLINDERS.**

The diameter of the Cylinder is \( \frac{4}{12} \) inches, measured from back to back of two opposite needles.

All cylinders of same diameter, but of different grooves, are interchangeable in every machine.

The 84 and 72 cylinders, or for Scotland 60, with dials to correspond, will do the greatest variety of work.

To knit Ribbed work each cylinder requires a dial, see under dials, page 54.

The following cylinders are recommended as the most suitable for the several yarns mentioned.

- **4\frac{1}{2} inch 60 cylinder:** For thick, Alloa, 3 ply wheeling yarns, etc., coarse needles to be used. Also for 4 ply fingering for small size children’s stockings, medium needles.

- **4\frac{1}{2} inch 72 cylinder:** For 5 ply fingering and 2 ply wheeling yarns, coarse needles to be used. Also for 4 ply fingering for boys’ and girls’ stockings, medium needles.

- **4\frac{1}{2} inch 84 cylinder:** For 3, 4, or 5 ply fingering, 5 ply merino, and yarns similar in thickness, but no thicker, use medium needles.
4½ inch 96 cylinder:—
Same yarns as for 84, but this cylinder is used chiefly
for wider socks and stockings than are made on the 84
cylinder, use medium needles.

4½ inch 108, 120, 132, or 144 cylinder:—
For fine merino, cashmere, fingering, andalusian, elder,
cotton and silk, etc., yarns, use fine needles.

Heavy wheeling, Alloa, or such like heavy yarns should be
kept out of the yarn eyelet or yarn bracket (excepting when
forming flat web, a heel, or toe) when knitting on 60 or 72
cylinder.

The halves of the grooves in each cylinder are shown by a
corner filed off the top of a post at each side.

To change Cylinders, after removing all needles, loose the
two screws 11, Fig. 2, when the cylinders can be lifted out.

DIALS.

A dial can only be used when machine has ribbing attach-
ment supplied with it.

Dials with different grooves, but of the same diameter, are
interchangeable in every machine.

A dial has generally half the number of grooves of a cylinder.

To change dials, after removing Ribber arm, loose from
below the nut 33, Fig. 17, when the dial can be removed and
another fixed in like manner.

NEEDLES.

These are of two forms—cylinder and dial.

These two forms are supplied in four grades, and are known
as "Coarse," "Medium," "Fine," and "Extra Fine," and are
supplied for cylinders and dials as stated below.

Coarse Needles have large hooks suitable for thick yarn, and
are used in cylinders of 72 grooves and coarser.

Medium Needles are the same thickness as "Coarse," but
have a smaller hook, and are used with cylinders having 76, 84,
or 90 grooves, also when working finer wools on the 72 cylinder.

Fine Needles are thinner and have smaller hooks than
"Medium," and are used in cylinders of 96 and 100 grooves.
Extra Fine Needles are thinner than "Fine," and have the smallest hooks; they are used in cylinders of 108 grooves and finer.

Dial Needles are to correspond with Cylinder Needles.

See under "Cylinders," page 53, as to yarns suitable for the different cylinders.

When ordering needles it is best to send a sample.

CAUTION.—Bent latches of needles are caused by the latch opener striking them, which must frequently happen if handle is turned quickly when there are no loops on the needles.

If the latches get bent they will be stiff, but can be readily straightened and loosened with pincers, or with the finger and thumb, and without removing the needle from the cylinder. Bent, or stiff, latches cause the yarn to gather about the needles and the work to be full of holes, and sometimes stop the machine. Latches must open and close freely and fully upon their hooks and stems.

If a latch, or foot, breaks off a needle when in use in the cylinder, it may get between the cams and block the needle way, and if the machine sticks, and you attempt to force it, damage may result. Lift out and examine cylinder grooves and shell, and remove the obstruction, then replace cylinder.

If a needle stem gets bent, it will not work freely in its groove, and so will cause machine to stick. Straighten it with the fingers, and to make sure it is straight place it in the cylinder (or dial of a ribbing machine), and see that it moves freely in the groove.

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FAULTS, IRREGULARITIES, & DIFFICULTIES

In WORKING MACHINE, and REMEDIES for same.

TO KNITTERS.—First read the "FAULTS" (in dark type) marked Fault A, B, C, D, E, F, G, H, I, and ascertain which refers to your difficulty, next read the numbered "CAUSE" under the section, and apply the remedy below.

FAULT A.

If the yarn gathers, and lies loosely outside the needles when knitting circular web.

Cause 1.—Too tight a stitch (tension).

Remedy 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 thumb nut firmly. It is best for the inexperienced to commence working machine with a loose tension, say at 5 on shell, 3 on cam plate. If 5 ply or thick yarns be used, put both tensions at loosest.

Cause 2.—Insufficient weight.

Remedy 2.—Apply more weight, or pull fabric down with the left hand under machine.

Cause 3.—Too coarse a yarn for the cylinder.

Remedy 3.—See pages 53 and 54 for the kinds of yarns suitable for the different cylinders.

Cause 4.—Dial lug pinching the fabric on to the Edge of the dial regulator post inside cylinder.

Remedy 4.—Pull down more firmly the fabric at that side by the post, and see "Faults and Remedies" C. 7.
FAULT B.

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

Cause 5.—The cause of this is, that take-up does not draw back excess yarn, or yarn-grip does not act, or the weight is too high on the take-up.

Remedy 5.—See that the take-up has yarn in its hook (from front of yarn-grip), so that, at each row across, the yarn drawn off in excess of the needles in action, is entirely drawn back. See that the yarn-grip pinches the yarn on to the yarn-bracket, and so prevents the yarn coming from bobbin, whilst excess is taken up.

If more weight is required to make action of take-up quicker, weight should be moved towards the end of the wire. To adjust weight, release the small screw, which holds weight to the wire, adjust weight and refix screw.

Cause 6.—Fabric not having been held down properly at the end needles in action.

Remedy 6.—Use heel-wire with weight as directed on page 16, or pull fabric down at the end needle with the hand. It is a good plan to pull, and press fabric away from yarn-guide as it travels across each time.

FAULT C.

If the driving-handle is hard to turn.

Cause 7.—The work is not held down sufficiently, or only on one side.

Remedy 7.—Grasp weights, or the fabric, with left hand close underneath machine, and press down whilst knitting. See that work is held down evenly all round.