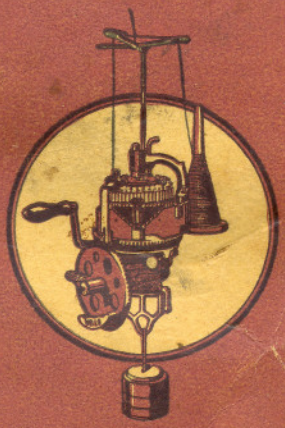
The Auto Knitter Instruction Book



Eighteenth Edition

AUTO KNITTER HOSIERY (Canada) CO., Ltd.
(WEST) TORONTO - CANADA

HOW TO USE THIS BOOK

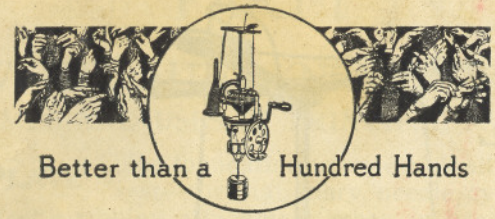
This instruction book has been written for the person who has never seen a knitting machine, knows nothing about knitting of any kind and understands very little about mechanical things. By photographs and drawings everything is made so clear that almost anyone with a little study and application should readily learn to operate the Auto Knitter.

It is absolutely necessary to know the principal parts of the machine and understand how they work in order to use it intelligently. The index of this book makes it easy to instantly refer to any part of the machine or its operation.

Learn first the names of the principal parts, their functions; study carefully the needle action and get thoroughly acquainted with the machine. This should enable you to become a good operator in a very short time.

☞ *To Save Possible Delay* ☜

Be sure and
Quote Your Work Number
in all letters to us.



HOW TO UNPACK THE MACHINE

The machine should be unpacked with care so as not to damage any parts, particularly the needles or to disturb the work which is on the machine.

Place the box on a table or bench and remove the lid. Take out the packing material, the weights, and other loose parts and lay them to one side. It will then be seen that the machine is clamped to a wooden cross piece to prevent it moving in transit. Undo the clamp screws, take the machine out and fasten it at once by means of these clamp screws to a bench or table. Carefully clean off all grease, paper, etc., which were used to keep parts from damage and rusting while in transit.

Do not try to operate the Auto Knitter until you are thoroughly familiar with the functions of its parts as described on pages 2 to 7. Beginning with page 8, you will find instructions "How to Make Socks On The Auto Knitter", but until you reach these pages simply study.

DO NOT MAKE ANY ADJUSTMENTS UNTIL YOU HAVE BECOME FAMILIAR WITH THE MACHINE AND ITS PARTS.

Auto Knitter Hosiery (Canada) Co., Ltd.
Toronto, Canada

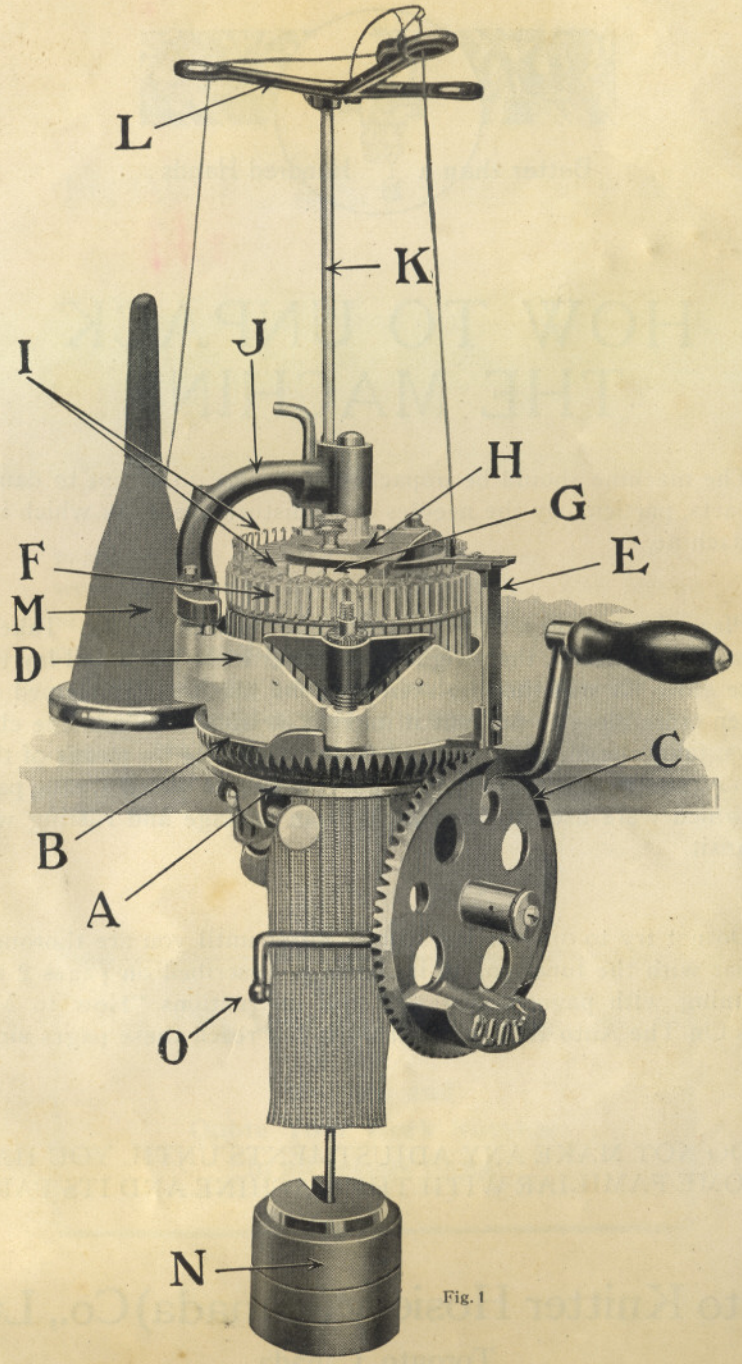


Fig. 1

From time to time mechanical improvements are made which are not necessarily illustrated.

PART I

HOW THE AUTO KNITTER WORKS

NAMES AND USES OF PRINCIPAL PARTS

A BED PLATE The foundation upon which all the other parts rest—the stationary needle cylinder, the cam shell (with ribbing attachment when in use), and the yarn stand. It is secured to the bench or table by thumb screws.

B & C GEAR RING AND CRANK WHEEL The crank wheel attached to the bed plate operates the gear ring which in turn operates all the other parts.

D CAM SHELL The outside shell of the machine containing the needle paths and cams which operate the long needles. It rests on the gear ring which moves it around the needle cylinder.

E YARN CARRIER An upright attached to the gear ring which supplies yarn to the needles as it travels around the cylinder with the cam shell.

F NEEDLE CYLINDER A hollow cylinder, slotted outside to hold the long needles. This cylinder does not move but is stationary.

G RIBBER NEEDLE DIAL A flat disc, slotted on its upper side to hold the short needles which make the ribbing or "purling".

H TAPPET PLATE A plate which rests on the ribber dial and contains the cams governing the action of the ribber needles.

I NEEDLES Steel wires provided with a hook and latch on one end and a projection called the "butt" or "heel" on the other end. When the butt or heel moves the needle out and in by the guidance of a pathway the hook catches the yarn while the latch automatically closes over the hook. This permits the new stitch to be pulled through the last one and the needle to move out again for another stitch. There are two sets of needles—long for use in the cylinder and short for the ribber dial.

J RIBBER ARM A detachable support for the ribber dial and tappet plate. It suspends these parts over the stationary needle cylinder.

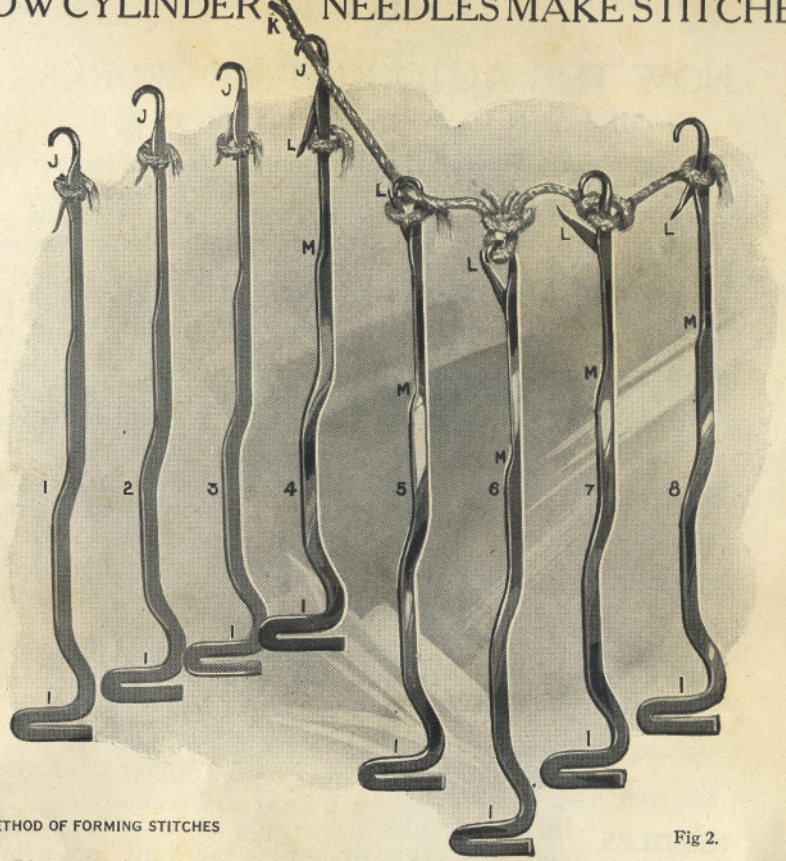
K & L YARN STAND A long rod with several arms containing eyes by means of which the yarn is unwound from the bobbin and fed into the yarn carrier.

M BOBBIN is the wooden spindle to which the yarn is transferred from the skein or hank.

N WEIGHTS with holders to be attached to "set up" or buckle for holding work down close to top of needle cylinder.

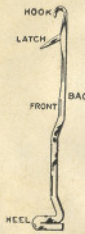
O BUCKLE is the clamp which clasps the work and the weights are attached to it.

HOW CYLINDER NEEDLES MAKE STITCHES



METHOD OF FORMING STITCHES

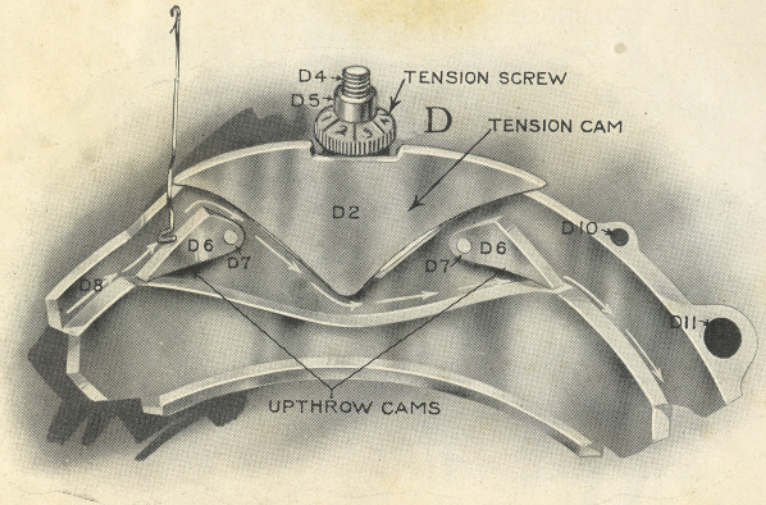
Fig 2.



If you will examine a piece of knitted wear closely, you will see that it is only a succession of slip knots. You can cut it anywhere and it will unravel into a single piece of yarn. That is all there is to plain knitting—making slip knots. This is the principal operation of the Knitting Machine.

For this purpose each needle in the machine is made with a hook and latch. Follow the illustration which shows progressively each step of the needle in making a stitch. When the hook catches the yarn the latch is automatically closed over the hook by the previous stitch pushing the latch up. The position of the needle in 1 to 5 illustrates this. Positions 6 to 8 show how the latch permits the new stitch to be pulled through the previous one and how the needle in rising forces the yarn to push down the latch and permits the stitch to slide out of the hook. One slip knot or stitch is now completed and the needle is ready for the next stitch. Thus the stitches are made by the raising and lowering of the self-acting needles. One row of stitches is made at every revolution of the cam shell around the needle cylinder. Although there are many needles in the cylinder, only one needle makes a stitch at a time. Two or three needles ahead of it always have stitches in process of completion but only one needle at a time actually finishes a stitch. Needles work as rapidly as the machine is turned.

HOW THE CAM SHELL OPERATES THE CYLINDER NEEDLES



INSIDE VIEW OF SECTION OF SHELL SHOWING CAMS AND NEEDLE PATH

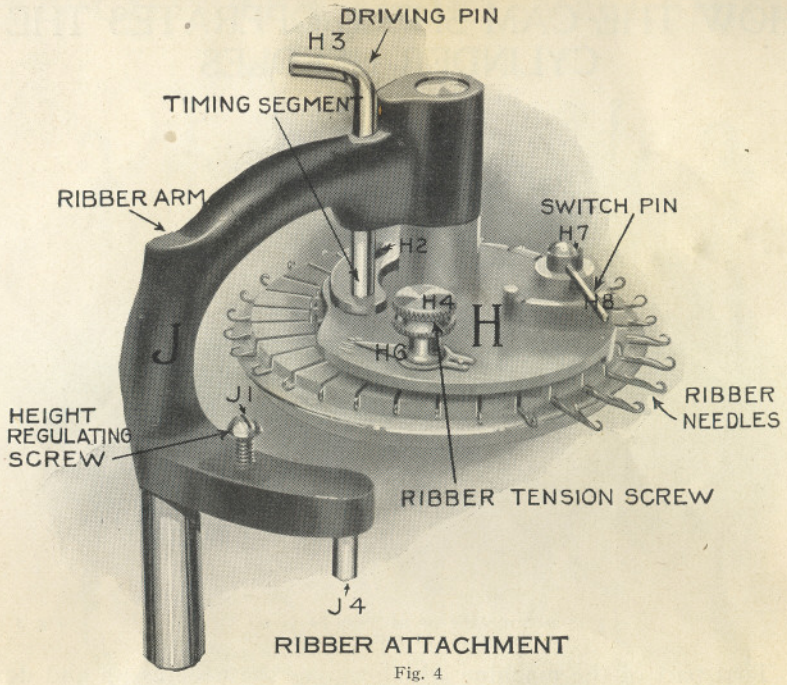
Fig. 3

That part of the machine which moves the needles up and down in their slots in the cylinder is called the cam shell because it is a shell containing the cams or needle paths. You will notice in Figure 2 that there is a projection on the lower end of the needle called the "heel" or "butt." Just as there must be a flange in trolley wheels to fit the tracks so the needle has to have this butt in order to travel in the needle path or track.

Only that part of the cam shell path (D) which raises and lowers the needles is shown in the illustration, Figure 3. The three cams which take care of raising and lowering the needles (one D 2 and two D 6 make a sort of hill and valley path for the needles. The illustration shows a needle travelling uphill on the first D6 cam. When it reaches the top, cam D2 will send it downhill and it then rises on a gentle slope up-in-under the second D6 cam, after which it travels all the way around the cam shell before again entering the cams. Both D6 cams swing on pivots so that when operating the cam shell in the opposite direction the opposite cam will do the raising of the needles. Tension cam D2 is movable up and down to regulate the length of stitch or knitting tension. The lower this cam is, the longer the stitch, while the higher it is the shorter the stitch because the cam's position determines to what depth the needles shall travel.

The cam shell travelling around the needle cylinder makes what is called a "needle wave." That is, the rising and falling of the needles as the cams engage them one after another all around the cylinder resembles a wave.

The ribber arm which supports the ribbing attachment sets in a socket in the cam shell. It revolves with the cam shell thus operating at once both the cylinder and ribber needles.



RIBBER ATTACHMENT

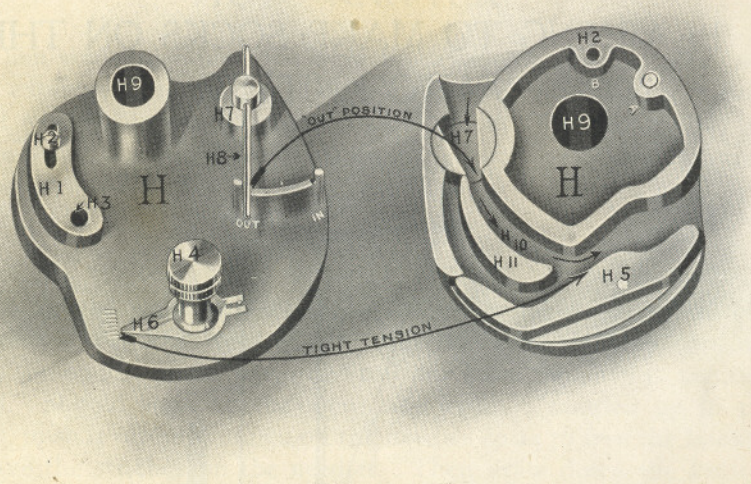
Fig. 4

HOW THE RIBBER WORKS

The ribbing attachment—ribber arm, tappet plate and dial—perform the same work horizontally that the cylinder and cam shell do vertically. They work in unison in order to produce the ribbing or "purling" which forms the top of the sock. That is why the ribbing attachment is made to set in the cam shell so that when it turns it operates both sets of needles at the same time.

The ribber arm "J," from which are suspended the tappet plate and dial, is adjustable to different heights by set screw "J-1." This is one of several adjustments which enables the ribbing needles to work in harmony with the cylinder needles.

The tappet plate "H" (Figure 5) corresponds to the cam shell. Its needle paths are flat instead of circular as in the cam shell. But they give the same "hill and valley" movement to the ribber needles as the cam shell gives to the cylinder needles. It is likewise fitted with a tension cam "H-5" regulating the distance out to which the needles shall go. A switch cam "H-7" throws the needles in or out of action. Another adjustment called the timing segment (H-1) enables you to regulate the exact time at which the needles shoot out to take the stitch so that they operate simultaneously with the cylinder needles. The pin "H-3" causes the tappet plate to revolve with the ribber arm over the dial containing the needles.



TAPPET PLATE-UNDERNEATH

TAPPET PLATE-TOP VIEW

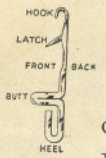


Fig. 5

If you will look again at Figure 4 you will see that, just as in the cam shell, only a part of the needles, those at the front, are active, while those to the right and left are not engaged in the cams and are idle. Study the two views of the tappet plate well until you are sure you understand how these cams guide the ribber needles in and out and how the tension and switch cams work. This is very important and will make its operation easier for you.

The ribber dial "G" is a flat disc with slots radiating from the center. They hold the needles and are just half the number of those in the cylinder. This is because purling requires that the ribber needles operate between the cylinder needles. A projection on the under side of the dial fits against a dial adjuster and holds the dial immovable just as the cylinder is stationary.

The ribber needle is practically the same as the cylinder needle, but shorter. There is the same hook, latch and butt and they are also self-acting. The butt of the ribber needle moves in the needle path or cams of the tappet plate exactly as the cylinder needles move in the cam shell path.

* * * *

The ribber needles make their stitches in the same manner but work horizontally in and out instead of vertically up and down.

PART II

LEARNING TO MAKE SOCKS ON THE AUTO KNITTER

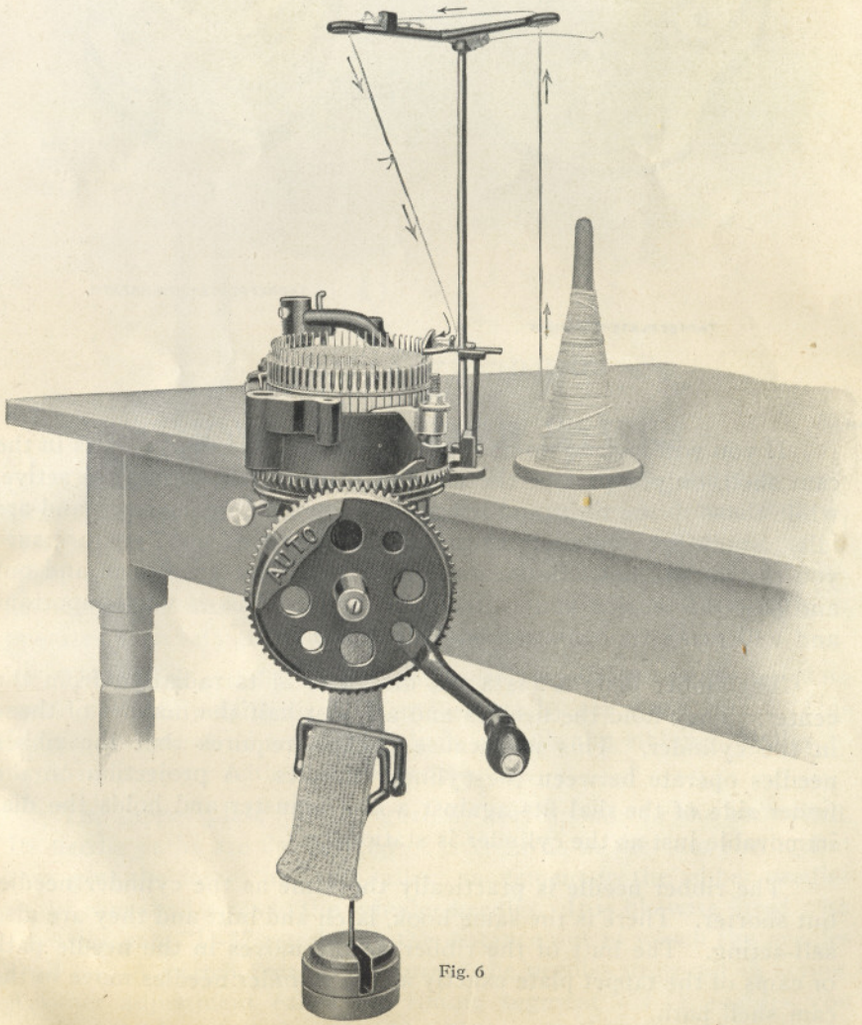


Fig. 6

Note how yarn travels from bobbin to needles. Also how buckle and weights are attached to work.

LEARNING TO MAKE SOCKS ON THE AUTO KNITTER

When you understand the working principles of the Auto Knitter as explained in the preceding pages, these directions carefully studied will enable you to master its operation. Remember that going slowly and learning thoroughly as you go will save you much time and help to make it easy, and that speed comes with practice.

HOW TO START

The knitted work in the machine is tied to the crank wheel (C) to prevent the stitches coming off. Cut this string, taking care not to turn the handle of the machine until you have the yarn in position to feed. Should some of the web have become tangled up in the needles, push it carefully down on the needles so as to free the latches, but leave the stitches on the needles. Then draw down the knitted web with your hand and attach the buckle (O) by drawing the fabric under its frame and over its clamp and hang the weights into the buckle. See Fig. 6.

Remove the ribbing attachment (J-H-G) from the machine and do not attempt to use it until you are thoroughly familiar with plain knitting. Put all loose parts in a safe place until they are needed.

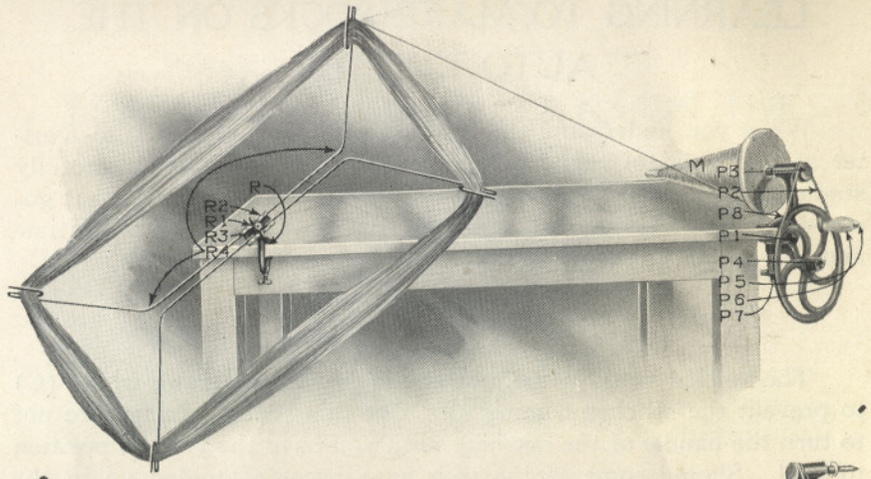
Take the loose end of the yarn and unwind the rounds that are loosely wound around the needles and let this hang until you are ready to knit.

Place the yarn stand rod (K) in the hole in the bed plate (A) at the back, and tighten the screw. Attach the yarn stand top (L) to the top of the rod, so that the eye in the long arm of the top will be directly over the centre of the needle cylinder (F). Tighten the screw in the yarn stand top that holds it to the rod. See Fig. 6.

Do NOT try to use any part of the equipment until you have read directions carefully and are sure you know its use.

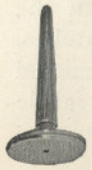
* * * *

Many different cylinders and dials may be used in the Auto Knitter to do a wider range of work. To avoid confusion, however, this explanation of the machine's working principles will mention only the 4½ inch, 60 x 30 outfit, as a basis for all other sizes.

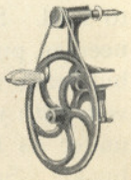


BOBBIN WINDER AND SWIFT

Fig. 7



Bobbin



Yarn Winder

BOBBIN WINDING

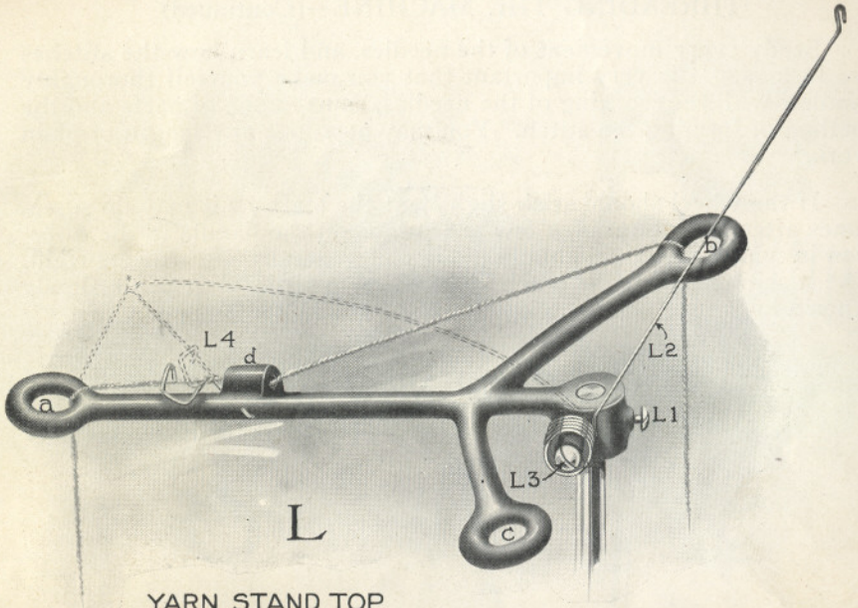
Yarn usually comes in loose bundles called "hanks" or "skeins". These are stretched on a wire frame called a "swift" which revolves on a shaft unwinding the yarn onto a spindle known as a "bobbin". Two or more bobbins are usually wound at one time so as not to interrupt knitting to wind on more yarn.

It is very necessary to learn to wind a good bobbin because the machine operates best when the yarn runs off freely and evenly.

The illustration shows how to put together the bobbin winder and swift. From your loose parts take swift holder "R," swift wires, wooden bobbin and bobbin winder "P." Clamp the bobbin winder on one corner of the table and the swift holder on the other corner. Slide swift wires into holder (R-1) and tighten the screw to hold them in place. These wires should be balanced so that when the yarn is unwound the swift will turn steadily and not in jerks. Stretch the skein of yarn on the wires evenly so that it will unwind freely without crossing or twisting.

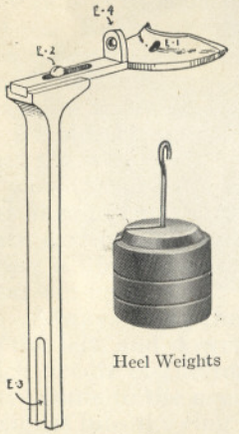
Press the bobbin onto the tapered spindle of the winder. Turn the handle a few revolutions to see that the leather belt is properly fixed and that the bobbin does not wobble on the spindle. Tie the yarn to the bobbin at the bottom where you should commence winding. Fill the bottom gradually, filling toward the top. Wind in the form of a cone with a medium even slope.

The best bobbin is made by moving the left hand sideways back and forth with a movement of about three inches as the hand guides the thread onto the bobbin. This movement should be made quickly. It has the effect of making the yarn cross.



YARN STAND TOP

Fig. 8

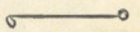


Yarn Carrier

Heel Weights

Take-up Lock

Buckle



Heel Spring

THREADING THE MACHINE

Set a bobbin of yarn directly under the eye of either short arm (b or c) of the yarn stand top. See Fig. 6 and 8. Draw the yarn up through this eye, through the hole in the lug "d" on the long arm, under the take-up lock "L-4" and down through the eye "a" at the end of the long arm, which must be exactly over the center of the cylinder. Draw the yarn through the yarn carrier from the outside through the two holes if you are setting up new work or tie this end to the end of the yarn which you unwound from the needles and wind all slack onto the bobbin. See Fig. 6. (The illustration above shows by dotted lines the position of the heel spring when making heel and toe.

Before turning the handle see that all needle latches are open and pointing down—not straight out—and that the yarn has no slack and will feed evenly. Now you are ready to knit. Turn the handle clockwise (to the right) slowly at first until you see that everything is working properly. Don't fail to have sufficient weights to hold the work down properly. If the machine is blocked and the crank wheel will not turn, it is because the upthrow cams have been thrown out of adjustment in transit. To correct see page 31.

Study every movement of the needles, and learn how the stitches are formed. It is very important that you make yourself thoroughly familiar with the working of the needles, cams, name of parts and the method of forming the stitch. You may now knit any length of plain work.

If the wheel should stick slightly at the start, as it may do sometimes after lying unused, a few sharp taps on the handle in the direction in which the wheel should move will generally put matters right. The machine will work much easier after a little use. Knit slowly when a knot reaches a needle.

SETTING UP NEW WORK

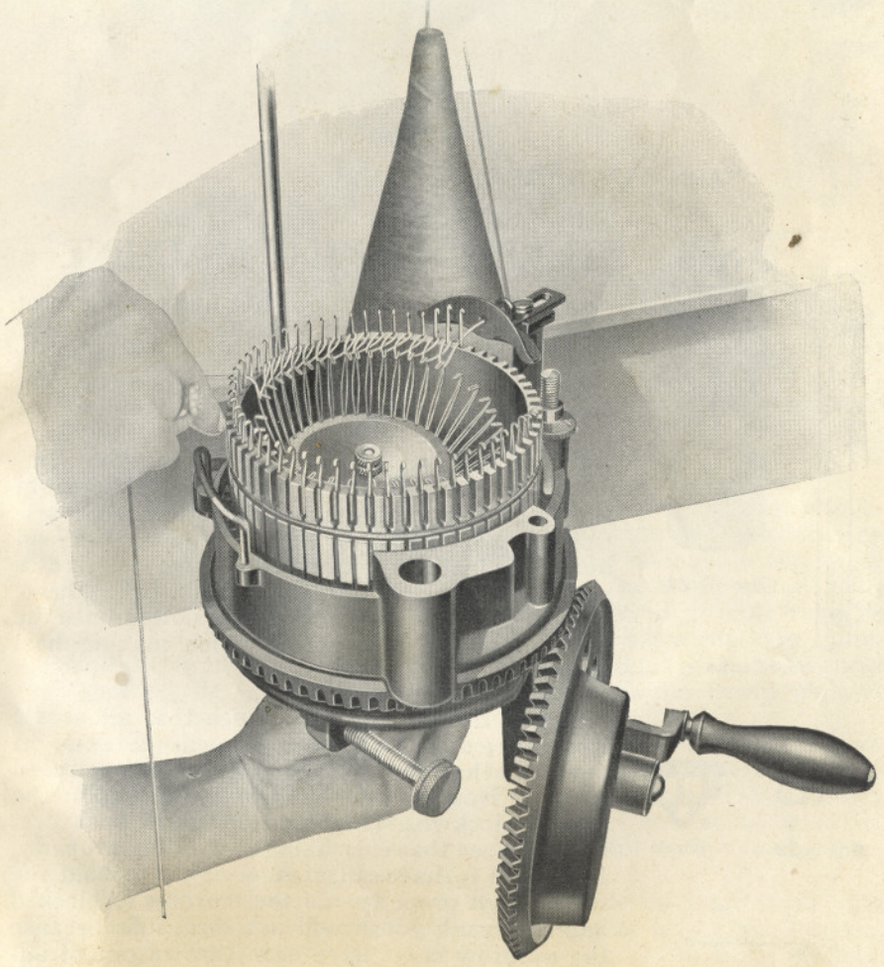
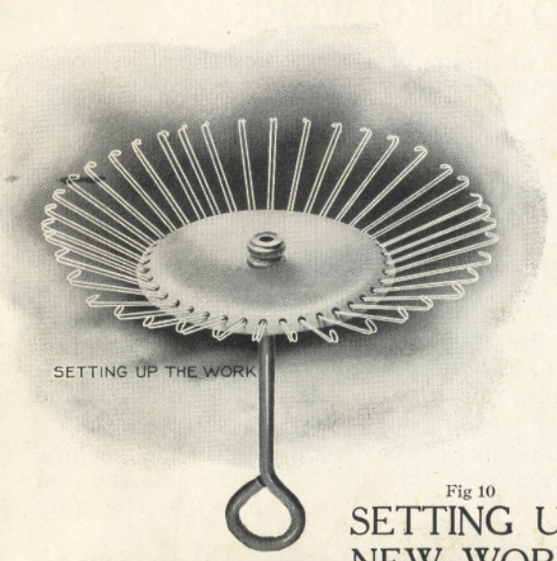


Fig. 9



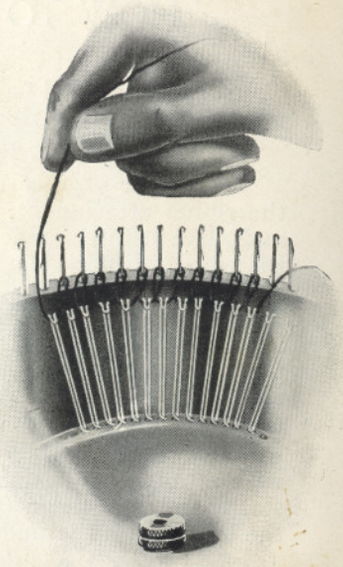


Fig 10

SETTING UP NEW WORK

If the web accidentally runs off the machine or it is necessary for any reason to start new work, you will need to know how to use the set up. Before using this umbrella shaped tool make sure that none of the wires are bent but all stand out at equal distances. See that all needle latches are open and that the yarn carrier is at the front of the machine and thread it as explained in the previous paragraph.

Hold the set-up inside the needle cylinder with the left hand so that the wires rest against it just below the top. Draw about a yard of yarn through the yarn carrier letting it hang down outside the cylinder ahead of the yarn carrier. Now take hold of the yarn close to the yarn carrier; catch it under the nearest set-up hook to the right; then bring it up and around the nearest needle and then down again to the next set-up hook to the right and so on, making a series of loops.

Always bring the yarn around the needle from the right hand side to the left, and down under the next hook of the set-up, until around each needle of the machine and under a hook of the set-up, and you have come to the needles which are down in the cams. Now hook the weights into the ring of the set-up and turn the machine slowly to the right, bringing the needles which are down in the cams up on a level with the other needles. Should you have too much yarn drawn through break off the end. See Fig. 9 and 10.

It is very important that the hooks of the set-up should be held a little below the edge of the needle cylinder, and that the yarn is not wound too tightly around the needles so that it will not break in the first round. There are more needles in the machine than there are hooks in the set-up; therefore catch under the same hook twice. You can be guided by keeping the needles and hooks even with each other.

If you have a stitch on every needle and all your needle latches open, you may now commence knitting. If you have missed any of the needles when setting up—see that their latches are open—knit several rounds and you will find that they will take up a stitch.

HOW TO DO RIBBED WORK

Ribbing is just what the name implies—a "rib" on the plain work. To rib—use the dial with ribber needles. They work horizontally between the vertical cylinder needles, making the rib.

TO PLACE THE RIBBING ATTACHMENT IN POSITION

Have the yarn carrier (E) at the back of the machine. Pick up the ribber attachment, holding it by the arch in the ribber arm (J), and place it in the machine. Fig. 1 shows the correct position, with the ribber arm and the ribber arm guide pin (J4) resting in the holes provided in the cam shell (D). The Ribber Arm Height Regulating Screw should rest on the Cam Shell, and the Dial (G) should rest above the cylinder (F) with just space enough between them to allow the knitting to pass between. These parts will fit snug to begin with and may have to be tapped into position, but as you use the machine they will slide in with a nice working fit.

The illustration shows a picture of the dial adjuster in the machine with all obstructing parts removed. The dial adjuster holds the dial stationary in position (just as the cylinder is stationary) by engaging the lug G-1 on the underside of dial. See Fig. 11.

The correct position for dial slots is directly opposite cylinder needles. Move the dial forward with your hand till it presses against the upright. See Fig 11. If the slots are not exactly opposite cylinder needles, adjust the upright forward or backward by means of screw F6. Turn to the left for adjustment backward and to the right for adjustment forward, pressing dial forward at the same time.

When the ribber arm is pressed home the dial should be high enough to allow the web sufficient clearance to pass freely off the needles down between the cylinder and dial. Varying yarns may necessitate alteration in the height of the dial. To raise or lower the dial, turn Ribber Arm Height Regulating Screw (J1) to the right to raise dial, and to the left to lower it.

An alteration in the height of dial may entail adjustment in height of Yarn Carrier (E).

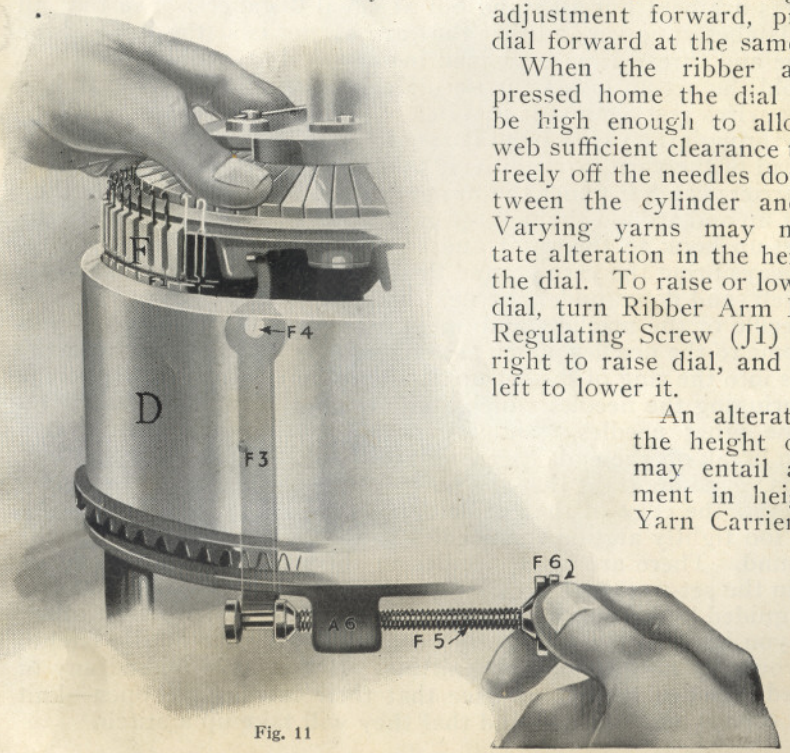


Fig. 11

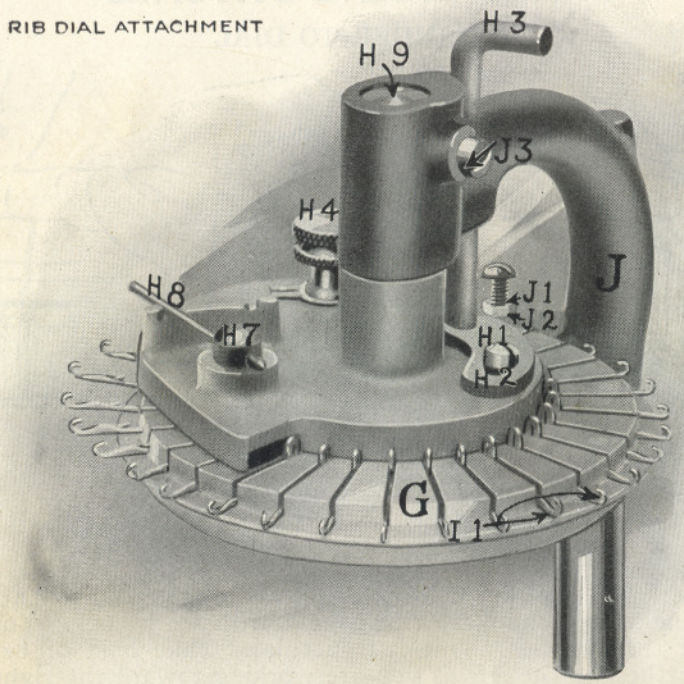


Fig. 12

PUTTING RIBBER NEEDLES IN DIAL

Ribber needles slide into the slots of the dial, heel first, and lie on their back with butt up. They should be pushed in as far as they will go, so that the butt touches the rim of the tappet plate.

The needles can be placed in slots in any part of the dial with the exception of that part which is covered by cams of tappet plate. Slide in the ribber needles commencing at the left hand side and working around toward the right. See that the switch lever H-8 is at the "in" position, to clear the needle path, and that the driving pin H-3 is in place. Have all needle latches open so that needles can take stitches.

A VARIETY OF RIBBED STITCHES

For a 1 and 1 rib, all the ribber needles must be in the dial, but only every alternate needle in the cylinder. The dial must be adjusted so that the ribber needles are opposite the empty cylinder slots. This makes the most suitable cuff for a gentleman's sock.

For a 2 and 1 rib, all the needles must be in both cylinder and dial and the dial must be adjusted so that the ribber needles are exactly central between the cylinder needles.

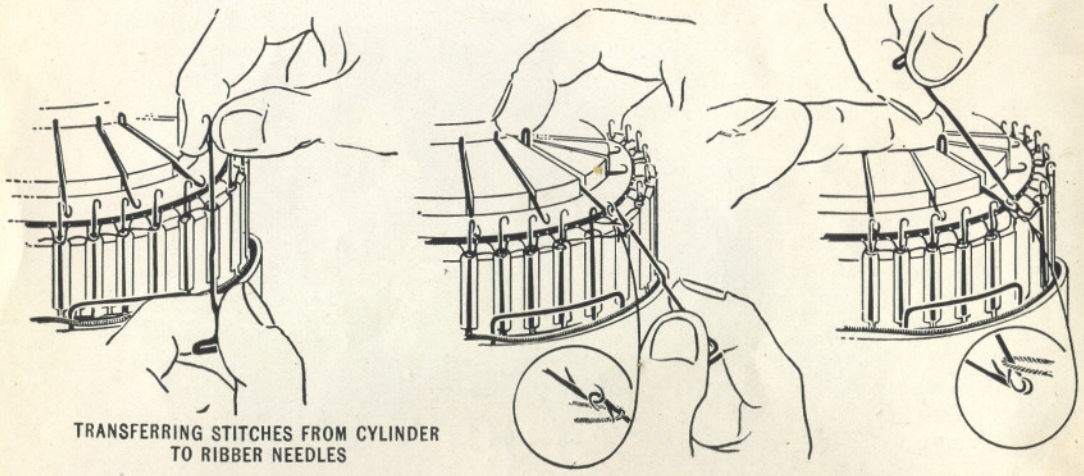
For a 3 and 1 rib, every fourth needle is left out of the cylinder, and every alternate needle out of the dial; adjustment as in 1 and 1 rib. This makes the most suitable leg for a gentleman's sock.

For a 4 and 1 rib, all needles are in the cylinder and every alternate needle in dial; adjustment as for 2 and 1 rib.

Other ribs are formed in a similar manner.

TRANSFERRING STITCHES

CYLINDER TO DIAL



TRANSFERRING STITCHES FROM CYLINDER TO RIBBER NEEDLES

Fig. 13

Have your clasp ring holder, which sets in the cam shell, at front of machine and extend clasp ring over it with work hook. You will find that this releases about four needles. Take hold of cylinder needle farthest to the left as you are working toward the right, and draw it up through its stitch until the stitch is below the latch. Then place the hook of the cylinder needle into the hook of the ribber needle immediately above it which must have its latch open. Slide stitch from the cylinder needle over its closing latch onto the ribber needle with its open latch. Transfer in this manner necessary cylinder needles until you have your machine set for the rib desired.

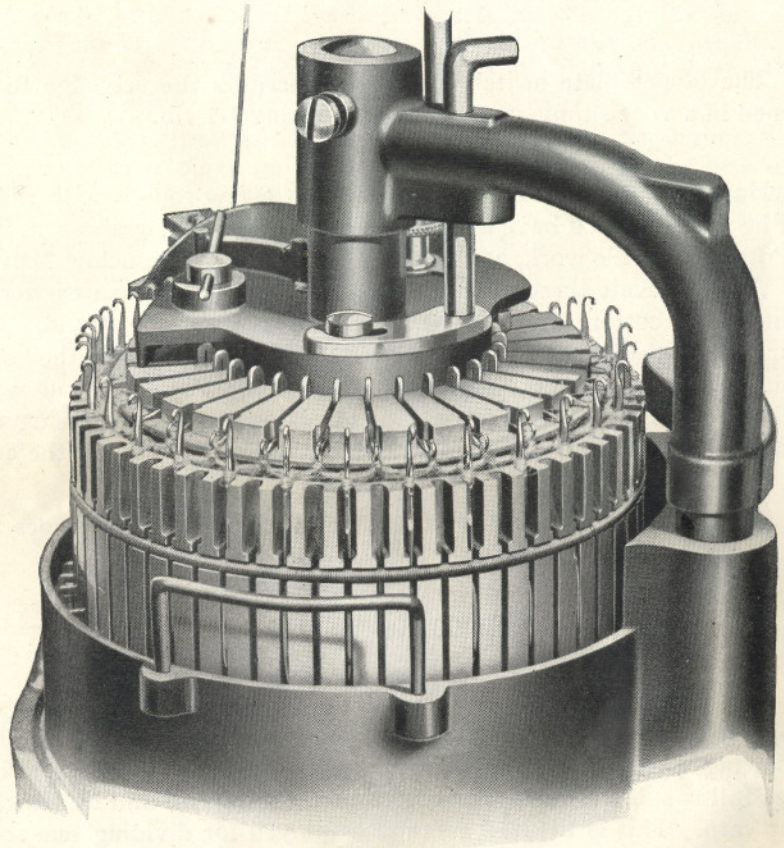
Turn the crank slowly to move the tappet plate forward and clear the way for the remainder of the needles, not forgetting to hold the work down so that the cylinder stitches will continue to knit properly. When you have finished transferring stitches slip clasp ring back.

It will be found that when the ribber is in use it is not necessary to pull the work down as strongly as in plain knitting. In fact, the left hand need do little more than rest on the work, but the pull must be steady, and in a vertical direction. If the pull be to one side, or unsteady or even too strong, it may cause the ribber needles to drop their stitches.

1 AND 1 RIB

If you have a needle in every slot in the dial and a needle in every other slot in the cylinder; that is, one rib needle to one cylinder needle, you are ready to knit 1-1 rib. See that all your needle latches are open and that your yarn is feeding properly, and then proceed to knit. Watch carefully the operation of the dial needles and how they work. You will notice in 1-1 rib that the dial needle works in exact time with the cylinder needle just ahead of it, and that they take their stitches at just the same time. If this is not true, then your ribber needs timing. (page 36).

MACHINE SET FOR 1-1 RIB



THIS ILLUSTRATION SHOWS MACHINE SET FOR 1-1 RIB, READY FOR MAKING CUFF OF STANDARD SOCK.

Fig. 14

Notice that every *other* needle is in cylinder and every needle in dial.

PART III

STANDARD OLDE TYME SOCKS

TO FORM A SELVEDGE FOR RIB WORK

The tappet plate switch cam (H-7) permits the selvedge to be formed in a very simple manner when knitting 1-1 rib.

Have the machine set for 1-1 rib. Knit a few rounds with ribber and be sure that you have a stitch on every needle. Break yarn, join on cotton to divide work, as explained in the paragraph below "Dividing Work". Knit three or four rows of cotton, stop yarn carrier at front, break cotton, join on yarn and knit exactly one round. Put your ribber needles out of action by moving switch (H-8) to the "out" position (see page 7) and then knit three rounds holding your work well down. Put the ribber needles in action again by moving the switch to the "in" position, and proceed to knit 1-1 rib as for the cuff.

In moving switch pin, care must be taken to see that it goes the full distance and rests in either the "in" or "out" groove.

DIVIDING WORK

Having knitted a length of practice work, break the yarn near the bobbin and join on some strong white cotton (crochet cotton, or No. 10 sewing cotton will do.) Take up any slackness as before and knit three full rounds. Break your cotton near the bobbin and tie back on your yarn. This is the best method employed for dividing one sock, etc., from another. The garments are afterward separated by cutting and unravelling the cotton, or they may be cut off one by one as they appear below the cylinder, always leaving a sufficient length of work to attach the weights to. By using this method you need never run your work off the machine and you will save yourself the trouble of setting up new work.

THE CUFF OF A STANDARD SOCK

The Selvedge being finished, knit 1-1 rib 5 inches long for the cuff of the sock.

MEASURING WORK

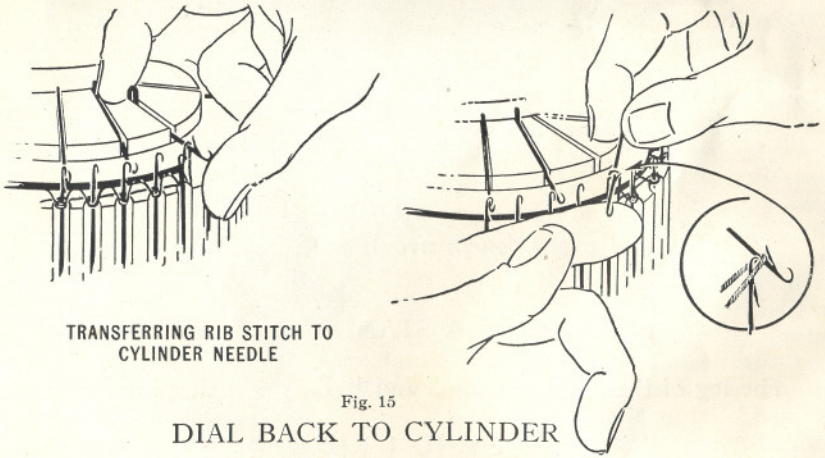
In order that all parts of the sock shall be of the proper length and in the right proportion to each other it is necessary for you to measure the web as it is made. Remember in measuring that the web is naturally stretched somewhat when the weights are on and you must allow for this.

A sure method of measuring work is by means of a foot rule. Hold the rule up inside the cylinder so that it presses against the dial and measure from the dial down. If the ribber is not on the machine measure from the top of the cylinder.

The cuff is measured from the selvedge to the beginning of the leg. The leg is measured from the end of the cuff to the beginning of the heel. The foot is measured from the gore in the heel, along the rib of the foot to the beginning of the toe. See Illustration Page 26. This measurement is 7" and will give a foot measure when toe is knitted of 11" from point of heel to point of toe. The toe is then knitted.

Measurements are sometimes taken by counting the number of rows made, although using the rule is a more certain method. However, if you are using the same weight yarn and the same tension you may find counting rows helpful. Remember though that different weights of yarn and different tensions effect the length of the work.

TRANSFERRING NEEDLES



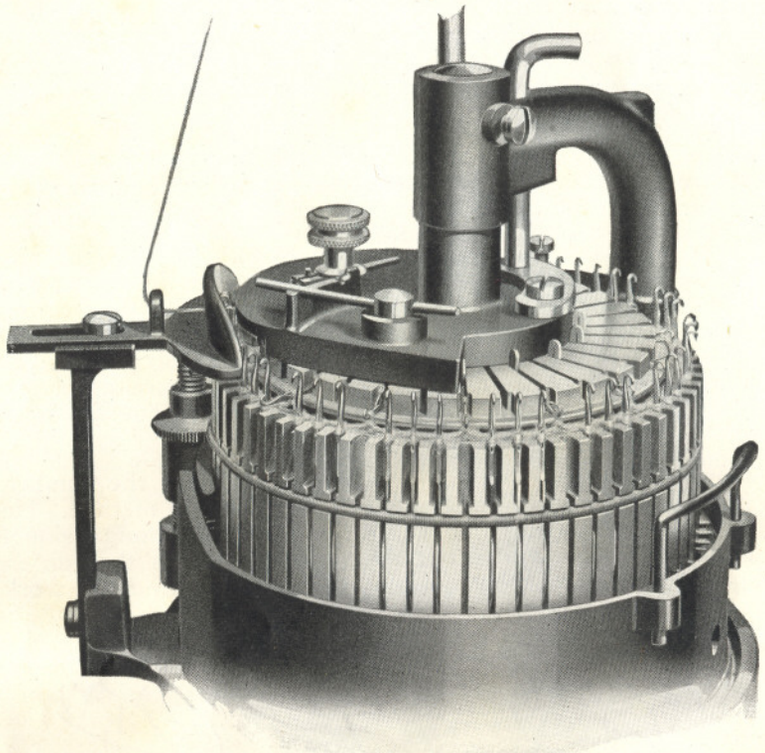
TRANSFERRING RIB STITCH TO CYLINDER NEEDLE

Fig. 15

DIAL BACK TO CYLINDER

Put in cylinder needle where rib stitch is to be transferred. See page 20. With work hook or just your finger draw out the ribber needle until its stitch is behind the latch. Now hook it into the hook of the cylinder needle below and slide the stitch over the closing latch of ribber needle onto the cylinder needle with open latch. Transfer in this manner as many rib stitches as are desired for next pattern, turning the crank wheel slightly as required to release needles engaged in the cams.

MACHINE SET FOR 3-1 RIB



THIS ILLUSTRATION SHOWS MACHINE SET FOR 3-1 RIB, READY FOR MAKING LEG OF STANDARD SOCK.

Fig. 16

Notice that every *other* needle is in dial and every *fourth* needle *out* of cylinder.

THE LEG OF A STANDARD SOCK

The leg of the sock is made 3 and 1 rib, 8½ inches long.

3 AND 1 RIB

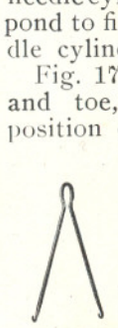
For the 3 and 1 rib, every fourth needle is left out of the cylinder, and every alternate needle out of the dial; adjustment as in 1 and 1 rib.

This will mean that you will have to transfer the stitches from every alternate ribber needle back to a cylinder needle.

MAKING HEEL AND TOE

To knit the heel and toe only the front half section of the machine is used. Please study the cylinder chart (Fig. 19) carefully. You will then see that the actual knitting of the heel and toe is done by needles in the front half of the cylinder, the ribber needles in the front half of the dial having been removed. The inside circle represents the top of a sixty needle cylinder. Figures below the chart show the number of needles to be raised and lowered and to be left in action on various needle cylinders. The figures 1, 2, 3 and 4 on the chart correspond to figures or indentations stamped on the top of the needle cylinder making a visible guide.

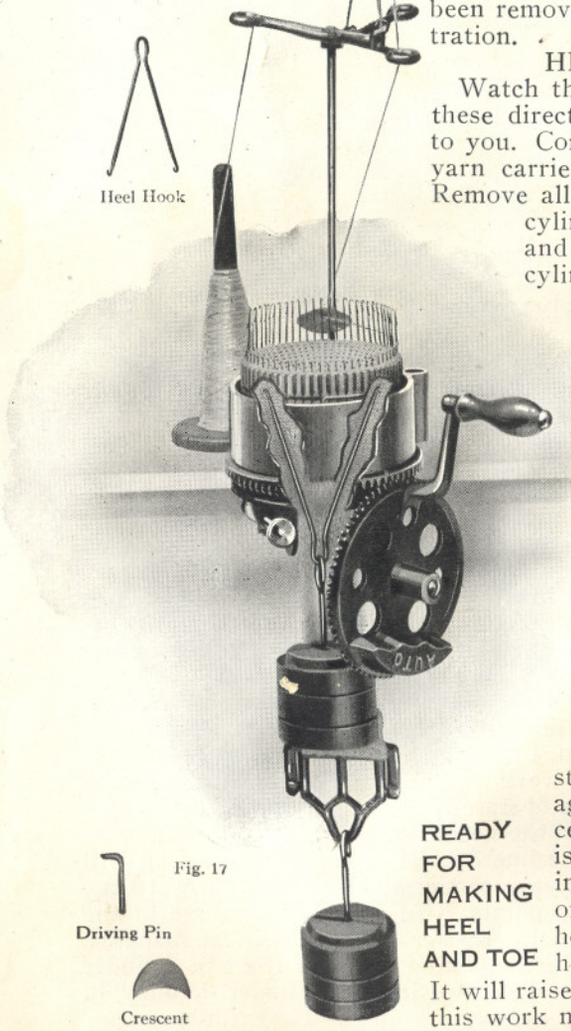
Fig. 17 shows the heel spring in place for knitting the heel and toe, also heel hook and weights attached. To show the position of the heel hook clearly the ribbing attachment has been removed from the machine in illustration.



Heel Hook

HEEL—FIRST HALF

Watch the cylinder chart as you read these directions and all should be clear to you. Commence heel by stopping the yarn carrier at A or back of machine. Remove all dial needles in front of half cylinder marks, see chart, Fig. 19 and transfer their stitches to the cylinder needles which place in the empty slots. See page 22. Turn yarn carrier to C or front of machine. Remove driving pin to prevent rib needles knitting. See page 22. Note that your machine is now set for 3-1 rib at back and plain work at front. Raise out of action all needles back of centre line B-D or at cylinder marks 1-2. Needles are raised out of action simply by pulling them up until their butt rests against the clasp ring holding them in their slots. They will stay there until pushed down again into action. The crescent so called from its shape, is the best thing to use in raising more than one needle out of action at a time. Simply hold the hollow side under the hooks of the needles and lift. It will raise about fifteen at once making this work much quicker and easier.

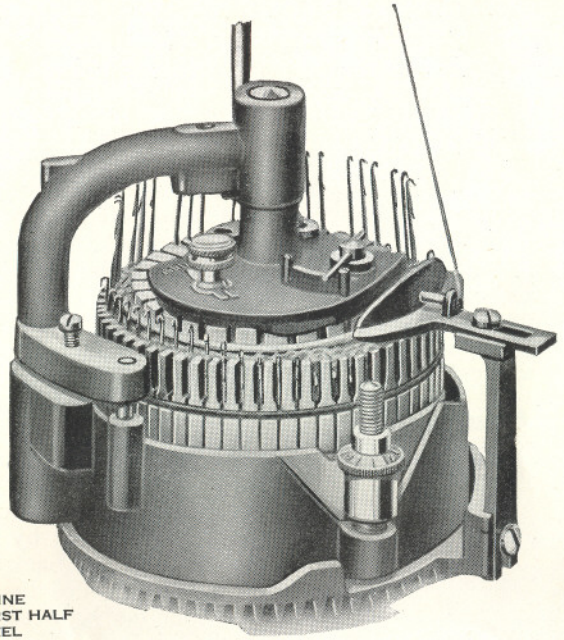


READY FOR MAKING HEEL AND TOE

Fig. 17

Driving Pin

Crescent



MACHINE
SET FOR FIRST HALF
OF HEEL

Fig. 18

HEEL—FIRST HALF—(Continued)

Pass yarn over heel spring between take-up lock and front eye of yarn stand top as shown in Figure 17, and see that it is properly regulated to take up all slack yarn caused by reversing the machine. The heel-spring is regulated by means of screw L-3; setting it back gives a stronger and forward a weaker spring effect. Hold down the work well at front half of machine so that stitches cannot rise on the needles. At the same time turn the crank forward to knit in the direction of C-D-A. Stop the yarn carrier at A or back of machine. Raise needle No. 1 out of action on the same side you have just knit, or at D. Hold the work down firmly at C or front of machine. Turn crank backward to knit in the direction of D-C-B. Stop the yarn carrier at A or back of machine. Raise needle No. 1 out of action on the left at point B which your yarn carrier has just passed. Holding down your work well at front of machine, turn crank forward and knit in the direction of B-C-D again. Stop yarn carrier at A. Raise one needle out of action—the last one to make a stitch—that is, needle No. 2 on the right at D. Hold the work well down at C and continue raising one needle (the last needle operated) out of action, alternately on the left and right sides until all the needles are raised out of action on the front of machine up to the line 3-4. The last needle raised will have been on the left, and the yarn carrier should now be toward the back of the machine, between points B-A. Knit one course in the direction of B-C-D, and stop yarn carrier at A or back of machine. See chart for number of needles remaining down in front of cylinder according to the number of needles used in that cylinder, namely 12 in the 60 cylinder; 16 in the 80 cylinder; 20 in the 100 cylinder, etc.

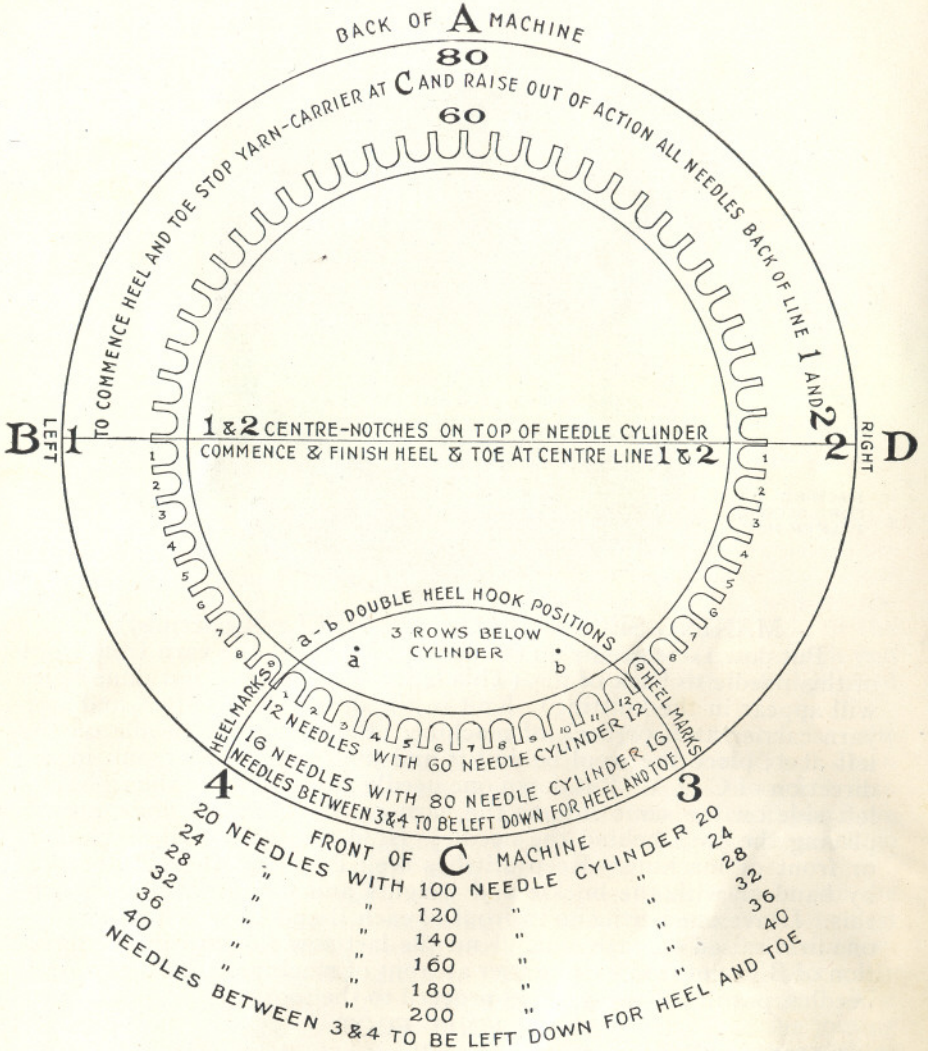
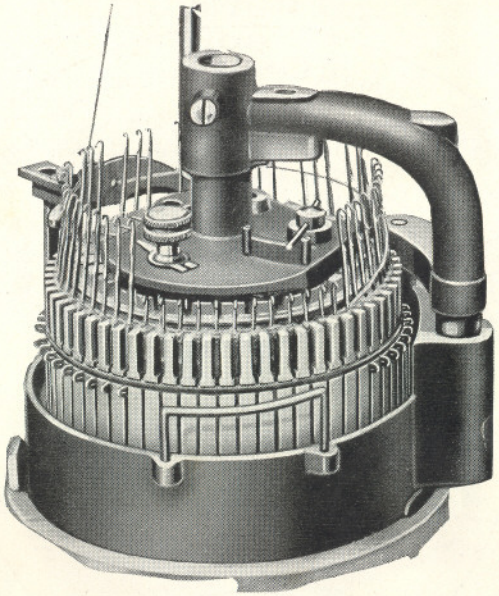


Fig.19

HEEL—SECOND HALF

The second half of the heel is knit in the same way, the needles previously raised being lowered one each row knit. The only needles now in action in the whole cylinder are those between points 3 and 4. The heel hook is always used to hold down work in knitting the second part of the heel and is placed directly in the centre of the heel web, hooks inward, three rows of stitches down from the top of needle cylinder. Place one or more weights upon the heel hook and pull down on the heel hook by hand when the ordinary weight of heel hook is not sufficient to keep the stitches close down to the top of needle cylinder.



MACHINE SET FOR SECOND HALF OF HEEL

Fig. 20

MAKING SECOND HALF OF HEEL—(Continued)

Put down one needle on the right at 3 and lift the yarn from front of this needle to back of it. (This is important and if not done holes will appear in the knitting). Knit in the direction of C-B-A and stop yarn carrier at A or back of machine. Put down one needle on the left at 4; place the wool behind it and knit by turning crank in the direction of C-D-A. Put down one needle alternately on the right and left side on the same side as the yarn carrier each row knit, **always** placing the yarn behind the needle. Hold the work well down at C or front of machine. Keep stitches well down on the side needles by hand or with the buckle and weights and pay strict attention to this. Leave one needle up in front of each B and D, which will be the one first raised on each side. Knit the last row forward in the direction of B-C and stop yarn carrier at front of machine. Put down ALL needles, put in driving pin and proceed to the foot.

TO KNIT FOOT

If the cylinder needle latches will not stay down raise the needles slightly. Now remove the yarn from the heel spring so as to remove all strain from the yarn while knitting the foot. Knit the foot as many inches long as desired, see Fig. 22, measuring with rule from the dial downward. The top of the foot will be 3-1 rib, the bottom plain.

KNITTING THE TOE

The toe is made exactly the same as the heel, except that in the second half all needles are put down to line B-D including the needle first raised. Knit the last half row of toe forward in the direction of B-C and stop yarn carrier at front of machine. Put down all needles remaining up. Remove yarn from heel spring. Knit two or three rounds for hand closing of toe. (See Figure 21.)

The sock is now finished, but do not remove it from the machine. Start the next sock by running in dividing cotton and continuing another sock.

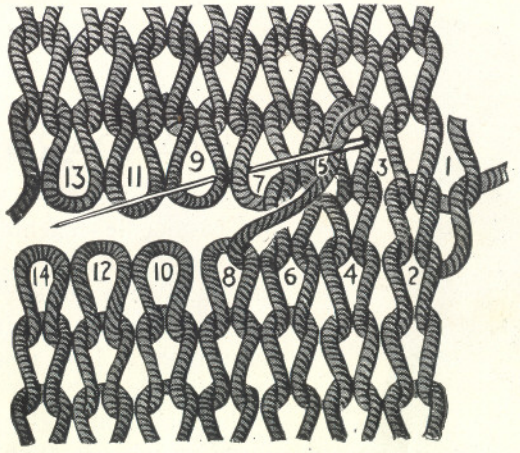


Fig. 21

Hose Board

CLOSING THE TOE

When the sock or stocking is taken out of the machine, the toe must be laid flat and pressed under a damp cloth with a hot iron. This makes the stitches flat and firm, and prevents their unravelling. Now unravel exactly the number of extra rounds knitted. It will be observed that a small hole appears in the knitting at each side of the toe where the actual finish took place. This is the point to which you should unravel. Then join up the stitches by hand with a dull pointed ordinary darning needle as follows:

Begin on one side of the toe according to Figure 21 and pass the needle down through 1, up through 2, back through 1, into loop 3, down through 2, into loop 4, up through 3, into loop 5, down through 4, into loop 6, up through 5, into loop 7, continuing this process until you have completed closing the toe, taking care each time to draw the stitch so that it will be the same length as in the knitting.

This joining up of the toe is very simple if the instructions are followed precisely, and the illustration carefully studied. It is best practiced at first on light colored work, joining up with dark wool, so that the formation of the stitch can be better followed. If correctly done it cannot be told from the remainder of the knitting. The stitches must not be twisted or crossed, and the tension of the joining stitch should be the same as that of the knitting itelf, neither tighter nor slacker. The number of rows unravelled should be exactly the extra number knitted, if fewer, a lump will be caused at each end of the joining up. Toeing up should be done with great care and when properly done the closing will not be discernable.

FINISHING KNIT GOODS

The best method of finishing woolen hosiery is to draw sock on hose board, press each side with hot iron using a damp cloth to prevent scorching. Allow sock to thoroughly dry while on board. This gives it a perfect shape and prevents shrinking but the iron must not be too hot or it will scorch. Special articles of knitted wear should be laid out flat on a table or board; then a damp cloth having been laid upon them, they should be pressed with a hot iron.

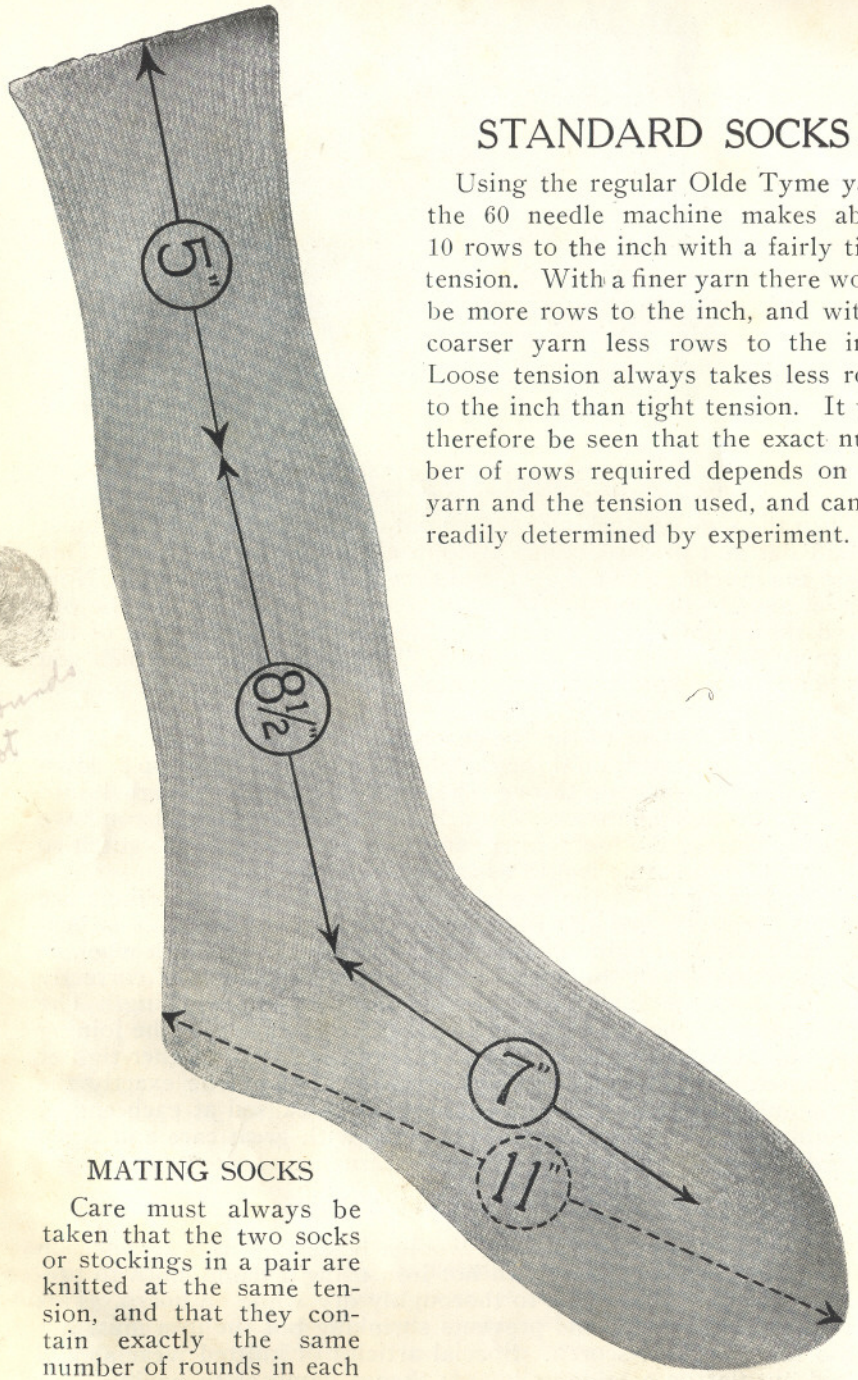


Fig. 22

STANDARD SOCKS

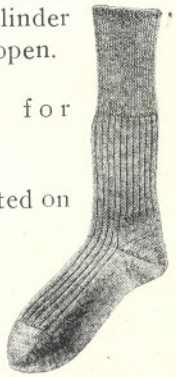
Using the regular Olde Tyme yarn, the 60 needle machine makes about 10 rows to the inch with a fairly tight tension. With a finer yarn there would be more rows to the inch, and with a coarser yarn less rows to the inch. Loose tension always takes less rows to the inch than tight tension. It will therefore be seen that the exact number of rows required depends on the yarn and the tension used, and can be readily determined by experiment.

MATING SOCKS

Care must always be taken that the two socks or stockings in a pair are knitted at the same tension, and that they contain exactly the same number of rounds in each part or they will not "pair."

STANDARD OLDE TYME SOCK

SOCK WITH 1-1 RIB CUFF AND 3-1 RIB LEG AND FOOT



1. Have a needle in every slot in cylinder with latches open.
2. Set machine for loose tension.
3. Set up as directed on page 13.
4. Knit six revolutions to get a plain stitch on every needle.
5. Put in, and adjust ribber. See page 14.
6. Put a ribber needle in every slot in dial, transferring cylinder stitch to ribber needle as each ribber needle is inserted. See page 16. 1-1 rib.
7. Put in dividing cotton. See page 18 and knit three rows with ribber.
8. Put back yarn, and knit one row. See page 18.
9. Put switch pin in "Out" position, and knit three rows for selvedge. See page 18.
10. Put switch pin back in "In" position, and proceed to knit cuff 1-1 rib, 5 inches long, holding work well down.
11. Set machine for 3-1 rib. See page 20. You will now have every other needle in the dial and every fourth needle out of the cylinder.
12. Knit leg 3-1 rib 8½ inches long.
13. Stop yarn carrier at back of machine.
14. Remove all dial needles in front of half cylinder marks see chart, Fig. 19 and transfer their stitches to the cylinder needles which place in the empty slots, See page 20.
15. Turn yarn carrier to front of machine.
16. Remove driving pin to prevent rib needles knitting. See page 6.
17. Note that your machine is now set for 3-1 rib at back and plain work at front.
18. Raise cylinder needles out of action on back half of cylinder.
19. Place yarn over heel spring.
20. Place heel hook and weights in position.
21. Turn yarn carrier to back of machine.

22. Raise needle 1 on right out of action. Knit one course to the left and stop yarn carrier at back of machine. Raise needle 1 on left out of action. Knit one course to the right and stop yarn carrier at back of machine. Raise one needle on right out of action, and continue knitting back and forth, raising out of action the needle to which yarn is attached until first half of heel is completed. See chart page 23. Note that the rib needles in back half of dial are not in action.

23. For second half of heel knit back and forth always lowering needle on the same side as the yarn carrier, and lift the yarn from in front of the needle lowered to the back of it, leave up one needle on each side in front of half cylinder marks, which will be the two needles first raised.

24. Turn yarn carrier to front of machine.

25. Lower all needles into action watching that latches are open.

26. Put in driving pin.

27. Release heel spring and knit the foot. Note that top of foot is 3-1 rib and bottom plain.

28. The foot from the back of the heel to the point of the toe should measure 11 inches.

29. Knit toe same as 15 to 22 inclusive.

30. Knit back and forth always lowering needle on same side as the yarn carrier, and lift the yarn from in front of the needle lowered to the back of it. Put down all needles to half cylinder marks, including both needles first raised.

31. Bring yarn carrier from left side to front of machine.

32. Lower all needles into action seeing that latches are open.

33. Release heel spring.

34. Knit three revolutions which are later unravelled for closing toe. See page 25.

The sock is now finished, but do not remove it from machine. Now begin and follow directions from paragraph 6.

KNITTING STANDARD SOCKS

Socks that are imperfect cannot be accepted by us. When knitting for us all socks must be up to standard, as instructions call for.

It is recommended that a sample pair of socks be submitted us before knitting a quantity. This sample pair will be examined and returned with our O. K. or suggestions for perfecting your work, to prevent your making up a quantity which may not be correct.

Socks sent us must be knitted of our yarn with 1-1 ribbed cuff and 3-1 ribbed leg and foot. Size to be as follows.—5 inch cuff, 8½ inch leg, 11 inch foot. Measure foot from the back of the heel to the tip of the toe. Follow instructions on page 27 and 28 and diagram on page 26.

Particular care should be taken not to knit socks too tight in cuff and leg. They must allow the hand or foot to slip in easy and fit without being too snug or binding.

When removing dividing cotton from selvedge of sock do not cut too close so as to cut into the selvedge of sock and be sure that knot joining dividing cotton to wool is left in to prevent selvedge from fraying out. In case by error knot is cut off be sure to put another in its place. **Always remove all dividing cotton from selvedge.**

Care should be taken in toeing up and with a little practice the closing will not be discernible in the finished sock.

The weight of yarn to be used depends on the number of needles in the cylinder. Be sure to use the proper weight yarn for the number of needles in the cylinder in use.

HOW TO SHIP HOSIERY

All hosiery tendered us under our Work Contract must be made of our yarn and properly boarded and ironed under damp cloth, and tied in dozens before parceling for shipping.

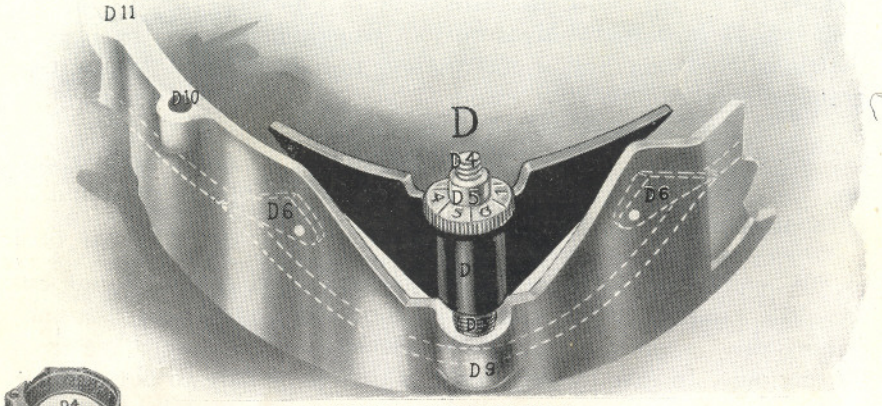
When ordering needles, state cylinder or ribber needles. This will save time, and avoid mistakes.

Always prepay charges and place your name, address and work number on your parcels, both outside and inside, so that we may know the sender.

PART IV

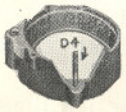
MAKING ADJUSTMENTS

Each Auto Knitter is carefully tested with actual knitting and adjusted before leaving the factory. These adjustments will enable you to work the machine and observe its action, without change, but you should familiarize yourself with the different adjustments in order to regulate the machine for varying sizes of yarn and other conditions, when necessary.



OUTSIDE VIEW OF SECTION OF SHELL SHOWING TENSION ADJUSTMENT

Fig. 23



D
Cam Shell

CYLINDER TENSION ADJUSTMENT—LENGTH OF STITCH—TENSION CAM (D2)

It is the Cylinder Tension Cam which governs the length of the cylinder or plain stitch, and it is regulated by means of the Cylinder Tension Screw (D5). You will notice that on the surface of the Cylinder Tension Screw there are figures indicating degrees of tension. Corresponding to these figures on the under side of the screw are holes into which fits a little pin to hold the tension at the point it is placed. If you ever take the Tension Screw and Cam from the machine, make sure that you replace this pin and the Spring (D3). Otherwise the tension will slip.

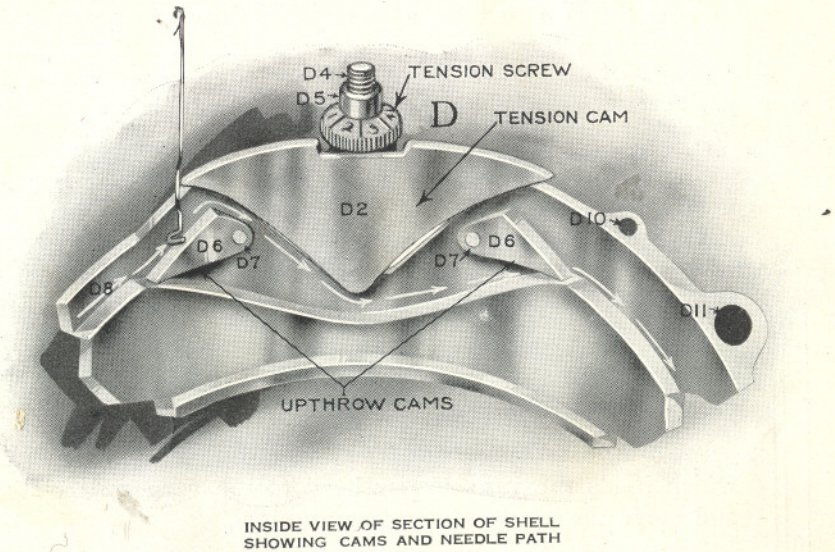
To tighten the tension—turn the Cylinder Tension Screw to the left, raising the tension cam.

If the tension is too tight—the work will climb up on the needles—the machine will turn hard—and the work will be very closely woven and hard.

If you find that the needles are not knitting and the yarn lies in front of them your trouble may be too short a stitch (tight tension).

To loosen the tension—turn the Cylinder Tension Screw to the right lowering the tension cam.

If the tension is too loose—the work will be flimsy, and wide. Also the machine is apt to drop stitches.



INSIDE VIEW OF SECTION OF SHELL SHOWING CAMS AND NEEDLE PATH

Fig. 24

UPTHROW CAMS (D6)

There are two upthrow cams (D6) Fig. 24. It is these two cams working with the Tension Cam (D2) which operate the cylinder needles. When knitting forward the right upthrow cam should be under the needles, raising them to take their stitches as they reach the yarn carrier. The left upthrow cam just passes over the heels of the needles. In reversing the machine as in making the heel and toe, this position is reversed but in all instances whether working forward or backward it is the Upthrow Cam which reaches the needles first that operates them.

Never turn the machine backwards with all the needles in action, for this may cause the machine to either block and refuse to turn, or get the upthrow cams in a position so that both are riding on top of the heels of the needles, when your cylinder needles will not form stitches.

If your machine blocks and will not turn—raise 10 or 12 cylinder needles out of action (see page 21) just in front of the forward cam. Press the point of this cam down in position (Fig 24) so that the Upthrow Cam may regain its position **under the heels** of the needles, turn the crank wheel forward, see that the cylinder needles are operating, put back in action the cylinder needles raised, and continue knitting.

Should the needles fail to rise and the yarn wrap around them without knitting, it may be because both upthrow cams are over the heels of the needles, in which case the needles will not form stitches. Remove all work from the machine. Raise all cylinder needles out of action. See that upthrow is pressed in position to travel under the heels of the needles. Put cylinder needles in action. Set up new work on the machine (Page 13) and continue knitting.

YARN CARRIER (E)

The yarn carrier consists of two parts—the yarn carrier stem and the yarn carrier head. The yarn carrier is adjustable up and down and in and out.

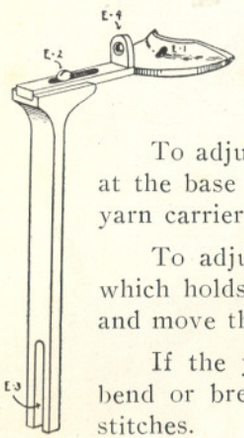


Fig. 25
Yarn
Carrier

For proper position for the yarn carrier see that the top of the cylinder needle in action just reaches the **bottom** edge of the hole in the yarn carrier head, and that the yarn carrier is as close as possible to the needles without touching them.

To adjust the yarn carrier up or down loosen the screw at the base of the yarn carrier stem, and raise or lower the yarn carrier as required.

To adjust the yarn carrier in or out, loosen the screw which holds the yarn carrier head to the yarn carrier stem, and move the head in or out as required.

If the yarn carrier is too close to the needles, it will bend or break the needle latches, thereby causing dropped stitches.

If the yarn carrier is too far away from the needles, it will cause the machine to drop stitches, as the needle latch will close without having received its stitch.

If the yarn carrier is too low, it will break ribber needles, and will perhaps even cause the machine to bind and refuse to move.

PLACING AND REMOVING CYLINDER NEEDLES

To remove a cylinder needle from the machine draw it up so that the heel touches the clasp ring. Turn the top of the needle outward and downward until the heel will release itself from the clasp ring. When removing a number of cylinder needles extend the clasp ring by catching it with the work hook over the clasp ring holder which sets in the cam shell. Then simply raise out of the cylinder those needles released by the clasp ring.

To replace cylinder needles, place heel of the needle down behind the clasp ring, then turn it up straight in the cylinder and push down as far as it will go. If you have extended clasp ring, the needles will slide into the slots directly. Be sure to let your clasp ring back when needles are in position. Always remove or replace needles away from the yarn carrier or away from the cams for you cannot raise needles when they are held in the cams.

THE DIAL ADJUSTER

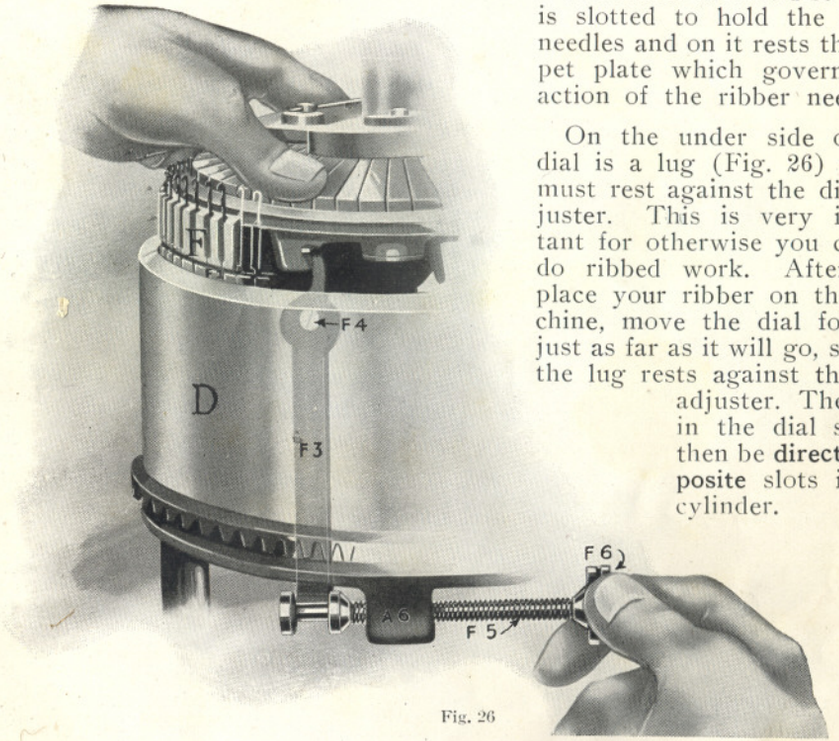


Fig. 26

The dial is the flat disc which is slotted to hold the ribber needles and on it rests the tappet plate which governs the action of the ribber needles.

On the under side of the dial is a lug (Fig. 26) which must rest against the dial adjuster. This is very important for otherwise you cannot do ribbed work. After you place your ribber on the machine, move the dial forward just as far as it will go, so that the lug rests against the dial adjuster. The slots in the dial should then be **directly opposite** slots in the cylinder.

If the dial slots are not directly opposite cylinder slots the dial may be adjusted backward or forward by means of the dial adjuster.

To move the dial forward—turn the screw F6 to the right.

To move the dial backward—turn the screw F6 to the left.

Note: If when you have work on the ribber, it shifts pressing the ribber needles up against cylinder needles, it is because you have not pressed the dial lug in place against the dial adjuster, and it will be necessary for you to remove the work from the machine and start afresh.

The dial is adjusted up and down by means of the Ribber Arm Height Regulating Screw J1. This screw passes through the Ribber Arm, and rests on the Cam Shell.

There should be just sufficient space between the cylinder and the dial to allow the work to pass through easily.

If the dial is too high, the machine will drop stitches, and the ribber needles may rub against the yarn carrier.

If the dial is too low—the work will not pass through between the cylinder and dial, causing the machine to clog.

MAKING ADJUSTMENTS

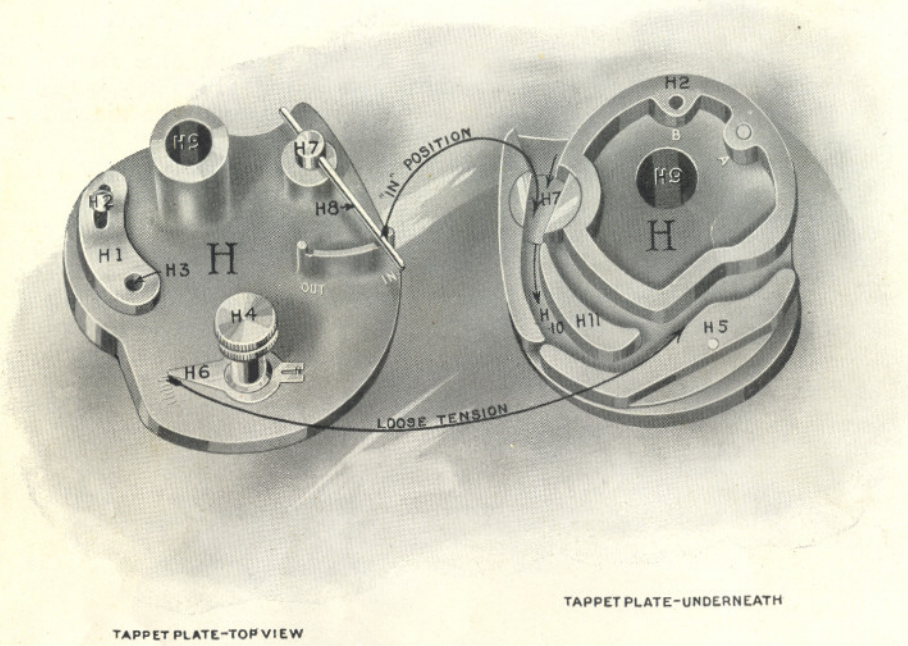


Fig. 27

THE TAPPET PLATE

The tappet plate containing the needle paths for the ribber needles has only three adjustments—the switch cam H-7 which throws the needles in or out of action by diverting them to the inner or outer path, the timing segment H-1 controlling the time at which the needles shoot out to take their stitches, and the tension cam H-5. Only one of these, the tension cam, will need to be changed from time to time as different grades of yarn are used and different kinds of knitting are done. It corresponds to the tension cam D-2 in the cam shell which operates the cylinder needles.

The tension cam in the tappet plate performs the same duty for the ribber needles as the tension cam in the cam shell does for the cylinder needles—that of making the stitches long, short or medium.

RIBBER TENSION

The same cautions hold for this tension cam as for the other—too short a stitch makes a tight webbing, hard to knit and too closely knit for use—while too long a stitch makes a flimsy web and may necessitate a change in the timing segment. The tension is changed by loosening the screw H-4 and moving the pointer H-6 along the graduated scale toward the center for a long, loose stitch and away from the center for a short tight stitch.

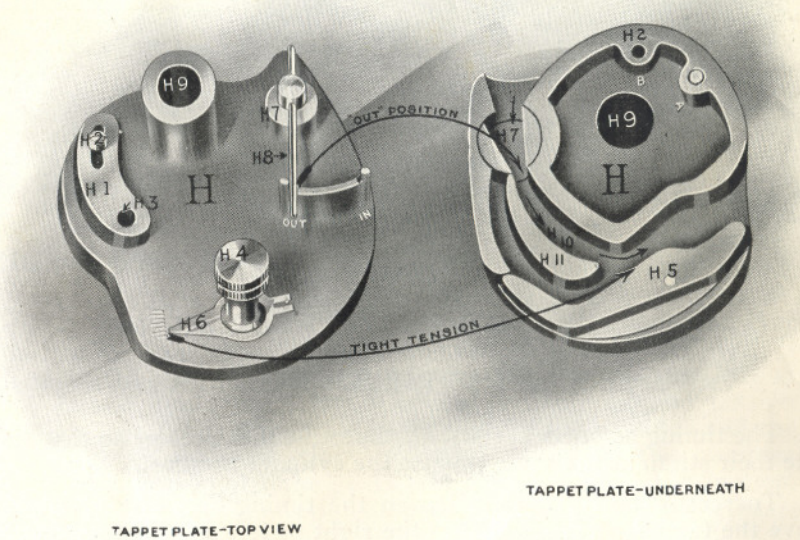


Fig. 28

The switch cam H-7 is moved by the lever H-8. When this handle is in the "in" position the ribber needles are guided by the switch cam into the needle path which cause the needles to make stitches. When in the "out" position the cam guides the needles into "idle" paths and no stitches are made. This switch cam handle should be in either position all the time—"in" when making ribbing and "out" when not ribbing—but never between the two as the needle paths would be blocked and the needles broken.

MAKING ADJUSTMENTS—Continued

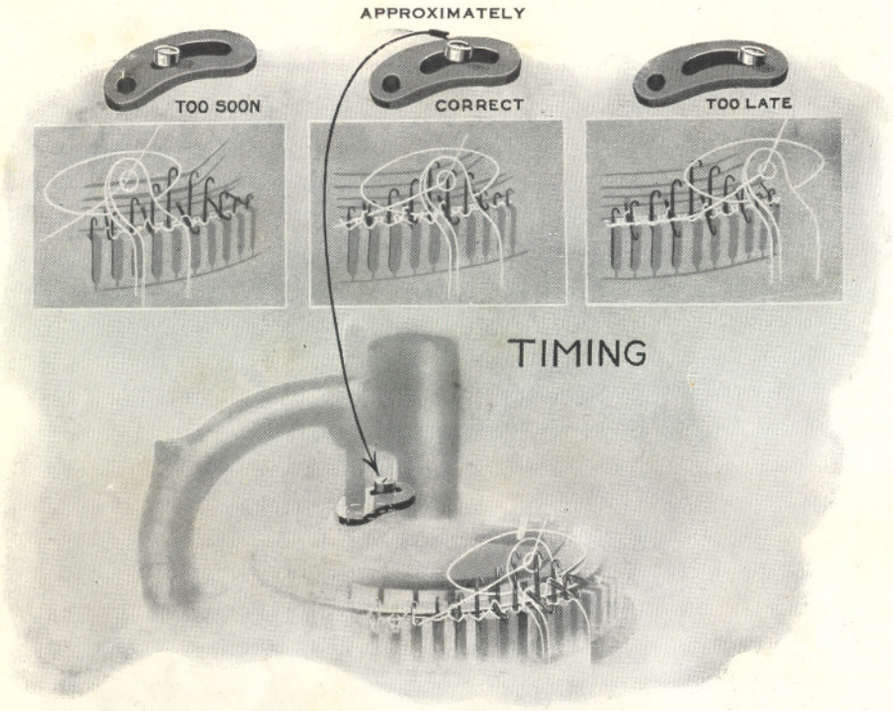


Fig. 29

TIMING THE RIBBER NEEDLES

The timing segment screw H-2 times the dial needles so that they take their stitch at the same time as the cylinder needles.

To rectify faulty timing, loosen the timing segment screw and move the tappet plate slightly to the right or left as required, leaving the driving pin H-3 in position in its hole at other end of segment. When set tighten timing segment screw with screw driver.

Watch the dial needles to see what is taking place. If the dial needle is too late the yarn gets behind the latch and slides off without making a stitch; if too soon, it gets back without the yarn getting in the hook at all. In either case it drops its stitch. The correct timing requires the yarn to lie across the ribber needles, half way between the latch and the hook when the latch of the needle stands straight up. **The latches of the cylinder and dial needles about to form a stitch should be timed so as to close at the same time.**

Any alteration to the timing should be made carefully as a slight move makes considerable difference. As a rule it will be found correct if screw H-2 is about halfway in its slot in segment. However, varying grades of yarn may alter this slightly.

MAKING ADJUSTMENTS

HEEL SPRING The heel spring is only used in knitting heel and toe or flat work. It is adjusted by the screw in the yarn stand top. If there is too much tension on the spring it is liable to cut holes in the webbing. If the spring is too loose it will not take up the slack in knitting backwards.

WEIGHTS The weight does not affect the length of the stitches but only holds them down so that the needles can rise. So then, if the stitch is of the right length, and you have the proper amount of weight, there will be no difficulty, as needles are always self-acting.

BOBBIN It is important that you learn to wind a good bobbin. Wind the yarn on the bobbin so that it will run off evenly and freely, otherwise you cannot expect good knitting. If a bobbin does not run properly, rewind it a second time.

CHANGING CYLINDERS To put the cylinder in see that dial adjuster is at the left and start one screw, giving it two or three turns only, then start the other screw tightening up both gradually. There is no need to disturb the shell and gear ring but, to prevent their getting moved out of place by accident, it is well before starting to turn the crank wheel so that the handle is at the bottom and notice the position of the yarn carrier and tension cam. The yarn carrier should be at the back of the machine and the lug which holds the tension cam should be between the two bumpers on the gear ring, otherwise the gears will not set the shell in motion. Be sure of these relative positions when the change is completed.

HOLDING DOWN WORK It is of the utmost importance always to pull the work well down with the left hand in addition to the weights, and to see that all needle latches are down before commencing to knit at any time. In knitting tight work, put on plenty of weight, or assist the weights in holding down the fabric, with the left hand. Too light weight will allow the stitches to raise up on the needles as they are being formed. Too heavy weight will cut holes in the webbing. Care must be taken in holding down the webbing with the left hand in knitting the heel and toe. Hold down in such a manner that you are not drawing down harder on the last needles that are down in the cylinder at the sides, than in the center. This will be the cause of cutting holes in the gore of the heel and toe.

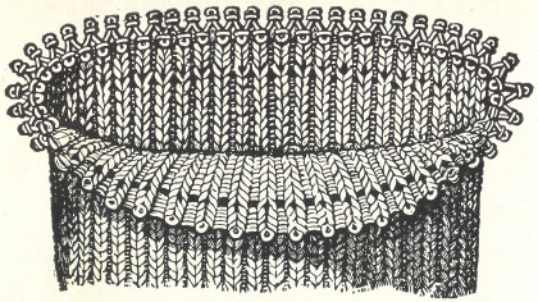


Fig. 30

TO PUT WORK ON THE MACHINE

If the work accidentally runs off through breaking of wool or other cause, press the end of the knitted work with a hot iron to make the stitches firm. Then unravel one or two rounds to get an even row of stitches and pick the stitches onto the needles again with work hook or spare needles as follows:

Have yarn carrier at front of machine. Put stitches on about 40 needles, commencing at right hand side of cylinder and working round the back, letting the loose end of wool hang down at right hand side. (The stitches at first need only be just inside the hooks so as not to stretch them, but when all are on the needles they must be pulled down to cylinder top as usual.) Raise these 40 needles out of action and turn yarn carrier forward to back of machine, being careful not to damage any of the needle latches, which are apt to fly out when no stitch is on the needle, and may catch against the yarn carrier if care is not taken. Put stitches on the remaining needles and raise them out of action. Now pull the stitches down to the top of the cylinder; bring the yarn carrier to the front; thread the machine with wool or cotton and join up to hanging end. Take up any slackness; press down about 50 needles, commencing with the first after that from which the wool hangs and proceed to knit. Before beginning to knit see that all the needle latches are down, and do not forget to pull the work down.

A little practice will give facility in thus putting work on the machine. It is worth acquiring as the stitches have to be placed on the needles in this way for re-footing.

PICKING UP DROPPED CYLINDER STITCHES

If a stitch slips off the needle from any cause it will generally, if the weights are on, run down through a number of rounds. The weights should be taken off immediately and the stitch picked up as follows:

Take a spare cylinder needle and pass this down hook end first, between the work and the cylinder, with the hook pointing inwards towards the work. Pass the left hand up inside the cylinder from underneath the machine. Take hold of the work and bring the dropped stitch within the reach of the needle hook. Get the stitch onto the hook, being careful not to split the wool, slide the needle through the stitch until the stitch is behind the latch, then turn the needle a quarter turn to the right, pull it slowly back until the latch stands out almost straight but not quite, the stitch still being behind it. Then work the latch up behind the yarn immediately above the stitch. This done proceed to draw the needle slowly back and the latch will take the yarn inside the hook, allowing the old stitch to slide over and thus forming the new one. Having now a new stitch inside the hook, slide the needle through the work again until the stitch is behind the latch, and repeat the whole operation until you get the stitch to the top, when it must be placed on its cylinder needle.

If the ribber is in use when the stitch slips off the cylinder needle, the ribber needles must first be taken out, as directed below and the complete ribbing attachment removed.

For first practice, should a stitch have slipped off the needle, it is sufficient to pull up onto the needle any stitch from the nearest part of the knitting, the only object being to get a distinct and separate loop around each needle, so that it will knit properly. One loop must not be taken around two needles. If only a single stitch is off at any point, the cross thread of yarn just behind the needle should be pulled onto it. ("Behind a needle" is "inside the cylinder.")

PICKING UP DROPPED RIB STITCHES

This is done on the same principle as explained above except that, of course, it is done from the inside of the work instead of the outside. All of the ribber needles must be taken out of the dial and left hanging to their stitches, outside the cylinder. The complete ribbing attachment can then be removed so as to allow free access to the work.

CARE OF THE MACHINE

OILING The machine should be kept well oiled, and oil may be applied with advantage wherever two metal parts rub together in working. The special parts to oil are:

The Cylinder Grooves with needles in.

The Dial and Dial Grooves with needles in.

The Cams inside the Shell.

The Crank Wheel Teeth and Stud on which it revolves.

The Winder and Swift.

Generally speaking, oil will do no harm except where it is likely to get on the knitted work, but the machine should not be flooded with oil. Oiling is best done frequently and in small doses. The machine can then be kept neat and clean. All fluff from the wool should be regularly cleaned off. A little trouble in this direction is well repaid by the easier running of the machine.

NEEDLES Never run the machine fast when there is no work on the needles as it may damage the needle latches. If needle latches do not work, bend them carefully into line and back and forth if necessary until they work easily on their hinge.

Bent latches are usually caused by the yarn carrier striking them. This is liable to happen if the handle is turned quickly when there are no stitches in the needles, or by forcing the machine when some obstruction is in the way of its working freely.

NEEDLE CYLINDERS When cleaning the machine and for other purposes it is sometimes desired to remove the cylinder from the machine. To do this take out all cylinder needles, and unscrew the two cylinder screws in the under edge of cylinder, which hold it to the bed plate.

CAUTIONS

If the machine should block—before making any adjustments—see that nothing has dropped between the cam shell and the cylinder blocking the path of the cams.

If the machine works hard—it may need oil. Never leave the machine in a damp place, and if the machine is not to be used for a while, remove the needles from the machine and wrap them up in an oily cloth. Rusty needles will not do good work.

If the machine drops stitches—see that all your needle latches are open. Also see that you have no bent latches which are cutting the work and that there are no broken latches.

Never force the machine, find out the cause of its sticking and remedy this.

Never turn the crank wheel backwards with the ribber needles in action.

Never turn the crank wheel backwards unless you have cylinder needles out of action to allow the Upthrow Cams to reverse their positions.

Never attempt to remove the ribber from the machine while the needles are in the dial. Remove needles first.

Always have the machine set up with plain work before putting the ribbing attachment on the machine.

Should the Switch Pin H8 become blocked when moving it from one position to the other, do not force it, but put it back in the position from which you are moving it, turn the crank wheel slightly to move the needle blocking the way, and then the switch pin can be moved without further difficulty.

PART V

KNITTING FOR HOME TRADE

SOCK WITH 1-1 RIB CUFF, AND PLAIN LEG

To knit a sock with 1-1 rib cuff and plain leg, proceed as instructed on page 27—following out the details from paragraph 1 to 10. To make the leg transfer all dial needle stitches to cylinder needles and knit as for plain knitting. To make heel and toe raise needles as for rib sock. See page 27, paragraphs 18-36.

KNITTING FLAT WEB

Take sufficient needles out at the back of the needle cylinder to clear the cams. Turn the handle so that the came or yarn carrier will be at the back where there are no needles. Set up the work on the remaining needles as instructed on page 13. Knit backwards and forwards as in making heel and toe, but change the turn when the cams or yarn carrier will be where you have taken out the needles, as otherwise the reverse cam cannot drop and the machine will not knit. The webbing can be narrowed or widened by either removing or replacing needles in the cylinder, although enough needles must always be left out of the cylinder so as to allow for the reverse of the same.

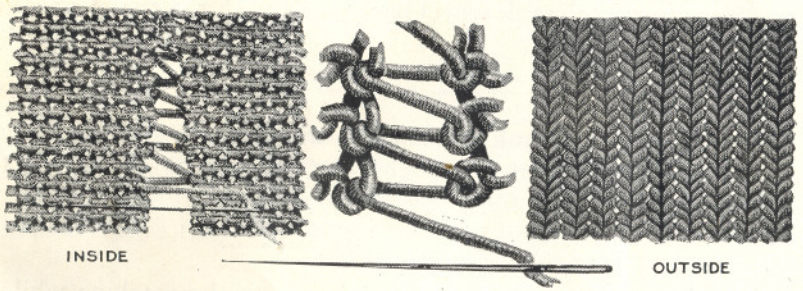


Fig. 31

SEAMING FLAT WEB

Figure 31 represents the right side of the knitting apparently without seam when properly sewed together. This sewing should always be done when possible in the same direction the web was knit, and always from the inside of the web. The middle stitch of each, as shown in Figure 31, is ravelled out so that the stitches to be sewed can be readily seen. There are three stitches which appear in the selvedge. Only one, the shortest one, is the right stitch to be taken in sewing. It will be known as the "inside stitch," as shown by the needle and thread which passes through the inside small stitches (Figure 31.)

TAKING THE STITCHES

Pass the needle through the short or small inside stitch on the right; then pass through the corresponding stitch on the other side of web, on the left. Draw the needle with thread through the two stitches, as shown in Figure 31; again pass the needle through the right stitch, then through the left stitch and draw the yarn through until the web is drawn close together and looks like regular knitting on the right side of web. Dampening and pressing with a hot iron will help the operator in finding the stitches, which are to be taken while sewing.

RE-FOOTING

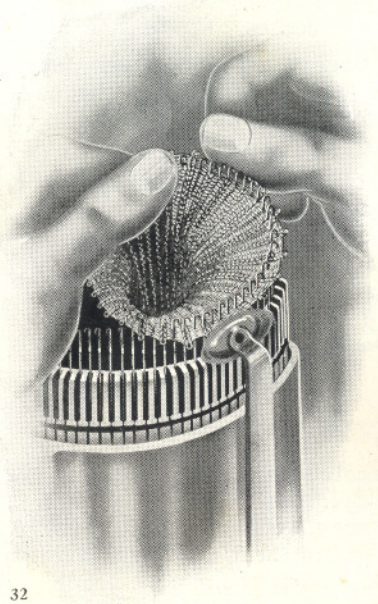


Fig. 32

Cut off the waste part; press the end of the leg with hot iron to make the stitches firm; unravel a few rounds to get an even row of stitches, and put the work on the needles. If the work or stocking contains more stitches than the number of needles in your machine, two stitches must be placed on one needle at regular intervals round the cylinder. If there are less stitches in a plain sock than there are needles in the 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 top of the needles, and make loops for the empty needles. This is done as follows: Take out the empty needle pick up the loop, and replace the needle in the groove; or pick up with the work hook or other needle the cross stitch which is under the loop of the nearest needle, and place it on the next empty needle.

TO UNRAVEL WORK WHILE ON THE MACHINE

This can only be done when the ribber is not in use. Stop yarn carrier at front of machine and push work up at back so as to get the stitches inside the hooks of the needles. With work hook, pull tightly outwards the cross thread of yarn between two of the stitches and then pull this yarn slightly upwards. This will free the last row of stitches and will cause the previous row to come over into the hooks. Get the stitches off about 20 needles at the back in this way, repeating the operation according to the number of rows it is desired to unravel, and raise these 20 needles out of action. Then knit until yarn carrier is under the needles raised. Unravel the same number of rows off the remainder of the work in the same way. With care, this can be done to any extent without dropping a stitch. Pull back the slack wool to

the bobbin and raise 20 more needles leading up to the others so that the yarn carrier can be moved backwards in order to start knitting at the needle from which the wool hangs. Now proceed to knit.

If it is necessary to unravel when making heel, pull the stitches into the hooks, draw the wool out tightly in a line with the hooks, then pull gently a little upwards and outwards, when the stitches will slide off. If in the first part of the heel, push a needle down as each row is unravelled; if in the second part, pull a needle up each time.

TO FORM SELVEDGE FOR PLAIN WORK

To prevent a garment from unravelling it must have a selvedge. This selvedge is made as follows. It is made immediately after dividing work while the cotton is still on the needles.

Raise out of action all needles not engaged in V cam. Holding down the work, knit forward until V cam passes under the needles raised out of action, thus releasing those which were engaged in cams and these must now be raised also.

Break the cotton, leaving a short length hanging, say 10 or 12 inches, and pass this down inside the cylinder. It will now be noticed that the crank wheel may be turned freely, without actuating the needles, which are therefore "out of action."

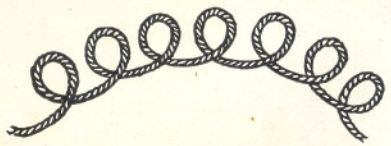


Fig. 33

Thread machine with yarn as directed on Page 11, leaving about a yard hanging on the inside over the cylinder. Make a neat slip knot at the end of the yarn and drop this over one of the needles at the right hand side of the cylinder, to form the first stitch. Then taking the yarn in the right hand, pass it across the back of the next needle away from you, round it, and in again at the side nearest to you; then along the back of the next needle farther away from you, round it in the same manner.

In doing this, hold each loop down (with forefinger of left hand) close to top of cylinder, whilst making the next. The yarn carrier may be moved freely out of you way in either direction, as the needles are out of action, but care must be taken to keep the yarn outside the needles.

Figure 33 shows the direction and the method in which the yarn should be twisted round the needles to form the loops, commencing from the right hand side, working towards back of machine, and continuing in the same direction all round the cylinder until a loop is on every needle.

This selvedge must be of medium tension—neither very tight nor very slack. Having placed loops on all the needles, have yarn carrier at front of machine and press down into action about two-thirds of the needles, commencing with that on which the first loop was placed. See that all latches are down, take up any slackness in the yarn; pull

work well down; see that yarn feeds into the hook of the first needle; and knit half way around. (Whenever you stop knitting do not let yarn carrier move backward.) Having moved the V cam forward, the remaining needles can now be pressed down into action. Again see that all needle latches are open, and proceed to knit slowly, holding work well down. There being a double stitch (cotton and wool) on each needle, the crank wheel may work a little stiffly in knitting the first round. Practice the forming of selvedge until thoroughly mastered and do not attempt to knit too quickly at first.

LARGE HEEL

A larger heel can be made by raising out of action two less than half of the needles (that is, one short of the half cylinder mark at each side) when commencing the heel, and continuing first part as usual until 14 needles are left in action. In this case, the pressing down of needles in the second part must be continued right up to the half cylinder mark.

POINTED TOE

A more pointed toe is made by narrowing the first part of the toe down to four needles less than heel, that is, two needles less on each side, so that the toe will be more pointed than the heel.

REINFORCING

To splice heel or toe. Heels or toes are made double by knitting or "splicing" yarn. Place the bobbin with splicing yarn under the other eye at back of yarn stand top; thread the yarn through the eye and tie it neatly to the other yarn in use, so that the two pass together through the middle eye. The tension should be slacked one point when knitting splicing in, and altered back to its original position when heel or toe is finished. Finer yarns are used to advantage by knitting double which is done in the manner described above.

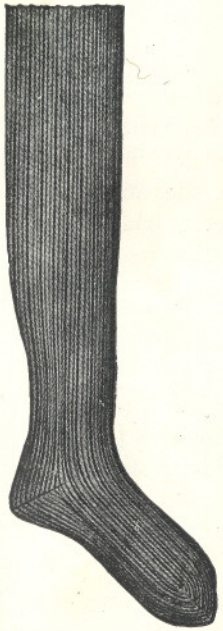
LADIES' RIBBED HOSE, 4 and 1 RIB, WITH SCALLOPED VANDYKE TOP.

Put on Selvedge in usual manner with all Cylinder needles in; knit one round, put on Ribber without needles in the Dial, and regulate Dial for 4 and 1 rib; then proceed to put in alternate Ribber needle, at the same time catching up into its hook both the cross threads of wool (it will be noticed there are two) between the Cylinder needles. Tighten tension nut (D5), knit 6 rows, slacken tension again, and knit upper part of leg required, say 12 inches.

The Scalloped Top can be made more pronounced by knitting 2 rounds and there will be 3 cross-threads to catch up.

NARROWING ANKLE.

Lift out two needles directly in front of machine on the left Rib-needle (half-way between the half-cylinder mark), place the stitch of the second needle on the third, place the first needle in the second groove, leaving an empty groove in front of Dial needle. Knit six rows, narrow once on each side of first narrowing, knit a further six rows, narrow again once on each side of last narrowing, and repeat this until the narrowings have gone all round the Machine. The result is then a 3 and 1 rib, and the Dial should be re-adjusted so that the Ribber needles will now be central with the Cylinder needles. Knit about 4 inches for ankle, and make heel, foot, and toe as in gentlemen's sock, but shorter. Size of foot, 9 to 10 inches; medium, 9½ inches.



LADIES RIBBED HOSE, WITH HEM TOP

A Hem Top is made as follows: Take Ribber off machine, have stitches on all Cylinder needles and proceed to knit straight off, after the dividing cotton, there being no need to form a selvedge Knit from 10 to 20 rounds according to depth of hem required; then pull the work up inside the Cylinder and place the first row of stitches on the needles (so that there will be two stitches on each needle) being careful not to twist the work; knit one round, put ribber on and adjust for 4 and 1 rib; catch a stitch up to each Ribber needle from the back of the adjoining Cylinder needle and proceed to knit stocking as usual.

LADIES' RIBBED HOSE WITH 3 AND 1 WELT

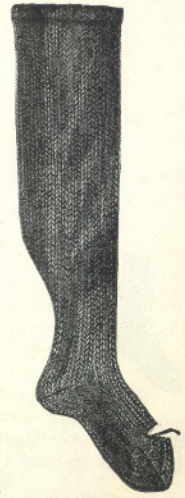
Start without Ribber, all Cylinder needles in, form Selvedge in usual way, knit one round only, put on Ribber, adjust for 3 and 1 Rib, put in every alternate Ribber needle, transferring a stitch on to same from the Cylinder needle in front of it which will then, of course, be taken out. Knit 3 or 4 inches, as desired, for welt; adjust Dial for 4 and 1 rib, put in the other Cylinder needles, catching a stitch onto each from the back of the adjoining Cylinder needle on the same side of Ribber needle; that is to say, a stitch must not be pulled across the Ribber needle from the Cylinder needle on the other side. Proceed to knit stocking as usual.

If Scalloped or Vandyck Top be preferred, start with every fourth needle out of Cylinder and knit one round before putting Ribber on. Then put Ribber needles in opposite the empty Cylinder grooves, catching up the two cross threads of wool to form first stitch as explained above.

LADIES' PLAIN HOSE, FASHIONED.

A ladies' plain stocking can be knitted and fashioned, as explained in the following, the instruction being based on a 120 needle cylinder, but can be equally applied to any standard machine by adapting it proportionately to the number of needles in the cylinder.

Commence with Hem Top, or Ordinary Selvedge, as preferred, knit 4 inches with tight tension, slacken tension, and knit usual length of leg prior to narrowing. Then begin to knit flat web (see page 23) dividing at front of Machine, half way between the half-cylinder marks. Narrow by taking out the third needle on each side of the division, transfer its stitch onto the fourth needle, and close up by moving the first and second needles into the second and third grooves. Knit 8 rows, narrow on each side again and so on, narrowing ten times in all, which will leave 80 needles in.



Raise out of action 20 needles at each end which will be used later for the heel. Knit the top of the foot backwards and forwards on the other 40 needles, say 50 to 60 rows according to length of foot required. Then commence narrowing exactly as in the leg, but knitting only two rows between each narrowing, and continue until only 10 to 12 needles are left in the work. Now press down into action all the needles remaining in the Cylinder, and take off the Clasp Ring. Bring together all the 40 needles for the heel by moving one lot to the other side, and knit the heel on these in the usual way. After finishing the heel, knit the lower part of the foot exactly like the upper part.

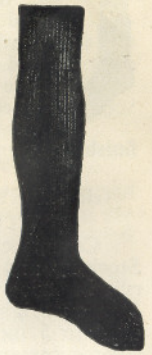
When the Stocking comes from the Machine, it will require joining up at the toe, the sides of the feet and the back of the leg from the commencement of the narrowings to the beginning of the heel.

GENTLEMEN'S HOSE.

These are knitted same as Ladies' Hose except that the wool used is of stronger counts, and the tension consequently a few points looser. They are usually made with the 3 and 1 welt top, the length of leg and foot being altered as required. Length of leg is generally about 22 inches over all.

YOUTHS' OR BOYS' STOCKINGS.

Form Selvedge with Selvedge Tappet (see page 36) 1 and 1 rib, length of welt required, say 4 inches, change to 3 and 1 rib for leg as in Standard Rib Sock, knit straight leg of the length required, narrowing for ankle by tightening tension very gradually. Take Ribber needles out for the heel and make heel on the Cylinder needles at the front of machine, taking out Driving Pin as usual. In finishing second half of heel, stop one needle short of the point you started at. The toe is made in the same way, but knitting right up to the starting point again, instead of stopping one short. In joining up the toe, it will be found necessary to join two stitches at the one side to one stitch at the other, about every third stitch.



MAKING A MOCK RIB.

A very good mock rib can be made by taking every third or fourth needle out of the cylinder. Then set up in the usual way, and proceed to knit the top, using a fairly tight tension to make the knitting as close as possible. Put in the needles that were taken out. With your work hook or extra needle, take a stitch below and made by one of the adjoining needles, and place it over the needle just put in, until you have a stitch on all the needles. They will then form their own stitches. Loosen your tension, and proceed to knit plain knitting.

A YOUTH'S PLAIN STOCKING

can be fashioned by knitting Flat Web where the narowings are to begin. Knit welt and leg as in plain sock (see page 43) and when ready to narrow, commence knitting flat web on all needles as explained on page 23. Let the division in the work come at the back of the machine, and exactly half-way between the half-cylinder marks. Narrow on each side every ten rounds, by taking out the third needle from the division and placing its stitch on the fourth needle. Put the second needle in third groove, and the first in the second, on each side. After sufficient narrowings have been made, knit the required length for ankle, and

make the heel half on each side, as in Child's stocking (see next paragraph). Knit the toe at the front of the Machine as usual, and then join up the lower half of leg and the under side of foot, along with the toe, after the stocking leaves the machine. The joining must be carefully done and pressed so that no ridge is felt.

CHILD'S SOCK OR STOCKING, MADE ON THE FLAT WEB PLAN.

Have the necessary number of needles in Cylinder according to width of stocking (or sock) desired, form selvedge on these in usual way, and make the length of leg required, by knitting backwards and forwards, just as in making heel and with the yarn in heel spring. The ankle may be shaped by tightening the tension slightly. Finish the leg by knitting to the left.

The heel is knitted half at each side of the work. Raise out of action all needles except 12 at the left. Knit to the right, raise out of action the last needle knitted, knit to the left and right again(a double course), raise another needle, and so on, raising one needle each double course knitted until you have only about three needles left, then commence pressing these needles into action again, one each double course, placing the yarn behind the needle, just as in doing the second part of an ordinary heel, and proceed until you have 11 needles in action (or one less than you started the heel with), then press all the remainder into action, knit right across and do the other half of heel at the opposite side in a similar way.

The toe is best knitted in the centre of the work at the front of the Machine, just in the ordinary way, but of course with a suitable number of needles, say 24.

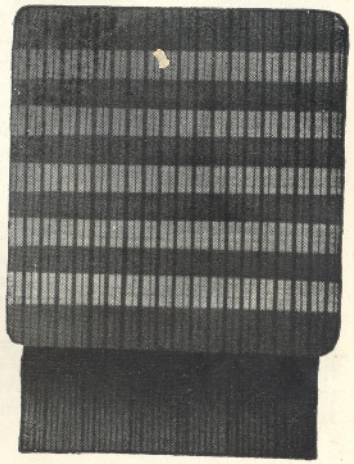
Smaller sizes, even doll's stockings, can be done by starting with fewer needles, and when first trying the experiment it is best to take at least 30 needles out of the machine.

CHILD'S SOCK WITH ORNAMENTAL BODY PART.

A very nice effect is produced by making a plain welt and then knitting the body, or leg part with a fancy "pyramid" stitch as follows, working on the flat web plan as on page 23.

Raise out of action the first needle on the left hand side of machine, and every fourth from the first needle you raised. Hold the work well down, and knit three rows; press into action all needles that are raised and knit two rows; raise the third needle from the end of the left hand side of machine, and every fourth from the third needle raised; knit three rows, then press needles into action, and knit two rounds. Repeat this several times to give required length of leg; knit ankle plain, and finish as in previous paragraph.

GENTLEMEN'S CYCLE STOCKINGS, WITH STRIPED TOP.

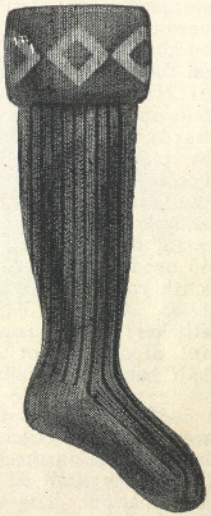


Commence with small hem top as in Ladies' Stocking, and after knitting a few rounds further, run in stripe of 3 or 4 rounds of another color. Join on original color again, making striped top of 4 to 5 inches with 1 inch of main color at commencement and finish, say 6 or 7 inches altogether for the turnover top. Take the work out of Machine, turn it inside out, pick the stitches onto the needles again, and knit the leg in the usual way, commencing with 4 and 1 rib. The length of leg over all may be 24 to 27 inches, or 18 to 20 inches when the top is folded over.

The pattern is improved by varying the width of the stripes, and may be elaborated by further ornamentation by hand after the stocking leaves the Machine.

GENTLEMEN'S CYCLE STOCKING, WITH DIAMOND TOP.

This makes a very effective Cycle Top, though it requires a little patience to work out the first time. It is done on the principle of small heels all round the machine, and the following particulars are for a 10-diamond top made on the 120-cylinder Machine, but can be applied to any standard machine by adapting it proportionately to the number of needles in the cylinder. Commence with small hem top and run in stripe in the same way. Knit three rounds of original color and three rounds of another color (same as stripe or different, according to wearer's preference.)



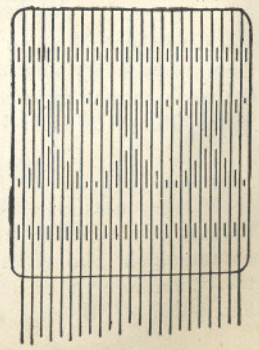
(*a*) Raise out of action all needles but 12, put yarn over Heel-spring, knit backwards and forwards as in making heel, raising one needle each course knitted. See that both end needles knit each time, and particularly the last stitch when only one needle is left up. When this last needle is raised, press down into action the next 12 needles, and repeat the process all round the Cylinder. In passing from one lot of 12 to another let the yarn remain outside the needles, and it will knit in later on.

(*b*) When the last batch of 12 has been knitted break the yarn join on the color you wish to use for the actual diamonds, press down the sixth needle from the last one knitted, knit forward (making sure that the needle knits), press down the next needle on the same side as the wool, place the yarn behind the needle, knit backwards, press down another needle, and so on, just as in second half of heel, until you have 12 needles in action again, the last course being knitted backwards. Then begin raising three needles again, one each course knitted as in section (*a*). When the last needle is knitted and raised bring the Yarn Carrier back a little so as to be able to knit forwards the first course in the next diamond, press down the 11th needle from the last one knitted, and repeat the same process all round the Cylinder.

(*c*) Then change the yarn back to the preceding color, press down into action the fifth and sixth needles from the last one knitted. Knit forwards and backwards until 12 needles in action, last course being knitted forwards. Raise the 12 needles out of action, move Yarn Carrier backwards a little, press down into action the sixth and seventh needles from the last one knitted, and repeat all round the Cylinder as before. In the last half diamond, before knitting forwards, on the last twelve needles, press down into action all the needles as far as possible, knit half way round, press down remainder, knit several rounds, run in original color and stripe, finishing with original color to match the commencement of the diamond top. Take the work out of Machine, reverse, and put stitches on needles again, proceeding exactly as in previous paragraph.

GENTLEMEN'S CYCLE STOCKINGS, WITH LARGE HEM TOP.

This method obviates the necessity for taking the work off the needles and reversing. No selvedge need be formed, but instead of the usual small hem top knit about 4 inches of principal color, then make fancy portion (diamond, striped, or other ornamental pattern), finish top with a further 4 inches of principal color, then pull up the work inside the Cylinder and place the first row of stitches on the needles, forming a large hem top. When the stocking comes from the Machine, fold the hem over in the usual manner.



The proper way to fold a hem top is so that the joining shall come at the middle of the inside, and the full pattern be displayed.

GENTLEMEN'S CYCLE STOCKINGS, WITH 1 AND 1 STRIPED RIBBED TOP.

The appearance of a 1 and 1 rib being practically the same on both sides, a Striped Cycle Top formed with this rib need not be taken off the needles to reverse, but can be knitted straight on and folded over afterwards in the usual way. A 1 and 1 rib Cycle Top should be knitted with slack tension, otherwise it may come out too small.

CHILDREN'S COMBINATIONS.

Knitted in 4 pieces, the instruction being based on 96 needle cylinder to be applied proportionately for other counts.

Set up, making selvedge with Selvedge Tappet as directed, with 1 and 1 rib. Knit 40 rows with tight tension; then transfer rib stitches on to plain needles, stopping with Yarn Carrier in front of machine. Take off Ribber; lift all the needles at back half of the Machine out of their grooves and let them drop inside the Cylinder with the stitches remaining on them. Knit forwards taking the Yarn Carier to the back of Machine where the needles are out of Cylinder; loosen tension; put yarn into heel spring; knit backwards and forwards four rows and increase one needle on the right side by moving two end needles a groove forward, putting a needle into the empty groove and catching with this extra needle a stitch from the back of the next needle to it. Knit another four rows in the same way and increase one needle again on the right, repeating this operation until you have 56 needles in the Machine. Then increase one needle every sixth row until you have 64 needles in, after which knit 46 rows. Cast off eight stitches, knit 140 rows; cast off 27 stitches; knit 16 rows and run work off machine, being careful, of course, not to let any stitches slip back. This forms half back of combination.

Now insert in front of Machine the needles which were left hanging in the work with the stitches on them and, still using the heel spring, proceed as before, but increase on the left side until you have 56 needles in. Knit 210 rows; cast off 27 stitches; knit 30 rows, and run work off Machine. This forms half front of combination. The two parts are then joined together at the shoulder with the knitting stitch, and if this is neatly done the joining will not be perceptible (see page 23.) The two parts when oined together form one half of the complete garment.

Make the two pieces for the other half in a similar manner, but reverse the sides for increasing and decreasing in each case. When these are completed, join neatly together and finish the neck and sleeves with the crochet stitch.

Sleeves can be knitted for the foregoing by commencing as for gentlemen's socks—1 and 1 rib, knit 30 rounds tight tension; transfer rib stitches to plain; loosen tension; knit 35 rounds; break wool and tie on cotton; knit three rounds and change needles back to 1 and 1 rib for next sleeve. Press the stitches of sleeves before joining onto combination.

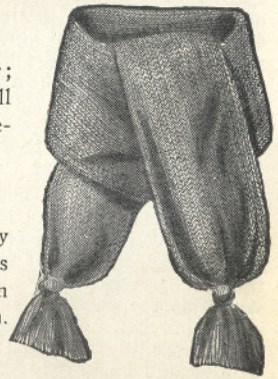
If preferred the front ot the garment can be left open about 5 inches at the top. More needles must be used if a larger garment is required.

CASTING OFF STITCHES.

Casting off stitches is done as follows: Take out the needle which knitted the last stitch, catch the wool inside the hook and draw it through the stitch, this makes another stitch which must be placed on the next needle.

MUFFLER OR SCARF

Knit about 36 inches plain with all needles in Cylinder; then throw every alternate stitch off its needle and pull the work so that these stitches run back to the commencement. Finish off with frince or tassel at each end.

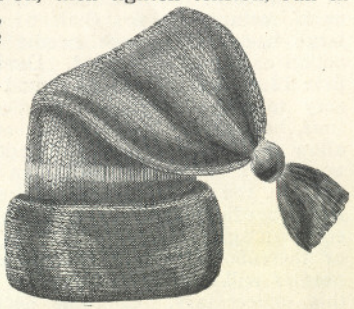


MOTOR SCARF.

A very neat two-color Motor Scarf can be made by knitting two separate lengths as directed in the previous paragraph, in two different colors. Lay the one flat on the other, join up each side with crochet or chain stitch. and finish off the ends with fringe.

CHILD'S TOQUE.

No selvedge is necessary. Proceed to knit straight on after the dividing cotton, but with very loose tension. Knit 60 rounds and pull up the work to form hem top; knit further 20 rounds still with loose tension, then tighten tension, run in stripe of 3 or 4 rounds, tighten tension slightly, knit 10 rounds original color, tighten tension once more, run in another stripe again and knit length required, say a further 9 to 12 inches. A third stripe can be run in if desired. When finished, draw the end up, passing a thread of wool through the stitches, and finish off with bob and tassel.



If desired, the roll (or head part) can be made to fold over twice (3 thicknesses) instead of the hem. In this case, a selvedge must be formed, and 100 to 120 rounds knitted before running in first stripe.

CORD.

A very neat cord can be knitted by having only 2, 3, 4 or 5 needles in the Cylinder at the front of the Machine. Commence the work by looping the wool round each needle, and to and from the weight hook between each stitch so that the work will be properly pulled down. Pass the wool over heel-spring, and knit round the Machine in the usual way. The effect is enhanced by using variegated wools.

LADY'S RIBBED VEST

Commence with Scalloped Top, knit 56 inches with very loose tension for the body part. (This is double length, having to be folded afterwards.) Run in dividing cotton, and knit in a similar manner two pieces, each 5 inches long, for sleeves, separating with cotton as usual.

TO FINISH

Body part must be pressed, two or three rows unravelled to get an even row of stitches, and finished off with loose crochet stitch. Then cut up evenly along one of the rib stitches, open out flat, fold over, bringing the Scalloped and Crocheted edges together, and join the sides up neatly, leaving 8 inches space for the sleeves. The neck is made by cutting out a rectangular piece, leaving the front one inch lower than the back. Finish neck with crochet or ornamental stitch and draw-cord.

BOYS' JERSEY, 2 AND 1 RIB.

Set the Machine for 2 and 1 rib, knit 20 rounds with tight tension, loosen tension and knit 350 rounds; tighten tension again and knit 23 rounds. This forms the body part of Jersey. Run in dividing cotton, change to 1 and 1 rib, and form selvedge with Selvedge Tappet; knit 4 inches, put remaining Cylinder needles in to form 2 and 1 rib, catching up a stitch onto each from the back of needle on the left, loosen tension and knit sleeves of length required. Knit the two sleeves, dividing with cotton, and knit 4 inches in 2 and 1 rib for collar.

TO FINISH.—Press body part, collar and sleeves. Unravel three rounds from body, and work a loose chain stitch round. Cut up and fold over and join up sides same as Lady's Vest, leaving 7 inches for sleeves. Secure stitches of width required for neck, turn collar inside out, sew on firmly, and turn over to form roll.

KNEE CAP.

Commence with Scalloped Top, 4 and 1 rib, knit 50 rounds, take off Ribber, transferring the rib stitches to Cylinder needles, and raise 9 needles out of action at the back of the machine. Knit on the remaining needles to form the knee part, as if making the first half of a very large heel, raising one needle out of action each course knitted. During the first 12 rounds it will be found necessary to raise additional needles each time, beyond those already up, so as to allow the V cam to pass sufficiently forward to knit the last needle in action, and on the return course these additional needles must, of course, be pressed down again. After the first 12 rounds or thereabouts, a sufficient number of needles will be out of action to render this unnecessary. Continue decreasing until only 15 needles left in action, letting the last course be knitted to the right, but stopping Yarn Carrier at front of Machine. Press all needles into action, put on Ribber, change to 3 and 1 rib, commencing with 9 needles first raised out of action, and working round the Machine in the usual direction. Knit 50 rounds and finish off. Secure the stitches by passing a thread of yarn through, or by any other desired means, when the work comes from the Machine.

RIBBED MITTENS.

Make 4½ inch ribbed cuff just like welt of Gent's Sock, change to 3 and 1 rib, knit one inch, take out at front of Machine 6 ribber needles, inserting corresponding Cylinder needles to which the stitches must be transferred. This will give 21 Cylinder needles together, upon which the thumb will be knitted. Bring Yarn Carrier to the front so that the V cam is under these 21 needles, put in remaining Cylinder needles, take off Ribber, transferring the stitches to the empty Cylinder needles, and raise out of action all but the 21 needles for the thumb. Knit backwards and forwards (flat web) 40 rows holding work well down, break the wool, and then lift from each selvedge edge of the thumb stitches onto 11 needles, being careful that there are no holes at junction of hand and thumb Bring Yarn Carrier round to the left, join on wool, and knit forwards to bring V cam under the 21 needles again, holding the thumb part well down. Put Ribber on, change back to 3 and 1 rib, and knit 40 rounds to complete. Finish off the ends of thumb and hand with chain or other suitable stitch, and press.

PLAIN MITTENS.

Plain Mittens are made either with ribbed cuff or large hem for double cuff. In either case about one inch plain should be knitted after the cuff before commencing the thumb. In this case the trouble of putting the ribber off and on again in doing the thumb is saved. The end may be left open, or closed as in toe of sock.

Stripes may be run in either plain or ribbed mittens if desired.

GIRL'S VICTORINE OR CAPE.

Start flat web on, say 50 needles. Knit about 10 inches, raise one needle on the right, knit one course, raise another needle on the same side, and continue knitting to and fro, raising one needle each course and always on the right, until only four needles are left in action. Press all needles down again, knit one or two complete rows, and then decrease again one needle on the right each course. Repeat this until five of these taper sections have been knitted, and then knit 10 inches full width again. The Cape may be wadded and lined, and fringed at the ends. The effect is considerably enhanced by using fancy work.

If a larger size be required add one or more of the taper sections, and knit the plain part also a little longer.

TOILET MAT.

Neat Toilet Mats in white cotton may be made by knitting in taper sections as explained in previous paragraph. Six sections will make the complete circle, and the outer edge should be fringed or finished with some ornamental stitch.

Table Mats may also be made in wool, varying the color for the different sections. If two needles be raised each time there will be twelve sections to the circle instead of six.

BABY'S OVERALLS, IN WHITE OR OTHER SUITABLE WOOL.

A Baby's Overall, similar to the lower half of Children's Combinations, but with feet, is made as follows: Commence with ordinary selvedge, knitting flat web, on 40 needles, slack tension. Knit 8 rows, then widen one stitch, knit 4 rows, widen again. and continue widening every 4 rows until 55 needles are in use. Then knit 8 rows, after which begin to narrow two stitches every 4 rows, and continue until 16 narrowings have been made. Run in dividing cotton, and knit another piece exactly like the above, following on with two other similar pieces, but with the widenings and narrowings on the opposite sides. Join up the four parts neatly to form the upper portion.

For the feet knit 40 rows on 54 needles, no selvedge being necessary; run in dividing cotton, and knit another 40 rows for the other foot. These pieces are doubled over to form the feet, and joined up to the ends of the legs with the usual joining stitch, as used in finishing the toe of a stocking. For the front part of feet, the knitted web is turned into the shape required and joined up or worked over in any suitable way.

Finish off the waist with crochet stitch, and run in draw-cord both at the waist and ankles.

BABY'S JACKET, IN BLUE, WHITE, OR OTHER COLORS.

A Child's Jacket is made on a similar plan of the Boy's Jersey, but is also cut down the front, the edges being worked over with a suitable ornamental stitch. The neck, instead of a collar, should have a fancy pattern crocheted round, and a draw cord should be run through at the waist. Some of the fancy stitches given are very suitable for articles of this kind.

If the sleeves are required narrow, they must be knitted flat web, and joined as usual.

EASY LESSON FOR BOYS AND GIRLS.

THE AMATEUR'S FIRST KNITTING LESSON is not intended for persons of a mechanical turn of mind who learn easily. Such persons, after studying thoroughly mechanical lesson, and applying the instruction, may proceed at once to knitting. We would, however, advise those who wish to go slowly and surely, to practice all in this lesson, as a means of familiarizing the mind thoroughly with threading of the machine, cam and needle action, stitch formation, use of tension, narrowing, widening, etc., which make practical and more important work very simple.

The experience gained by this lesson is valuable, and attained more easily with one or more needles in the machine rather than with all the needles in, and is less complicated for beginners and promotes self-teaching.

KNITTING BRAID CORD: Remove all needles from the Needle cylinder, except one needle at C or front of machine. See Chart, page 17. Turn crank, stop yarn carrier at C or front. Thread the machine as shown and described on page 11. Tie a loop on the yarn 6 inches from the end. Place the loop over the needle in the machine. Regulate the take-up or Heel Spring (see page 28.) Or place a stitch from any web over needle. Hold down very gently on yarn or web with left hand. Turn crank and knit a few complete rounds. Regulate the length of stitch if necessary, and knit any length of cord desired.

In cord and reverse knitting the Heel Spring should be no stronger than necessary to give power to control and take up the slack yarn caused by the needle in the machine. Regulate the take-up or Heel Spring (see page 28.) Or strength of the Heel Spring.

KNITTING SQUARE CORD: Place two needles in Needle cylinder at C or front. Place a second needle in alongside of the first needle. Place stitches on both needles from any web or place a stitch on second needle from braid cord. Hold down gently on the square cord and knit circular web or cord on the two needles. See that the Heel Spring and Tensions are all O. K. Knit square cord required; examine work.

KNITTING ROUND CORD: Place three needles in cylinder at C or front, or place a third needle in alongside of the first two. Place stitches on the needles from any web, or place a stitch on third needle from square cord. Hold down gently on the round cord, and knit circular web or cord with the three needles. Change the tension or length of stitch, first to close work and then to loose work.

Round cord knit with four needles will be larger and rounder, provided the work is fairly well held down.

KNITTING FRINGE: Place two needles in cylinder at A or back of machine, opposite the four needles used for round cord; or place four needles in cylinder at C or front, if they are not already in the machine. See that stitches are placed on all needles or lift stitches on the two back needles from cord. Hold down the double web with weight hook. Knit circular double web on the six needles. Remove fringe by breaking yarn and turning crank. Ravel out the stitches of the two needles. Cut the lower end of fringe if desired. Twist each two strands together if preferred.

SHORT DOUBLE FRINGE is knit by using 4, 6 or 8 needles on each side of the machine at C or front and at A or back. Stitches are placed on these needles from any web, or work may be started with set-up. For setting up, see page 13. Hold work well down. Knit the length of fringe desired. Cut fringe in two pieces.

KNITTING FLAT WEB: Place in cylinder 10 or 12 needles at C or front. Place stitches on them from any web; or set up with set-up as described and shown on page 12. Thread machine as shown and described, page 11. Regulate take-up and place yarn in Heel Spring. Place weight hook with one or more weights on work. Hold down work with left hand if necessary. Knit forward and backward a few times. Regulate tension or length of stitch if required. See that take-up or Heel Spring controls or takes up all slack yarn caused by reversing. Practice flat web until well and fully understood.

Flat web work is very easy and is good practice preparatory to knitting heel and toe, and lays the foundation for all kinds of flat web knitting as required in very small children's stockings, drawers, underwear, etc.

NARROWING: Stop Clasp Ring holder at B or left. Place Clasp Ring over it. Lift third needle to right of left side of web out of cylinder, with stitch on, and place its stitch on the next needle to the right. Lift out of cylinder the two needles on the left. Place them in the next two grooves to the right. Knit four or five rows backward and forward. Repeat the narrowing on the left side of web, with cylinder band remaining over band holder.

WIDENING: Lift out of cylinder two needles on left of web. Place them into the two next grooves on the left. Place one needle into the empty cylinder groove. Lift a stitch from the first needle on the right. Lift the last stitch cast off by this needle. Place it on the needle placed in empty groove. Knit 5 or 6 rounds and repeat the widening on one or both sides of web as may be desired.

Narrowing or widening can be done on one or both sides of the web when required, and also done on as many stitches from the edge of the web as desired according to the nature of the work.

HEEL AND TOE FLAT WEB.

Used in Knitting New Heels and Toes in Old Work, etc.

ROUND HEEL AND TOE: Have, or place needles in front half of cylinder. Turn crank, stop Yarn Carrier at B or left side. Have, or place stitches on needles from any web, or set up with set-up as described and shown, page 12. Place on the weight hook with one or more weights. Thread machine; regulate tension, take-up, etc. Knit as many rows flat web as may be desired. Stop yarn carrier, last row at right or at D. Count the needles used in knitting flat web.

Raise out of action one-quarter of needles on right, leaving one-half down in centre.

FIRST PART OF HEEL: Raise out of action one needle on left or at B. Knit one row to right and stop carrier at A. Raise out of action one needle on right or at D. Knit one row to left, and stop carrier at back or A. Continue raising one needle each row knit, until all needles are raised except 8, 10, 12, etc., according to the size of heel required. The number of needles varies according to cylinder used. Knit last row in direction of C. B. A. See Chart.

SECOND PART OF HEEL: Place the heel hook on the Heel side of web (see chart.) Put down one needle at left or at B. That is, on the same side as the yarn. Place the yarn over on the back of the needle put down. Knit one row to right and stop carrier at back or A. Put down one needle at right or at D. Place the yarn over on the back of the needle put down. Knit one row to left and stop Carrier at back or at A. Continue putting down one needle each row knit, until all the needles raised in making first part of heel are put down, except the first needle, raised on each side when first starting heel. At this point the heel is finished. Now knit last part of row from left to right. Stop yarn carrier at the front or at C. Put down all needles remaining up. Knit foot, then toe, the same as heel. Knit one row or round before running off the work. This round is afterward ravelled for seaming toe. Catch work and weights in left hand. Raise the work up slightly to prevent stitches from ravelling out while running off work. Break yarn and knit backward and forward, until all stitches are run off needles. Place weight hook, work and weights on table.

HEEL AND TOE are made practically the same, and for practice are more easily made with only half the needles in the machine. In second part of heel or toe the needles may be put down on the opposite side to the yarn, without placing the yarn over on the back of needles put down, which makes the usual Commercial Heel made in factories and is the most rapidly done and illustrates the manner of Heel Knitting on both circular and flat web work.

CHILD'S PLAIN STOCKING.

KNIT FLAT WEB (See also page 23): Remove all needles from Needle cylinder on back and from front half, except those required, say 30, 40 or 50, according to the size of stocking. Put yarn in Heel spring. Commence with set up in the usual manner. (See page 12.) Make hem top or ordinary set-up top as desired. Knit 50 or 60 rounds flat web, according to size. Narrow ankle on each side of flat web. See page 23. Knit 20 or 30 rows after narrowing are complete. Stop yarn carrier at the left or at B. Raise out of action on the side opposite yarn, three quarters of whole number of needles left after narrowing. Put down two or three needles to make heel larger, especially if same yarn is used in knitting heel. Knit one row to right; stop carrier at A; hold down heel by hand or with heel hooks.

MAKING HEEL, FIRST HALF: Raise out of action on right side of needles down, one needle in the same manner as in ordinary heel. Knit one row to left and one back to right. Raise one more needle out of action on same side. Knit one row to left and one back to right. Continue raising one needle each two rows knit, until all needles down on left are raised, except four, five or six, according to size of heel required. Stop yarn carrier last row knit at left or at B. Put down the first needle on right of needles down. Knit forward and backward, and put down one more needle on same side as first, and knit forward and backward until all needles are put down which have double stitches, except the last one on right, with double stitch. Stop yarn carrier last round knit on left or at B. Put down all needles and knit one row to right. Stop the yarn carrier at the back or at A.

MAKING HEEL, SECOND HALF: Raise out of action three-quarters of all the needles on the left side of the flat web, less three on right. Knit to left; raise one more needle on left. Knit one row to right and one back to left, raise one more needle out of action same side, and knit two rows backward and forward, and continue raising one needle each two rows knit until all needles down on right are raised, except four, five or six, according to the size of the heel required. Stop yarn carrier last row knit at right or at D. Put down the first needle on left of needles down. Knit two rows, backward and forward, and put down one more needle on same side as first, and knit two more rows backward and forward until all needles are put down which have double stitches, except the last one on left with double stitches. Stop yarn carrier last row knit on right or

at D. Put down all needles; knit toe, foot, etc., in usual manner. Break off yarn; hold work and weights from falling; turn crank backward and forward until all stitches are run off the needles. Place work and weights on table together.

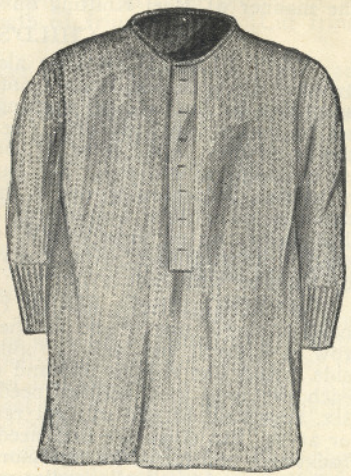
FLAT WEB TOE: Raise out of action one quarter of the needles on each side of the flat web, and knit the toe on the centre or middle half, exactly the same as the toe of a circular stocking, only narrow down the needles in the first part of the toe to correspond to the size of stocking and number of stitches used.

ALL SIZES OF STOCKINGS. Children's and Misses' Hose can be made flat web at the rate of one-half to one dozen a day by a good operator, which renders flat web knitting thoroughly practical for family use, and especially so, as the flat web hose has the advantage of being full fashioned or narrowed in the ankle—the same as the best English and French hose, usually purchased in the stores, which are made exactly as children's flat web stockings herein described, with Selvedge seam up the back of leg.

LARGE FLAT WEB can be knit with all the needles in the cylinder by raising with a cord 12 to 15 needles on each side of the web to allow the cams to pass under the needles raised, then the needles are put down again before knitting the next row.

MAN'S UNDERSHIRT.

KNIT ON PLAIN MACHINE: Knit flat web with medium yarn. Knit with medium tension or loose stitch, and with all needles in the cylinder, provided you wish to knit a large size (see page 23), for knitting large flat web. Knit two flat web strips, each about 72 inches long, and full width of machine, knit the two webs straight on the sides. Fold them evenly in the centre of web. The one web will form left half of shirt, and the other web, the right half. Sew webs together with flat web stitch (see Fig. 16), for seaming flat web. Sew the outside seams within ten inches from the top, leaving ten inches for sleeve. Sew the back seam to the top of shirt. Sew the front seam within thirteen inches of top. Cut the neck in a half circle on front web. Sew the half circular piece to the back with a herring bone stitch, to cover seam. Bind off the front in the usual manner; make buttonholes; sew on buttons, etc. Finish the bottom by hem or crochet stitch.



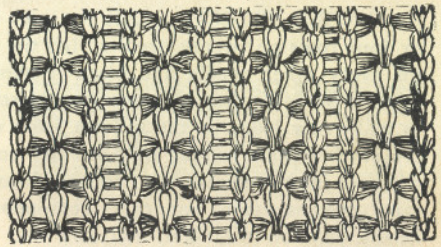
KNITTING SLEEVES: The sleeves are knit the same as a stocking leg with ordinary rib-top (or with 1 and 1 rib top with ribber) about four inches long. The top part of sleeve is knit full size flat web for five inches and a square piece five inches square, or knit on about 30 needles and placed into the flat web opening, that is, one corner is placed into the sleeve and the other corner runs down the side seam of the shirt.

MEN'S AND BOYS' RIBBED UNDERSHIRTS are quickly and easily made on machine with ribber by knitting with loose web with all the needles in the cylinder and all the dial, making web double the length of the body of shirt. Then cut it open from end to end along a rib seam. Fold it in the middle and it will represent the body of a shirt. The web should now be cut in a half circular or elliptical form for the neck and straight down for the bosom opening. The half circular piece formed by cutting neck may be fastened to the back of shirt with the herring bone stitch, or bound down with a piece of tape, and the sides of shirt to arm pits in the same manner. The bottom may be hemmed around or finished with the crochet stitch. The bosom should be finished with a band of knit work made flat web, or with any suitable cloth band made with buttonholes, etc.

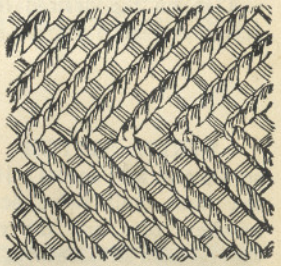
FANCY STITCHES

These fancy stitches make very attractive patterns, but in most cases the effect cannot be adequately realized in woodcuts, and we therefore recommend our customers to try a length of each in order to see the actual effect produced, this depending on the ingenuity of the operator. They are well worth the trouble of working out, and they lend themselves to a variety of purposes, e. g., scarfs, table mats, anti-macassars, children's bonnets and caps, trimmings, etc. They can be knitted either "flat web" or all round the machine, and most of the patterns can be varied by altering the number of needles and the number of rows knitted between each alteration. Commence with ordinary selvedge in each case, knit a few rows plain and have tension LOOSE. When knitting backwards and forwards always thread wool over heel-spring.

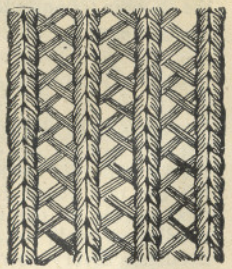
HERRING BONE PATTERN: Have needles in every groove, knit once across or round, put the stitch from each alternate needle onto the next needle to the right, knit one row, forming loops across the empty needles, change the loops one needle to the right; knit one row, change loops again, and repeat, say twelve times; then change the loops to the left for the same number of times; afterwards again to the right until sufficient length knitted.



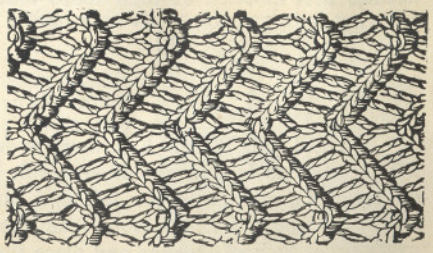
CHEVRON STITCH: Set up flat web on every needle for the desired width; knit once across; put the stitch of each alternate needle upon the next needle to the right; knit once across and change the loops one needle to the right; work thus twelve times across, and then change the loops to the left twelve times, knitting across each time as before. Suitable for trimming children's garments, sacks, etc. For wider work, knit more than twelve times across before changing; for narrower, less.



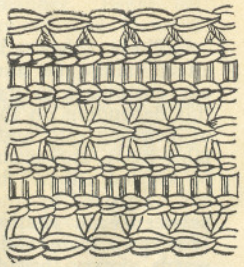
LATTICE STITCH: Commence as before by taking the stitches from every other needle and putting them over the next to the left; knit across once, forming loops; move the loops to the next needles to the right; knit across and carry the loops to the left; knit across and carry the loops to the left, and so on to the length desired.



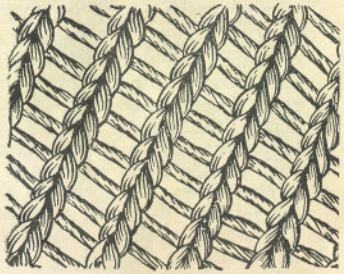
LACEWORK PATTERN: Raise every third needle, knit 3 rows, press all needles down, knit one row, raise same needles again, and repeat. This pattern is more effective with every alternate needle OUT of the Cylinder.



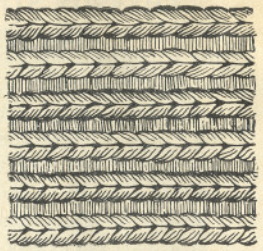
LACE STITCH: Set up the work with either all the needles in or every other one out, according to the coarseness of the stitch desired. Lift every third needle out of action; knit three times across or around; depress the raised needles and knit once across or round; raise the same needles as before and knit across or around three times, and so on, raising and depressing needles. This pattern may be varied by knitting twice instead of three times, or by lifting out of action each alternate needle, instead of each third needle.



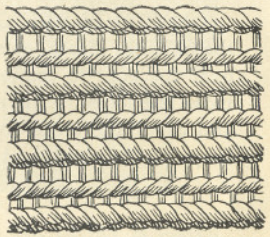
ANGLE STITCH: Knit flat web three or four rows on twenty needles; lift the stitch off every other needle and place it upon the next to the left; then knit one row of stitches to make new loops on the needles from which the stitches were taken; knit another row of stitches; now remove the stitches from the same needles again, and cast them upon the needle next on the right, and knit two rows, and so on the desired length.



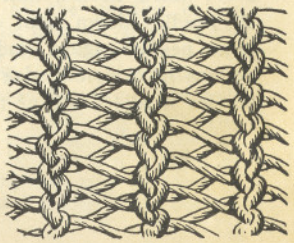
STRIPE STITCH: Take out every other needle, set up and knit across; lift every alternate needle above the cams, knit twice across; change the bobbin for another color, put the raised needles down, and lift those which knit before; knit twice across and change the bobbin; continue to knit in this manner for desired length.



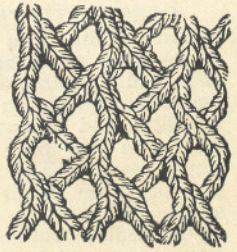
CORD PATTERN: Knit three or four rows plain; lift the stitches off every other needle and place them on the next needle on the left, and knit one row of stitches; lift the new loops formed on the empty needles onto the next needle on the left, and leave the loops on their own needles as well, which will place these loops on the two needles. Every row of new stitches lift the loop off the needles first emptied of their loops onto the next needle, allowing it to remain on its own needle as well.



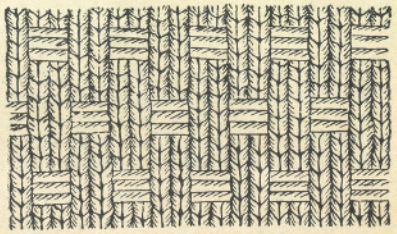
SPIRAL STITCH: Knit three or four rows plain; lift the stitches from every other needle and place them on the next needles to the left and knit one row of stitches; remove the new loops from the empty needles every other row of stitches and place them on the next needles to the left, first to the left, then to the right.



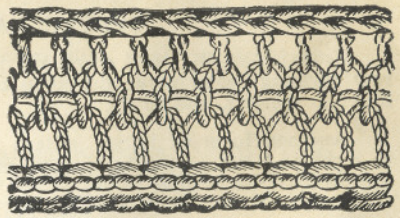
TIDY STITCH: Set up flat web required width; knit once across; change the stitch on the second needle to the third needle, the fourth to the fifth, and so on across, moving to the left; knit across, forming loops over the empty needles; knit back again, forming stitches with these loops; put the stitch of the second needle over the first, that of the fourth over the third, moving the stitches to the right, knit across and back as before, change the stitches to the left, and continue.



BASKET STITCH: Set up for either circular or flat web the number of needles required; knit three or more rows round and across; stop with yarn carrier at front; commence at the right and take out alternate groups of three needles and let them hang upon their own loops inside of cylinder (this will leave three needles in action and three out). Knit three rows round or across; replace the hanging needles; knit three rows across; leave the hanging needles in the cylinder, and take out the other groups of three needles, knit three rows and continue as above.

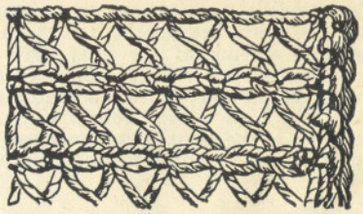


INSERTION PATTERN: On twenty needles flat web knit three or four rows of stitches plain; lift all the needles except one out of action; knit four or six times across on the one needle and hold its stitches down by hand; now lift this needle out of action and depress the next one, and knit four or six rows of stitches on it; lift it out of action and depress the next, and so on completely across the web; or when circular work is desired, all around the work knit one row of plain stitches and work in another fancy stitch, or repeat the same, or knit plain, as desired.



TWISTED STITCH: Have every other needle in; knit across; lift every other needle above the cams; knit three times across; push the needles down and knit once across plain; take up the needles that were down before and knit three times across; put all the needles down and knit once across plain; lift the needles previously in work and knit across three times; proceed thus for the desired length.

LASSO STITCH: Set up flat web of required width: knit a few rows; commence at the right and transfer the loop of the second needle to the next needle—that is, put the second needle on the first, the fourth on the third, and so on; replace the empty needles; knit two rows to form loops on the empty needles. Transfer the loop of the second needle on the first; the fourth and sixth on the fifth needle; eighth and tenth on the ninth needle; continue in this way, transferring one second loop to the right and one to the left; knit two rows. Transfer the loops again, but in the opposite direction—that is, put the second and fourth on the third needle, the sixth and eighth on the seventh needle, and so on; knit two rows; repeat the transfer of the loops, reversing the direction every time, and being careful to start each time on the same needle and knitting for the length required.



NET OR FILET PATTERN.

Needles in every groove, raise out of action all but five; knit to and fro five rows, last row backwards; press into action the next five needles, knit across the ten, raise the first five out of action, knit five rows across the remaining five; press down the next five, knit across the ten, raise the previous five and so on. Start the second row two stitches earlier or later to vary the position of the holes.

BAR AND DIAMOND PATTERN.

Change every alternate stitch to the left, knit across or round, forming loops, and back, forming stitches on the empty needles, change the stitches formed with the loops to the right. Knit twice across, or round, as before, change to the left, and so on.

HONEYCOMB PATTERN.

Every alternate needle out of cylinder. Raise every second needle and knit two rows; press down the one lot of needles and the others; knit two rows, and so on.

SPECIAL LATTICE PATTERN.

Transfer stitch from every alternate needle to the one on the left, knit one row forming loops, move the loops one needle to the right; knit one row, move loops to the left, and so on.

Another form of lattice pattern is produced by moving the loops alternately to right and left in the same row, and reversing in the next row. Start on the same needle each time.

PYRAMID PATTERN.

All needles in cylinder, raise every sixth needle, knit 4 rows; press all needles down, knit two rows; raise the middle needle of each group in the first section, knit 4 rows; press all down, knit two rows; and so on.

SPECIAL RIBBED PATTERN

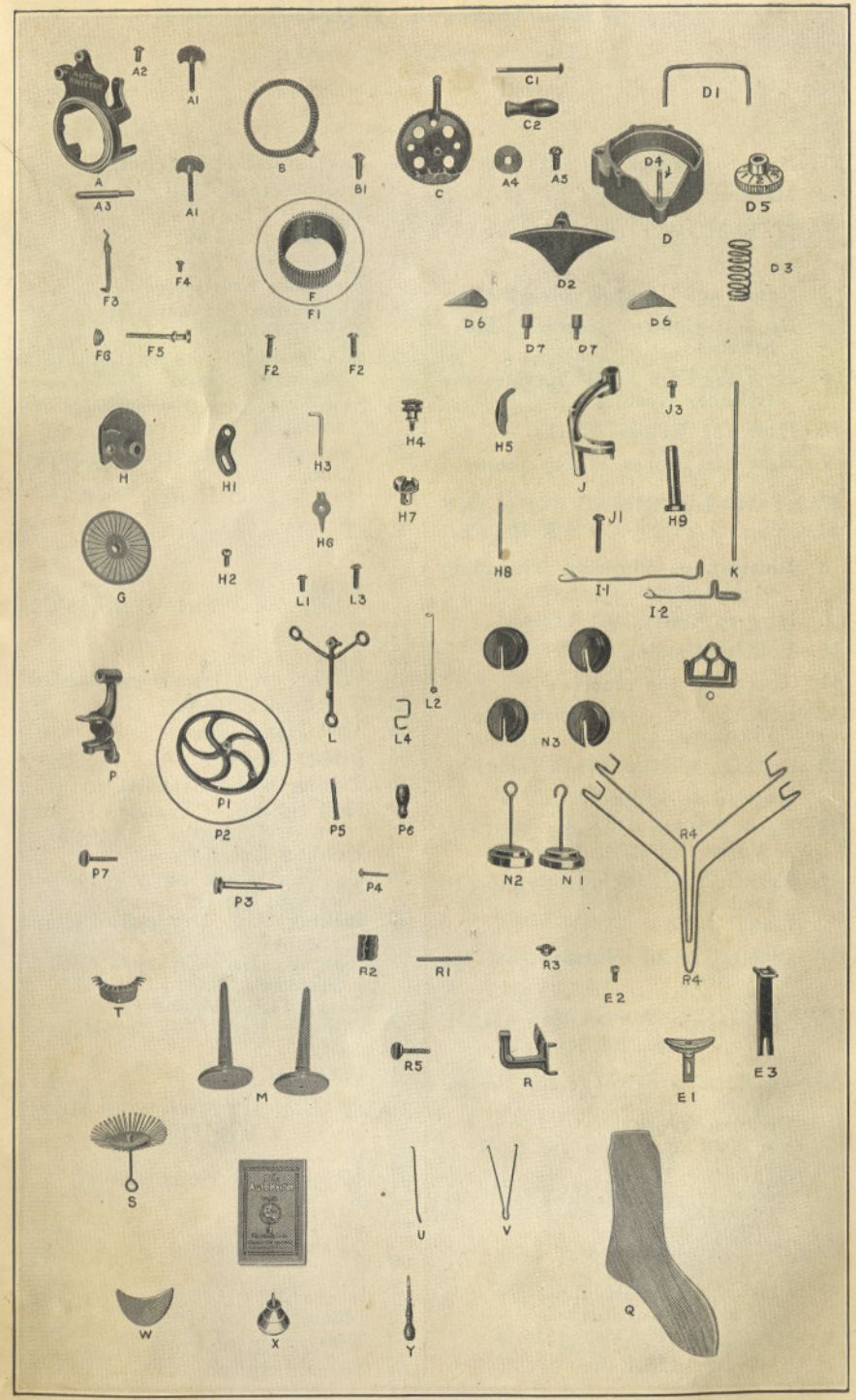
This requires very loose tension. Change every third stitch one needle to the left, knit one row forming loops, carry each loop over the needle both to its right and left so that it will then be in front of 3 needles; knit one row forming loops on the same needles again, carry them to right and left as before, and continue This forms an exceedingly neat pattern.

RIBBON WORK PATTERN.

Take off clasp ring, knit several rows, take out alternate lots of 3 needles, letting them hang on their stitches inside the cylinder, and thus leaving 2 in and 3 out. Knit 3 rows, put all needles in, knit 3 more rows, and throw out the other groups of needles in the same way as the first. Continue thus, throwing out first one set of needles, and then the other.

INDEX

For Ready Reference to Machine Parts And Their Operation



GENERAL INDEX

PRICE LIST OF PARTS

Delivery Charges Prepaid.

Parts	New Price
A. Bed Plate	$4.50
1. Clamp Screws, (each)	.25
2. Yarn Stand Rod Set Screw	.15
3. Crank Wheel Stud	.75
4. Washer for Crank Wheel	.15
5. Screw for Crank Wheel	.15
B. Gear Ring	2.50
1. Yarn Carrier Screw	.15
C. Crank Wheel	2.50
1. Crank Wheel Rivet	.25
2. Crank Wheel Handle	.25
D. Cam Shell	6.00
1. Clasp Ring Holder	.25
2. Tension (or V) Cam	2.00
3. Tension Screw Spring	.25
4. Tension Screw Pin	.50
5. Tension Screw Head	1.00
6. Right and Left Upthrow Cams. (each)	1.00
7. Upthrow Cams	.15
E. Yarn Carrier Head	1.50
1. Yarn Carrier Stem	1.25
2. Yarn Carrier Head Screw	.15
F. Cylinders	
4½ inch 60 slots	7.00
4½ inch 80 slots	10.00
4½ inch 100 slots	12.00
4½ inch 120 slots	15.00
1. Cylinder Clasp Ring	.50
2. Cylinder Screws (each)	.15
3. Dial Adjuster Lever	1.00
4. Dial Adjuster Lever Screw	.15
5. Dial Adjuster Regulator	1.50
6. Dial Adjuster Regulator Head	.50
G. Ribber Dials	
4½ inch 30 slots	3.50
4½ inch 40 slots	5.00
4½ inch 50 slots	6.00
4½ inch 60 slots	7.50
H. Tappet Plate	3.50
1. Timing Segment	.25
2. Timing Segment Screw	.15
3. Driving Pin	.25
4. Ribber Tension Thumb Screw	.50
5. Ribber Tension Cam	1.50
6. Ribber Tension Pointer	.15
7. Switch Cam	2.00
8. Handle or Switch Pin	.15
9. Dial Post	1.00
I. Needles 12, 18 or 36 gauge	
1. Cylinder (or long) Per dozen	.60
2. Ribber (or short) Per dozen	.60
J. Ribber Arm	3.00
1. Height Regulating Screw	.25
K. Yarn Stand Rod	.75
Ribber Arm Set Screw	.15
L. Yarn Stand Top	2.00
1. Yarn Stand Top Set Screw	.15
2. Take Up (or heel) Spring	.25
3. Take Up (or heel) Spring Screw	.15
4. Take Up Lock	.20
M. Bobbins (each)	.50
N. Weights and Holders	
1. Weight Holder (open)	.30
2. Weight Holder (closed)	.30
3. Weights (each)	.50
O. Buckle	.75
P. Yarn Winder Clamp	1.00
1. Yarn Winder Wheel	1.00
2. Yarn Winder Belt	.25
3. Yarn Winder Spindle	.50
4. Yarn Winder Stud Screw	.15
5. Yarn Winder Handle Rivet	.25
6. Yarn Winder Handle	.25
7. Yarn Winder Clamp Screw	.25
Q. Hose Boards (Men's) each	.50
R. Swift Clamp	1.00
1. Swift Clamp Shaft	.50
2. Swift Arm Holder	.50
3. Swift Arm Nut	.25
4. Swift Arms (each)	.50
5. Swift Clamp Screws	.25
S. Set Up Complete	1.50
T. Hold Down	.50
U. Work Hook	.25
V. Heel Hook	.50
W. Crescent	.25
X. Oil Can	.25
Y. Screw Driver	.25
Instruction Book	1.00

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