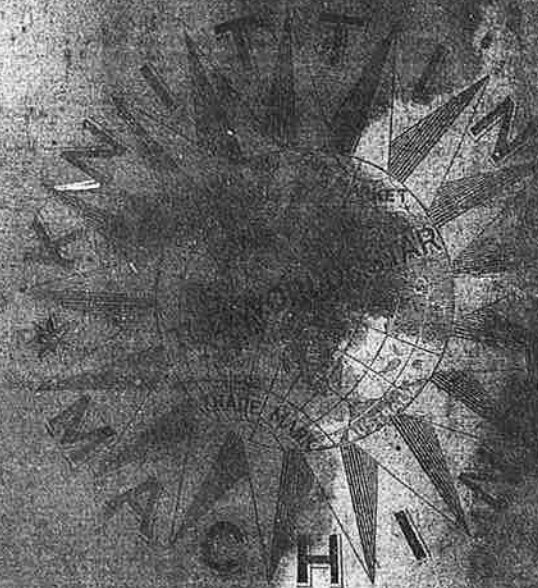


INSTRUCTION BOOK

THE WORLD'S STAR



Royal Letter's Patent, No. 450,000

MANUFACTURED BY

CREELMAN BROS.

GEORGETOWN, ONT., CANADA



BEST
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8 to one

C. BLACKETT ROBINSON, PRINTER, 5 JORDAN STREET, TORONTO

IMPORTANT.

Each Part of Machine can be Sent by Mail.

Nos. 1, 2, 3, 4, and one or two other heavy pieces can be shipped in most cases more cheaply by express. Unless we have special orders how to ship, we will ship goods ordered by the quickest and cheapest conveyance.

Goods mailed are charged at the usual postage and parcel rate, 6 cents per 4 oz. over and above our regular list price.

Parties with whom we are not acquainted sufficiently to credit, will save *their time and ours* by sending cash with order in current money, by Registered letter, Post Office order, or Bank Cheque, otherwise goods ordered will be shipped by Express, C.O.D. with collect charges for return of the money added to the bill.

Exchange on Money is charged to customers, as *our prices quoted are net.* Liberal discount to large dealers and manufacturers.

100 24-gauge needles weigh 3 oz. Postage, 6 cents.

100 18-gauge needles weigh 3½ oz. " "

100 12-gauge needles weigh 4 oz. " "

Each additional 100 or part of 100 will cost an extra rate of 6 cents postage.

One dozen needles will cost the same as 100 by parcel postage. But if sent by letter can be mailed at single rates.

To Manufacturers of Hosiery.

can supply four sizes of Machines:

| | | | |
|----|----------------------------------|-------|---|
| 4½ | inch diameter of Family Machine. | | |
| 4 | " | Mfrs. | " |
| 3½ | " | " | " |
| 2½ | " | " | " |

orders run in numbers from 36 up to the finest which can be change in gauge where the fineness requires it.

INTRODUCTION.

WE offer "The World's Star" Knitting Machine, under Royal Letters Patent to the public, with the fullest assurance that it will meet the urgent demand so long made by the trade for cheap and pure seamless hosiery, and especially the great domestic want—a perfect, simple and reliable knitter.

It is intended to be eminently and emphatically a Family Knitting Machine, yet, notwithstanding its superiority in this respect, it has climbed another ladder of fame and stepped to the foremost rank, and now holds the enviable position of "The Great Hosiery Knitter" among manufacturers of pure seamless hosiery, even outrivalling other machines of our own manufacture which have heretofore held a deserving and enviable reputation above others. The high merits and reputation gained for this new Knitter have arisen undoubtedly from its pure merits of superiority and perfection, which are the outgrowth of many years of constant study of the ingenious inventive minds of the proprietors, and their best mechanical skill.

Ten years' experience in selling and manufacturing knitting machines has enabled us to see where improvements were needed and the simplest and best means of applying them, and, in consequence, we have perfected our old patents and invented an entirely new machine, "The World's Star" which is the most complete, reliable, cheap Knitter for factory and family use yet offered to the public, and the only circular knitting machine in the world which makes full fashioned seamless hosiery.

SEND
Cut the
to one

DRAWINGS OF ALL MACHINE PARTS

FOR THE
PLAIN MACHINE.

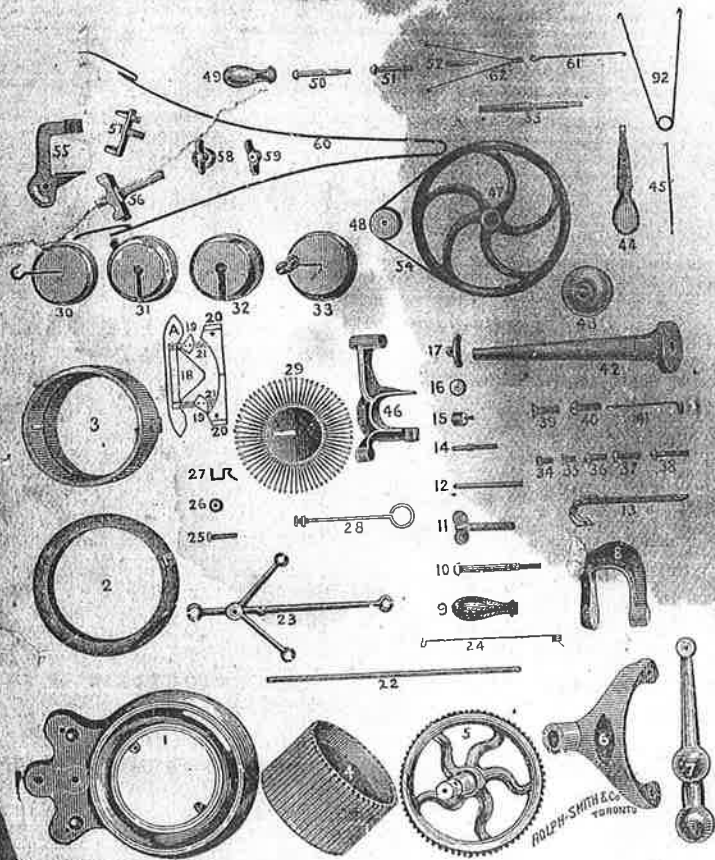


FIG. 1.

Do not fail to send diameter size of machine when ordering repair parts of Machine or Ribber; also the number of the part and

PRICE LIST OF PARTS

FOR
PLAIN MACHINE

| No. | Name of Part. | Price Each. | No. | Name of Part. | Price Each. |
|-----|----------------------|----------------|-----|--------------------------|-------------|
| 1 | Bed-plate | \$5 00 | 33 | Heel-holder | \$0 75 |
| 2 | Cog-ring | 2 00 | 34 | Tension bearing-screw | 0 05 |
| 3 | Cam-cylinder | 6 00 | 35 | Cam-screws | 0 05 |
| 4 | Needle-cylinder | \$4 00 to 6 00 | 36 | Yarn-carrier screw | 0 10 |
| 5 | Crank-wheel | 2 00 | 37 | Needle-cylinder screw | 0 10 |
| 6 | Crank-wheel cap | 1 50 | 38 | Crank-screw, old style | 0 10 |
| 7 | Crank | 0 75 | 39 | Crank-wheel cap-screw | 0 15 |
| 8 | Table-clamp | 0 50 | 40 | Bed-plate clamp-screw | 0 15 |
| 9 | Crank-handle | 0 10 | 41 | Needle | 0 05 |
| 10 | Crank handle-yivet | 0 10 | 42 | Bobbin | 0 06 |
| 11 | Table-clamp screw | 0 15 | 43 | Oil-can | 0 20 |
| 12 | Bobbin-pin | 0 05 | 44 | Screw-driver | 0 20 |
| 13 | Yarn-carrier | 2 00 | 45 | Wool-hook | 0 20 |
| 14 | Tension-screw | 0 20 | 46 | Bobbin-winder clamp | 0 50 |
| 15 | Tension-screw nut | 0 20 | 47 | " wheel | 0 50 |
| 16 | Tension-screw head | 0 10 | 48 | " pulley | 0 25 |
| 17 | Tension-bearing | 0 25 | 49 | " handle | 0 10 |
| 18 | Tension V-cam | 0 75 | 50 | " rivet | 0 10 |
| 19 | Sliding-lugs | 0 15 | 51 | " wheel | 0 10 |
| 20 | Lower-cams | 0 30 | 52 | Crank-screw, new style | 0 10 |
| 21 | Sliding-lug back | 0 10 | 53 | Bobbin-winder spindle | 0 25 |
| 22 | V-protecting-cam | 0 75 | 54 | " belt | 0 10 |
| 23 | Yarn-stand rod | 0 25 | 55 | Swift table-clamp | 0 50 |
| 24 | Take-up spring | 0 50 | 56 | " arm-holder | 0 50 |
| 25 | Take-up spring arbor | 0 25 | 57 | " adjuster | 0 50 |
| 26 | Take-up spring nut | 0 15 | 58 | " arm-holder nut | 0 15 |
| 27 | Take-up lock | 0 15 | 59 | " adjuster nut | 0 10 |
| 28 | Set-up rod | 0 15 | 60 | " arms | 0 25 |
| 29 | Set-up device | 0 30 | 61 | Outside heel-hook | 0 15 |
| 30 | Wool-hook | 1 20 | 62 | Double heel-hook | 0 30 |
| 31 | Small weight | 0 25 | 63 | Manufacturers' heel-hook | 0 30 |
| 32 | Large weight | 0 15 | 64 | Tension pointer | 0 10 |
| | | 0 25 | 65 | " indicator | 0 10 |

Prices of Combined Parts.

| No. | Name of Part. | Price Each. | Name of Part. | Price Each. |
|-----|--------------------|-------------|------------------------|-------------|
| | Bed-plate complete | \$4 00 | Bobbin-winder complete | \$4 00 |
| | Cam-cylinder | 6 00 | Swift or Yarn-reel | 2 00 |
| | Yarn-stand | 2 00 | Lower cam | 0 30 |
| | Set up device | 1 50 | Needles, per dozen | 0 30 |
| | Heel-hooks | 1 25 | " per 100 | 3 00 |
| | Crank-handle | 1 00 | Bobbins, per dozen | 0 40 |

MANUFACTURERS OF HOSIERY, using One Dozen or more Machines, supplied with repair parts and Machines at special prices. Will be pleased to quote prices and give all particulars respecting Cost of Plant, Cost of Yarn, Cost per Dozen, Quantity made per day, Profits, and to send Agents and bona fide Manufacturers, on application.

Do Not Forget It.

It is of the greatest importance, and an absolute necessity, that new beginners should become thoroughly acquainted with the names of all parts of the plain machine before attempting to knit a single stitch. Then our instructions will appear simple, and the operator more intelligent to receive them.

Parties having no Ribber with the Machine will only become acquainted with the list below of plain machine parts.

Those having the Ribber will find it better not to tax the mind with names of Ribber parts until they are practical operators on plain machine. (See p. 50.)

STYLE NO. 1.

FAMILY

Knitting Machine

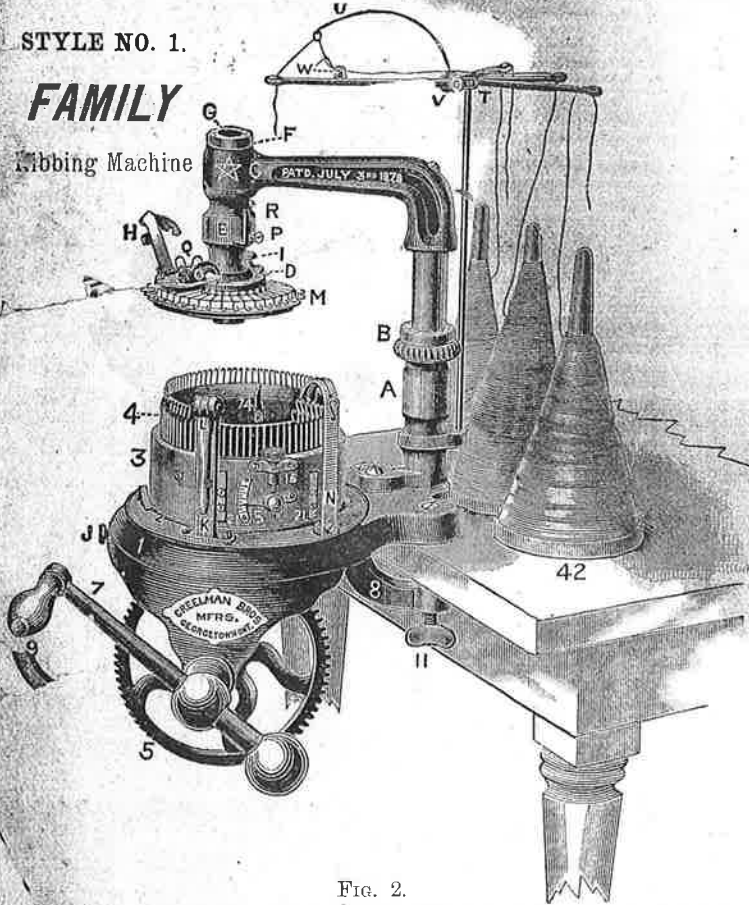


FIG. 2.

Names and Numbers by which Machine Parts are known.

1, Bed-Plate. No. 2, Cog-Ring. No. 3, Cam-Cylinder. No. 4, Needle-Holder. No. 5, Crank-Wheel. No. 7, Crank. No. 8, Table-clamp. No. 9, Yarn-Handle. No. 11, Table-Screw. No. 16, Tension-Screw. No. 42, Yarn-Carrier. N, Yarn-Carrier. S, Tension-Indicator. T, Yarn-Stand, complete. V, Take-up Spring. V, Take-up Arbor; Take-up Nut. W, Take-up Lock.

BEFORE CUT represents our 4 1/2 inch Family Machine with Ribber. IN MACHINE is the same with Ribber detached.

« A Complete Machine with Outfit. »

Each plain Machine is considered complete with One Needle-Cylinder and one set of needles corresponding to the number and size of grooves and the following Extras: See these articles on page 9.

- One Bobbin Winder.
- Three Bobbins.
- One Heel-Holder.
- “ Weight-Hook.
- “ Set of Weights.
- “ Book of Instruction.
- “ Yarn-Reel.
- “ Set-up-Device.
- “ Oil-Can with Oil.
- “ Work-Hook.
- “ Screw-Driver.
- Six Extra Needles.
- One Take-up-Spring.

Extra Needle-Cylinders and other parts are furnished at our regular list-price.

No buckle is required if the work, when too long, is knotted up and the weight-hook end placed in the knot, or a machine needle run through the work at any point, and the weight-hook end placed over the needle.

When machines are ordered at retail price without bobbin-winder, or swift, or other small parts, the price of the parts not wanted will be made up in extra needles, bobbins, repairs, etc., or a part discount of prices can be allowed.

FOLLOW MARGINAL HEAVY TYPE

all through the instruction when a special part is wanted for reference.

BENT
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PART I.

INSTRUCTION.

After taking the machine out of the packing box and clamping it securely to a table by means of the table-screws, the operator, if inexperienced, should at once run off the few rounds of knit work which came on the machine, which is easily done by turning the crank forward, and at same time hold down the knit-work with the other hand; now run the machine a few rounds forward but not backward, and watch closely the movement of the needles and machine parts, and while thus engaged, go to work and introduce yourself to every necessary part of the machine, shown in Fig. 2, and become as familiar with their names in the annexed list as you are with the individual members of your own family.

When you come to the letter T in the list, representing the yarn-stand complete, place it in its place on the machine; and so soon as you are well acquainted with the parts and names of the plain machine, place the ribber in the holder and leave it to the left of the machine, out of action. If you have a ribber, when thoroughly acquainted with plain machine, set to work with equal determination to shake hands and get equally well acquainted with all the ribber parts and their names.

How to take the Machine apart. } The machine needles should all be taken out of the machine; now remove the two needle cylinder screws from the bottom of the cylinder; then lift out the needle cylinder, and take off the cam-cylinder and cog-ring.

Oiling the Machine } *Sperm oil is the best.* Very little oil is needed; a few drops on the bed-plate seats of cam-cylinder and cog-ring, also the driving-wheel journal through the oil hole in cap-wheel-hub. Don't forget the face of the operating-cams and the cam-cylinder needle bed. Oil them sure and a little around the needle cylinder grooves, which can be done as equally well around the top of cam-cylinder after the needle cylinder is placed in the machine. Once or twice a day, in proportion to the work done, will be sufficient to keep the machine in good humour. The bobbin-winder should not be forgotten on its bearings and wearing when in use.

Cam-Cylinder } By holding the cam-cylinder and looking into it from the top side, with the tension screw and cams on the farthest away, the cams will appear as in Fig. 3. The lugs 19 and 20 are called right or left cams, according to this view. The arrows indicate the course the needles travel when in action and acted upon by the cams.

Putting Machine together. } Place the cog-ring into its place on the bed-plate, then give the cam-cylinder its right place on the bed-plate. The machine will do no work when together unless you honour the cam-nub in its proper place, between its two nub friends on the cog-

Place in the needle-cylinder and screws which pass through two lugs from the bottom of bed-plate into the two corresponding needle-cylinder lugs, and the machine together.

Needle Cylinder Operating Cams.

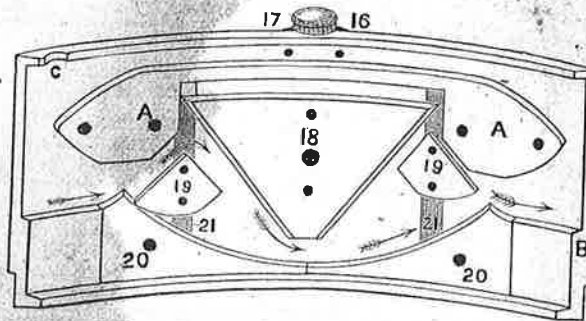


FIG. 3.

When ordering any repair parts give the diameter size of machine, and number, thus: Style 1, 4 1/4 inch diameter. No.

| | |
|-------------------|---------|
| Protecting cam | No. A. |
| Tension V | " 18. |
| Right Sliding cam | " 19. |
| Left | " " 19. |
| Left Lower | " " 20. |
| Right Lower | " " 20. |
| Sliding cam back | " 21. |

Read this and don't you forget to always state whether the parts wanted are for left or right side, and give the diameter size of machine.

By attending to the instruction on this page when ordering repairs, you will save your own time and ours, and get your repairs more promptly. See price list, page 3. Send money and postage with order.

GRIND THE FACE OF CAMS on an emery wheel or grindstone when they become Rough or Worn, and make SMOOTH WITH AN OIL STONE.

By keeping the Cams Smooth, the NEEDLES, CAMS and CYLINDERS will wear longer.

* SHOULD ANY OF THE NEEDLE LATCHES BECOME BENT they will pass the hook and not form their stitch, and will cut the yarn unless straightened, which should be done by pressing to one side by hand or a pair of pliers.

Needle Action and Stitch Formation.

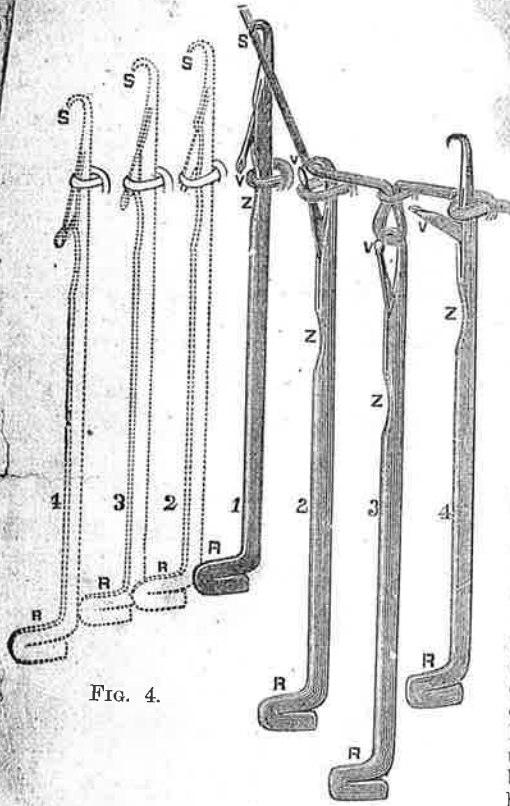


FIG. 4.

Place in the machine, on front side, only four needles; take a piece of fine yarn, one yard long, and loop it around each needle and the hook of weight-hook alternately, ending on the needle on the right, leaving the weight-hook half an inch down from top of the needle-cylinder on the inside. Now move the yarn-carrier round to the right of the four needles, and draw the end of the yarn (held in the right hand while placing the loops upon the needles) through the front and back feeding eyes of yarn carrier; turn the crank *slowly* back, or in the opposite way to which the hands of a clock move, until the needles occupy the position shown in Fig. 4 by the needle 1 and dotted needles 2, 3 and 4, at which point the needle 1 is elevated directly to the top of cam-lug 19, as shown in Fig. 3, and the loop upon the needle has passed down below the latch V into the hollow Z.

Now at this point the needle 1 descends upon the declining face of the V cam, and the loop upon the needle causes the latch V to rise as the needle 1 descends to position occupied by needle 2, and as the machine is turned it takes the position 3 and then rises upon the lower cam 20 to position 4, at which point the loop on needle 4 will be observed to be pressing down the latch V as the needle continues to rise upon cam 20, after the stitch is drawn through and formed as shown by needle 3. The weight upon the work draws down the stitches, which are prevented from rolling off and being dropped, and allows the needle to rise in the stitch. Want of sufficient weight, or the weight being unevenly divided, is the *great cause of the needles casting loops* and allowing the yarn to pass from one needle to another unknit after being once drawn through the loop.

The latch V, when raised to the position shown in needle 2, guides the loop safely over the hook S. The heel R is the portion of the needle acted upon by the cams, and are thereby moved up and down in the needle grooves to form their stitches. If the yarn in the carrier will allow the machine to be reversed, the needles can be observed in the same manner to rise and lower and form new stitches, and so on every row knit. See star, page 7.

BOBBIN WINDING.

Bobbin Winders are of three classes - good, bad, and indifferent. The former cultivate good taste and proper knowledge; the second are careless, or don't want to know how; the latter are lazy, or lack interest. Wise operators will be happier and find a pleasure in knitting, who cultivate taste; and pay the strictest attention to the instruction given here.

THE SWIFT OR YARN REEL
Which we recommend, and give with each Family Machine.

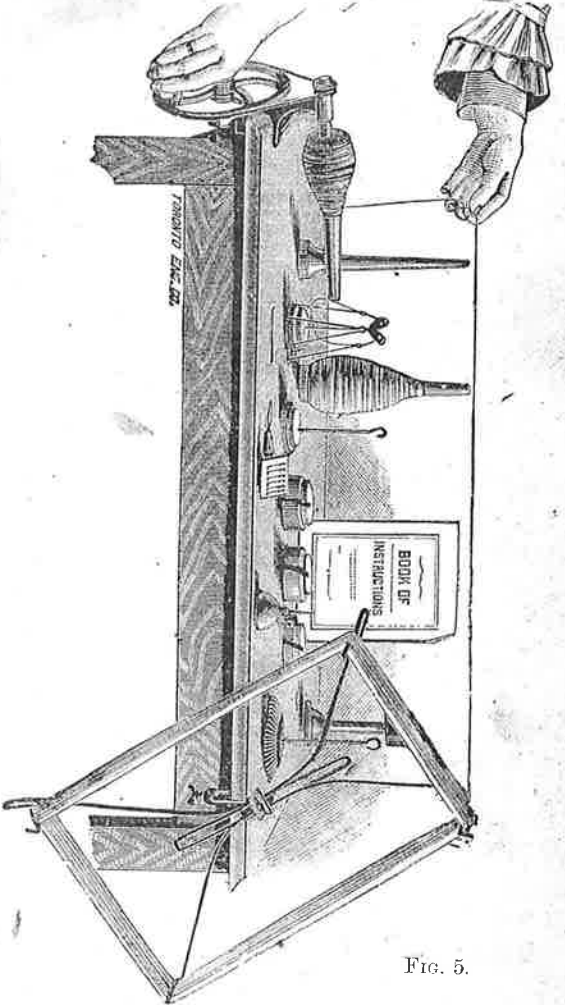


FIG. 5.

Winding the Yarn on } In filling the bobbin commence at the bottom, Bobbins. See Figure. } and wind into the form of a cone, filling the lower end first in a *short even slope*, as represented in Fig. 5 (which shows one bobbin filled, and one on winder being filled).

Fine yarn, or soft twisted wool, should be wound loosely without much pressure while running through the hand; cotton yarns and coarse yarn should be held firm and wound tightly. If the bobbins are poorly wound, the machine at once speaks to the operator, saying: "Wind your bobbins right, and I will work light and right."

See the table on page 22, which gives the yarn most suitable to each needle-cylinder.

Placing Needles in the Machine. } The needles are most readily placed in the machine on the side opposite the *cam-action and tension*.

Each needle is held with the shank or heel end toward the needle-cylinder with the heel downward, and placed in the middle groove close to the top of cam-cylinder, while being held at a right angle to the needle groove, and is then raised upwards, allowing the heel to turn below the cam-cylinder flange.

Speedy operators hold a supply of needles in the one hand with latch ends toward the other hand, and hold the supply hand near to the hand placing in the needles.

Removing Needles from the Machine. } The needles are most readily taken out of the machine on the side opposite the *cams and tension*.

Speedy operators lift the needles up until the shanks come in contact with the flange of cam-cylinder; then draw them forward from the cylinder, and at same time, when at right angles, lift them up and out with the other hand, which carries all that are taken out and all are laid down on the table at once, that they can be readily picked up when placing them in the machine again.

Manufacturers, for convenience and speed to operators, tack down upon the table a piece of doubled knit goods, about six inches square, and the needles are laid down upon this pad, which enables the operator to pick up the needles more quickly, and saves much time.

Removing Needles with their Stitches. } When widening or narrowing on flat-web work, the needles can be removed with their stitches on them by lifting one or two at a time, as required, out through the *slot in the cam-cylinder flange*, on the right side of the tension thumb-screw, and can be placed back to working position again in the same manner with their stitches upon them.

Any machine not having the cam-cylinder slot requires the stitches to be lifted off the needles with the pick-up hook, then they can be removed from the machine entirely, or replaced and the stitch placed on again. Narrowing or widening can be done in either of these ways, but can be done most readily by means of the *cam-cylinder slot*. See letter C, Fig. 3.

HARSH, or BADLY DYED YARNS knit much easier and are more free from breaking, when wound on the bobbin, by passing the yarn through an oily cloth or an oily piece of knit-goods. Wash the yarn if the dyeing has made it hard.

PART II.

FIRST KNITTING LESSON.

Because the world was made in six days, learners should not think they can knit a full fashioned sock or stocking the first trial. They can readily become good operators, and even experts, from a careful study of the Book Instructions alone, without any personal instructions, provided they exercise patience, and creep before they walk, and learn one thing at a time, and the instruction in each part or lesson before proceeding to the next.

Knitting Cord, Fringe, Flat-Web, Etc.

Move the yarn-carrier to the back or side of the machine farthest away from the operator.

Place in the machine, on the front side, only 4 needles, and move the yarn-carrier to the left of the 4 needles. Set a bobbin wound with fine yarn upon one of the three bobbin pins.

Threading the Yarn-Stand. } Pass the yarn through the *yarn-stand eye* directly opposite the bobbin point and forward under the *hook-eye of take-up-lock*, then over the *locking-cross-bar* and under the *front swinging-eye*; now down through the *front eye of yarn-stand* to the yarn-carrier.

Threading the Yarn-Carrier. } Pass the yarn under the hook on the back of carrier, then draw it upward and forward into the *front feeding eye* and through 10 or 12 inches.

Starting the Cord on Needles. } Place the *weight-hook* on the inside of the cylinder half an inch from the top, and pass the yarn around the *hook*, then around the *needle on the left*, again around the *weight-hook* and the *next needle*, and so on until the four needles have been looped alternately with the *weight-hook*. Fasten the yarn securely to the latter, and proceed to knit.

The Take-up-Spring and Take-up-Lock. } Always use the *take-up-spring and lock* for heel and toe work, cord and flat-web knitting. See that the *take-up-lock* is properly threaded, and lift the yarn between the lock and front eye of yarn-stand, into the *eye of take-up-spring*, which must be bent forward to receive it. Turn the crank forward slowly in the direction the hands of a clock until the four needles have completed one row of stitches.

Regulating Tension. } For a short and tight stitch or close knitting. Turn or length of stitch. } the tension *thumb-screw* in the direction the hands of a watch move until the *pointer* moves upward on the *tension indicator* one or two marks, according to the firmness of the work required.

For a long and loose stitch or open knitting. Turn the *tension thumb-screw* in the opposite direction, moving the *pointer* down on indicator according to the quality of web required.

Knitting Cord on Four Needles. } Knit a few rounds slowly, changing the *tension* from *tight to loose* knitting, each few rounds, until the *tension* is well understood, and any length of stitch required can be

side. After knitting a few inches of cord in this manner, break off the yarn within one inch of *yarn-carrier*, and remove the bobbin, and replace it with another with *coarser yarn*. Now thread up the *yarn-stand*, *take-up-lock and spring*, place the new yarn in the carrier with the other, and knit another row of stitches which will be double where the two yarns crossed.

Regulate the *tension* to suit the yarn now in use, and knit a few rounds, break the yarn and change back to the first yarn again, and change *tension* to suit if necessary, and knit the length of cord desired for practice.

Knitting Fringe on Four Needles. Place one needle in the machine on the opposite side to the four cord needles, and proceed as in knitting the cord; raise the *single needle* up out of action above the *cams*, and hold it up until the yarn passes around it, and press the yarn down as the carrier approaches the four needles so that the four needles will catch it; knit eight or ten rounds in this manner, pressing the yarn down each time it approaches the four needles; now cut the yarn on the one needle all but the *last round* which remains to hold the needle up for the next eight or ten rounds, and so on, cutting the yarn in the same manner and knitting eight or ten rounds until the desired practice is obtained. The yarn can be changed in colour as often as desired. Lastly, cut all the threads around the one needle.

Knitting two Fringes at Once. Place three or six needles in the machine opposite the four needles, and lift upon them stitches from the lower end of the cord or any part of the single fringe, and place upon the fringe the weight-hook with one small weight in such manner as will hold down the work on both sides. Knit as many rounds as are desired, and change the colour of yarn as often as desired for practice.

The *cross threads* between the two fringes are cut in the centre after the work is removed from the machine. Three or more fringes can be knit in this manner according to the number of sets of needles employed, and any width of fringe desired can be made on the same principle. As the *yarn-carrier* on the last round approaches the back fringe needles, remove the yarn from carrier and hold the weight-hook from falling; now remove the back needles and place the *weight-hook* upon the front web made by the four needles, and place the *yarn in carrier* again, and knit back and forward on the four needles, forming a few rows of flat-web; then stop the *yarn-carrier* on the left of the four needles.

Widening on Sides of Flat-Web. Lift out the *first needle* on the left of the four needles, and place it in the next empty groove; now lift out the *second needle*, and place it in the groove occupied by the first one removed. Place an extra needle in the middle groove, and place a stitch upon it by lifting the loop cast off from the first needle on either side; now four or six rows should be knit and the widening repeated on the left of the five needles and also on the right in the same manner, again knit four or six rows and repeat the widening on *each side* every four or five rows, or the widening can all be done on *one side* as the nature of the work requires it.

Extra Weight and Heel Hooks. As the flat-web increases in width, the work may require *additional weight*, which can be applied by resting the *left hand* upon the weight-hook or around the work with a light pressure.

When the work climbs up on the side needles, or the side needles on each side are observed to *cast their stitch* after being formed, the two outside heel-hooks should be placed one on *each side* of the web about *one or two* rows of stitches from the top, and *one or two* away from the *selvage edge*. A perfect *selvage* is necessary to make a *perfect seam* when sewed together. By shifting the outside heel-hook occasionally nearer the top or selvage edge, the side needles will knit the selvage more perfectly.

Narrowing on Sides of Flat-Web. Lift out the third needle from the side of the web on which the *cam-cylinder slot* stands, and place its stitch upon the fourth needle; now move the *first and second* needles one groove nearer the web, then knit across and repeat the same operation on the *other side*, and so on every four or six rows knit.

When not convenient to narrow or widen by means of the *cam-cylinder slot* on the desired row of stitches, the stitches can be lifted off the needles to be taken out, and off those to be changed in places by means of the *work-hook* and the needles shifted empty, then the stitches can be replaced. The narrowing may be done on one side, or both, as desired.

Raising Needles out of Action. By lifting any needle or number of needles up until their heels come in contact with the *flange of cam-cylinder*, they will then pass around above the operating *cams* out of action, which is necessary for heel and toe work and fancy stitches. The stitches upon the needles hold them from falling, unless when a stitch has become very loose, in which case the stitch should be tightened or a new stitch placed upon the needle.

Putting Down the Needles once Raised. The operator will do well to raise a few of the needles in the web and then put them down. If they are put down too low the stitch on the needle will cause the *latch to rise and close*; the yarn is then missed and the *stitch dropped*. This will occur more frequently if the yarn used is coarse.

Machine Missing Stitches.

Knitting up Dropped Stitches. Any stitches dropped while knitting can be easily picked up on the *plain machine* while the work is on the machine, but when they occur with ribber in use, it will be found better to do so after the work is removed from the machine. The rib stitches are picked up by turning the work *inside out*, and then raised the same as plain stitches, as follows:

Hold the work with the *dropped stitch next you*, which will keep the end of the work last knit away from you; place the hook of a needle into the *dropped stitch*, and push the needle through under the *first loop* to be lifted and over the *second*, until the stitch and the loop are both back of the latch; now turn the needle on its side with the *latch to the left*, and draw the needle back, guiding the latch under the loop to be lifted, and when under turn the needle with the *latch upward* and draw the needle back until the loop is drawn through the stitch upon the needle; again push the needle through the new stitch under the *next loop* and over the *second*, until they are both back of the latch; now turn the needle on its side, with *latch to the left*, and draw through the loop, and so on until the last one is lifted. The last stitch can then be securely fastened with a needle and thread of yarn, or the yarn drawn through and knotted. The stitches are picked up on the machine in the same manner, only the needle is run down between the *needle-cylinder* and the first cross thread of web and down on the outside of the work until the needle reaches the stitch, which is then hooked up and the needle pushed down to raise the stitch above the latch; now the needle is turned on its side, with the *latch to the left*, and the latch guided up between the first and second cross threads; and as the needle is drawn up, the *latch again is turned up*, and closes upon the loop as it is drawn through. The needle is again depressed until the stitch rises above the latch and the other loops are lifted in the same manner, and the last one placed upon the needle which dropped it.

Practice Better than Precept. Experience teaches fools is a proverb that will suit the wise equally well; therefore, we offer this friendly advice to the inexperienced: *Practise diligently* the instruction so far given, and register in your mind all the details respecting the use of *tension* in different kinds of yarn, the use of *take-up-spring and lock*, and then widen out the web regularly on *each side* until the needles are placed in all the grooves on the *front half* of the *needle-cylinder*.

Knitting Heel and Toe Flat-Web.

Knitting Heel for Practice. } Knit across the last time, so that the yarn-carrier will stand on the right of the web; now raise out the first needle on the right and knit across, then raise the first on the left and knit back; now raise the second needle on the right and knit across again, then raise the second on the left and knit back, and so on, knitting back and forward, always raising one needle to its full height on the side on which the yarn-carrier stands.

Holding down Heel by Hand. } After the first and second needle on each side is raised, the work usually climbs up on the needles and leaves loose loops of yarn unknit on some needles. When this occurs, catch the work with the left hand directly in the middle of the web, or on that part of the heel occupied by the needles knitting. The work can be most easily held on the front side of the machine by placing the back of the hand toward the work, and resting the palm of the hand against the bottom of the needle-cylinder, holding down the work firmly between the thumb and forefinger, and drawing it toward the bottom of the cylinder on the opposite side. Each 3 or 4 times knit across, the thumb and finger will have to be moved upward on the heel for a better hold, and should, as the heel grows narrower, be caught with less cloth folded between the finger and thumb. Speedy operators always hold down the heel by hand and the most determined effort should be made to do it well, as the side needles will invariably cast off the stitch each time of knitting across; in which case the loose thread should be placed behind the needle before it is raised out of action, or the stitch below the loop on the needle cast over the needle-hook by means of the work-hook, which will make the stitch perfect like the others. Any other needle casting a loop can be completed again by means of the work-hook in the same manner. Holding down the heel by hand appears difficult to some; when this is the case, use the heel-hooks.

Holding Down Heel with Heel-Hooks. } The heel-hooks, with one small weight for fine yarn and a large one added for coarse, should be used, and is readily done by holding the weight-hooks with weights in the left hand, and the double heel-hooks at the bottom end in the right; now pass the hooks up close to the needle-cylinder, with their hooks toward the web, and when within one inch of the top press the hooks into the cloth, directly in the centre of the heel needles unraised. In the same manner, the outside heel-hooks should be placed, one on each side of the web, three or four needles toward the centre from the last needles raised, and four to six rows of stitches down from the top. The heel may now be knit, and as the stitches are observed to rise on the side needles, the outside heel-hooks should be placed nearer the centre of the heel as the needles are raised. Stop the yarn-carrier on the left, after raising the needles.

Number of Heel-Needles to be Raised. } For a man's sock, raise the right number of needles until the space occupied by the needles left down is equal to about $2\frac{1}{2}$ inches, measuring by the last needles up on each side. Other size socks and stockings are measured $1\frac{1}{2}$, 2 and $2\frac{1}{4}$ inches according to size. The last needle lifted should be on the left side of the machine before knitting across.

Adjusting Heel-Hooks for 2nd Half. } The double heel-hooks should now be moved upward on the web, within one row of stitches from the top, and placed directly in the centre of the web occupied by the needles down. The outside heel-hook should be placed half an inch down from the top, and opposite the second or third needle away from those that are down. Extra pressure on the heel-hooks by the left hand will assist the needles to form their stitches better for the first few times across.

Putting down Heel Needles. } When putting down the heel needles, be careful not to press them down too far, as the latches are pressed up and closed by the double stitches upon those needles which have been raised, and off go the stitches sure. Put down the first needle opposite the yarn-carrier, which should be the one opposite the last one raised, and knit across, then put down one on the other side and knit back, and so you go knitting back and forward. The outside heel-hooks require to be moved away from the centre, three or four needles when the stitches are observed to rise on the side needles. Always put down the needles in heel and toe on the side opposite to the yarn-carrier.

Double Stitches on the Heel Needles. } All the needles raised while the heel or toe is being knit have two stitches upon them, or a stitch and a loop, which is formed by raising the needles before knitting across, which is always done on the side on which the yarn-carrier stands. The heel is knit when all the needles with double stitch are put down but one on each side. After putting down the last needle on the left, knit across and back, until the yarn-carrier stands in the centre of the heel needles; now put down the two needles on each side, and knit once across each way. Holes will appear in the sides of the heel unless the needles are raised and put down properly.

Knitting a Toe in Man's Sock. } The toe is made in the same manner as the heel, only narrowed down until the space occupied by the needles unlifted measures 2 inches, and small sizes $\frac{1}{2}$ inch or more narrower according to size. When the space occupied by the needles unlifted is made too narrow, the heel and toe will be pointed, and when too many needles are left down the other fault of being too round will appear. Neither of these shapes looks well. Good taste will regulate this matter. Practise diligently and thoroughly this heel and toe business, and you will be competent for promotion to sock-knitting, and happier when you practically confer this honour upon yourself.

Taking the Work from the Machine. } Knit one round after the toe is knit, and then break off the yarn at the carrier, and hold the work with all the weights, from falling to the floor, with the left hand, and turn one or two rounds with the right. Leave the usual weight upon the work while running off. Place the work and weights upon the table, then remove the work from them as soon as taken out of the machine.

NEW HEELS AND TOES.

Old work can be repaired much neater and more substantially in the heels and toes, when worn out, by knitting new heel and toes in place of resorting to the old method of doing a great deal of darning.

For heel or a toe, place in the machine as many needles as the heel or toe originally had, unless finer or coarser yarn is used than in the old work, in which case more or less needles should be put in the machine and two stitches cast upon one needle or an extra stitch cast upon a needle at intervals to make the heel the desired size. After picking up the stitches, make the heel in the usual manner and run off the work and join the stitches run off, to the foot by the knit stitch; knit the toe in the regular way, and press with a damp cloth.

SECOND KNITTING LESSON.

Pupils at school are usually kept at the same lesson—even one week—until they know it. The knitting machine is a good schoolmaster, and will not advance a pupil quickly unless competent, and only when practical on what has been taught; therefore, do not be surprised if you are turned back a few times to mind your P's and Q's and A B C lessons.

Knitting with all the Cylinder Needles. Place all the needles in the machine and turn the yarn-carrier to the back of the machine; now thread the yarn-stand and yarn-carrier properly, and place the set-up into the top of the needle-cylinder with the right hand, and catch the shank of the set-up from below the cylinder with the left, and hold it so that the hooks will be level and about one-eighth of an inch below the top of the needle-cylinder. Now draw yarn from the bobbin through the yarn-carrier until it reaches the floor.

Setting-up the Work.

Set-up used for Setting-up.

Place the set-up within the cylinder, as shown in cut (Fig. 6). Pass the yarn around the right side of the first set-up hook on the left of the yarn-carrier, and then around the left side of the first needle directly opposite; then around the right side of another hook and around the left side of the next needle; and so on setting-up, advancing in the opposite direction around the machine to which the hands of a watch move, alternately passing the yarn around every needle and such set-up hooks that come directly opposite the needles, in such manner that the yarn crosses between the needles and the set-up hooks. When the last needle upon the right of the yarn-carrier has been looped with a hook of the set-up, hold down the set-up with the left hand with sufficient weight to keep the stitches upon the needles after being formed. Now turn the crank forward about a half-turn, and continue setting-up loops upon the remaining needles

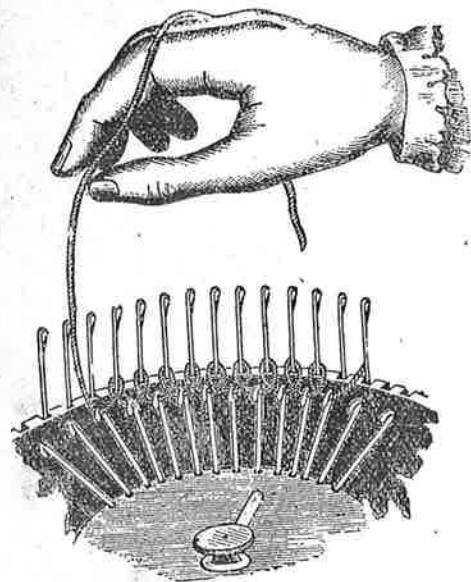


FIG. 6.

and the corresponding set-up hooks. Then repeat the setting-up on the first and second needles which were first looped, and wind the yarn twice or three times around the nut in the centre of the set-up, and break off any extra yarn. Pass the yarn around the same hook twice at intervals, or miss the hook when necessary, to make the hooks and needles come out even.

Weight Hook and Weights. The weight-hook and weights should now be placed upon the set-up, one small weight for fine yarn and the large weight for medium, while coarse yarn requires one large and one small, or more, according to the grade of coarseness. The tension or stitch should now be made long or loose, for coarse yarn, and short or tight if fine yarn is used. Knit 50 or 60 rounds, then stop the yarn-carrier on the front of the machine.

Raising Half the Needles for Heel. Raise out of action,* above the operating cams, the half of the needles on the back side of the machine, and then proceed to knit a heel on the front half of the needles in the same manner as described in first knitting lesson. Should any of the needles raised get pressed down while knitting, they should be at once raised again.

The yarn should be in the take-up-spring and lock, and the heel well held down by hand or with the heel-hooks; then all will go well. Raise one needle each time before knitting across, always on the same side as the yarn-carrier. When the space occupied by the needles down measures two and a-half inches, stop the carrier on the same side on which the first needle was raised, and adjust or put on the heel-hooks, as in first lesson, and put down a needle each time before knitting across, always on the side opposite the yarn-carrier, until all the needles which have the two loops on them are down, except the one on each side first raised, which should be put down with the back half of the needles raised before starting the heel. If the needles have been put down in regular order, the yarn-carrier will now stand on the left or side opposite the first heel needle raised. The yarn-carrier is now moved forward to the centre of the heel.

All Heel Needles raised put down. The needles raised on the back half of the machine before commencing heel are now all put down at once by the palm of the hand, and the first heel needle, raised on each side having the two loops, is put down with them.

Drop Stitches by closed Latches. When putting down the heel needles singly, or all the needles after the heel is knit, drop stitches are caused by putting down the needles too far, especially when knitting coarse yarn; the stitches on the needles causing the latches to rise and close, and the yarn, in passing next time, is missed by the hook of the needles, and the stitches go overboard. Be careful, therefore, and put down all needles just right. Now remove the yarn from the take-up spring, and proceed to knit the foot about 60 rounds, and stop knitting with the yarn-carrier on the back of the machine, and proceed to form the first half of the toe.

Raising half the Needles for Toe. Raise out of action above the cams the half of the needles on the front side of the machine, and place the yarn in the take-up spring and knit across to the left side, and raise the first needle down on this side and knit back; then raise one on the right or yarn-carrier side, and repeat the raising of needles and knitting across in the same manner as described for the heel. Only leave two inches in the space occupied by the needles down in action for the toe of a man's sock.

Now knit the second half of the toe by putting the needles down on the opposite side to which they were raised, viz., opposite the yarn-carrier, in the same manner as the heel.

The first toe needle, raised on each side having two loops upon them, should now be put down with the front half of the needles.

Practice makes Perfect. If the operator can now manage the setting-up, heel and toe, tension or stitch regulator, and the take-up-lock and spring thoroughly, promotion to the honour of a sock will immediately follow. But we would advise those not yet master of the heel and toe, etc., to practise on them until they feel at home knitting heels and toes.

* Spedy operators raise first half of heel and toe needles by a cord, for convenience attached to a bobbin-pin.

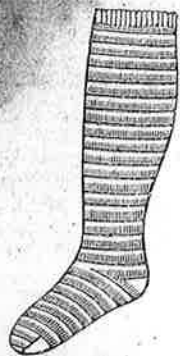


FIG. 7.

One half-dozen heels and toes may be made alternately on the one web after setting up, and this kind of practice, knitting a-quarter pound of yarn over and over again until the yarn is worn out, is better than knitting one pair of socks imperfectly.

Striping or Changing of Colours. } Stop the yarn-carrier on the back of the machine, break off the yarn within one inch of the carrier, place a second bobbin with yarn of a suitable colour on an empty bobbin-pin, and pass the yarn through the corresponding eye of yarn-stand direct to the yarn-carrier; draw the yarn under the hook on back of carrier and forward into its front feeding eye, then across the needles, leaving one inch of the yarn on the inside of the work; the two colours cross each other, forming a splice in the carrier, and both are knit by three or four needles at same time, which is considered better than tying and knotting the yarns. Various colours can be introduced in this manner, and any number of rounds knit between.

Striping by Tying or Knotting. } Break the yarn about two inches from the carrier, for ribber. } when on the back of plain machine and on the front are joined, but can be knit on any side. The stripes are more easily joined on the plain machine at the back, and therefore the heel is usually made on that side. The new colour is tied on with a weaver's knot, or the common knot used in tying up a sore finger. The smaller the knot the more easily it is knit.

Knitting two Colours at once. } Two bobbins are wound with fine yarn, or a very fine one and a coarse one can be knit with a coarse cylinder, and should be knit with the take-up-spring made weak. The two colours knit more evenly when passed over a light take-up-spring. Two threads can be knit in this manner for double heels or knees of children's stockings, or a heavy yarn may be knit in heels or toes of all hosiery.

Seaming the Toe with Knit Stitch.

Hold the work with side to be sewed next you and toe upward. Ravel one or two rows, according as one or more have been knit after toe was knit. Ravel out until the thread comes to the right hand corner. Break off the thread ravelled, all but three-quarters of a yard. Thread the end through a short darning needle; or a short wool needle is better. See Fig. 8.

How to Take the Stitches. } Each stitch has the needle passed through it twice, the first time, outward through from the wrong side of the stitch, and the second time down through the stitch from the outside of the stitch. One new stitch is taken each time the needle is drawn through, as follows: } Pass the needle through the first stitch upon the toe, and take up an extra stitch upon the corner, and then through the first stitch upon the foot; draw the yarn through and pass the needle down through the first stitch upon the toe again and out through the second, and draw the yarn through again, and then pass the needle down through the first stitch upon the foot and out through the second, and so on; take the left half of the stitch down through from the right side of the knitting, and a new one out through from the wrong side. Pass the forefinger under the web and the thumb over the web, and hold all the stitches firm, except the one which is taken up by the needle until the yarn is drawn through; pass the finger and thumb back and forward each time a new stitch is taken from the opposite side of the web. Press the toe under a damp cloth until the stitches can be sewed properly, which will appear as if knit unless the stitches get twisted, split or ravelled out while being sewed.

PART III.

PRACTICAL KNITTING ON PLAIN MACHINE.

Persons quick at learning should be able to proceed to the following practical work without studying the details of first and second knitting lessons, as we have endeavoured to teach clearly, simply and directly, allowing good judgment to play an important part; but for the benefit of children and inexperienced minds, we have written the first and second lessons more full in details, and repeated things of importance more than once, which renders the instruction longer but more effective. We offer this friendly advice to new beginners:—Master thoroughly first and second knitting lessons, or the machine will be boss, and rule against you in practical work.

Knitting a Man's Sock.

Ordinary Rib-Top, } Use needle-cylinder best adapted to yarn to be three and one Rib. } knit (see table, page 22); remove every fourth needle from the cylinder; regulate tension-stitch indicator to suit yarn; thread yarn-stand, take-up-lock and yarn-carrier; commence setting up work with yarn-

Closing or Seaming the Toe. See page 18.



FIG. 8.

carrier on back of machine, on its left side, in the manner illustrated in Fig. 6. When needles are well set-up to right of yarn-carrier, hold down firmly the set-up with left hand, and turn crank forward one-half turn with right; complete setting-up on all needles. See second lesson.

Weight-hooks and Weights. } Place the holder, with one or more weights according to grade of yarn, on set-up, and knit 40 rounds. Stop yarn-carrier on back of machine; place in machine, commencing on left of yarn-carrier, all the needles left out to form the rib. With the pick-up-hook lift from the first needles to the left of those just put in the first loop below the stitches on them, and place these loops upon the needles put in; now turn the crank one-half turn forward, and put in those needles out on the back, placing stitches on them in like manner; lengthen the stitch a little, and knit the plain part of leg 75 rounds. Stop knitting with yarn-carrier on back of machine.

Round-Heel. } Place the yarn in the take-up-spring and lock; raise First Part. } out of action, on front side of machine, one-half the needles; raise on the yarn-carrier side one needle each time before knitting across. When knitting back and forward on heel, hold down the heel firmly by hand, or with the heel-hook and weight centrally placed, with the double hooks about one inch from top of work, the single hooks half an inch down and three needles nearer the centre of heel than the first needle up on each side; change the position of the single hooks two or three needles nearer the centre, as the stitches appear to rise up on the needles. Adding a little extra weight to the weights with the left hand will prevent the stitches from rising, and loops or loose yarn from forming. Narrow the heel by lifting needles until the space between those raised measures straight across two and a-half inches, and leave the yarn-carrier on the right; now place the double heel-hook directly in the centre of the web occupied by the upraised needles, and within one round of the top. Regulate the single heel-hooks, each side half an inch down, and three needles away from the upraised needles.

Heel, Second Part. } Put down one needle opposite yarn carrier each Widenig. } time before knitting across; when knitting back and forward, move the single heel-hooks two or three needles away from the unraised needles when the stitches appear to climb up on the side needles; add a little extra pressure to the weight with the left hand if loose thread or loops appear, widen by putting down needles until the yarn-carrier stands on the right, and only one needle on the left, with two loops upon it. Now put down (not too low to cause the latches of the needles to raise and drop stitches) with the palm of the hand all needles in front of the yarn-carrier, and turn crank forward, at same time put down the rest of the raised needles; then take the yarn out of the take-up-spring and knit 60 rounds for foot, stopping the yarn-carrier on the front of machine.

Toe made same as Heel. } Place the yarn into the take-up-spring and lock. Raise on back of machine one-half of the needles and knit across to the right; raise on the yarn-carrier side one needle each time before knitting across. Hold down the toe firmly in the same manner as described for heel; narrow the toe until the space occupied by the unraised needles measures across two inches. Now adjust the heel-hooks same as for second half of heel, and put down one needle each time of knitting across on the side opposite the yarn carrier, widening the toe until all the needles with double loops on them are put down, except the first toe needle raised on each side, which should be put down with the back half of the needles, raised before forming the first half of the toe.

The yarn-carrier should move the last time of knitting across from left to right, and be stopped on the front side or centre of the toe, while the back half of the needles are being put down by the palm of the hand. One

round, or at most one and a-half rounds, should be knit after the needles are put down. The yarn may now be broken and the work run off the machine, completing the sock except closing the toe. See Fig. 8.

Knitting a Woman's Plain Stocking.

Set-up the work with all the needles in the cylinder in the same manner as described in practice lesson. Regulate the tension to knit a medium length or loose stitch, and knit 16, 20, or 30 rounds, according to the width of bound of top desired, and stop knitting with yarn-carrier on the front of machine.

Bound of Top with Set-up. } Remove the set-up and weights from the work. Turn the top or lower end of the stocking up or inside of itself, and commence on the right of yarn-carrier, and lift one of each of the loops formed in setting up the work upon every needle around to the left of yarn-carrier. The loops can be pressed over by thumb. Now turn the yarn-carrier forward to the back of machine, and at the same time press the work down on the needles directly under the yarn-carrier with the left hand, moving the pressing hand around the work as the yarn-carrier travels. This pressure serves in place of the weights while knitting the half round. Lift up or press over the needles the remaining setting-up loops.

The set-up should now be placed in the machine again, and its hooks run through the work from the cylinder side or outside in six or eight places, or sufficiently to hold the work down while knitting.

The weight-holder should be put on the set-up and the crank turned forward. The left hand may be used to advantage in aiding the set-up and weights the first round, by pressing the work down directly under the yarn-carrier for one round. Now knit the leg to the ankle 75 rounds.

Narrowing Ankle by the Tension. } The ankle is now made smaller by raising the tension indicator one half mark, making the stitches shorter and tighter; then knitting 10 or 15 rounds, and so on, until 65 rounds are knit, raising the indicator each 10 or 15 rounds until the knitting is quite firm.

Add additional weight, if required, by pulling on the work with the left hand.

The yarn is now put in the take-up-spring and lock, and the tension indicator lowered sufficiently to counteract the extra tension added by the take-up-spring, and allow the heel to knit freely and yet form good work.

The heel is now formed the same as the heel of the sock and the foot knit 60 rounds, and the toe then formed in the same manner. A second stocking can be knit before removing the first from the machine by removing the set-up and tying a knot on the work, and placing the weight-hooks with weights in the knot.

Bound of Top Separated by Thread. } Knit one round after putting down the needles on finishing toe of preceding stocking, and stop yarn-carrier on the back of the machine; then break off the yarn close to carrier, and splice in a No. 30 white cotton thread and knit two rounds. Now break the thread and splice in the yarn in the same manner as explained in striping in first knitting lesson, and knit 16, 20, or 30 rounds. Remove the weights from the work and turn the lower end of the new stocking up inside of itself, and lift its stitches next the cotton thread, and place them upon the needles. Press the work down directly under the yarn-carrier, while moving it forward out of the way, to allow of the bound of top being finished. Now place the weight hook with sufficient weight back into the knot again, and then press down the work directly under the yarn-carrier with the left hand for one round, and complete knitting the stocking in the same manner as already described.

Approximate Table for Length of Hose.

| YARNS * Named below, of Medium Grades, are those best adapted to the Sizes and Needle-cylin- ders named. | No. of Needles in the Cylinder. | Gauge of Cylinder Grooves & Needles. | SIZES. See this under headings for No. of rows to be knit. | Men's Half Hose. | | | Men's Long Full Hose. | | | Women's Full Hose. | | | | |
|--|------------------------------------|---|--|---------------------|--------------|-------|--------------------------|---------------|--------|-----------------------|--------------------|---------------|--------|-------|
| | | | | Ribbed Top. | Let to Heel. | Foot. | Hem or Rib Top. | Leg to Ankle. | Ankle. | Foot. | Hem or Rib Top. | Leg to Ankle. | Ankle. | Foot. |
| Farmers', Alloa..... | 56 | 12g | Small.. | 36 | 60 | 56 | 24 | 100 | 66 | 60 | 24 | 100 | 66 | 46 |
| Double Fingering..... | 64 | 12g | Med'm. | 38 | 64 | 60 | 26 | 110 | 70 | 64 | 26 | 110 | 70 | 50 |
| Coarse Cotton..... | 72 | 12g | Large | 68 | 64 | 28 | 120 | 74 | 68 | 28 | 120 | 74 | 54 | |
| Double Merino..... | 72 | 18g | Small.. | 46 | 80 | 75 | 26 | 110 | 75 | 75 | 26 | 110 | 75 | 60 |
| Four-fold Fingering. | 84 | 18g | Med'm. | 48 | 85 | 80 | 28 | 120 | 80 | 80 | 28 | 120 | 80 | 65 |
| Merino and Cotton... | 96 | 18g | Large.. | 50 | 90 | 85 | 30 | 130 | 85 | 85 | 30 | 130 | 85 | 70 |
| Cotton, etc..... | 96 | 24g | Small.. | 72 | 118 | 110 | 28 | 200 | 118 | 110 | 28 | 200 | 118 | 100 |
| Fine Merino..... | 108 | 24g | Med'm. | 76 | 124 | 118 | 30 | 210 | 124 | 118 | 30 | 210 | 124 | 108 |
| Silk, Linen..... | 120 | 24g | Large.. | 80 | 132 | 124 | 32 | 220 | 132 | 124 | 32 | 220 | 132 | 116 |

The Nos. 1, 2, 3 and 4 on the left of the columns indicate the size knit on each cylinder with the same rib, each rib making a different number and size.

The Nos. 1, 2, 3 and 4 at the head of the columns indicate the sizes of tubular hose knit on same cylinder by ribbing with 1, 2, 3 or 4 of the needles out of the cylinders.

| | Size of hose with each rib. | Boys' and Misses' All-rib Hose. | | | | No. of needles | Children's Flat-Web. | | | | | | |
|---|--------------------------------------|---------------------------------|-------------------------|-------------------------|--------------------------|-------------------------|----------------------|-------------------------|----------------------|----------------------|-------------------------|-------------------------|----------------------|
| | | 1 | 2 | 3 | 4 | | | | | | | | |
| Fingerings and Medium coarse yarns in Cotton or Wool. | 56 12g 64 12g 72 18g 84 18g | 1 2 3 4 | Every other needle out. | Every third needle out. | Every fourth needle out. | Every fifth needle out. | 20 22 24 26 | 80 100 120 140 | 35 40 45 50 | 48 56 64 72 | 80 100 120 140 | 50 60 70 85 | 35 40 45 50 |
| Fingerings and Medium fine yarns in Cotton or Wool. | 64 12g 72 18g 84 18g 96 18g | 1 2 3 4 | Every other needle out. | Every third needle out. | Every fourth needle out. | Every fifth needle out. | 22 24 26 28 | 85 105 125 145 | 55 65 75 85 | 40 45 50 55 | 52 60 68 76 | 85 105 125 145 | 40 45 50 55 |

* Extra coarse yarns named may knit too close and cut upon the fine cylinders, and should only be knit on the coarse cylinders. Smaller sizes than named can be knit on the coarse cylinders with good elastic yarn. The number of rounds to be knit in each part is indicated in columns headed Top, Leg, Ankle, Foot, etc.

As every gauge of yarn knit on the same cylinder will make a different size, and every cylinder will make a different size, this table cannot be complete; judgment must be used.

WORTH KNOWING.

Our needles are the celebrated Integral Latch Needles. HAVING NO RIVET to work loose and cut the yarn, therefore give better satisfaction and smoothness in work.

SEND DIRECT TO US OR OUR AUTHORIZED AGENTS

By mail. Do not on any account purchase needles from Tom, Dick or Harry, on account of cheapness, as cheap needles are very liable to lack in temper, smoothness of finish, size and length. A POOR NEEDLE is dear at any price, and will wear out the needle-cylinders, cams, etc., very quickly, and may ruin the machinery before you can detect it.

A Woman's Stocking, Rib Ankle and Cap Heel.



FIG. 9.

Bind off the top of the stocking in either of the ways described, and knit 75 rounds, then narrow the ankle.

Narrowed Ankle } Lift out one needle directly Ribbed three and one. } on the back of the machine, through the slot in the cam-cylinder, and place its stitch upon the needle next it; now knit four rounds and lift out the fourth needle on each side of the first one removed, and place their stitches upon the needles next them; again knit four rounds, and so on. Every four rounds lift out the fourth needle from the last one removed on each side until every fourth needle all round the machine is removed, forming the ankle, three and one rib. Now knit 20 rounds, and form the heel on the back of the machine.

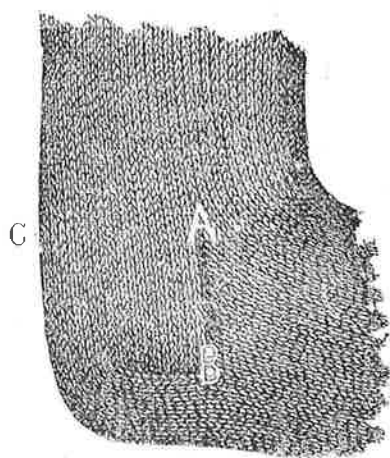


FIG. 10.

Cap Heel like Hand Knit. } Place the yarn-carrier on the front of the machine; raise half the needles on the back, put yarn in take-up-spring and lock, then knit back and forward on the other half of the needles without raising any more needles, knitting a flat-web 26 times across for 64 and 72 cylinders; 28 times for 84 cylinder; and 30, 32, etc., for finer cylinders; and leave the yarn-carrier the last time on the left side. Raise directly on the front of the machine, or centre of the heel, about ten needles for coarse cylinders, 12 needles for medium cylinders, and 14 needles for fine cylinders, which will leave the same number down on each side of the heel raised in the centre of the heel.

Now raise the half on the right of the centre ones, and knit across the half on the left. Remove the yarn from the carrier, and turn the crank forward until the needle-slot in the cam-cylinder arrives opposite the first needle un-raised on the left of the heel. Lift out through this slot the heel-needles down on the left, two or three at a time, with their stitches on them, and place them on the inside of the needle-cylinder out of the way of the passing yarn-carrier. Continue turning the crank forward until the cam-cylinder slot passes the centre heel-needles first raised, then lift out the half of the heel needles on the right of the centre needles, two at a time, placing them in the inside of the needle-cylinder, out of the way of the passing yarn-carrier, in the same manner as described on the left of the centre heel-needles. Now turn the crank forward until the yarn-carrier arrives at the left side of the centre needles, and put down the centre needles at the same time.

Place the yarn in the yarn-carrier again, and the centre heel-hooks, with a light weight, upon the centre heel-needles.

Knitting Bottom of Cap Heel. Lift the first needle lying on the inside of the needle-cylinder on the right of the centre heel-needles, and cast its stitch upon the right side needle of the centre heel-needles; then withdraw the needle and knit across and place the stitch of the corresponding needle on the left upon the side needle on the left of the centre heel-needles, and so on, placing the stitches of the next needle lying within the cylinder upon the first needle of the centre heel-needles opposite the yarn-carrier every time before knitting across, until all the needles lying within the cylinder are lifted upon the side needles of the centre heel-needles. Stop the yarn-carrier on the left side after lifting the last stitch.

Now put in the needles out on the right side, and put down the first needle up on the right side; lift a stitch upon the needle put down from the lowest corner of the flat-web, and upon each of the needles put in, place stitches lifted from selvage of the flat-web on the same side. The stitches should be lifted from the selvage so as to distribute the length of the selvage evenly on the needles put in, and will come out right if the heel flat-web part has been knit the proper length to suit the cylinder used, and needles put in on the side of the centre heel-needles.

Place upon the heel opposite the needles just put in, the outside heel-hook corresponding to that side. Put down the back half of the needles at the same time and knit around. Now put in the other half of the needles on the left of the centre heel-needles, and place a stitch from the lower corner of the selvage upon the first foot needle upon that side, and lift stitches from the selvage on each of the needles put in, and place the corresponding heel-hook upon this side of the heel. Now put on an extra weight if necessary, and proceed to knit the foot the same as in first stocking the desired length. The toe can now be knit as described in man's full knee stocking.

Special Toe in two Parts. Raise out of action half the needles on the front of the machine, and knit across back and forward flat-web, then lift out of the machine the third needle on each side of the web; and place their stitches upon the fourth needles; then move the first and second needles each side over one needle groove next the needle having the narrowed stitch. Again knit across back and forward, narrow the third needles each side on to the fourth, and move the first and second needles over in the same manner as in first narrowing. Narrow in this manner every two rows knit until all but 10, 12, 14, 16 needles, etc., according to the cylinder used, are left in on the back of the machine. Now break off the yarn and run off the work of the centre needles, and lift them out of the machine.

Put down the needles on the front of the machine, and proceed to narrow the other half of the toe in the same manner. The stitches of the centre needles taken out on each side can be closed with the knit stitch in the manner described and illustrated on pages 18 and 19.

Then the work can be turned inside out and the selvage edge of the toe sewed together by means of the flat-web stitch. See page 47.

Full-Fashioned Plain Stocking.

Commence the stocking with a bound of top, and knit 125 rounds for the leg before narrowing. Now remove a needle directly on the front of the machine, and cast its stitch upon the needle next it, and raise out of action 14 to 18 needles on the right of the needle removed, and knit around until all the needles on the left of those raised have completed their stitch.

Now place the yarn in the take-up-spring and lock, and knit back. At same time put down those needles just raised when the yarn-carrier is opposite the narrowing on the back of the machine; and raise 14 to 18 needles on the left of the needle which was taken out, and so on; knit backward and forward flat-web 6 rows of stitches, putting down those needles raised on one side

and raising as many on the opposite side as will allow the machine to be reversed without the cams engaging with the needles on the side on which needles are raised.

Narrow every six rows on each side of the first needle removed; lift the third needle out on each side, and cast its stitch upon the fourth one; then move the first and second needle on each side one groove toward the first needle removed, to close up the vacant needle grooves caused by the removal of the narrowing needles. Narrow six or seven times, reducing the stitches on a 72 cylinder tubular work to 60 flat-web. Knit 35 rows flat-web after narrowing, then put in the needles which were taken out, one every four rows knit, which is done by lifting out the first needle on each side and moving it one groove away from the work, and moving the second needle on each side into the groove occupied by the first. Fill up the grooves occupied by the second needles by new needles, and lift the loop below the stitch on the fourth needle each side, and place them on the needles put in. Widen out in this manner every four rounds until all the needles are put in the cylinder again. Now knit three or four rounds and form the round or cap-heel on the same side as the narrowing, knit the foot 55 rounds, and form either round or special toe.

Full Fashioned Knit on two Cylinders. After narrowing the seventh time for the ankle, the yarn is broken and the work run off, then a cylinder with 12 needles less is put on the machine, and the stitches of stocking, when run off the machine, are lifted upon the needles in the cylinder in such manner as will bring the two sides of the flat-web either directly on the back or the front of the machine. The ankle is then knit the proper length tubular, and the heel formed on the same side as the narrowing is on, and the foot and toe are then knit, completing the stocking. Stockings are usually narrowed in this manner: 12 needles making the 120 suit the 108, the 108 the 96, the 96 the 84, the 84 the 72, and so on, down the list of cylinders.

Flat-Web Stocking Gored Out.

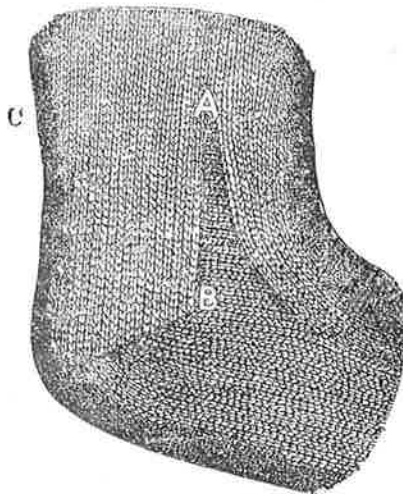


FIG. 11.

Set-up the work on any cylinder with suitable yarn according to size desired, knitting the top either ribbed or hem-top; knit the desired length for the ankle according to table of lengths, page 22; lift out one needle directly on the front of the machine and knit flat-web, narrowing the ankle on each side in the usual manner, every 4, 6, or 8 rows, according to size and yarn used. Knit the proper length for ankle; stop the yarn-carrier on the back of the machine, and lift out of the machine, and leave on the inside of the cylinder one-half of the needles with their stitches upon them, removing the same number of needles on each side of the web. Now knit the instep and top of the foot the desired length according to the table on page 22, and narrow off the toe as described on page 24; remove the work and the remaining needles from the machine, and place in the machine again those needles which were removed with the stitches upon them, so that the side

needles come together to form one web A to C, and knit a flat-web on these needles from A to B for heel-cap. Then form heel by narrowing or lifting out of action one needle on the yarn-carrier side each time of knitting across, until the round heel is narrowed down to two and a-half inches, then depress the needles and widen out again in the ordinary way. Stop the yarn-carrier in the middle of the web and place in 14, 16, or 18 needles according to size, and lift the stitches from the selvage A B each side upon the needles put in; knit backward and forward, raising one needle on each side until the same number that were put in to receive the selvage edge needles are raised. Knit the bottom of the foot in length to correspond with the top of the foot; narrow off the toe in the same manner as the upper half.

Sew up the sides of the foot and leg, and close the toe with the knit-seaming stitch on page 18.

Men's Gauntlets and Mitts.



FIG. 12.

Lifting Selvage } Lift on to the first needles each side which have
Stitches of Thumb. } stitches upon them a stitch from the corners of the flat-web first knit; so as to make a good connection where the flat-web joins the hand.

Lift upon half of the thumb needles stitches from one side of selvage of thumb, and place upon the other half of the needles stitches from the selvage edge of corresponding side of thumb. Thread the yarn in the carrier.

Placing on Heel- } Place upon the web or thumb side the heel-hooks
Hooks. } in the usual way, and knit the hand 50 or 60 rows, according to size, and finish the same as the toe of a sock, only leave a few more needles down.

Gauntlets and mitts, large sizes, are made tubular on all the cylinder needles, with some of the fancy stitches which will make the top wide, and are then gradually reduced by ribbing, tightening the tension, or some of the fancy stitches which will contract the wrist and hand (like the figure) may be used.

A plain mitt is knit with ordinary rib for the wrist, or a fancy wide top, and the needles then put in for plain knitting, and the stitches picked up to prevent holes; then 8, 10, or 12 rounds are knit plain.

Thumb-Knit Flat- } For the left hand
Web. } the thumb is made on one side of the front of the machine, and for the right hand is made on the other side of the front half of the needles.

Stop the yarn-carrier on the front side and raise out of action all the needles on the back half of the machine and all on the front half, except 20 or 24 needles on the front, counting from the notch on the top and left side of cylinder, indicating the half of the needles. Place on the heel-hook and knit 40 to 50 rows flat-web for the thumb, and finish the point in the same manner as the toe of a small flat-web stocking. Break the yarn and run off the work, and put down all the needles raised.

Ladies' Mitts, Flat-Web.



FIG. 13.

Knitting Thumb }
for Left-Hand. }

Raise out of action the half of the needles on the left side of the web, and all on the right side except 16, 18, or 20, etc., according to size of thumb desired; knit the thumb flat-web the length required, and run off the work. Now pick up the stitches from each side of the web on an equal number of the thumb-needles, and put on the weight-hooks, and press the needles down; then place the yarn in the carrier, and knit the hand the desired length according to size. Finish the mitt in the same manner as a toe of a flat-web stocking, and close the mitt with the knit and seam stitch. The end of the thumb of small sizes can be finished by drawing the stitches together like the top of a purse. Any size mitts can be made on the principle of flat-web.

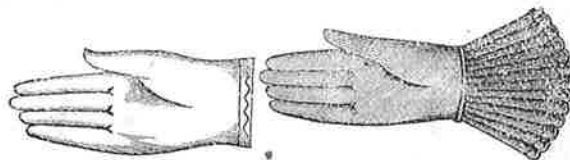


FIG. 14.

Gloves Knit Like Mitts.

Gloves are made like mitts, either flat-web or tubular. The wrist, thumb and hand, to where the fingers start to join the hand, are made the same as a mitt; 25 to 50 rows, according to size and yarn used, are knit, then the work run off, and another, right or left, as the case may be, is knit, when a pair is wanted. Each finger is now knit flat-web, as follows: Remove all the needles except quarter of the whole number, which leave in on the front of the machine.

Knitting First Finger } Take the stitch which represents the row which
Left-hand Glove. } runs down immediately by the left side of the thumb, which is the stitch on the left side of the thumb knit by the first needle upon the left side when thumb was started, and place it upon the middle needle but one, so as to leave one needle more on the right of those left in for knitting the forefinger. Place upon each of the other needles the stitches opposite and corresponding to the needles; place a needle in the first vacant groove and corresponding to the needles; place a needle in the first vacant groove to the right, and its corresponding stitch upon it; now thread the carrier and knit once across, and place a needle in the first vacant groove to the left of the web. Lift upon it the last loop cast off by the needle next the one put in; knit across again and add another needle, and stitch on the left, and so on each row knit, until 3 needles are added on the left. These three needles are added to each finger on the left when commencing the finger, to form the web between the fingers, which will make six stitches more upon the two middle fingers than upon the outside ones; for this reason we put one or two needles more upon the forefinger and the little finger, to reduce the number on the two middle ones to about four stitches more than on the others, which will be about right according to size.

Knit Second Finger on Two } Lift out 3 needles on the left, and take
 Needles less than quarter. } one-eighth of the whole number of
 stitches in the hand, front side, and place them upon the right half of the
 needles, placing the stitches nearest the forefinger on the centre needles.
 Now place on the next 3 centre needles to the left stitches taken from the
 selvage knit by the 3 needles which were put in on the left of the forefinger,
 and upon the other needles to the left place stitches taken from the back of
 the hand, commencing next the forefinger first. The stitches taken up on
 the back of the hand for each finger should be two less than on the front;
 knit the finger the same as the first, adding one needle and stitch on the left,
 each row, until 3 needles are put in and knit a few rows longer, finishing in
 the same manner as the first.

Third Finger Knit } Place upon the needles, after taking the 3 widening
 same as Second. } needles out on the left, two stitches more from the
 front of hand than on the back, or one-eighth of the whole off the hand,
 front side, and 2 stitches less from back of hand. Place stitches from the
 web selvage knit by the 3 widening needles of second finger, and place them
 upon the left of the centre needles which occupy the stitches lifted from the
 front of hand; now lift the stitches from the back of hand upon the remain-
 ing needles to the left, and add the 3 widening needles again, one each row,
 and so on finishing the finger the same as the second.

Fourth Finger Knit } Lift upon the needles the remaining stitches, and
 same as First. } 3 stitches from the selvage of the 3 widening needles,
 then remove any extra needles, and knit the desired length.

BODY GARMENTS FOR DOMESTIC USE.

Men's Drawers.

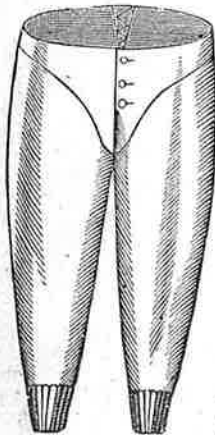


FIG. 15.

and narrow on the opposite side from the first.

Knit two pieces, commencing on the 40 needles lifted out of the machine,
 and gradually widen out in the same manner on one side, and knit straight
 on the other for about 160 rows, then knit straight on both sides for about

Set-up as for a man's sock on a fine cylinder and
 suitable yarn: knit about six inches of rib for the bot-
 tom of the leg of the drawers, and knit with *medium*
stitch, and gradually loosen the stitch until the length
 of a man's full size hose is knit. Now remove out of
 the machine on the front side 40 needles. The needles
 lifted out can remain on the inside of the web with
 their stitches upon them or removed entirely. Now
 knit flat-web straight on the left side, and widen out
 on the right side one stitch about every four rows until
 about 160 rows are knit, and all the needles are again
 in the cylinder. The needles on each side of the flat-
 web will require to be raised, and put down each row
 of stitches after the widening has caused the yarn and
 cams to engage with needles of the opposite side of the
 web. Now knit both sides of the web straight for
 about 80 rows, and narrow one stitch on the same side
 as the widening was done on, about every four rows
 until about 80 rows are knit; run off the work, and
 form a second leg in the same manner. Only
 knit the second straight on the opposite side, and widen

160 rows more. Knit the second piece in the same manner, only widen on
 the opposite side. A small gusset piece about four inches square will make
 a better shape to the drawers if knit and placed in the seat, one corner in
 each seam of the leg. The lengths of the various parts, and the nar-
 rowings and widenings, may be too many or too few for some kinds of yarn.
 A little practice will enable the operator to make drawers of various sizes on
 this plan. They should be bound on the top and lined on the inside of the
 waist about three inches, and a narrow band placed up the front on each side
 for the button-holes and buttons.

Second Method.

Set up in the same manner as before, and knit the leg up to the knee.
 Now take out one needle and knit flat-web up to the top of the drawers; knit
 a second web of this kind; now knit another flat-web the length of the body
 of the drawers on about two-thirds of the number of needles first used, and
 raise out of action one-half of the needles, and knit a wedge-shaped piece on
 the remaining needles, narrowing one needle on the side next those raised
 every three or four rows, according to the length required; knit each half
 of the web down wedge-shaped in this manner until each is narrowed down
 to about two stitches. Insert this wedge-shaped piece in the legs of the
 drawers where the flat-web commenced, sew up the seams, put in the square
 in the seat, and bind off the drawers in the same manner as the first.

Child's Ribbed Shirt



FIG. 16.

Can be made in the same manner as children's shirts of much larger size,
 when the ribber is used with all the dial needles, and all the needles of the
 corresponding needle cylinder. The rib needles are arranged to work be-
 tween the cylinder needles, and should be knit with a *medium* yarn and
medium tension on the ribber and machine, and the dial lower down than for
 ordinary knitting. Different sizes can also be made with ribber by using
 one-half, one-third or one-fourth of the rib needles in the dial. For a very
 soft and loose open child's shirt, rip up every other stitch after the web is knit.



FIG. 17.

Children's Under-shirts.

With a fine cylinder and medium yarn, and all the needles in the machine except two out on the front, knit with a loose stitch two yards, or as long as may be desired to suit the size. Run off the work, and cut the web open down the cross threads where the two needles were left out; now fold the two ends together, sew up the sides as far as the arm-holes, casting the needle around one complete stitch on each side of the web. Shape the neck and cut down the breast, and bind off the shirt, and put in sleeves the same as described for a man's shirt.

Man's Undershirt.



FIG. 18.

Knit with medium fine yarn on an 84, 96, or 108 when a large size is required; use all the needles in the cylinder, and knit flat-web the full size of the machine by raising sufficient needles on one side of the web as the yarn-carrier approaches; then press down these needles again when knitting back, and raise on the opposite side sufficient to allow the yarn-carrier to pass without engaging in opposite side of the web. Knit in this manner a flat-web strip three and one-third yards long, or as long as may be needed for the shirt; cut it in two equal parts, and place one-half over each shoulder, so that the four ends will hang down an even distance; now it will be seen that if each web is sewed up on the sides as far as the arms, also the two webs sewed together on the back up to the neck, and the two webs on the

front up to the breast, that an undershirt will be made, all but binding off the bottom and placing in the sleeves, etc. The bottom may be crotched around or bound off in any desirable manner. Cut the web in a direct line with the top of the shoulders on the inside selvage, and the row of stitches forming this direct line; ravel out about half-way across the web on each side, and turn down the corner on each side forming part of the neck front, or it may be cut off and bound. The back of the neck should be bound or better finished by a small piece about eight inches long, knit flat-web, straight on one side and circular on the other, and then sewed on the back of the shirt with the straight side even with the back and top of the neck. Bind each side of the

breast with a piece of suitable material, and work button-holes and sew on buttons in the usual manner. The sleeves are knit flat-web and shaped to suit the taste, or can be knit like a stocking, with rib at the wrist and plain to the top, with the tension gradually loosened to shape the sleeve. *To form the sleeve perfectly*, it should be knit at the shoulder with a gusset, which can be done by knitting the upper portion of the sleeve flat-web, the full size of the machine, for five or six inches; then knit a flat-web piece four or five inches square, and place one corner of it in the sleeve between the two flat-webs and sew them together on the two sides; then place the opposite corner of the gusset in the bottom of the arm-hole, and sew the sleeve with the gusset into the arm-hole. The material for four such shirts can be readily made in one day, and three-quarters of a day will finish them; making a shirt with good yarn equal to one for which you will pay \$2.00. *The gusset may be knit for the sleeve by raising two or three needles less than half, the same as for heel work, and then narrowing down as for a heel by raising the needles until only two needles are down; then put down all the needles and run off the work. The gusset forms a part of the sleeve, and the pointed end is placed in the lower part of the arm-hole and sewed in.*

Gentlemen's Chest Protectors.

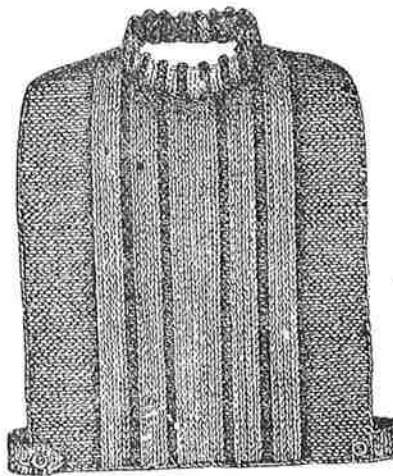


FIG. 19.

These useful garments can be made with any colour of suitable wool with plain rib or fancy stitches, and can be made whole as one piece, or in stripes and sewed together. When knit plain, one row of stitches, if ripped out down the web, leaving four or six stitches between, will give it a design in the front. The neck and shoulders are knit by widening and narrowing to suit the shape shown in figure. The neck-band and belt can be knit either plain or rib, and sewed on. *The button-hole is knit in the web by raising up one-half the needles on one side of the web and knitting the length of the web on the remaining needles, then depress the needles raised and raise the other half, and knit the second side of the button-hole the same number of rows as the first, then depress the*

needles and narrow off the end on each side every round, or every other round, by taking out the needles on each side.

Rouching with a Ring.

Bend a piece of nicely polished wire, the size of a lead pencil, about three and a-half inches long, to suit the inside circle of the needle-cylinder, and loop a second coloured yarn over the wire and around each needle alternately with the wire, and knit forward, holding down the wire while the yarn-carrier passes. Move the wire around in the loops the length of itself each time the wire is filled with loops. The wire will have to be gradually moved around while being looped.

The muffs and tippetts will require to be lined and padded to suit the taste, and can be made circular or flat-web. They can be checked by

knitting the rouching in flat-web stripes of 10, 15, or 20 needles wide, and change the colour to form a square; then sew these flat-web stripes around the muff so that the colours will come opposite, and if closely sewed will not require to be sewed together before placing on the muff.

Muffs, Tippetts, and Cuffs.

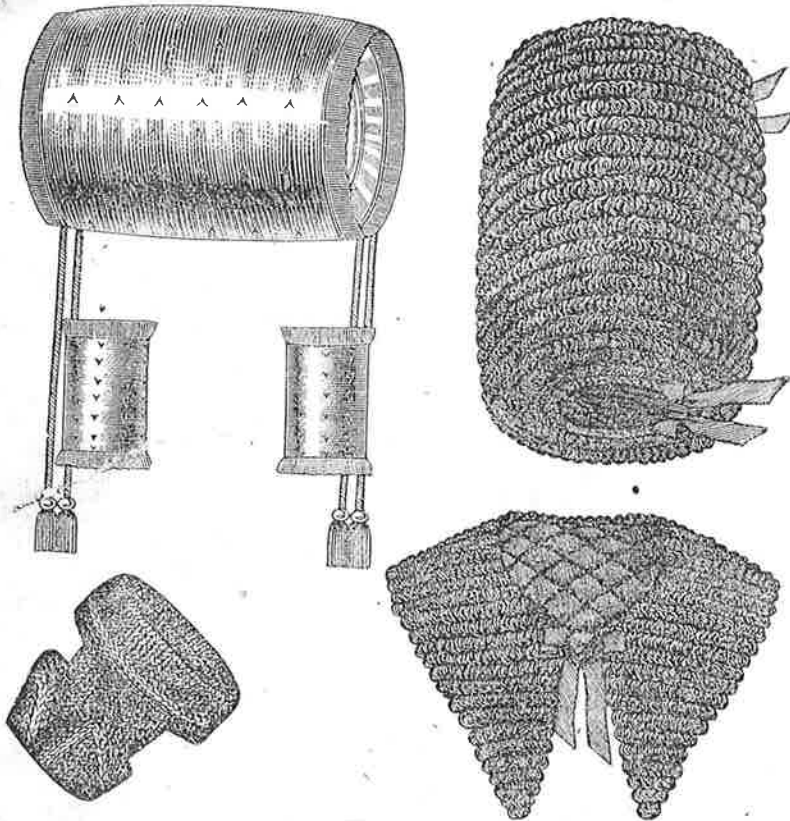


FIG. 20.

Cuffs, mitts, and fancy trimmings can be made with the rouching in short or long loops, according to the size of wire used for a looper.

The above four figures can be made with rouching or tufted work by having an extra thread of yarn wound in a small ball resting on the inside of the cylinder, and can be used with another colour if desired, or the same yarn may be used when knitting flat-web rouching, on say 10 to 20 needles by removing the yarn from the carrier each row of loops made and moving it around to the left side. Then cast the yarn around the forefinger of the left hand and around a needle, and around the finger again and around the next needle, and so on all across. Now place the yarn in the carrier again and knit across; remove the yarn again and loop over the finger back again. Be careful to hold down the loops while the needles rise up through, and while knitting, each time of knitting across.

Skating Hoods.



FIG. 21.

FIG. 21 represents a hood made out of superior fingering or worsted yarn on any suitable cylinder, and knit flat-web sufficient length for the cape; then a row of holes are made for a drawing-cord, and the upper portion can be knit in the same manner as a heel, by lifting the needles and depressing them, only lifting sufficient to give the hood the desired round, which will be in proportion to the size. There are several of the fancy stitches which are suitable. The hood may be trimmed by cord knit on three stitches, as shown in the figure, or the centre stitch of the cord can be unravelled and the hood trimmed with unravelled cord.

Lady's Hood.

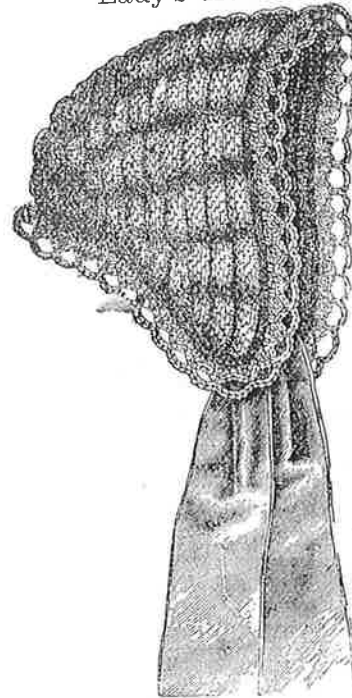


FIG. 22.

Knit on ten or fifteen needles stripes to reach on the front from one side of the hood to the other, gradually making them shorter each time to give the shape at the back. Knit ten rows with coarse, soft yarn, with a long stitch, and four rows with a fine yarn, of second colour, with tight stitch, which will form puffs in the work, as represented. Sew the stripes together, and ornament the border, to suit the taste, with fancy knit or crochet work.

Child's Hood.

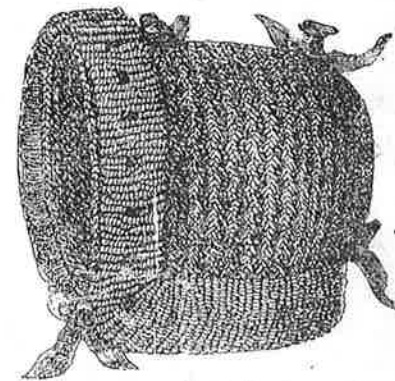


FIG. 23.

A baby's hood or hoods for children can be made and trimmed like Fig. 23, in colours to suit the taste. Operators will find very little trouble in knitting any of the styles shown in figures, or other new styles of their own designing.



FIG. 24.

Gored Skirts.

Knit upon a fine or medium cylinder, with a suitable yarn and desired colour, four flat-web pieces the length required, and narrow one or two of the stripes on each side of the web to narrow the top of garment down to the desired size. All four pieces can be gradually narrowed at the top ends to give the skirt the proper size at the top, and all are sewed together by the closing flat-web stitch; add more stripes for larger and less for smaller sizes.

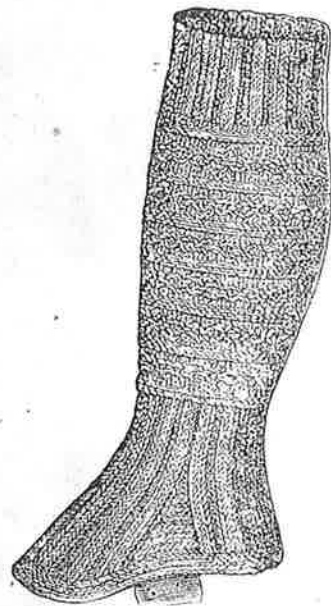


FIG. 25.

Leggings.

Fig. 25 shows how a legging may be knit with part rib and part fancy stitches, and may be knit either tubular or flat-web. The instep is knit by raising one-half of the needles and knitting flat-web on the other half the desired length, then depressing the first half raised and knit flat-web for the heel; then remove the needles, and take up the stitches from the selvage, and knit a gusset on each side, raising a needle on the top side of gusset each two rows in the same manner as the flat-web heel. Bind off with the crochet stitch, or in any manner to please the taste.

Lady's Overshoe.



FIG. 26.

Fig. 26 shows how overshoes are made in three parts, commencing at the top with the desired number of needles, according to the size. Then one or two needles are removed on each side to form the depressions in the front; now widen out for two rounds again and knit to the heel; then knit the front of the foot in two pieces, commencing at the top, and gradually widen out to

form the tip in the front, and then narrow again on the front each two or three rows across until the desired length is knit. Line the overshoe with red flannel or cloth, and sew on a heavy sole of felt or cloth. Bind off and work button-holes, and sew on buttons to finish.



FIG. 27.

Fig. 27 shows one knit tubular for sufficient length to allow the top being turned over, and can be knit rib or with any of the fancy stitches to the heel, and then two-thirds of the needles lifted out of action and flat-web knit for the heel. The work is now run off the heel needles and the needles removed, and one-half of the remaining needles removed with their stitches upon them and left on the inside of the cylinder. The half of the front is now knit down to the toe, widened a few stitches on the heel side, and narrowed on the centre of the foot side, as shown by Fig. 27.

Any of the fancy stitches most suitable can be used and varied to suit the taste. Finish with a sole the same as the first. Children's overshoes or babies' boots can be made in the same manner.

Babies' Boots.

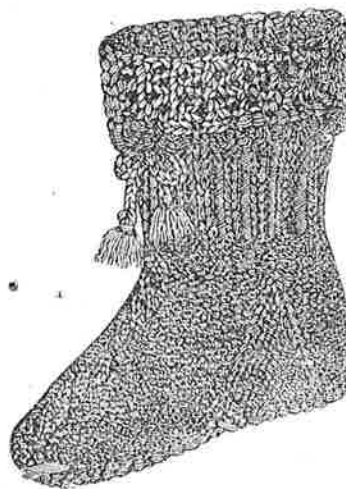


FIG. 28.

Knit on a fine cylinder and with suitable yarn, say on thirty-four needles, five rows of one colour plain; knit three rows of honey-comb stitch, back and forth, that is nine times; again knit five rows of scarlet plain; now knit twenty-five rows of white; narrow four stitches on each side, knitting five rows plain between each narrowing; then knit twenty rows for the ankle; drop twelve stitches on each side for the heel; knit thirty-five rows for the top of the foot; then knit the toe the same as a gored stocking, and run off the work. Now take up the selvage stitches of the heel and form a gore, and the bottom of foot and toe in the usual manner. Stripe the top of the foot, or knit with fancy stitches, as desired, and sew up the sides of leg and toe; then turn down the top of ankle and finish with tassels.

Ladies' Jackets.



FIG. 29.



FIG. 30.

Children's Fancy Scarfs.

Knit out of any soft yarn of good quality, and use any of the fancy stitches for the ends. Knit with every third needle out, forming a two and one rib, and raise out of action every alternate pair of needles for the centre of the scarf; then change the pattern by raising out of action each alternate set of two needles, knitting two rows while each is set up and only one row between each time of raising and depressing the needles, and finish with any desired fringe or tassel. Turn inside out before fringing, if desired.

The jacket shown in Fig. 29 is made with soft wools, in colours to suit the taste, and is made flat-web, narrowed or widened to suit the shape, and trimmed with work made with some fancy stitches for trimmings. Other shaped sleeves may be used and finally finished with button-holes and buttons. Many other styles can be made in shape and trimmings. See Fig. 30.

Men's Scarfs.

Knit out of coarse yarn on as fine a needle-cylinder as will knit the yarn without cutting it, and knit the ends striped any desirable pattern. After the scarf is knit two-thirds of the desired length, run off the work and ravel out every other stitch which will lengthen out the scarf and make the web loose. When an extra large scarf is desired knit two flat-webs the desired length and sew together, and then rip out every other stitch. Small scarfs can be knit in the same manner, on the same cylinder with finer yarn, or on cylinders with less needles. Finish with a fringe.

Dress Neck Scarfs.

Knit out of silk or thread of suitable colour, with a medium stitch, plain, and turn inside out, or wear plain side out, as desired, or knit with any fancy stitch to suit the taste.

Snow-Shoeing Touque.

Men's knit caps are made pointed like a cone, and are knit either striped, plain, rib, or with fancy stitches, and are made any size, according to needle-cylinders and grade of yarn used. Large sizes are knit flat-web and circular, when knit ribbed with ribber.

Flat-Web Touque. } Knit flat-web the desired length for the touque, each side of the web, and raise out of action one-fourth of the needles on the remaining needles down, narrowing it to about three needles, and then widen out again; now knit the length of the touque for the other side; then change the colour and knit the length for a second touque, and form another toe, pointed, on the corresponding side; run off the work and sew up the sides of the touque, and close the middle by the closing stitch; now turn the one end inside of the other, and press the touque on a board of some shape. The lower end, after being turned within the other end, is turned up when worn. The upper and pointed end is turned down, and finished with a tassel.

Touque-Ribbed Tubular. } Knit with a good quality of fingering yarn on as fine a cylinder as will allow it to be knit with a medium stitch. Remove half of the needles on the back of the machine, and set up upon the other half in the same manner as for a one and one rib, so that the loops will ravel out. Knit the pointed part of the touque like a toe on the needles in the machine, and then widen out to the last needle on each side; put the second half of the needles back into the machine again; now remove the set-up, and cast the loops formed while setting-up on to the needles just put in. It will be found a little hard to get the stitches upon the needles unless the web is knit loose. Place the weight-hook through the cloth, and press down the work with the hand while knitting the first few rounds; now put on the ribber with a corresponding dial that will knit one and one rib, or two and one, and knit with all the cylinder-needles and dial-needles, or as many of the latter as are required for the desired rib. Knit about fifteen inches of tubular rib-web, then turn off ribber and cast the stitches upon the plain needles, and form a second pointed toe; knit a few rounds and run off the work; then close the two ends and turn one end up inside of the other and put on a tassel; press on a board and turn up the rim when on the head. Knit outside with one colour and inside with another, or stripe the outside to suit the taste. Any size touque can be made in this manner; with the cylinders to suit the sizes.

FANCY STITCHES FOR THE "ORNAMENTAL AND USEFUL."

The garments and fancy work which are shown are a few of the many beautiful designs which can be knit on the machine, and are only limited by the taste and ingenuity of the operator. A little experience in knitting the following variety will enable any one to apply the stitches to garments and useful domestic ornaments. *For practice knit all fancy stitches flat-web on front of machine with 18 needles in the machine.*

Basket-Stitch Pattern.

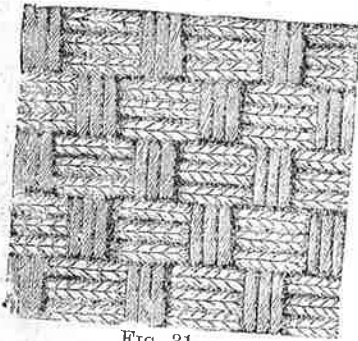


FIG. 31.

Lift out through the cam-cylinder slot each alternate set of three needles, and leave them, with their stitches upon them, on the inside of the needle-cylinder. Now knit three rows of stitches; replace the needles lifted out and knit three more rows. Lift out the sets of needles first let in, and again knit three rows upon the set of needles first removed, then replace all the needles again, and so on. Knit three rows every time the alternate sets of three needles are removed and replaced, allowing the needles to hang in their stitches upon the inside of the needle-cylinder when made to represent a number of beautiful patterns by simply lifting out the needles in sets of twos or fours, and knitting two or four rows of stitches as desired.

Honey-Comb Stitch.

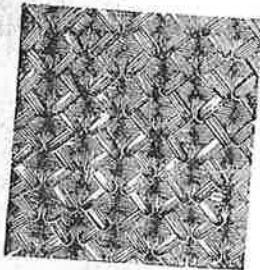


FIG. 32.

Knit a few rows of stitches after practising the first stitch; lift out of action above the cams each alternate needle; knit two rows of stitches; depress into action again the needles lifted, and lift out of action the alternate needles, or those left down at first; again knit two rows of stitches, and so every two rows knit. By knitting this stitch in stripes of two colours changed every two rows, beautiful afghans or carriage-ropes can be made by sewing them together. It is a desirable stitch for ornamenting babies' stockings. The honey-comb stitch can be varied by lifting the same set of needles, or by first removing every other needle from the cylinders, and then knitting in the manner described by lifting and depressing the alternate needles each two or three rounds; or other beautiful designs may be knit by lifting out of action the alternate needles every time a row of stitches is knit in place of every two rows, and when the colour of yarn is changed, every row of stitches knit stripes will appear both ways in the work.

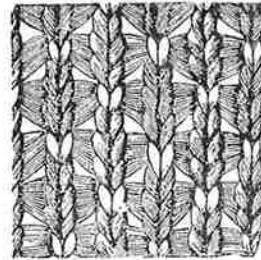


FIG. 33.

The pattern in Fig. 33 is especially adapted to mats, hoods, etc., and is made with every other needle out of the fine cylinders, and lifting out of action every alternate needle, and knitting three rows of stitches with one colour; then, after depressing the needles raised and lifting those unraised, knit three rows of stitches with a second colour, and depress and raise the alternate needles again; then knit three rows of stitches with a third colour, and so on; every three rows knit change the colour of the yarn in its turn.

Lace Stitch.

Every other needle should be removed in fine cylinders, and all the needles are used in the coarse. Lift every third or fourth needle out of action, as desired; knit three rows of stitches; depress the needles raised and knit one row of stitches; lift out of action the same needles again and knit three rows, and depress and knit one row, and so on; raise and depress and knit the rounds named. Vary the stitch to suit the taste by knitting two rows in place of three, and lift and depress every other needle in place of every third or fourth. This is a good fancy stocking pattern.

Another good fancy change: when all the needles are in the machine or a portion of the cylinder, remove one needle, then leave one in and remove the next; now leave three or four needles in and remove the next, and then leave one in and remove the next. Lift out of action those needles which now have one out on either side, and knit two or three rows of stitches as desired. Then depress the needles raised and knit one row; again lift out of action the same needles, and so on; every time the needles are raised knit two or three rows of stitches, and then one after depressing the needles raised.

Right and Left Diagonal Stitch.

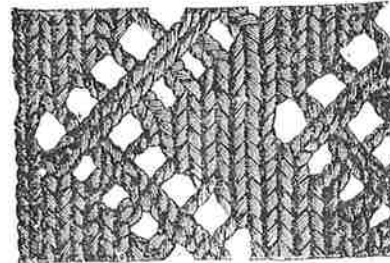


FIG. 34.

Knit three or four rounds plain on say thirty needles. Leave the yarn-carrier on the right-hand side, and lift out of action twenty needles on the left side; knit across, and raise the outside needle on the right; knit back and then put down one needle on the left and knit across again; again lift out of action one needle on the right, and so on; each time before knitting across, lift out of action one needle on the right when the yarn-carrier is on the left, and depress one needle on the left when carrier is on the right. In this manner nine needles will knit the one way, while ten will knit the other. Continue knitting this way all across the web, then knit back by raising the last needle put down on the left after the yarn-carrier knits to the right, and when again on the left, raise one needle on the right, and so on, changing the colour when desired. This stitch can be used to good advantage for trimming garments, and for scarfs, etc.

Insertion Pattern.

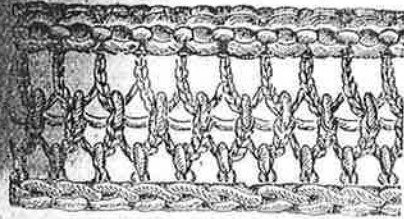


FIG. 35.

sired, 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.

Counterpane Pattern.

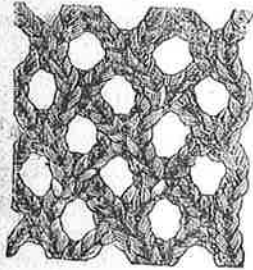


FIG. 36.

Then commence with two needles from the left side, and knit back in the same manner, so that the holes will not come opposite the first ones.

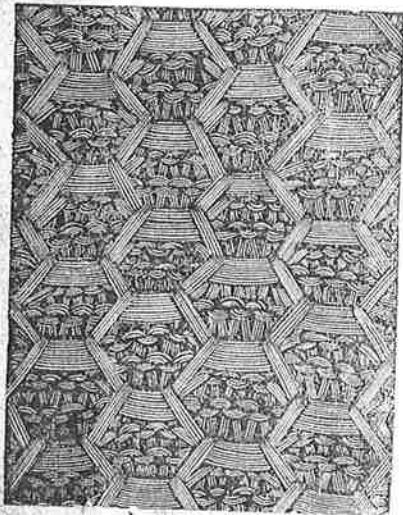


FIG. 37.

Cross-Bar Ribbed Work.

Set-up flat-web or circular work with three needles in and one out; knit three or four rows of stitches plain; lift out of action every alternate set of three needles; knit one row of stitches. Then depress the sets of three needles raised, and lift out of action the other set of alternate needles, and so on. Every round knit change the sets of needles in action with those out of action. Vary the stitch by using the needles in sets of two.

The double cross-bar rib is knit the same as the single bar just described; only two rows are knit between the changes of the needles.

Shell Pattern.

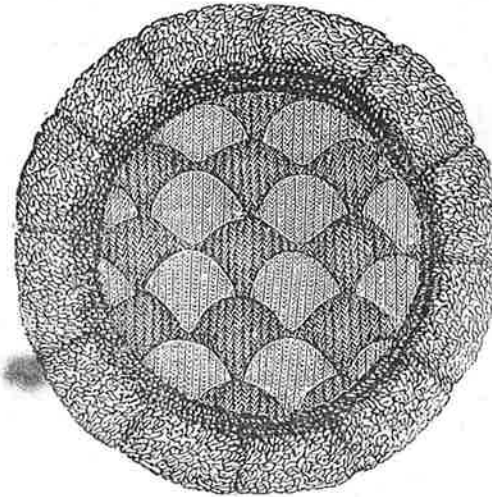


FIG. 38.

Set-up flat-web, say sixty needles; knit ten rows of stitches, and stop the yarn-carrier on the right; lift out of action all but sixth and seventh needles from the right side; knit once across these three needles; depress the next needle to right of these two; knit back across these two needles; depress the next needle to the left; knit across the four needles; and so on, depressing one needle each row of stitches knit, until twelve needles are down; stop the yarn-carrier on the left of these twelve, and lift them out of action, which completes the triangular shaped piece. Depress the eighth and ninth needles from the right side, and knit one row of stitches, and depress a needle each row until twelve more needles are down, which completes a second triangle. Form say five such triangles, and change the colour of wool. Depress all the needles, and knit once across to the right; lift out of action all but two needles on the right, and form half a triangle by depressing the needles on the left side only, until six needles are down; lift these out of action; depress the twelfth and thirteenth needles, and knit a complete triangle, which shall have its apex between the two bosses of the triangles, in the first row of triangles. Complete a row of four triangles with another half triangle on the left; change the colour of wool again; depress all the needles, and knit back to the right; and so on until the mat is completed, which can be bound off with work made by any suitable stitch or crochet work.

The Tidy Stitch.

Set-up flat-web three needles in and two out; lift out of action all but three needles on the right hand side; knit one row of stitches on the three needles; lift up the first needle on the right; knit across on the two needles; depress the first needle upon the left, and knit back, and raise another on the right, and so on, each row of stitches knit; depress one needle on the left and raise one on the right, advancing to the left until you reach that side; then reverse the raising and depressing of the needles each row of stitches, until the right side again is reached, and continue knitting until the desired length is knit. If scalloped edging be desired, continue to advance towards each side until only two needles are left down before returning back. Vary the pattern by setting up with two in and two out, or two in and four out, according to taste. The preceding stitches are all made by lifting out of action certain needles, and then depressing them and raising others between the rows of stitches, and can be knit more rapidly than those that follow, which are made by transferring stitches from one needle to another by means of the work-hook.

Diamond Stitch.

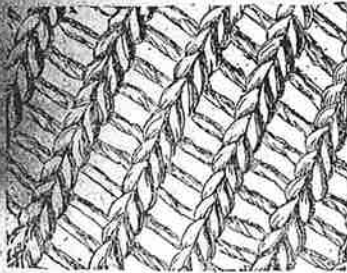


FIG. 39.

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 needles next on the right, and knit two rows, and so on the desired length.

Diagonal Cross-Bar Stitch.

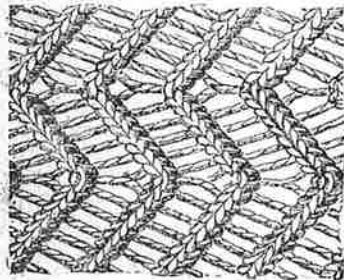


FIG. 40.

Knit three or four rows plain; lift the stitches off every other needle and place them on the next needle to the left; knit one row of stitches, and remove the new loops formed on the empty needles to the next needle on the left, and so on; each row of stitches knit remove the loops from the empty needles to the next on the left. Vary the pattern when desired by removing the stitches to the right in place of the left.

Herring-Bone Stitch.

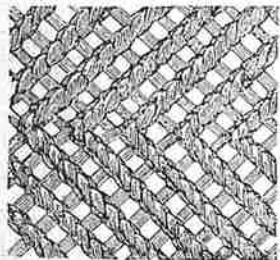


FIG. 41.

Knit three or four rows plain; lift the stitches off every other needle and place them on the next to the left; knit one row of stitches, and then lift the new loops formed on the empty needles on to the next needles on the left, and continue this for four or six rows, then change the loops to the right for four or six rows, and knit the desired length.

Spiral Stitch.

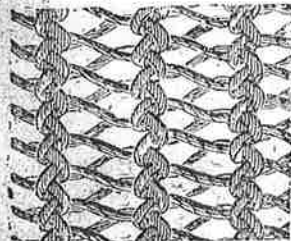


FIG. 42.

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.

Rope and Cord Pattern.

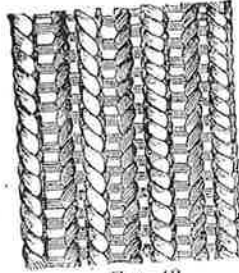


FIG. 43.

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 on to 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 on to the next needle, allowing it to remain on its own needle as well.

Net Work Stitch.

Knit three or four rows of stitches plain; lift the stitch from every third needle, commencing at the second needle from the edge, and put them on the next needle to the left; knit across and back; now lift the stitch off every third needle, commencing at the third one from the edge, and put it on the next needle to the right. Again knit two rows; repeat lifting the stitches off every third needle; commencing each time, first two needles from the edge and second three, and knit two rows each; change until the desired length is knit.

Crossed Crochet Stitch.

Knit three or four rows of stitches plain; lift the stitches off the second and fourth needles and place them each on the other's needle; lift the stitches off the sixth and eighth needles and place them each on the other's needle, and so on across the web; then knit two rows. Now lift the stitches off the fourth and sixth needles and place them on each other's needle, and the eighth and tenth on each other's needle, etc., and so on across the web; knit two rows, and repeat the first change until the desired length is knit.

Cable Pattern.

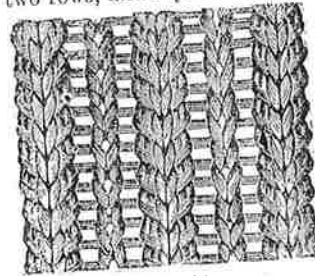


FIG. 44.

Knit three or four rows of stitches plain; cross the stitches of the second and fourth needles upon each other, and the stitches sixth and eighth in the same manner, all across the web as in preceding pattern. Knit two rows of stitches and repeat the interchanging of the stitches on the same needles, and knit in this manner the desired length.

Half-Diamond Stitch.

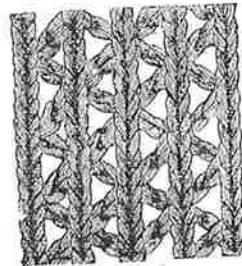


FIG. 45.

Knit three or four rows of stitches plain; lift the stitch off the second needle and place it upon the third, and lift the stitch off fourth and place upon the third needle also; now leave say three plain stitches, and lift the stitches off the eighth and tenth needles and place upon the ninth, and leave three more plain stitches, and so on across the web; now knit two rows, lift the stitches off the third and fifth needles and place them upon the fourth, and lift the stitches off the ninth and eleventh

and put them on the tenth, and so on across the web; again knit two rows, and lift the stitches off the fourth and sixth on to the third, and so on, leaving three needles between each needle which has the two stitches. Knit in this manner any number of times, say four. Complete diamonds can be effected accordingly.

The Dew-Drop Stitch.

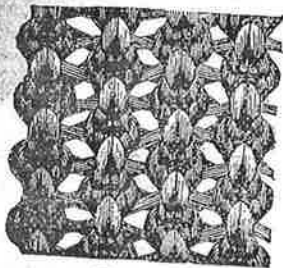


FIG. 46.

Knit three or four rows of stitches plain; lift the stitch from the second needle and put it on the third; lift the stitch from the sixth needle and place it upon the fifth; lift the stitch from the eighth needle and put it on the ninth, and the stitch from the twelfth needle and put it on the eleventh; and so on across the web in each of the successive changes, knit one row. Now take the stitch off the third needle and put it on the fourth, and the stitch off the fifth needle and put it on the fourth needle; also lift the stitches off the ninth and eleventh needles and put them on the tenth needle, and knit one row. Now take the loop off the third needle and put it on the second needle, and the loop off the fifth needle and put it on the sixth needle, and the loop off the ninth needle and put it on the eighth needle, and the loop off the eleventh and put it on to the twelfth needle, and knit one row. Again, take the stitch off the second needle and put it on the first, and the stitch off the sixth and eighth needles and put them on the seventh, and the stitch off the twelfth needle on to the thirteenth, and so on repeat from the first again.

Lattice Stitch.

Knit three or four rows of stitches plain; lift out of action every other needle, and knit two rows; press down the needles raised and knit one row; lift the needles first left down and knit two rows; depress those raised and

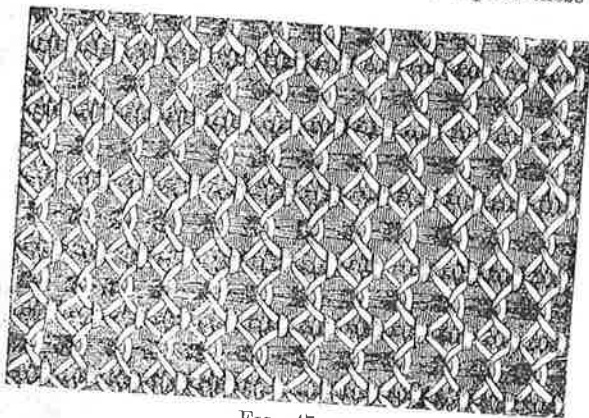


FIG. 47.

knit one row, and so on until the desired length is knit. This stitch, if made on the fine cylinders with every other needle out of the machine, will be much better for many uses.

Link or Band Stitch.

Knit four or six rows on twenty needles in the front of the machine, leaving one needle groove empty between the needles; make a very loose long stitch; leave the yarn-carrier to the right; lift out of action the half of the needles to the left, and knit across to the left; now lift out of action the five needles on the right; knit thirty rows on the five needles down, holding down the work by hand, and leave the yarn-carrier on the left; press down the five needles on the right and knit across to the right; now push down the ten needles to the left and knit six rows on all the needles; now raise up one-half the needles on the right and knit across to the right; lift up

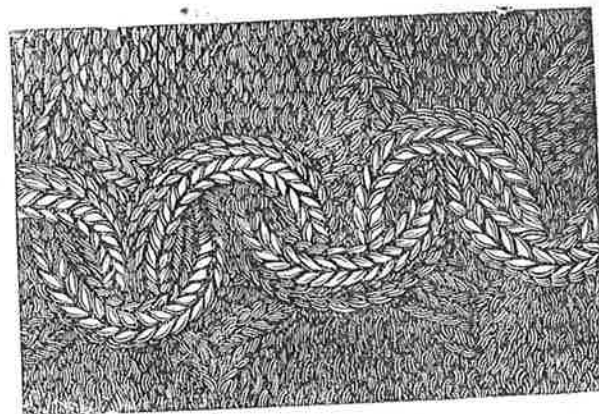


FIG. 48.

the five needles on the left and knit thirty rows on the five needles down and break off the yarn and run off the stitches of the five needles and keep the stripe through the first stripe and cast the stitches upon the same needles without twisting them; join the yarn and depress the needles up and knit six rows, and so on, continue the desired length to be knit; any number of needles can be used, and the links made any length desired. This link is very useful for afghans, sofa pillow covers, mats, tidies, etc. The link can be joined in any manner to suit the taste of the operator.

Imitation Moss.

Knit flat-web on ten needles of the required width and length; wet the web and press with a warm iron and ravel out all the stitches except two or three rows on one side of the flat-web, and use for trimming mats.

Cord Mat.

Knit cord on four needles one yard long, and another yard of a second colour of yarn; place the cord where the two colours meet, in the centre of a piece of canvas and sew the two cords on spiral form, and finish with a double fringe, moss rouching, or shell-work; shaded yarn may be used in place of the two colours.

Circular Mat in Sections.

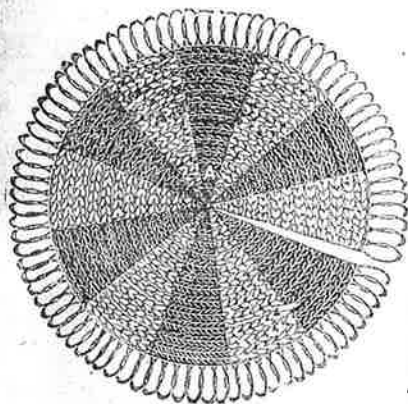


FIG. 49.

Set up with stitches equal to half the diameter of the mat required; knit back and forward flat-web, lifting out of action, on one side, one needle each time across until only three or four needles remain; depress all the needles, change the yarn for another colour, and knit section number two in the same manner, and repeat the same operation until six triangular sections; then close together with a needle, the first section with last one knit, leaving three or four outside stitches unclosed; press with a hot iron, and ravel out the outside three or four stitches to form a fringe. Lift two needles in place of one if more sections are wanted.

Remarks on the Fancy Stitches.

Most of the stitches named can be knit either flat-web or in circular work, and can be used in many of the following garments for trimming, etc. In some of the stitches where the work is not open enough, every other needle may be taken out of the fine cylinders, and then arrange the needles according to the instruction given; many beautiful designs of work can be made by intermingling the fancy stitches together and knitting a few rounds of plain knitting between them or a number of plain stitches around the cylinder, or in the web alternately with the fancy stitches and squares, triangles, diamonds, monograms, etc.

Bed spreads, carriage robes, shawls, window curtains, antimacassars, etc., can be knit in stripes and joined on the machine or with the needle, and may be pressed and lined when desired.

Children's Fancy Stockings.

When fancy hose are desired, they are usually knit plain to the ankle, then the needles are arranged across the web or all around the cylinder. The ankle and top of instep only are then knit with fancy stitches. The stitches which require part of the needles to be removed and made by lifting the needles above the cams out of action are the most practical and speedy for hosiery. Arrange the needles as follow: Either every other needle out, or every third one out; raise out of action every other needle, or every other pair of needles, and knit two rows; then put the needles first raised down and knit one row, and so on every time the needles are raised. Knit two rows while they are up and one when down before raising the next time. Change the alternate set of needles every other time and a new pattern will be made.

A good design is made by arranging the needles one needle out then one in, then another out and three or four in, and so on round the cylinder. Raise the needles out of action having one out on each side and knit two rows; then put down and knit one row, and repeat raising the same needles every time.

How to Seam Flat-Web.

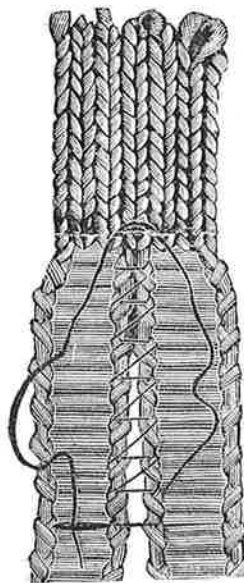


FIG. 50.

Fig. 50 represents two pieces of flat-web with three stitches in each. The upper half is turned over to show the right side of the knitting as it appears when sewed together. When properly done it will appear as if knit without a seam. The sewing should always be done from the inside, or wrong side of the web. The middle stitch of each web, as shown in lower half of Fig. 50, is ravelled out that the stitches to be taken up may be more readily seen. There are three stitches which appear on the selvage; only one of them is the right one, viz., the middle one. The needle passes through the one on the right, then directly through the one on the left edge, and each time the needle is drawn through two new stitches are taken up, one from each web.

Where possible, always sew the web in the direction the knitting was done. Keep the two edges of the web while sewing from curling by pressure between the forefinger and thumb of left hand. Damping and pressing the edges will keep them in better shape for seaming.

Children's Flat-Web Stockings.

Knit the leg the desired length, narrow the ankle to suit the taste. If a bound or hem-top is wanted, it can be made in the usual manner. See page 21.

Flat-Web Heel, } Raise out of action on the side opposite the yarn-carrier
First Half. } carrier three-fourths of all the needles, put down two needles that the heel may be made a little larger than when knit on quarter, especially if the same size yarn is used in the heel.

Knit back and forth, and raise a needle every two rows knit on the side on which the needles are raised when the yarn-carrier is on that side. Narrow down the heel by raising needles until only 4, 6, 8, etc., are left down, according to the size of the stockings.

When the last needle has been raised, and the yarn-carrier moved to the side of the web on which the needles are down, put down into action the first needle up next those down, and knit across and backward, and so on, until all the needles raised on the heel are down, which have the two stitches upon them, except the first one raised, which should be put down with the three-fourths first raised.

Second Half of } Knit across and back after putting down the second
Flat-Web Heel. } needle first raised, which has double stitches. Then put down all the needles which remain up; now raise the needles out of action on the other side, leaving down the same number on which the first half of the heel was knit. Knit back and forward, raising one needle each two rows knit; on the same side on which the needles are already raised, until 4, 6, 8, etc., like the first side, are left down. Again, put down one needle on the side next those down, and knit two rows, and so on each two

rows, until the second needle first raised, which has the double stitches, is put down. Now knit across and back, and put down all the needles remaining up, and knit the desired length for the foot.

Flat-Web Toe, on } Raise out of action quarter of the needles on each
one Half. } side, and knit the toe on the middle half the same as
the toe of a circular stocking, only narrow down the needles to suit the size
of stocking. Close up the stocking according to Fig. 50.

Fig. 50 All sizes of children's stockings, and ladies' or misses' hose, can be made in this manner flat-web, making a machine with two needle-cylinders, one for coarse yarn and one for fine, a very complete machine. Six to one dozen pairs can be made in one day, which should be fast enough for family use, and are *full-fashioned* when thus made.

Cap-Heel, Flat- } The cap-heel can be made flat-web by knitting
Web. } down half of the web-heel the desired length, in the
usual manner, narrowing two or three needles, according to size, on the out-
side of each web while knitting the last few rows across. The narrowing
gives the heel a round appearance at the back when sewed together.

PART IV.
INSTRUCTIONS

FOR WORKING AND SETTING-UP OUR

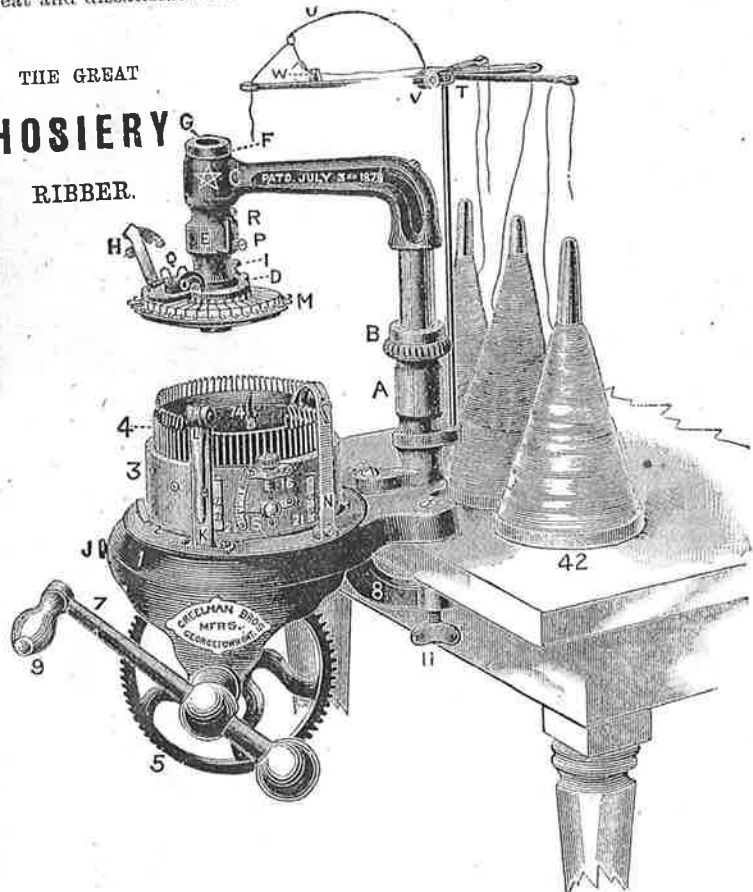
Great Hosiery and Family Ribber.

ROYAL LETTERS PATENT 4426.

PUBLIC NOTICE.

Any one attempting to use the Ribber before they are well acquainted with the plain machine sufficiently to knit at least a sock and stocking perfectly, will be **FINED** according to the rules of this book, and should be excommunicated as well, if they insist upon it. Nothing can be gained by the operator trying to learn the ribber too soon, unless defeat and dissatisfaction.

THE GREAT
HOSIERY
RIBBER.



NAMES OF RIBBER PARTS.

The table of Ribber parts and names given here is for the convenience of the operator while studying the use of the ribber, and should be known like A B C.
A—Arm-Holder. B—Arm-Nut. C—Arm. D E—Cam-Plate Hub. F—Cam-Hub Collar. G—Yarn Slot. H—Latch-Guide. I—Tension Thumb-Screw. J—Rib-Needle Reg. Screw. K—Driving-Arm. L—Driving-Arm Hinge. M—Needle Dial. O—Latch-Guide Button. P—Dial-Post Set-Screw. Q—Crown Cam. R—Bobbin-Pin.
For Full List of Ribber Parts and Numbers, see the Instruction Book.

TABLE

Showing Corresponding Cylinders and Dials.

| NUMBERS OF CYLINDERS AND GROOVES. | NUMBERS OF RIBBER DIAL GROOVES AND STYLE OF RIB MADE. | | | | | | | | | | | | |
|-----------------------------------|---|--------------------------|-------------------------|--------------------------|-----------------------------------|-------------------------|----------------------------------|-------------------------|----------------|----------------------------------|-------|----------------|---|
| | 24 | 28 | 30 | 32 | 36 | 40 | 42 | 44 | 46 | 48 | 54 | 57 | 60 |
| 48 | 1 & 1 1 & 3 1 & 7 | | 1 & 7 | 1 & 2 1 & 5 1 & 11 | 1 & 3 1 & 7 | 1 & 5 1 & 7 | | | | 1 & 1 1 & 3 | | | 1 & 3 |
| 56 | 1 & 6 1 & 3 1 & 7 | 1 & 1 1 & 3 1 & 7 | | 1 & 6 | | 1 & 6 1 & 3 1 & 7 | | | | 1 & 6 | | | |
| 60 | 1 & 4 | | 1 & 1 1 & 3 1 & 7 | | 1 & 4 1 & 9 1 & 5 | 1 & 2 1 & 5 | | | | 1 & 4 | | | 1 & 1 1 & 2 1 & 3 1 & 4 1 & 5 |
| 64 | 1 & 7 | | | 1 & 1 1 & 3 1 & 7 | | 1 & 7 | | | | 1 & 3 1 & 7 | | | |
| 72 | 1 & 2 1 & 5 1 & 8 | | | 1 & 8 1 & 3 1 & 7 | 1 & 1 1 & 3 1 & 5 | 1 & 8 | | | | 1 & 2 1 & 3 1 & 5 | 1 & 7 | | 1 & 5 |
| 80 | 1 & 9 | | | 1 & 4 1 & 9 | | 1 & 1 1 & 3 1 & 7 | | | | 1 & 4 | | | 1 & 3 1 & 7 |
| 84 | 1 & 6 1 & 5 1 & 11 | 1 & 2 1 & 5 1 & 11 | | | 1 & 6 | | 1 & 1 1 & 3 1 & 5 1 & 7 | | | 1 & 6 | | | 1 & 6 |
| 88 | 1 & 10 | | | 1 & 10 | | | | 1 & 1 1 & 3 1 & 7 | | | | | |
| 92 | | | | | | | | | 1 & 1 1 & 3 | | | | |
| 96 | 1 & 3 1 & 7 1 & 11 | | | 1 & 2 1 & 5 1 & 11 | 1 & 8 | | | | | 1 & 1 1 & 3 1 & 5 1 & 7 | | | 1 & 7 |
| 108 | 1 & 8 | | | | 1 & 2 1 & 5 1 & 8 1 & 11 | | | | 1 & 8 | 1 & 1 1 & 3 | | | 1 & 8 |
| 114 | | | | | | | | | | | | 1 & 1 1 & 5 | |
| 120 | 1 & 9 1 & 4 | | | | 1 & 2 1 & 5 | | | | | | | | 1 & 1 1 & 3 1 & 5 1 & 7 |

In addition to the cylinders mentioned in the above table we make the following numbers, viz.: 52, 54, 66, 68, 76, 78, 90, 100, 102 and 104, with corresponding dials.
The dials which make one and one rib with corresponding cylinder will also make a two and one rib by using all the needles in both cylinder and dial.
The Numbers on the top of table represent the numbers of dials and grooves which will work with the corresponding cylinder numbers on

the left, making the styles of ribs indicated by the figures in the squares below. Example: How to find the dial which will make *one and one rib* with any given cylinder in left hand column. Follow the upper dial figures from left to right until you come to the number of dial which represents one half of the number of needles in the cylinder, then follow down this row of squares until it meets the row opposite the desired cylinder number, and in the square forming the corner of the large square will be found the figures 1 and 1, 1 and 3, 1 and 7. The figures 1, 3 and 7 indicate the style of rib, and represent the number of cylinder-needles placed between each rib-needle used in dial.

All $4\frac{1}{2}$ inch diameter dials named in list up to 42 are cut 12 gauge, and are the best for ordinary family use; all up to 42 and above are also cut 24 gauge. The two gauges named use two different size needles, 12 gauge being the coarsest, for heavy knitting. Special cylinder needles, with small hooks, can be supplied for manufacturers' use, when the nature of the work requires it.

Table of Needles to be Used in Dial.

For one and one rib—all in the dial.
 For one and three rib—every other one out.
 For one and seven rib—every fourth one out.
 For one and two rib—all in the dial.
 For one and five—every other one out.
 For one and eleven—every fourth one out.

Other styles of rib can be made by some of the dials according to the table by removing needles from the dial, so that those that remain will divide exactly into the cylinder-needles.

The dials which make one and one rib, etc., with corresponding cylinder, and one and two with a cylinder of a higher number, are those most useful for family use.

We make special Cylinders and Dials to order for manufacturers, either 12, 18 or 24 gauge.

Preparing Ribber for Work.

The ribber is usually on the left of the machine when out of action, but can be swung off to the right side when found more convenient for the operator, and may be removed away from the machine entirely while learning the plain machine, or when much plain knitting is to be done.

Taking Ribber apart } Catch the ribber with the left hand, with the
and changing Dials. } palm below the dial to prevent it and the post
 from falling. Unfasten with the screw-driver the dial-post set-screw; now lower the left hand with the dial until the post is free.

Cam and Needle Action explained. } Lift the ribber arm out of its socket or holder and
 hold it in the left hand, with the cam-plate and cams up and toward you and the socket end away from you; examine the needle-operating cams, and take hold of the crown-cam with the right hand, and turn it one full turn, so that the switch-cam's inner point will be turned outward; now turn the crown-cam back and forward until its motion is well understood; leave it the last turn, so that the inner point of switch-cam rests on a line with outer edge of centre-cam.

Place a rib-needle, heel down, so that the projection on the back of the needle will rest upon the centre-cam at the back. Hold the needle with the

right hand and move it around with its heel resting against the outer face of the cam; continue moving the needle, and it will be observed that the needle ascends on the switch-cam.

Rib-Stitch, How Formed. } When it reaches the outer end of switch-cam, it has cast its stitch back of the latch, and as the needle is moved around, its heel comes in contact with the tension-cam and is drawn inward, which causes the stitch to move forward and throw the latch closed upon the yarn, which at this point is being caught by the hook of the needle; as the needle descends on the inner face of the tension-cam, the yarn, when caught by the needles, is drawn through the old stitch and forms a new one; the needle then proceeds on its course a second time, and so on each round, the heel following close to the outer face of the centre-cam; repeat this action of moving the needle around a few times until the stitch formation and needle action are well understood. Take special notice of the relation of the hook of the needle with the outer edge of the cam-plate, that you may understand well what cam or part of the cam is acting upon the heel of the needle when its hook ends stand at a certain point on the cam-plate or needle-dial.

Switch-Cam or Welt-Cam. } The crown switch-cam should now be moved so that the switch-cam's inner point will move outward and allow the needle to pass around the centre-cam; when moved around, it will be observed that the needle takes a different course in between the centre-cam and switch-cam and around, thereby causing the needles to be drawn in out of action for the purpose of forming a *welt-top*, or drawing the rib-needles in out of action and out of contact with the machine needles. Change the crown switch-cam back again and carry the rib-needle around, and so on repeat the changing of position of the switch-cam and moving the needle around until the two courses of the needle in and out of action are well understood.

Ribber Tension Stitch, How Regulated. } Hold the ribber in the left hand, cam upward, and fasten the *tension thumb-screw* with the right; move it inward so that the space between the centre-cam and itself is narrowed, which will produce a long and loose stitch suitable for coarse yarn and open knitting; move it again outward, so that the space between the centre-cam and itself is widened, which will produce a short and tight stitch suitable for fine yarn and close knitting. Medium points between the two will suit medium yarns and knit medium length of stitch; move the thumb-screw back and forward, watching the change of position of tension-cam until well understood. Now place the ribber on the machine in its holder.

Putting Dial on Filled with Needles. } Turn the *crown-cam* from left to right, that the switch-cam may be open; now see that all the needles are placed in the dial with their hooked ends level with the outer edge of dial; lift the dial up to place with the dial-post in the dial, and press up with the left hand, and at the same time turn the dial in the direction the hands of a watch move, and hold the cam-plate and hub with the right hand; pressing upward and turning the dial at same time allows the needles to come to place between the centre-cam and switch-cam. *Fasten the dial-post firmly* by means of the set-screw when the dial is at such height as to run closely without wobbling and not bind the needles. Should it bind on the needles and run hard, loose the set-screw and ease it down a little.

Oiling Ribber Wear-ing Parts. } Oil with good sperm oil the top of the needle-dial (and heels of needles when in the dial) before putting the dial to place; remove it when necessary to oil the dial and needles. Oil occasionally the arm where it turns in the holder, and likewise the groove of arm. Oil the top of the ribber arm on which the collar turns, and the cam-plate-hub where it turns in the arm, also the needles and dial through the hole in the cam-plate, near the hub, several times a day when in steady use. The machine costs more than oil.

Opening Rib-Needle Latches.

The rib-needle latches are opened before the ribber is swung on the machine with the latch-guide when down. Place the two fore fingers of the right hand upon the top of the *latch-guide*, between the hinge and the turned end. Place the thumb, with palm upward, lengthwise below the *latch-guide* part extending to the left, and immediately below the point where the rib-needles come in contact with the *latch-guide*. Press the thumb upward and turn the dial to the left, with the left hand, by means of the dial-lock. The needles pass over the palm of thumb and come in contact with the knife edge of the *latch-guide*, and are thrown back and open. Should any of the latches refuse to open owing to being short, they should be opened by hand, and should be straightened, when bent, by a pair of pincers or by the fingers.

Height of Dial and Ribber-Arm Nut.

The ribber-dial should be one full eighth of an inch from the needle cylinder for coarse yarn, and about one full sixteenth up for fine yarn, and is regulated by means of the nut around arm-holder. When knitting with all the needles in the cylinder, the dial should not be quite so high as for ordinary rib.

Placing Ribber on the Machine.

Turn the machine forward until the yarn-carrier is within two inches of the front of the machine and stop it there. Draw the rib-needles in out of action; swing the ribber over the machine with the right hand, at same time with left turn the lock on the bottom of needle-dial around to the left; now let the ribber down gradually to place, guiding the lock on needle-dial down behind the lock on the inside of middle cylinder, so that the dial-lock rests close against the cylinder-lock. The cylinder lever regulating screw should be about half-way out, and not to the extreme in or out.

Regulating Rib-Needles Between Machine Needles.

When the dial-lock rests back of and close against the cylinder lever-lock, the *rib-needle regulating-screw*, when turned to the left, will move the dial and rib-needles to the left, and when turned to the right the dial and rib-needles are moved to the right (when the machine is turned). Regulate the rib-needles directly in the centre of the machine-needles in this manner when commencing to knit, or after the heel has been knit, if found necessary to keep the rib-stitches in the centre of the plain ones.

Removing Cylinder Needles for Corresponding Rib Ones.

Be sure the dial-lock rests close against the cylinder lever-lock. Then remove the needles in the cylinder directly opposite the dial needles. If the right and corresponding dial and cylinder are in use the needles will come out evenly all around the cylinder.

The dial knitting one and one also knits three and one, etc. The dial that knits two and one also knits five and one, according to the number of needles in the dial, that is, half, third or quarter, etc.

How to know the first Cylinder-Needle wanted out.

When the ribber is once on to place, take the first needle out of the cylinder directly opposite the rib-needle nearest the mark on the top and left side of the needle cylinder, which indicates the half of the needles. This needle will always be the first one to be removed, and can be removed without putting on the ribber to try so long as the same rib, dial and cylinder are used, and the cylinder lever regulating screw-head is about three-quarters of an inch or half its distance out.

Connecting the Ribber Driving-Arm for Work.

Place the *yarn-carrier* within two inches of the front and left side of machine. Swing ribber on. Arrange the slot in *cam-plate-hub* and collar in a direct line with the slot in *ribber-arm*; swing down the *latch-guide* and secure it with button; move crank forward slowly with right hand, and at same time swing up the ribber driving-arm into front reception of *cam-plate-hub* projection and secure it by swinging-bar.

Threading Ribber for Knitting.

Thread the *yarn-stand* and *yarn-carrier* in the usual manner, and to show the action of the ribber without knitting, tie the end of the yarn to carrier; hold the yarn with the left hand directly above the ribber *arm-hole*, and with the notched-end of *work-hook*, held in the right hand, press the yarn into the *cam-plate-hub* and *arm-slots* through the hole at its lower end and under the hook, left side within the barrel of *cam-plate-hub*. The *work-hook* should incline to the right while pressing the yarn under the hook.

Unthreading the Ribber.

Hold the yarn directly above the ribber *arm-hole* and press the yarn to the left of the hook within the barrel of *cam-plate-hub* with the notched end of the *work-hook*, in the same manner as for threading.

Turning the Ribber without Knitting. Throw the rib-needles into action by turning the crown-cam from right to left, and turn the machine a few rounds slowly; the whole machine will now be practically operating, only not forming stitches as the yarn is held away from the needles. Examine every part of the machine closely while in motion, especially the needles, to see that they come out in their proper places between the cylinder needles, and that their latches are open. Any needle with a closed latch should be opened before proceeding to knit.

Change the *tension-cam* and *switch-cams* without seeing the cams, and practise the changes until you can do it with your eyes shut, and understand what the changes are for.

Removing Ribber off Machine.

Stop turning the machine when the *cam-plate-hub* and *collar slot* comes in a direct line with the *arm-slot*; unthread the ribber in the usual manner, swing down ribber *driving-arm hinge* into its clasp with the left hand, and at the same time move the *cog-ring* to the left with the same hand, while the right removes the button out of the way of the needles and swings up the *latch-guide*. Lift the *ribber-arm* up by catching it around the top of the arm close to the back part; when lifted up so that the bottom end of the ribber in the holder is above the *groove key*, then swing the ribber around to the left or to the right when found more convenient.

Our advice to new beginners is to review the whole work of putting the ribber off and on thus far, and practise the operation several times until it is well understood and can be done in *double quick time*; time is money, and much of it can be saved by having everything right when commencing to knit. Every mistake made when once the machine is threaded and the needles engaged with the yarn, usually causes the yarn and needles to get entangled, and all that has been done to be undone, and the operator to fly off the handle, mad.

Taking Out and Putting In Rib Needles. The rib-needles can be most readily taken out and put in directly on the right of the *tension-cam*, when the ribber is off the machine to the left and when the cams are on the front side facing the operator. Take the needles out with the right hand and turn the dial around, with the fingers and thumb of the left resting on the sides of the dial. Drop each needle as it is withdrawn into the palm of the left or holding hand. Replace the needles in the same manner, turning the dial around with the left hand, and place all the needles in the palm of the left hand, first lifting out one and inserting in the needle groove as the dial is gradually moved around.

We have made the foregoing instruction full and somewhat long, in order to make it plain for beginners; while the following instruction is short, and is intended for mechanical minds or advanced operators.

MANUFACTURERS, OR CUSTOM KNITTERS,

Who have more than one size of Ribber, should be very careful while working not to mix the different size rib-needles. Bad work will be made if the needles get mixed, as they are of different lengths.

Should the projection back of heel stand too high on any rib-needle, file it down level with the others.

PRACTICAL WORK ON THE RIBBER.

Sock Tops and Cuffs } Use good yarn suitable to the cylinder in use.
Ribbed one and one. } Take out half of the cylinder needles and use a dial according to dial table, page 51.

Thread the machine with the yarn carrier on the back.

Place the set-up with slot directly over the cylinder lever-lock.

Cast the yarn upon the needles and set-up hooks in the usual manner, *only do not cross the yarn between them.*

When two-thirds of the needles are set-up, turn yarn-carrier within two inches of front.

Complete setting up and place on weight-hook with one or two weights, according to grade of yarn and tightness of stitch.

Open rib-needle latches and draw in out of action all the needles.

Swing the ribber on the machine, at the same time guide the dial-lock down the back of the cylinder-lever lock so as to rest close against it.

Arrange the cam-plate-hub and collar slots in line with the arm-slot.

Swing down the latch-guide and secure it with button.

Move the crank forward slowly with the right hand, at same time swing up with the left the ribber driving arm into front reception of cam-plate-hub projection, and secure it there by swinging cross bars.

Thread the ribber by placing the yarn under the hook within the cam-plate-hub by notched end of work-hook.

Turn the crown-cam to the left and bring the rib-needles into action.

Proceed to knit. If the stitches climb up on the needles, or the needles fail to hold the stitch when formed, hold down the weight-hook by extra pressure from the hand.

Knit for sock-tops according to table of lengths, page 22, and for cuffs for the wrist, fifty to sixty rows.

Spool Thread for Separating. } Place upon the ribber bobbin-pin a spool of white cotton thread, No. 24 or 30; stop the machine with slots of ribber-arm, etc., in line as for threading the ribber; break off the yarn two inches from carrier; place the end of the spool-thread in the carrier so as to splice and lap on the yarn for three or four needles, and knit two rows; break the spool thread two inches from carrier, and splice on the yarn so as to lap in the same manner. -See striping, page 18.

Welt-Top, made only on one and one Rib. } Always knit one row of yarn after knitting the two rows of cotton thread, stopping the ribber with cam-plate-hub slot in line with ribber-arm slot; turn the crown-cam to the right to draw the rib-needles in out of action; knit two or three rows according to grade of yarn; turn the crown-cam to the left again to move the needles into action; knit fifty or sixty rows for a second cuff or the

desired number for sock-tops. Add extra weight with left hand, when necessary to make the needles knit properly, the second, third or fourth rows of welt-knitting. Any number of sock-tops can be knit in this manner, and the thread removed after being knit; then the tops can be transferred to the plain cylinder and the leg of the sock knit plain. Seventy-five to one hundred pairs of such tops can be knit in one day, and two to three dozen pairs of socks can be knit by transferring the rib-top, and is much the speediest method when rib-tops alone are wanted.

Cutting and Separating or Welting Thread.-Cut the spool thread on two opposite sides of the work, cutting each round, which makes two cuttings on each side. If cut in this manner the thread will draw out easily.

Double Cuffs one and one Rib. } Knit the cuff twice the length desired, either plain or striped, with sufficient number of rows of finer yarn knit plain at each end to form the inside of the cuff, which is turned in and sewed with the closing knit-stitch after being turned and off the machine.

Gentlemen's Full-Knee Stockings, Ribbed.

Knit one and one rib the desired number of rows, according to table lengths, page 22, and stop the yarn-carrier on the back of the machine.

Changing from one and one Rib to three and one. } Put needles into the vacant cylinder grooves on the front side of the machine opposite every other rib-needle.

Work-Hook used in Transferring Stitches. } Catch the hook of each rib-needle opposite the cylinder needles put in with the work-hook, and draw it completely out of the dial, still holding on to the rib-needle, and lift it up with the work-hook and cast the rib-stitches upon the machine needle put in, letting the rib-needle hang in the stitch, and so on with each of the other rib-needles to be removed.

Removing the Rib-Needles. } After the rib-needles have been withdrawn on the front of the machine and their stitches transferred, the rib-needles are removed from its stitch; the yarn-carrier is now moved to the front of the machine and the remaining cylinder needles placed in, and the rib-needles withdrawn and their stitches transferred; now knit the leg according to table lengths. *Loosen the tension slightly after the change to three and one rib.*

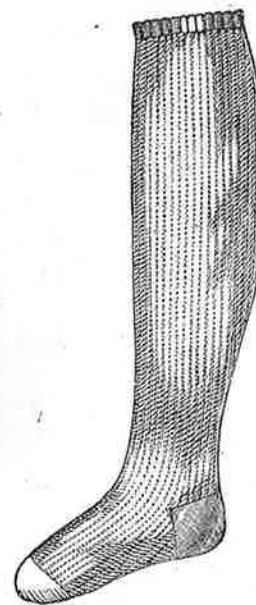


FIG. 51.

Heel made with Ribber on. } Stop the yarn-carrier on the back of the machine. } Place in the cylinder all needles out on the front-half and withdraw the rib-needles, transferring their stitches to the needles just put in so that the front of the machine will knit plain for heel. Turn the machine until the cam-plate hub and collar-slots are in line with the arm-slot; unthread the ribber with the left hand, and with same hand turn the cog-ring to the left a little; swing up the latch-guide with the right after removing the button; raise out of action one-half of the cylinder needles on the back, and proceed to form the heel with ribber on in the same

manner as on the plain machine; place the yarn in the take-up-spring and lock. *The importance of knowing thoroughly how to place the heel-hooks on the work in knitting heel and toe on the plain machine will now be readily seen, owing to the ribber hiding the work; the ribber-arm may be raised up in the holder, and the screw-driver placed between the nut and the arm-holder while knitting the heel and toe, until the operator can place the heel-hooks properly. Remove the screw-driver when commencing to knit again.*

Starting the Ribber } Stop the yarn-carrier on the left within two inches of the front after completing the heel; depress the needles upon back of machine; swing down the latch-guide and secure with button with right hand, and at same time with left; swing up the ribber driving-arm into the front reception and secure it with the swinging-bar; thread the ribber again, proceed to knit the foot according to table lengths, and form the toe in the same manner as heel, on the same side of the machine.

Knitting Toe after } Stop the cam-plate-hub and collar-slots in line
Removing Ribber. } with the arm-slot; swing down ribber driving-arm and latch-guide up, and unthread the ribber in the usual manner; hold the work up with the left hand so that the weight bears lightly upon it, or remove the weight to prevent the rib-stitches from ravelling down when cast off; turn the ribber-cam-plate around one or two rounds to drop off the rib-stitches; remove the ribber off the machine, and put needles in the vacant cylinder grooves, and lift the dropped rib-stitches upon them; knit the toe on the back of the machine in the same manner as on the plain machine.

The latter method of forming the toe we recommend, as the cylinder and needles are worn more evenly.

Ladies' Ribbed Stockings.

Hem-Top with Common Rib. } Prepare the cylinder needles to make three and one or two and one rib (according to dial used). Set-up the work and knit the number of rows required for the hem (according to table), ordinary rib without the ribber. After placing the set-up and weights upon the hem, swing the ribber on the machine and connect it. Turn the crown-cam to move the rib-needles into action; turn the crank, at same time move the needle-dial around to the right by the left hand, pressing on the dial at the point over the machine where the needles are down below the cams, to hold the dial-lock close against the cylinder lever-lock, that the first needle coming out is guided in its right place between the cylinder needles.

The double web of hem, unless the dial is held to the right, just as the machine is first turned, will spring the dial to the left, and if the first needle comes out wrong, all will be wrong. After knitting a round or two, loosen tension of machine a little for top of stocking, and gradually tighten for the ankle. Knit the heel and toe, etc., the same as a sock or man's full knee hose.

Ribbed Stocking, Narrowed Ankle.

Use all the Needles in Dial. } Knit a hem-top with all the needles in the cylinder. A dial which makes a two and one rib makes the stocking three and one in the top, and two and one in the ankle when the dial has all the needles in, and would recommend all the dial-needles to be used when a two and one dial is at hand. The one and one dial will work in the same manner, but makes the top too large for the ankle, and should be used with one-half of the needles out of the dial.

Swing on the ribber; be sure to press the dial to the right, just as the machine is first turned, to keep the rib-needles in right place as they come out. Knit the leg according to table, and shape the stocking as follows:

Narrowing Ankle by Removing Needles. } With the work-hook lift the stitches off all the second needles to the right of each rib-needle, and place them upon the third needles to the right.

Lift the stitches of all the first needles on the right of each rib-needle, and place them upon the second or empty needles. Remove the first needles on the right of each rib-needle all around the cylinder. The needles can be removed through the cam-cylinder flange-slot to narrow if desired; then all the cylinder-needles have been removed to make each rib one stitch less.

Regulate the rib-needles in the centre of the machine-needles by turning the *rib-needle regulating-screw* on the bottom of the bed-plate. Knit the ankle according to table, and heel and toe, etc., in the usual manner.

Double Heel and Long Heel. } When desired, the heel can be made extra heavy by knitting a second thread of same or second colour off a second bobbin, the two threads passing through the take-up spring and lock at same time. Change the rib-stitches to plain ones, and knit eight or ten rows before forming heel, when a long heel is desired. *Make the heel upon two or three needles more than half, when desired large, and the foot to stand up more.*

Stocking Ribbed Top—Narrowed Plain Ankle.

Knit a hem-top with all the needles in the cylinder; swing on the ribber and knit the leg to the ankle, the same as the narrow-ribbed-ankle stocking, with all the cylinder needles, and the half or all the dial needles according to dial used.

Changing from Rib to Plain. } Stop the cam-plate-hub and collar-slot in line with the arm-slot; unthread and disconnect the ribber.

Turn around the cam-plate one or two rounds to run off the rib stitches. Swing off the ribber and lift up the rib-stitches on the machine needles. Remove the weights or hold up the weight, while turning off the rib-stitches, if necessary, to prevent the stitches from ravelling down. Knit the ankle plain, with a tension somewhat tighter than the leg, and knit the heel and toe, etc., in the usual manner.

Men's Hose Ribbed all Round Foot.

When the needle-cylinder will not make the desired size out of the yarn, large sizes can be made by knitting with all the needles in the cylinder, and one-half, one-third, etc., or all the dial needles extra.

Knit the leg and form the heel in the usual manner, and on the second or third round, after forming the heel, put in the rib-needles again.

Changing from Plain to Rib-Work. } Lift up each cylinder needle, opposite the rib-needle grooves, and draw them out from the cylinder, at the same time insert the rib-needle from the top side into the stitch, and lift it up and off, pressing the machine-needle down with the left hand.

Remove the machine-needle with the left hand, and put the rib-needle in its needle-groove with the right; not so far as to throw the latch forward closed, or the stitches will drop the first round. Repeat the same thing with each rib-needle to be put in, and knit the foot, toe, etc., as usual.

Half Ribbed Ladies' Hose.

Good marketable hose are made with a bound off top and plain leg down half way to the ankle.

The ribber is then put on with a dial, and the needles in the dial, to form two and one or three and one rib,

Lift out through the *cam-cylinder flange-slot* a cylinder needle opposite each rib-needle, and place the hook of the machine-needle into the hook of the dial-needle, and lift the machine needle up and draw the rib-needle out a little at the same time, to run off the stitch upon the rib-needle, and so on with each of the other machine-needles required out.

The plain work can be changed to rib by lifting the stitch of each machine-needle with a rib-needle; then lift out the machine-needle and place rib-needle in the ribber with its stitch upon, and so on; more clearly described after knitting heel of men's hose ribbed all round foot.

Children's All-Ribbed Hose.

Ribbing one and one, or two and one, or three and one, on the various numbers of cylinders will make various sizes. Using different grades of yarn will knit various sizes on the same cylinder. Knitting tight or loose with same yarn and same cylinder will change the sizes. See table, page 22.

Narrowing the Instep of Stocking. } Children's stockings can be made a more perfect shape by transferring one or two plain needles for rib ones immediately after the heel is knit, making the change next the rib-needles, and keeping the rib the same as on the instep, when the foot is desired very small. The needles may be changed to rib on the bottom of the foot or as far round as may be found necessary for the size.

The toe for very small sizes may be made by putting needles in to form the plain part equal to one-third of the whole number of needles. Then the toe is formed on the one-third plain part, and the closing done by taking two stitches on the rib-side for one on the plain side.

Other Sizes.—The number of needles put in for forming the toe on can be varied, and when closing the toe the rib stitches can be taken up two at a time in the centre of the toe, so as to make the foot-part come out even with stitches in toe.

Small Sizes on One & One-Ribbed Dial. } Lift out of dial every other rib-needle, and lift out of the needle-cylinder two adjacent needles opposite each rib-needle left, which will make a two and one rib. (Use good elastic yarn.)

Now knit the stocking the desired length for the leg, transferring to a plain knitting in the usual way a sufficient number of needles to form the heel on, and make the heel equal to half of the whole number of needles in the machine; or make the heel on one or two needles each side more than half when the heel is wanted large. The toe is made on plain needles equal to one-half of the whole number of needles in the machine, and closed in the usual manner.

One and One Dial, Four and One Rib. } Use one-third of the needles in the dial and four needles in the cylinder between them; then two out of the cylinder opposite each dial-needle.

Make the heel and toe plain on needles equal in number to one-half of the whole number of needles used in the cylinder and dial. The rib will come out two needles in one place, which may be made on the front of the machine.

One & One Rib with Two & One Rib Dial. } Use all the needles in the dial with two adjacent needles out of the cylinder opposite the dial needles which will make one and one rib, and if made on fine dials and cylinders with good elastic yarn, a good stocking will be made.

Mitts, Cuffs, Etc., Made With Ribber.

Mitt, Ribbed Back and Plain Front. } Mitts can be made smaller in size by knitting the back of the hand ribbed; knit the wrist one and one rib thirty to forty rows; commence the thumb by first deciding the

number of stitches required according to size to be knit, then put a needle in the cylinder opposite a rib-needle, as many grooves away from the mark on the top and left of the cylinder as will represent half of the number of needles required for the thumb. Remove the rib-needle and place its stitch upon the needle put in, which will knit the row of stitches up the centre of the thumb.

Knit four rows and place one needle in on each side of the machine-needle first put in, and remove the rib-needles opposite, transferring their stitches to the machine-needles and knit four rows more, and again put in one needle on each side, and place their corresponding rib-stitches upon them, and so on every four rows knit. Add one needle on each side, until the plain or thumb part has 16, 18, 20, etc., needles, according to size changed to plain. Stop the cam-plate-hub and collar-slot in line with the arm-slot; unthread the ribber and disconnect the ribber the same as for the heel.

Raise out of action all the machine-needles except the thumb needles, and knit flat-web 40 to 50 rows, and finish the same as a small stocking, or run off the work and draw the point together by looping the stitches upon a thread after mitt is taken out of the machine.

Pick up the stitches from the selvage the same as in a plain mitt or cap-heel, and place on the heel-hooks, then put down all the needles up. Connect the ribber and knit one round. Transfer the rib-stitches between the thumb, and the mark on the top and right of needle-cylinder, so that all the front of the hand may be knit plain the length required for the hand, and finish the same as the toe of a sock. When commencing the thumb, after putting in the first needle, all the needles opposite the rib-needles on the front and right of the first one put in may be put in at the same time, and the rib-stitches changed for plain ones, which will make the palm of the hand plain to the wrist, in place of rib. The needles on the left of the first one of course will be put in every four rows knit, until the proper number are in for the thumb, which will extend to the mark on the top and left of the cylinder.

Knitting Mitt All Ribbed. } After the thumb, etc., are made in the usual manner, and the stitches picked up from the flat-web selvage, the needles put down, the ribber connected, and the yarn placed in the carrier, knit one round to cast-off the selvage stitches picked up, then transfer the needles occupied by the thumb back to rib again, and knit the length of hand. Remove the ribber by turning it one round or two to cast-off the rib-stitches, holding up the weight at the same time to prevent the rib-stitch from running down when cast-off. Pick the rib-stitches up on the machine-needles, and knit four or five rows, and run off the work. Rip out one or two rows and double the thread, and run the thread around the stitches and draw the mitt point in as close as possible, and securely fasten the end of mitt.

An all-ribbed-mitt means back of hand as well as front, and the thumb plain. The hand may be finished as the toe of a sock; knit plain when desired.

Ribbed Cuffs, Single or Double. } Cuffs for mitts can be made double by knitting the first half or length with fine yarn, or by knitting it upon one-half the needles in cylinders, every other one out with a loose stitch, and when the mitt is finished the first part is turned inside of the second half of cuff, and sewed around by hand. When knitting cuffs for wrist, make them double in the same manner. Only the fine yarn should be knit at each end, and when the cuff is off the machine, the two ends turned in and joined in the centre.

When knitting two or more cuffs, separate each cuff by two rounds of spool thread, which is cut in two places around the cuff; each round of thread must be cut to allow the separating thread to be readily drawn out. Only one change of the fine thread, or one change with every other needle out, will be all that is necessary for each pair of cuffs.

Ladies' Long Cuffs } Knit one and one rib for the first half of the cuff, Ribbed. } say 30 to 40 rows, then change the style of rib to three plain needles, then one rib, then one plain and another rib; then three plain needles again, and *one and one rib* between, and so on all round the cylinders; and knit the second half of the cuff the desired length. Turn the cuff inside out when preferred, which will appear one and *one* at one end and like *two and three* at the other. Bind or crochet the top end around.

Vandyke or Dutch Top.

Fancy tops scalloped, the same as some hands knit, make beautiful finished tops for silk, cashmere, and the best qualities of woollen goods, and are made continuously without removing the work on the machine.

After knitting the foot the desired length, *remove the ribber* and knit the toe in the usual manner, stopping the yarn-carrier on the front of the machine. Remove the yarn from the yarn-carrier, and leave it on the inside of the needles. Now knit two rows of spool thread, then raise *all the needles out of action*.

Thread the yarn-carrier with the yarn to be knit. Now commence the new top *directly on the front of the machine, as follows* :—

With the right hand carry the yarn inward between two needles, and around the one on the left, and again forward and inward between the next two on the right, and around the one on the left. As the one hand advances with the yarn around the needles the forefinger of the other is placed upon the loop last formed and holds it down to position until the new loop is cast upon the next needle, and so on all around the machine. *Note the setting-up, as just described, is done in the same direction as shown on page 16, only the thread crosses on the outside in place of the inside, and the setting-up device is not used.*

When all the needles are looped, press them down into action, and knit one row; open the latches of the rib-needles and draw them in out of action. Now place the ribber on the machine; lift with the work-hook upon each rib-needle two loops, viz., those formed between the machine-needles by the *setting-up loops and row of stitches last knit*.

Press the dial-staple close against the cylinder-lever; move the rib-needles into action, then proceed to knit the leg in the usual manner; *add additional weight by the hand for a few rows*. At all times a little extra weight by the hand will prevent the work from climbing up on the needles, and insure more perfect work.

Loop the needles loosely in setting-up to prevent the yarn from breaking while knitting the first row or two.

This style of setting-up can be used for plain hose, and is specially well adapted for ordinary rib goods in *two and one and three and one rib*, and when used the plain stitches are transferred to the rib-needles by lifting the machine needles opposite each rib one out through the cam-cylinder slot, and then placing their stitches upon the rib-needles in the usual manner as the cam-cylinder revolves. *One dozen or one hundred stockings or socks can be made in this way continuously without running the work off the machine.*

Full-Fashioned Ribbed-Stockings.

On pages 23 and 58 we explained how to make narrowed rib-stockings, but the instructions therein given are explicit enough in the details and different manners of doing the same, as here described :—

Ribbing-dials for one and one and two and one ribs can be used. When using the one and one, every other rib-needle should be removed. Manufacturers of the better class of hosiery will find the two and one dials make the finest and most marketable hose, as the rib is three and one in the top and one and one in the ankle and foot, while the one and one dial makes the rib

one stitch wider, and consequently looks somewhat coarser. The one and one dial makes the goods speedier and cheaper, as there are less narrowings.

Commence by making either the Vandyke-top or hem-top; or a one and one rib-top may be made. In the latter case, knit the one and one rib about two inches long, then place all the machine needles in the grooves and place stitches upon them with the work-hook by lifting the loops last cast off from the machine needles next the rib ones.

Now knit 150 or 200 rows, according to the coarseness of the yarn used, or about 14 inches for a full-size hose. Stop the cam-cylinder slot on the front of the machine opposite the rib-needle nearest the centre. Lift out through the cam-cylinder slot the two machine needles nearest the centre rib-needle; place the stitch of the second on to the third, taking out the second needle entirely; then place the first needle into the groove of the second. Now knit four full rows and narrow twice on the fifth row once on each side of the first narrowing in the same manner as the first narrowing. Cast the narrowed stitch on each side always in the same direction, that is to the right or to the left, according as you narrowed the first, and so on all around the machine.

The rib-needles should now be adjusted centrally before proceeding to knit the ankle, then the stocking is finished in the usual manner. Narrowed half way round makes a good shaped stocking more speedily, and is preferred by many.

DRAWINGS OF RIBBER PARTS.

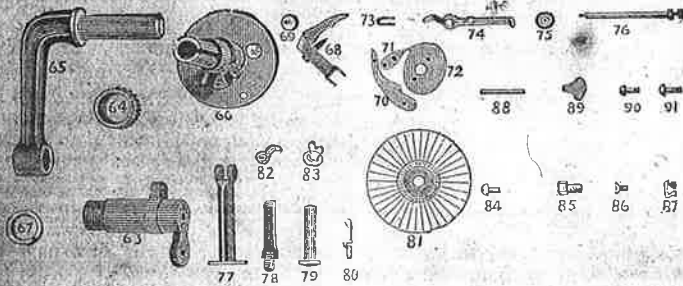


FIG. 52.

Retail Price List of all Ribber Parts.

| No. | Name of Part. | Price Each. | No. | Name of Part. | Price Each. |
|-----|---------------------------------|-------------|-----|-----------------------------|----------------|
| 63 | Arm holder | \$3 50 | 78 | Driving-arm hinge | \$0 50 |
| 64 | Arm nut | 0 75 | 79 | Dial-post | 0 30 |
| 65 | Arm | 3 00 | 80 | Rib-needle | 0 05 |
| 66 | Cam plate and hub | 4 00 | 81 | Ribber-dial | \$2 00 to 4 00 |
| 67 | Cam plate hub-collar | 0 50 | 82 | Latch-guide button | 0 15 |
| 68 | Latch guide | 1 50 | 83 | Crown-cam | 0 75 |
| 69 | Tension thumb-screw | 0 15 | 84 | Dial-post set-screw | 0 10 |
| 70 | Tension cam | 0 50 | 85 | Arm-holder bolt | 0 15 |
| 71 | Switch-cam | 0 40 | 86 | Driving-arm screw | 0 05 |
| 72 | Centre cam | 0 40 | 87 | Driving-arm spring | 0 10 |
| 73 | Dial lock steeple | 0 10 | 88 | Spool pin | 0 05 |
| 74 | Cylinder lever lock | 0 75 | 89 | Cylinder-lever screw-driver | 0 10 |
| 75 | Cylinder lever screw head | 0 10 | 90 | Crown-cam screw | 0 10 |
| 76 | Cylinder lever regulating screw | 0 50 | 91 | Latch-guide button-screw | 0 10 |
| 77 | Driving-arm | 0 75 | | | |

Price List of Combined Parts.

| | | | |
|-------------------------|--------|---------------------------------|--------|
| Cam plate hub, complete | \$7 00 | Cylinder lever regulating screw | \$0 60 |
| Driving arm | 1 40 | Needles per doz. | 0 60 |
| Set of cams | 1 30 | " " 100 | 3 00 |

Give Diameter Size of Machine every time in Ordering Repair Parts for Ribber or Plain Machine; also, the No. of Part and No. of Ribber and Machine.

HOSIERY PRESS FORMS.

We can supply the pattern papers by which to make good form shaping boards, at the rate of 50 cents per set of 12 sizes.

We can also furnish the wooden forms at 12, 15, and 20 pieces per pair, according to size.

The forms are usually made out of good hard wood $\frac{1}{2}$ inch thick, and the goods pressed while on the form. Custom Knitters can use these forms or zinc forms with round, smooth edges, pressing the goods by a hand-hot smoothing iron, overlaid with a damp cloth. Ribbed goods require narrow press-boards and light pressing.

We will be happy to give all information desired by letter.



SILVER MEDALS

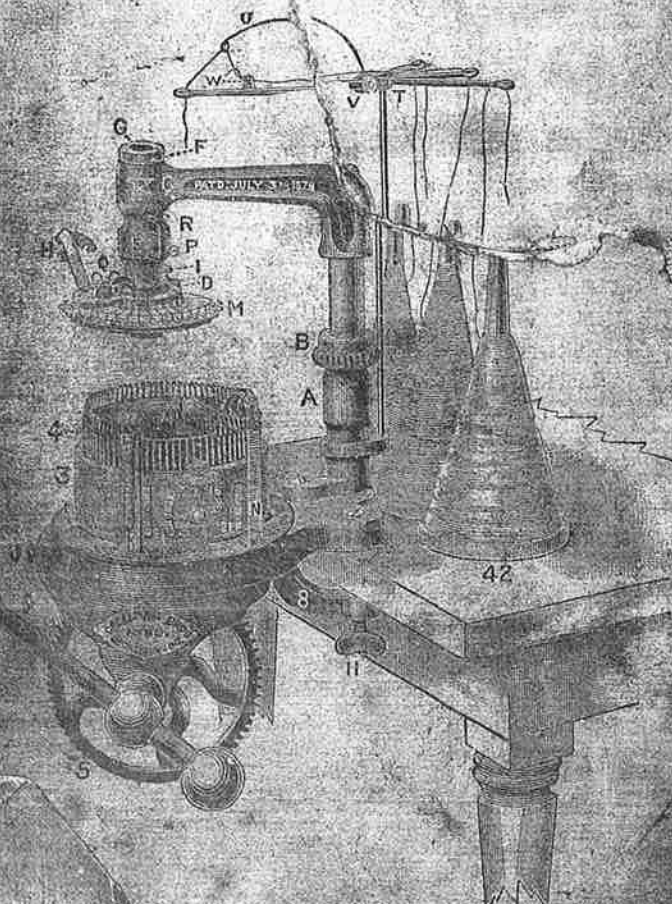
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