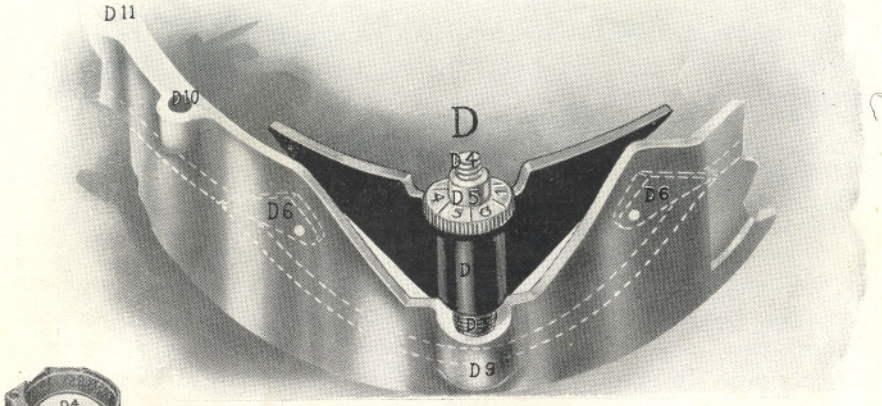
PART IV

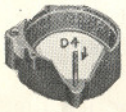
MAKING ADJUSTMENTS

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



OUTSIDE VIEW OF SECTION OF SHELL SHOWING TENSION ADJUSTMENT

Fig. 23



D
Cam Shell

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

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

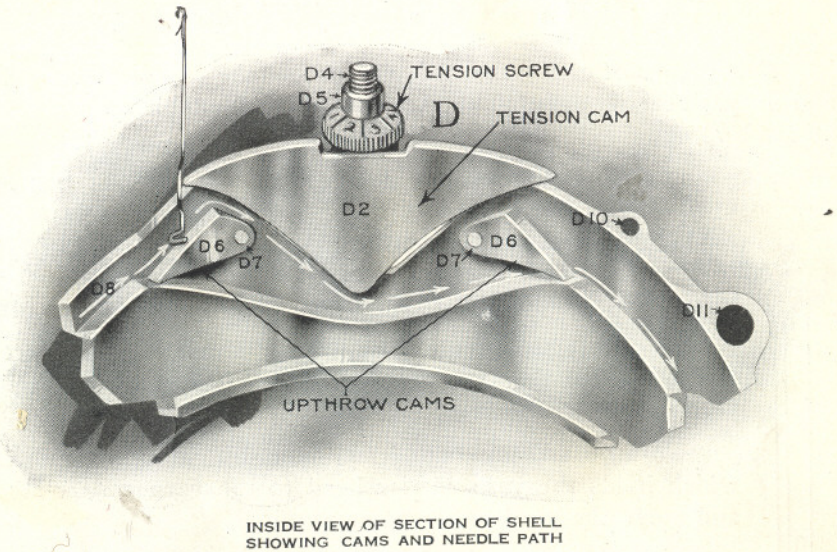
To tighten the tension—turn the Cylinder Tension Screw to the left, raising the tension cam.

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

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

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

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



INSIDE VIEW OF SECTION OF SHELL SHOWING CAMS AND NEEDLE PATH

Fig. 24

UPTHROW CAMS (D6)

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

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

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

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

YARN CARRIER (E)

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

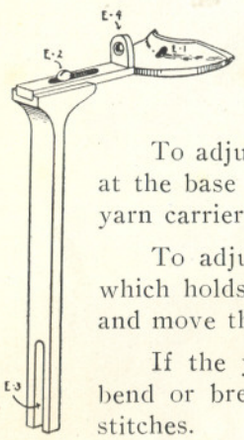


Fig. 25
Yarn
Carrier

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

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

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

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

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

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

PLACING AND REMOVING CYLINDER NEEDLES

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

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

THE DIAL ADJUSTER

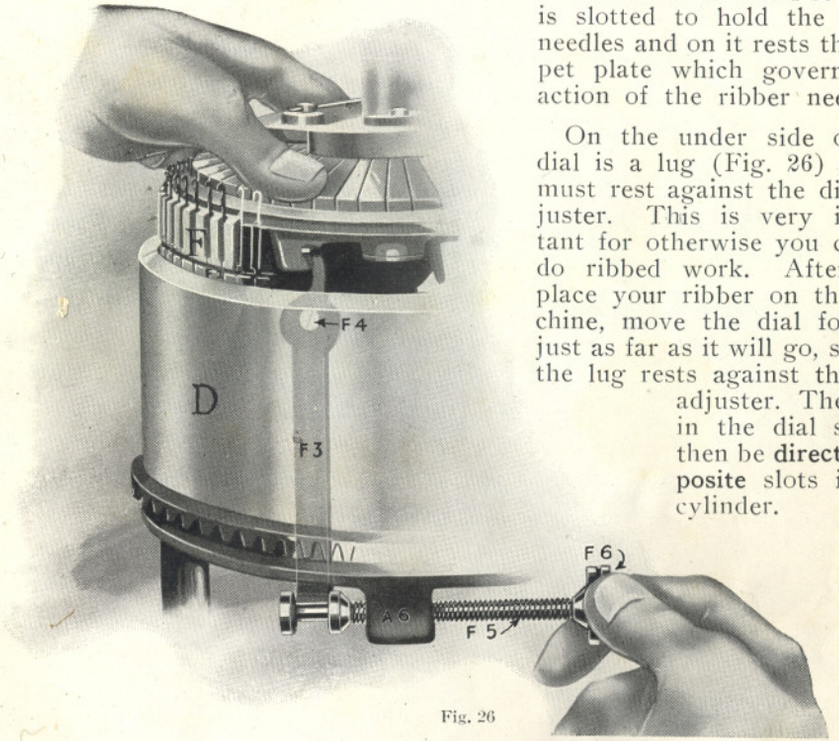


Fig. 26

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

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

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

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

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

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

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

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

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

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

MAKING ADJUSTMENTS

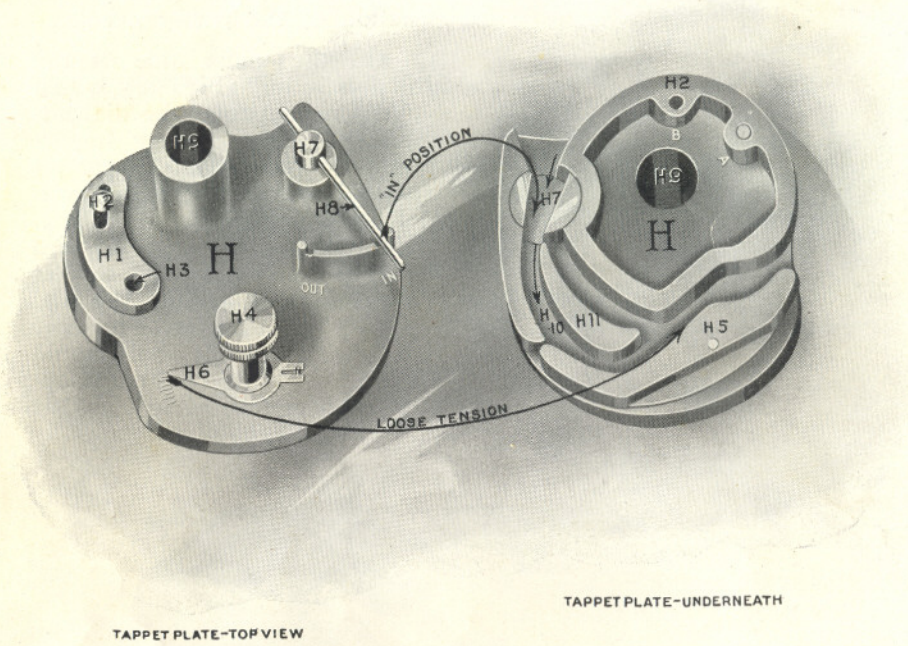


Fig. 27

THE TAPPET PLATE

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

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

RIBBER TENSION

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

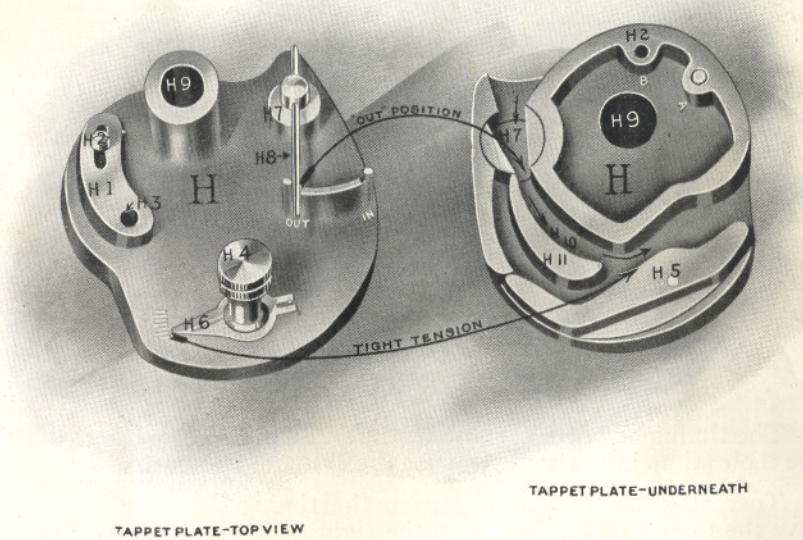


Fig. 28

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

MAKING ADJUSTMENTS—Continued

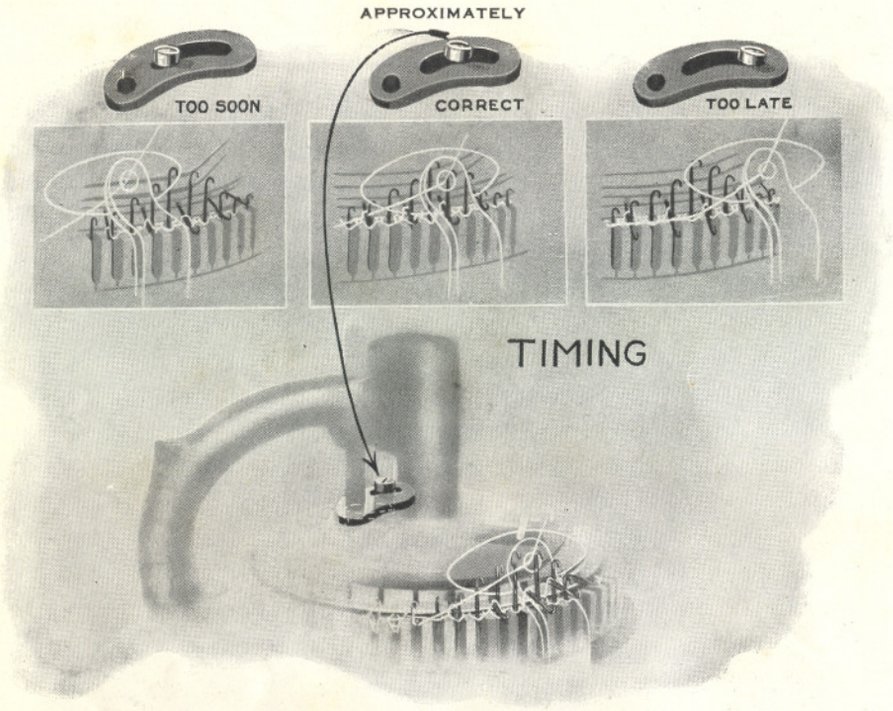


Fig. 29

TIMING THE RIBBER NEEDLES

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

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

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

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

MAKING ADJUSTMENTS

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

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

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

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

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

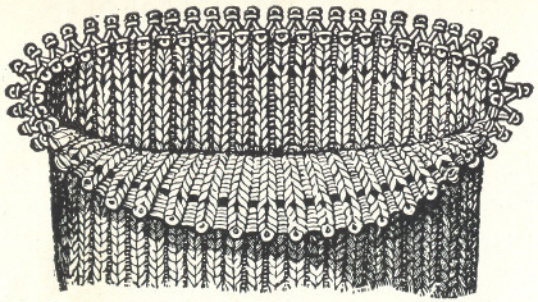


Fig. 30

TO PUT WORK ON THE MACHINE

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

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

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

PICKING UP DROPPED CYLINDER STITCHES

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

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

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

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

PICKING UP DROPPED RIB STITCHES

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

CARE OF THE MACHINE

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

The Cylinder Grooves with needles in.

The Dial and Dial Grooves with needles in.

The Cams inside the Shell.

The Crank Wheel Teeth and Stud on which it revolves.

The Winder and Swift.

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

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

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

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

CAUTIONS

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

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

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

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

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

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

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

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

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