

INSTRUCTIONS FOR OPERATING
THE HORIZONTAL WARPING MILL.

SETTING UP

The mill is delivered folded (fig. 300). To set it up, we first open it, (fig. 301) placing the chain under the pins, the heck-block should be placed on the rail (E Fig. 303)

The next step is to open the revolving frame (reel), put in place the cross-piece (G), and insert the pegs (H).

Finally the counter (T-fig. 303) is screwed to the heck-block, the rigid heddle (U-fig. 303) in the support in the same block, and the cord K in the two pulleys (P-fig. 303.).

The warping mill is now set up, but not adjusted.

PRINCIPLE OF WARPING

The rotating frame (fig. 302) works exactly in the same way as any warping reel, with the exception that it is horizontal and not vertical. For that matter, the warping mill may be used as a plain warping reel, simply by disconnecting the cord K.

When the cord K is in place it is attached to the heck-block (guide) by both ends and passes around a wooden cylinder (R-fig. 301), and around two pulleys which keep it away from the wooden parts of the mill. When the rotating frame turns the cylinder R turns also, and pulls the cord one way or the other depending on the direction of rotation. The cord in turn makes the heck-block P slide on the rail E. Thus the heck-block travels all the way from the left to the right and back.

The yarn used for warping passes through the opening in the guide (S-fig. 303 & M-fig. 304), and through the heddle-reed (fig. 305). The heck-block guides the yarn wound on the reel when the latter is in motion. The weaver does not touch the yarn except when making the crosses (leases) at each end of the warp. To avoid piling up of the yarn, change the position of the heck-block on its base from time to time. This is done by inserting the peg Z (Fig. 301 & 304) in one of a row of holes made in the base (N-fig. 304.).

The counter shows the number of portees, i.e. the number of times the heck-block comes to the extreme right of the mill. One portee contains twice as many warp ends as the number of tubes or bobbins used for warping. When the warping is finished the bearing is done directly from the warping mill. To get the proper tension of the warp, set the brake on the right hand side of the mill (Q-fig. 301). This brake is released when warping.

ADJUSTING

First find the proper position for the left hand cross-piece (G). The right hand piece is mounted always as far to the right as possible. The other can be set in any place whatsoever. One turn of the reel corresponds to 3 yards of the length of warp. If the warp is 15 yards long then we make 5 turns of the reel, always starting on the right hand side. Then we attach the cross-piece G to the reel opposite the guide in the heck-block. If, as mentioned above, the two cross-pieces are on opposite sides of the reel, the latter is balanced. If not, it must be balanced with additional weights. It must turn freely without tendency to stop in any particular position.

To prevent the reel from turning beyond the ends of the warp which might damage the cord or push the counter out of place, we use end of cross-pieces (G fig. 301) which are longer at one end, strike the heck-block when it approaches the end of the warp. Finally we adjust the cord K so that it will be rather tight; otherwise it may slide on the cylinder R. At the same time it must be so adjusted on the cylinder that the counter on the heck-block base just touches the rubber padding on the stop Y (fig. 303) at the end of each portee. This adjustment is very important, and should be checked several times before starting the warping. The counter can be set back on zero, by taking it out of its bracket and turning the knobs.

WARPING

After the warp is figured out, we have to decide whether we shall warp from 2, 4, 8, or more tubes or cones.

When warping from two tubes, we pass the threads only through the guide (S-fig. 303 & M-fig. 306), and the heddle-reed (U) can be completely removed. The crosses (one at each end) are made two by two threads, i.e. the ends do not cross each other singly but in pairs. There are even weavers who make crosses four by four (when warping from four tubes), but here we may have difficulties with certain yarns. On the other hand it is not very economical to warp from four tubes and make the crosses singly, because making a single cross takes as much time with 4, with 8 or 16 tubes. Therefore we advise to use either two tubes or eight.

When we use more than two tubes, the threads are passed first through the heddle-reed (Fig. 305) and then through the guide. (Fig. 306). When threading the heddle-reed take the ends in the same order in which they come from the bobin rack, so that they are not crossed or tangled. ~~Pass the first thread through a hole, the second through a dent (slot), the third - through the hole, the fourth - through the dent and so on.~~ Then all threads together go through the guide. The guide is not straight - it is set at an angle nearly equal to the angle of the warp on the reel.

Turn the reel until the heck-block reaches the extreme right - hand position touching the end of the cross-piece. Insert the peg H in the last hole on the right. Tie the warp ends together and make a cross. This end of warp will have crosses in groups of 4, 8 or even more threads. Now turn the reel in the opposite direction without touching the yarn until the heck-block will come to the left-hand cross, where it will stop by itself. Here we cross the threads singly.

To make a single cross we grasp the warp on the outside of the heck-block with the right hand and on the inside of the guide, with the left (fig. 304). Now if we move the right hand down, we shall open a small shed. We insert the index finger of the left hand into it, turn quarter of a turn to the right (clockwise) and bring the opening to the first peg in the crosspiece. Then, we move the right hand up, thus opening another shed, and repeat the performance with the second peg, turning the shed in the same direction and turn all ends around the third peg. Now we come back to the second peg and to the first making the same operation.

After the single cross is made we start turning the reel backwards, and come again to the first cross, where we cross the threads in group. The counter registers the first portee, and the whole cycle is repeated over and over again.

After we have made approximately $\frac{1}{4}$ or $\frac{1}{6}$ of the warp, we move the pin Z in the base N of the heck-block one hole of the left. For instance if we have a warp of 480 ends, and we warp from 3 tubes, it will take 30 portees to make the whole warp.

We can divide these into 6 groups of 5 portees each, and move the pin Z by one hole when the counter shows 5, 10, 15, 20, and 25.

BEAMING

The warping is finished on the right hand side cross. Now we set the brake (Q-fig. 301) to prevent the reel from turning freely, and place the whole mill in front of the loom. It is important to prevent the mill from sliding towards the loom during beaming. Put the front of warping mill on top of the loom after having removed the top cross bar from the loom. (Fig. 308)

The lease sticks are inserted in the right hand cross, and tied on both ends. Then, the first peg is pulled out, and the lease sticks with the cross moved towards the back of the loom (between the harness and the slabstock) where they should be tied to the loom frame, so that they won't move with the warp. A raddle is placed flat on the slabstock with the dents to the back, and tied firmly in this position.

Now we take the steel rod from the back apron, and pass it through the back loop in the warp. The rod and warp are pulled gently to the back, over the raddle, which is in the beater at the place of the reed. If the cross does not slide easily through the lease-sticks, the warp should be spread a little. The rod can be tied to the slabstock just below the raddle. We do the spreading as usual, trying to put a full number of portees in each dent.

The important operation which comes next is lacing the warp to the apron. First of all, put the pegs in the hole of top of warping mill and place the warp between the pegs, in the center of the warping section.

Now we take a rather long and smooth cord, attach one end to the rod in the apron (not the free rod in the warp) at the edge of the warp and lace the warp itself (not the rod) to the apron, by passing the cord through the loops of warp, then around the rod, then again through a group of loops, and so on until the whole warp is attached to the apron. The groups of loops should be all of the same size - so many portees of warp in each group.

When the lacing is ended, remove first the lease-rods, then the steel rod. You will notice that the tension of the warp is not uniform. It will be higher at the edges than in the center of the warp. This is why we have laced the warp directly to the apron. Adjust the cord by pulling it from the center toward the edges until the tension is even all across the warp.

To beam fast without stopping we use continuous paper, either heavy wrapping paper or building paper in rolls, or corrugated paper. When starting such a roll of paper, we have to make sure that it is straight, i.e. that the edge of the paper in the 2nd layer will come exactly on top of the edge in the 1st layer. Once the position of the paper is adjusted the beaming may be done at the top speed. When we come to the end, i.e. when the 2nd cross will be at the top of the mill, we insert the lease sticks in the 2nd cross, and tie them together as before.

Now, to finish the beaming without any help, tie a few yards of strong cord to the end of the warp (the last loop in the cross) and wind it around the reel in the same direction as the warp. Tie the other end of the cord to the reel. This operation could be done as well before beaming. Then, the beaming goes on. The cross will slip off the pegs, and the lease rods will stay in the warp. When the end of the warp reaches the breast piece of the loom we stop, and push the lease rods to the back of the loom to their normal position. Now the last loop of the warp is cut, and we are ready for threading.

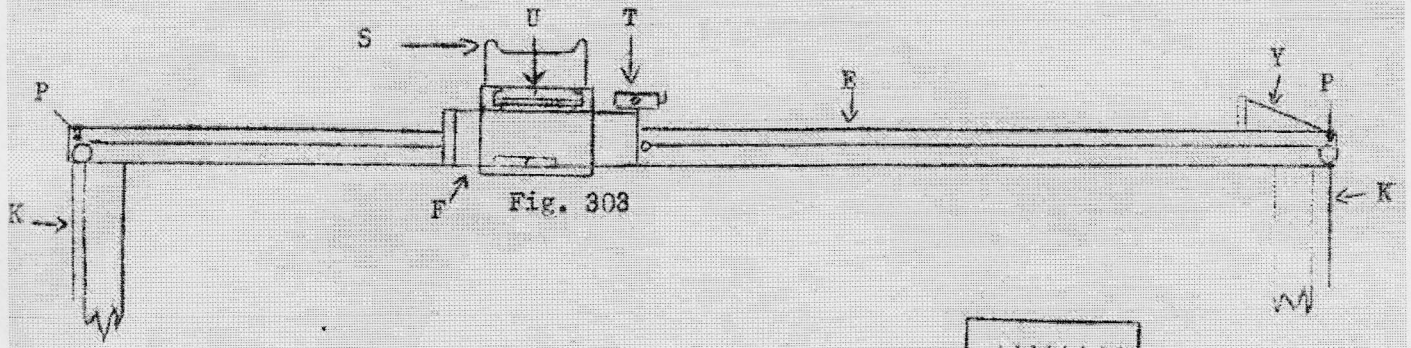


Fig. 303

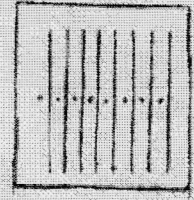


Fig. 305

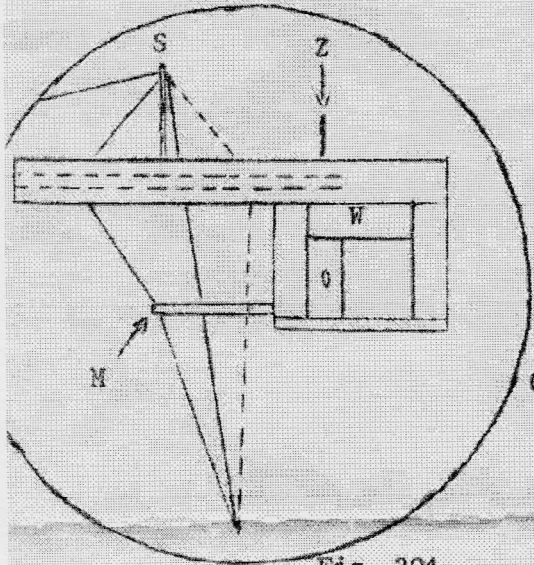


Fig. 304

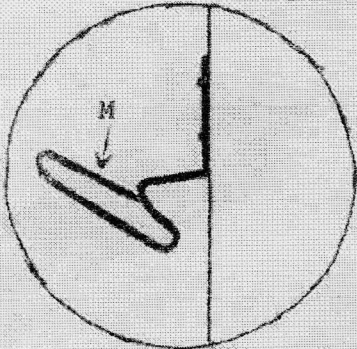


Fig. 306

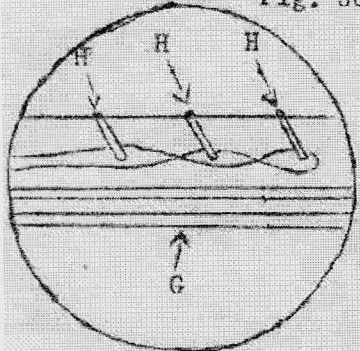


Fig. 307

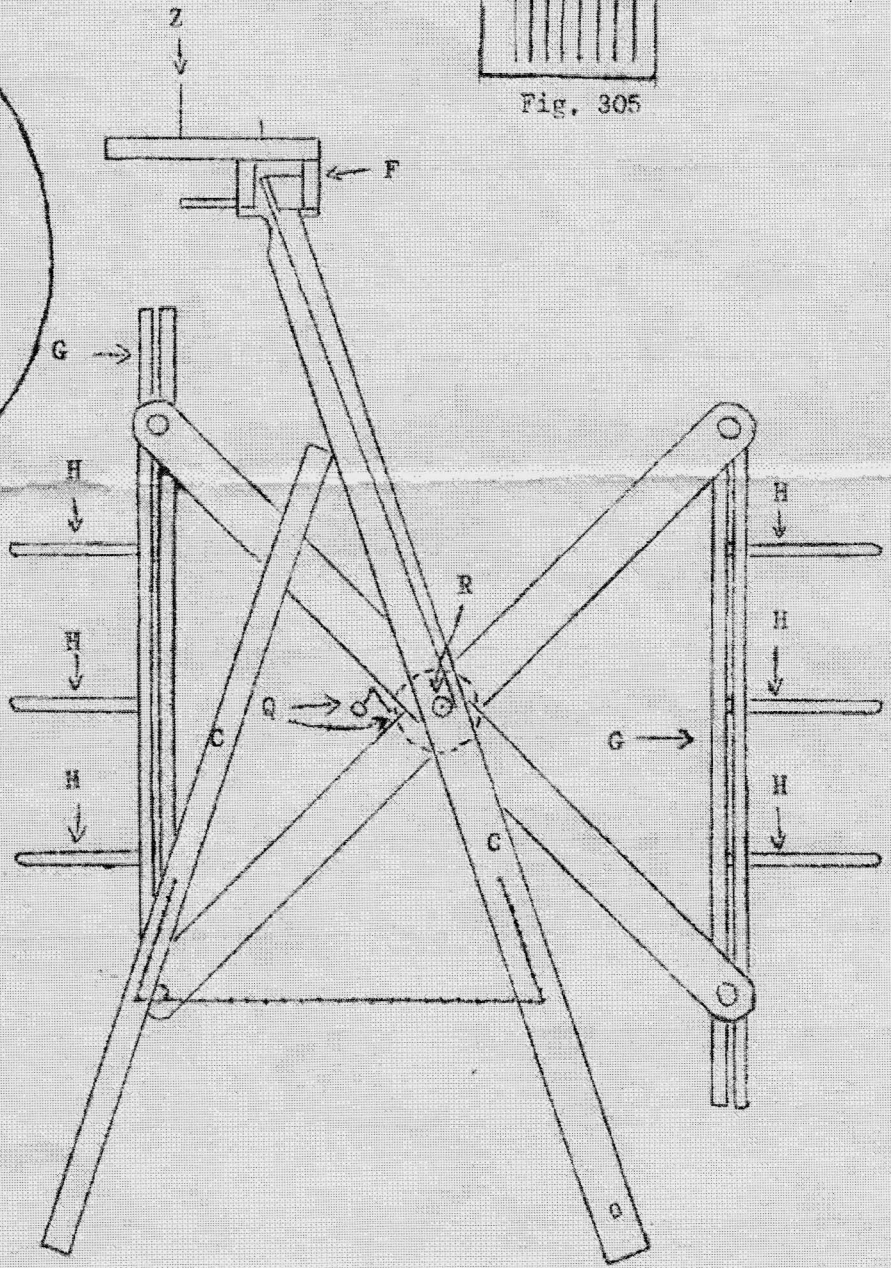


Fig. 301