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THE TUTTLE FAMILY KNITTER.

We present herewith three illustrations of the new Tuttle family knitting machine which embodies many valuable improvements, which consist mainly in its method and devices for knitting the hand rib stitch, in connection with plain and fancy stitches.

The machine as shown in the illustrations is similar to any circular knitter, having one perpendicular needle cylinder, used as a base, into which is introduced a conical needle cylinder held in position, so that by the rotation of the perpendicular cylinder, the needles in the cone cylinder are made to cross these in the straight cylinder while both are knitting, thereby producing a hand-rib stitch. This cone cylinder, when introduced into the perpendicular cylinder, is supplied with needles (being self-operating) taken from the perpendicular cylinder

without removing the stitch from the same, thus turning the outside stitch which was knit on the perpendicular cylinder on to the inside of the work, precisely as in hand knitting. The inside or conical cylinder is so arranged that no more rib stitches are made than are desired; for instance, if it is required to knit just a few rib or seam stitches on the in-

step of the stocking, this can be done and the machine immediately changed back to plain work at the will of the operator.

The usual mode of knitting rib top hosiery on this machine is to remove every other needle (or as many as desired) from the outside or perpendicular cylinder and place them in the conical cylinder and knit as far as may be required for the top of the stocking, and then change or return the needles from the conical to the perpendicular cylinder swing, the cone out of work and go on with the plain

bing by alternating the plain and rib stitches. Mittens can be made with rib on the back of the hand and plain in the palm of the hand, and *vice versa*.

This machine has a compound motion and can be run either way, backwards or forwards. Thus the work may stand still while the cylinders revolve, or the work revolve while the cylinders stand still. Each machine is provided with a register which accurately counts every full revolution of the machine whether turned either way.

Fig. 1 shows the conical cylinder or ribber at work, Fig. 2 the ribber when thrown out of work, and Fig. 3 exhibits the operation of transferring a needle from one cylinder to another. The machine is adapted to the manufacture of all kinds of hosiery and for family use.

Patented April 14, 1874. For further information address the Lamb Knitting Ma-

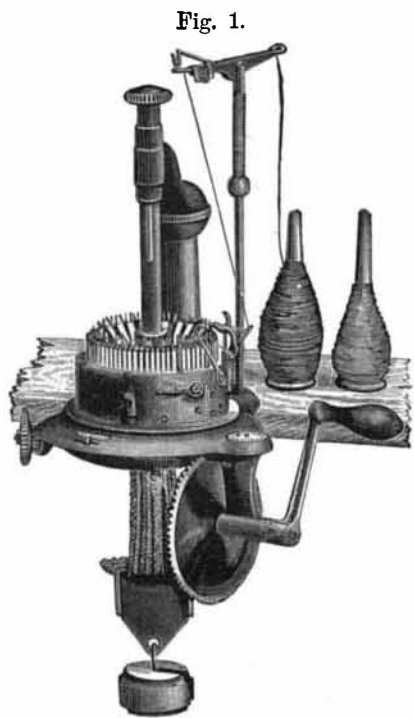


Fig. 1.

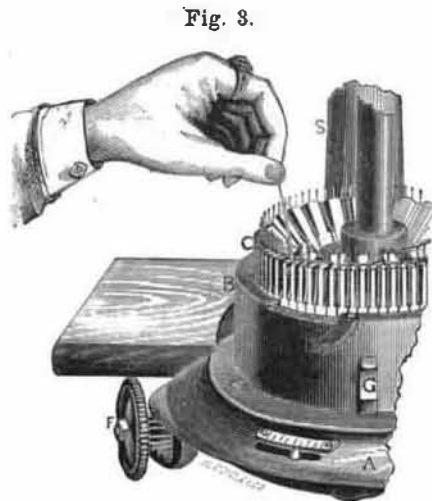


Fig. 3.

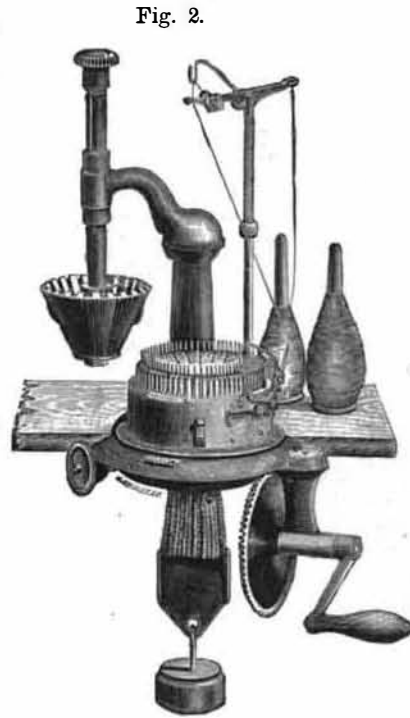


Fig. 2.

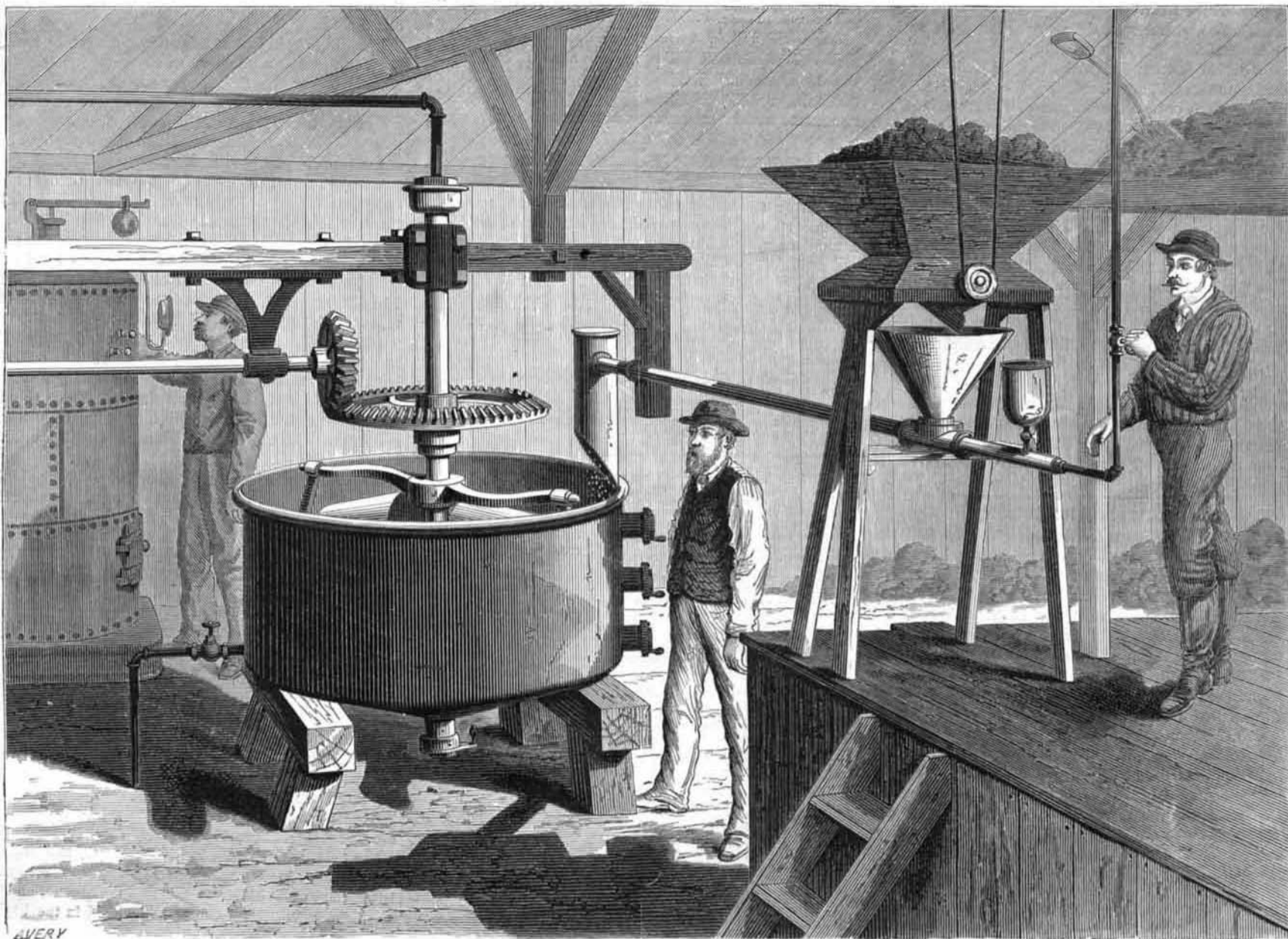
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stitch for the leg. When the ankle or instep is reached the conical cylinder may be returned to work and the ribbing performed, either upon one side or all the way round at pleasure. It will be readily seen that the ribbing may be continued all the way down the leg or foot. Very unique and fanciful styles can be produced in this method of rib-

chine Company, Chicopee Falls, Mass.

THE FORSTER-FIRMIN AMALGAMATOR AND ORE WASHER.

The magnitude of the mining interests in this country and the difficulties of treating ores containing the precious metals have resulted in many attempts to produce a machine or



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