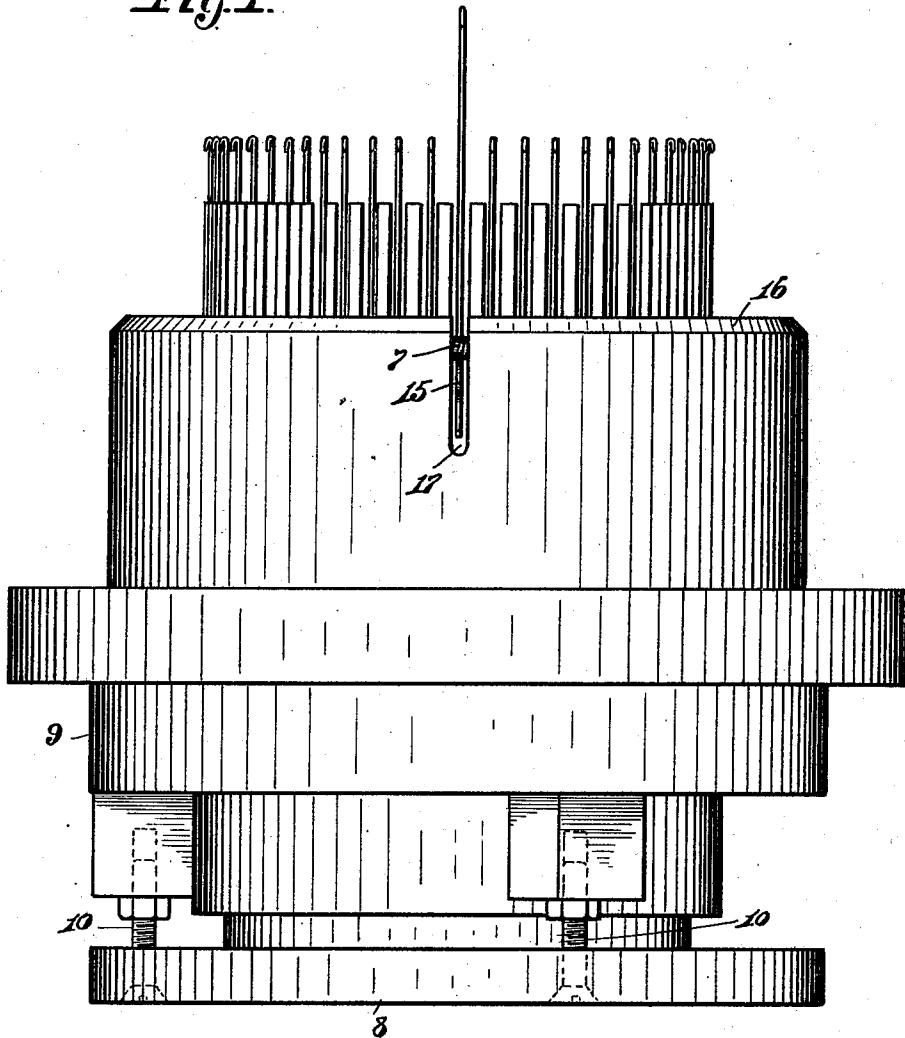


A. C. TIMMING.
KNITTING MACHINE.
APPLICATION FILED AUG. 18, 1910.

1,000,460.

Patented Aug. 15, 1911.
2 SHEETS—SHEET 1.

Fig. 1.



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By George J. Oltsch.
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Fig. 2.

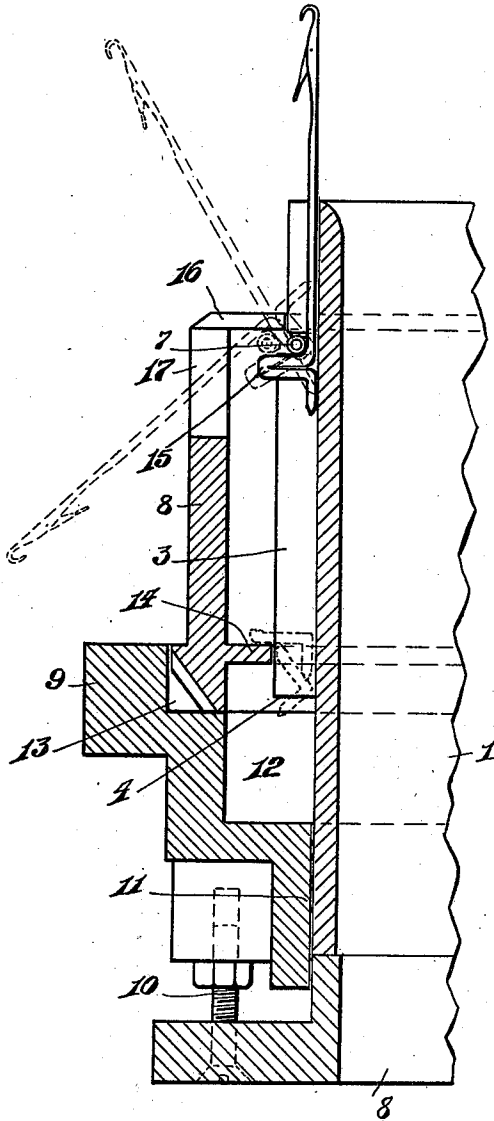
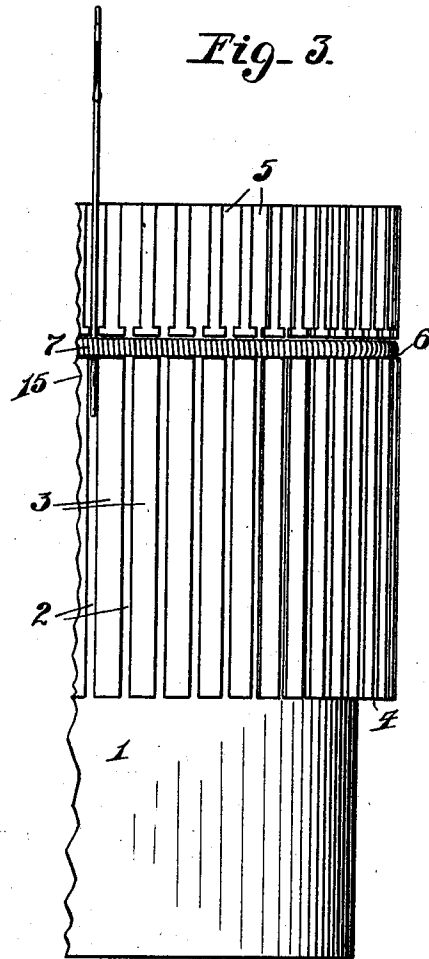


Fig. 3.



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UNITED STATES PATENT OFFICE.

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KNITTING-MACHINE.

1,000,460.

Specification of Letters Patent. Patented Aug. 15, 1911.

Application filed August 18, 1910. Serial No. 577,773.

To all whom it may concern:

Be it known that I, AUGUST C. TIMMING, a citizen of the United States, residing at South Bend, in the county of St. Joseph and State of Indiana, have invented certain new and useful Improvements in Knitting-Machines, of which the following is a specification.

My invention relates to improvements in circular knitting machines, and particularly to the bed plate and the cam and needle cylinders of such machines.

The object of the invention resides in the provision of means whereby a needle may be easily and quickly removed from the cylinder, and as easily and quickly replaced, without necessitating the removal of the needle cylinder from the machine.

Another object of the invention resides in the provision of means whereby a broken needle may be handily replaced by another, and the broken part received into a chamber out of the way of the operative part of the machine, without interfering with or stopping the operation of the machine.

With these and other objects in view, the invention consists of certain novel features of construction, as hereinafter described and pointed out in the claims.

In the drawings employed for illustrating the preferred embodiment of the invention:—Figure 1 is a side elevation of the bed plate, cam and needle cylinders of a circular knitting machine, Fig. 2 is a fragmentary vertical sectional view of the parts indicated in Fig. 1, and Fig. 3 is a fragmentary side elevation of a needle cylinder.

The tubular needle cylinder 1, is provided with a plurality of radially disposed needle slots 2, in which the needles are mounted for vertical reciprocation in the usual manner. The needle slots are formed by spaced ribs 3, which extend radially from the cylinder body, thus forming an annular offset 4, the purpose of which will be presently explained. Similar spaced ribs 5, extend from the upper end of the cylinder but shorter in depth, and the slots formed by the spacing of the ribs are in alinement with the aforesaid slots. The lower ends of the upper ribs and the upper ends of the lower ribs terminate short of each other, and thus form an annular groove or recess 6, intersecting all of the slots, and adapted to receive a coil spring band 7, which yieldingly bears

against the shanks of the needles mounted in the slots, and holds them in sliding engagement with the cylinder body so that they will be free to have vertical reciprocation, but held against lateral displacement.

The lower edge of the needle cylinder is mounted upon the upper edge of an adjusting ring 8, which latter is supported by the bed plate 9 by means of adjusting screw bolts 10, in the usual manner. The bed plate 9, is of step formation in cross section, the lower portion of which embraces the needle cylinder, as at 11, the middle portion being greater in diameter and forming an annular recess or chamber 12, and the upper portion of still greater diameter and forming a seat 13, for rotatably confining the cam cylinder in proper position with relation to the needle cylinder. The cam cylinder has an inner circumferential flange 14, to limit the downward movement of the needles, the heels 15 of which project beyond the ribs, as plainly shown in Fig. 2, and suitably secured to the upper edge of the cam cylinder is a top plate 16, to span the space between the cam and needle cylinder for the purpose of preventing dirt and dust from entering therebetween.

Formed in the side of the cam cylinder and extending through the top plate is a slot 17, through which needles may be inserted or removed from the needle cylinder. The method of removing or inserting a needle into the needle cylinder is as follows: As the needle cylinder remains stationary, the cam cylinder is rotated until the slot therein registers with the slot in the needle cylinder from which it is desired to insert or from which to remove a needle. In removing a needle the same is raised until its heel engages the spring band, which limits its upward movement. The upper end of the needle is next drawn outwardly and downwardly (as plainly indicated by dotted lines in Fig. 2) against the tension of the spring band, until the heel thereof clears the band, after which the same may be withdrawn without further hindrance, and without disturbing the remaining needles in the cylinder. In order to insert a needle the spring band is drawn out of its seat by any suitable tool, and held until the heel of the needle is passed over the same, when the tool is withdrawn and the needle will freely slide into its slot. As the weakest part of a needle is

at the point of the heel, and in consequence of which the most breakage occurs at that point, it frequently happens that the lower broken off section assumes such a position as to become jammed between the cam and needle cylinder, owing to the small intervening space, and thus interfere with the free rotation of the cam cylinder and necessitating the removal of the needle cylinder in order to displace the obstruction, with the consequent loss of time and expenditure of labor. It is for the purpose of overcoming this difficulty that the annular chamber 12 is provided for, which is located beneath the ends of the ribs on the needle cylinder, and permits the broken needle part, as shown by dotted lines in Fig. 2, to drop down in its slot until one arm thereof engages the flange on the cam cylinder, and by the action of the moving flange and the vibration of the machine gradually works around the edge of the flange and drops into the chamber, and out of reach of any of the working parts of the machine.

Having thus described my invention, what is claimed is:—

1. In a knitting machine, the combination with a needle cylinder, of means for releasably holding the needles against lateral movement, a cam cylinder coöperating with the needle cylinder to form a housing for the needles, said cam cylinder having a slot formed therein to permit a needle to be swung downwardly into said slot to effect a release of the needle and its removal from its cylinder.

2. In a knitting machine, the combination of a needle-cylinder embodying radially disposed ribs, a bed-plate having an annular offset located beneath the lower ends of said ribs to form a chamber, and a rotatable cam-cylinder mounted on the bed-plate in spaced relation with the needle-cylinder and having an internal annular stop-flange located above the lower ends of said ribs to limit the downward movement of the needles, said flange being narrow in vertical cross-section to permit the angular broken heel portion of a needle to work around the same between the ribs and drop into said chamber.

3. In a knitting machine, the combination of a needle cylinder embodying radially disposed ribs, a circumferential groove intersecting said ribs, a yielding band seated in said groove to hold the needles against lateral movement, a cam cylinder spaced from and extending above said yielding band, a flange plate carried by the cam cylinder to close the opening between the cylinders, and a slot in the side of the cam cylinder and flange plate to permit the upper end of a needle to be swung downwardly into said slot to draw the heel thereof around the yielding band for the removal of the needle from its cylinder.

In testimony whereof I affix my signature, in presence of two witnesses.

AUGUST C. TIMMING.

Witnesses:

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GEORGE W. SANDS.