W. FRANZ.

CIRCULAR KNITTING-MACHINE:

No. 172,989. Patented Feb. 1, 1876.

Fig 1

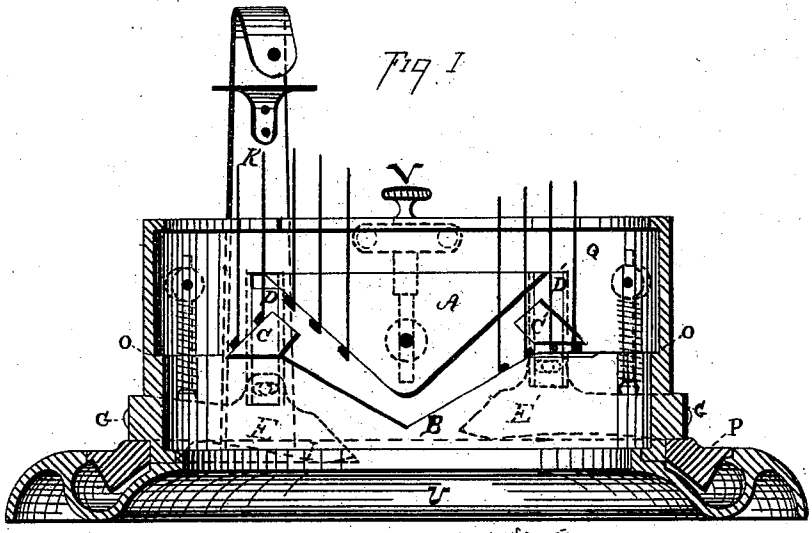
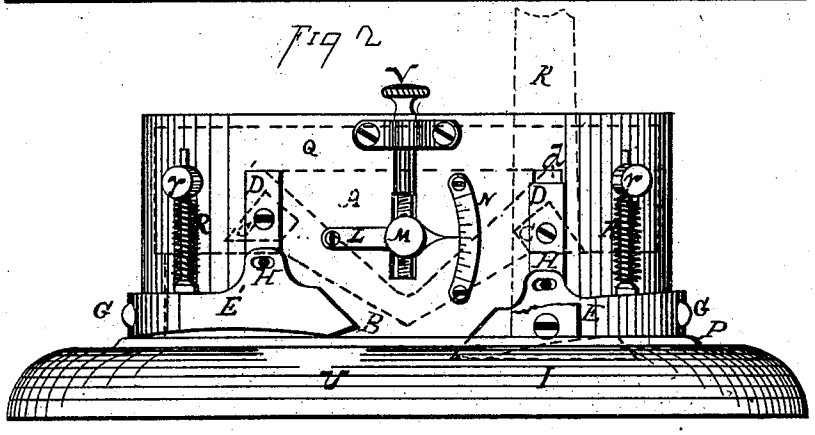


Fig 2



WITNESSES

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WILLIAM FRANZ, OF BUCYRUS, OHIO.

IMPROVEMENT IN CIRCULAR-KNITTING MACHINES.

Specification forming part of Letters Patent No. **172,989**, dated February 1, 1876; application filed September 20, 1875.

To all whom it may concern:

Be it known that I, WILLIAM FRANZ, of Bucyrus, in the county of Crawford and State of Ohio, have invented a certain new and useful Improvement in Circular-Knitting Machines, of which the following is a full, clear, and exact description, reference being had to the annexed drawing, in which—

Figure 1 is a vertical section of my improvement, and Fig. 2 a side view thereof.

Corresponding parts in the two figures are denoted by like letters.

This invention is designed to insure the proper performance of the work of the needles, and to avoid their being broken, &c., to render the machine automatically reversible, and facilitate the adjustment of the tension-cam, &c. It consists of dogs or levers pivoted to the revolving or cam cylinder, and having their free ends entering notches or a recess in the cogged rotating ring in the bed-plate, held therein by springs, and of the combination, with the said dogs or levers, of cams and connecting-slides, operating in connection with the cam-cylinder shown in United States Patent No. 99,426, granted to Franz and Pope, February 1, 1870, all substantially as hereinafter more fully specified.

To enable others skilled in the art to which my invention appertains to make and use the same, I will describe its construction and operation.

In the annexed drawing, Q refers to the cam-cylinder, the tension-cam A and needle-elevating cam B thereof (shown in full lines in Fig. 1) being the same as those shown and described in the patent of the above number and date. The needle-cylinder or sley is removed. The cam-cylinder Q is let into and revolves upon the bed-plate U, within which the cogged ring P is also inserted, and to which motion may be imparted by the usual beveled cog-gearing. E E′ are dogs or levers, pivoted at G G to the cam-cylinder Q, and take into the notches or recess I of the cogged ring P. The dogs or levers are provided in shoulders upon their upper surfaces with elongated slots H H, which receive, and in which play laterally, projections attached to slides or bars D D′, connected at their upper ends by screws or otherwise to cams C and C′, resting alternately upon the shoulder O of the cam-cylinder Q, and provided at their lower ends with projections entering and moving in slots *d* in the said cam-cylinder, as do also the screws connecting them to the cams C C′. Springs R R, encircling sliding rods moving in eyebolts or studs *r r*, projecting from the cam-cylinder Q, and resting upon the dogs or levers E E′, cause the latter to enter and be retained in the notches or recess I of the cogged ring P, as will more fully appear hereinafter. The same end may be attained by making the dogs heavier at their free ends; but the way shown is preferable. V is a screw for controlling the tension-cam A in regulating the length of the stitches or the tension of the yarn carried by the needles, whose shanks move along the lower surface of said cam. The said screw passes down through a screw eyebolt or stud, M, passing through a slot in the cam-cylinder Q, and entering the tension-cam A. An index or pointer, L, pivoted to the cam-cylinder Q and passing through the stud M, registers with the graduated arc N as the screw V is raised and lowered in indicating the movement of the tension-cam A.

It will be observed that, as the index or pointer L, by having its fulcrum to one side of the axis of the screw V, has a greater amount of sweep as the latter is vertically adjusted, the registration of the tension of the cam A upon the needles and yarn will be expedited, a slight movement of the cam causing the pointer or index to move over an area of space readily to be detected and registered.

For ordinary knitting, insert the dog E into the notch or recess I of cogged ring P, which will impart motion to the cam-cylinder, the gearing for operating the said ring having been put in motion, the shanks of the needle resting upon the shoulder O of the cam-cylinder until the cam C strikes them, as it approaches the same, and carries them up far enough to free their latches from the stitches already on them, the yarn at the same time being fed to their hooks by the yarn-carrier K, after which the cam A carries the needles down into the V-shaped cam B. They next ascend one of the inclines of the latter-mentioned cam, and approach the cam C′, under which they pass, it being retained in an ele-

vated position by its dog or lever E′ resting upon the cogged ring P, and onto the shoulder O again. By the cam C′ or one of the cams being thus retained or elevated a guide or passage is formed for the approaching needles, so as to avoid their being thrown up against the cam in diverting their line of motion from an inclined one to a horizontal one, as becomes necessary at this juncture of the operation, thereby preventing the needles dropping stitches, or the liability of the same, or the ribs of the grooved needle-cylinder or sley being broken, &c. As the machine is reversed to knit in the opposite direction the dog or lever E will be retracted from the notch or recess I, which in turn elevates the cam C. The cogged ring P will now begin to revolve until the yarn-carrier K and the notch or recess I are directly opposite the cam C′, when the dog or lever E′ will drop into said notch or recess, lowering the cam C′, consequently closing the space between it and the shoulder O of the cam-cylinder, and putting the latter in motion, when the operation of knitting will commence, the yarn having been adjusted to the needles; but should any of the needles fail to pass under the cam C′ the dog E′ will still maintain an elevated position, preventing the cam-cylinder from revolving, by which the needles or any of the operative mechanism will remain intact, avoiding the failure to take up all the stitches, &c.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In combination with the cam-cylinder Q and cogged ring P I, the dogs or levers E E′ and springs R R, substantially as and for the purpose specified.

2. In combination with the cam-cylinder Q, the dogs or levers E E′, slides or bars D D′, and cams C C′, substantially as and for the purpose set forth.

3. In combination with the cam-cylinder Q, having the cams A and B, the spring or weighted dogs or levers E E′, notched or recessed cogged ring P, slides D D′, and cams C C′, substantially as and for the purpose specified.

In testimony that I claim the foregoing as my own I have hereunto signed my name in presence of two subscribing witnesses.

WM. FRANZ.

Witnesses:
J. M. VAN VOORHIS,
WM. POPE.