2 Sheets—Sheet 1.

J. J. FITZ PATRICK.

ATTACHMENTS TO KNITTING MACHINES FOR REINFORCING THE KNEE-CAP OF STOCKINGS.

No. 193,646. Patented July 31, 1877.

Fig. I.

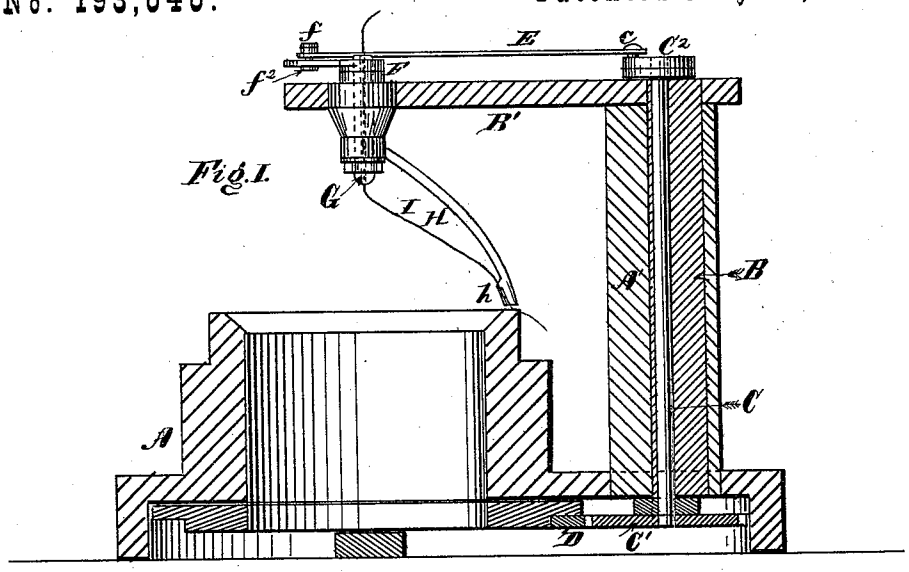

Fig. II.

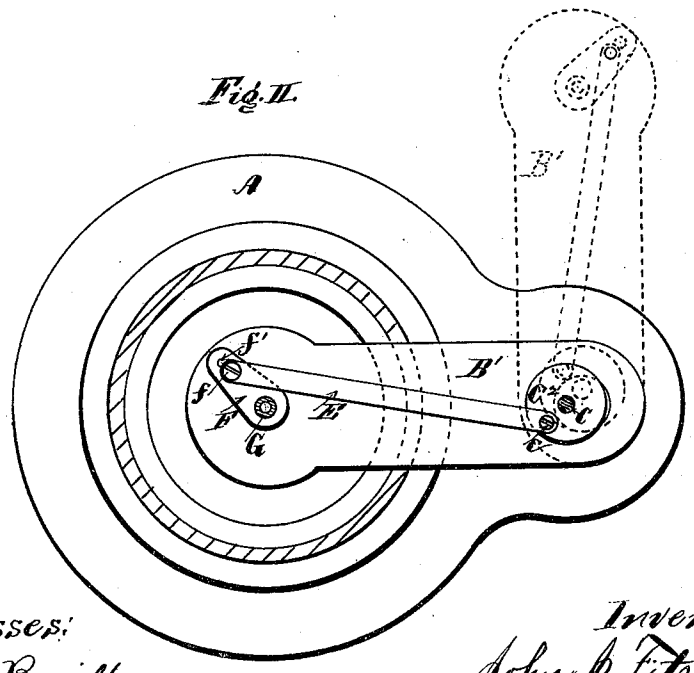

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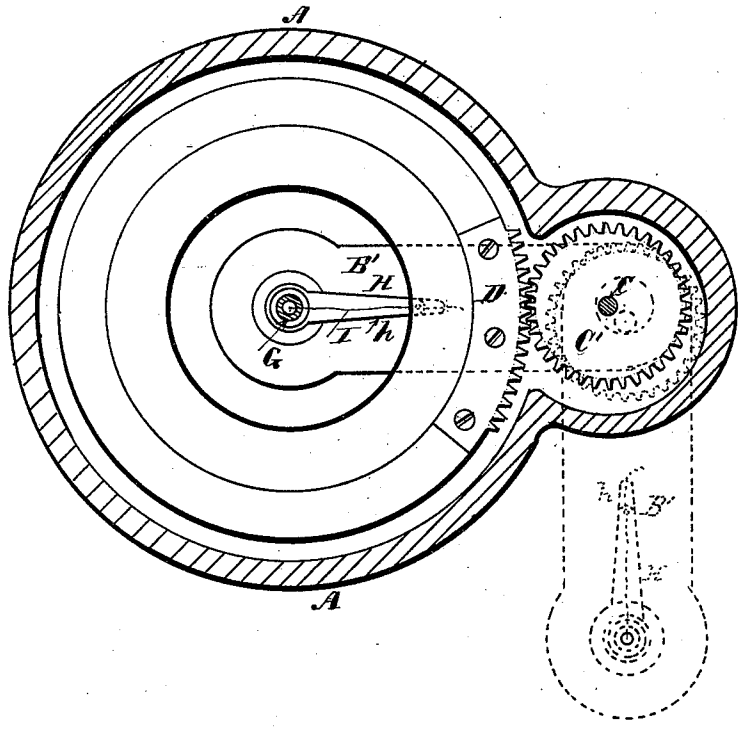
Fig. III.



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UNITED STATES PATENT OFFICE.

JOHN J. FITZPATRICK, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN ATTACHMENTS TO KNITTING-MACHINES FOR RE-ENFORCING THE KNEE-CAPS OF STOCKINGS.

Specification forming part of Letters Patent No. **193,646**, dated July 31, 1877; application filed January 10, 1876.

To all whom it may concern:

Be it known that I, JOHN J. FITZPATRICK, of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in an Attachment for Knitting-Machines for Re-enforcing the Knee-Caps of Stockings, of which the following is a specification:

The object of this invention is to re-enforce or increase the thickness of the stocking over the knee-cap, which is the place most severely worn.

The nature of the invention consists in providing an automatic attachment, which may be applied to any knitting-machine, for laying an extra thread in that part of the stocking which covers the knee-cap. This attachment lays the extra thread by the side of the regular thread for a distance of, say, two inches (more or less) on the front side of the stocking, and the two threads are worked simultaneously into the stocking by the ordinary action of the needles, thus increasing to the desired extent the thickness of that part of the stocking. When the increased thickness shall have been worked down as far as desired the attachment will be turned to one side, out of the way, when the ordinary work of the machine will proceed.

The invention will be readily understood by reference to the accompanying drawings, of which—

Figure I is a sectional elevation of the attachment as applied to a machine. Fig. II is a general plan of the same, and Fig. III is a bottom view of the same.

The frame A, that carries the ordinary parts of a knitting-machine, also carries a hollow column, A′, at the back of the machine proper, which said column furnishes the supports for the operative parts of the re-enforcing attachment. In this column A′, and supported by it, is a cylindrical post, B, the top end of which carries a horizontal table, B′, which, when in use, will be turned out over the machine proper, as in the full lines in Figs. II and III, but when not in use will be turned aside out of the way, as in the dotted lines in Figs. II and III. For this purpose the post B is arranged to turn easily about its vertical axis, in its bearings in the column A′. An aperture placed eccentrically through the length of the post B receives the vertical shaft C, which is arranged to rotate on its axis and operate the parts of the attachments. The shaft C receives its motion from the cogged wheel C^1 on its lower end, and the wheel C^1 is driven by the cogged sector D, that is actuated by the ordinary crank and gearing that drives the machine proper; but as these parts are common to all machines of this kind they are not herein especially described or shown. The cogged sector D is preferably constructed on an annular plate that is attached by suitable bearings to the bottom part of the machine proper. On the top end of the shaft C is a crank-head, C^2, to which is attached a crank-pin, *e*, from which motion is imparted, through the link E, to the crank F, to which the opposite end of the connecting-rod is attached by the crank-pin *f*. The crank F is carried on the top end of the vertical rock-shaft G, that has its bearings in the free end of the table B′. The arrangement of the parts is such that when the table is swung out over the machine in the position for use, the axis of the shaft G will coincide with the axis of the machine proper, and in this position the swinging arm H, attached to G, and whose outer end carries the thread-guide for the re-enforcing thread, as it is moved around, will describe a circle concentric with the circle in which the needles of the machine are set. The crank-pin *f* is set in a slot, f^1, in the crank F, so as to adjust the length of its stroke by moving it toward or from the center of the crank-head. The pin *f* is fixed in position by the set-screw f^2 below the crank-head. In this manner the length of the stroke of the thread-guide *h* may be regulated, so as to make the knee-cap of any desired width. The guide *h* is given a reciprocating motion by the arrangement of the crank-pins *e* and *f*, the crank-pin *e* being given a complete rotation about the axis of its shaft C, while the crank-pin *f*, being placed at a greater distance from the center of its shaft G, does not make a complete rotation about the axis of G, but only a rotary reciprocating motion; hence the desired reciprocating motion is given to the

thread-carrier *h*. The re-enforcing thread I, that forms the knee-cap, passes down through an aperture in the center of shaft G; thence to the carrier *h*, from which it will be laid by the side of the regular thread, and incorporated by the needles with the garment, in the usual manner. When the knee-cap shall have been finished, the re-enforcing thread will be cut off, and the attachment turned to one side, out of the way. While the attachment is in use the regular thread will pass through a guide on the outer end of the table B′.

The arrangement of the parts is such that the auxiliary thread-carrier will lay a thread with the regular thread, and to accomplish this result the sector D is constructed so that at every revolution it will give the wheel C^1 a half-revolution, and a half-revolution of C^1 will give one full motion to the thread-carrier *h*.

When the table B′ is turned to one side the effect of the eccentric position of the shaft C within its bearing-column will be to throw the cogged wheel C^1 out of gear with the sector D, as is shown by the dotted lines, and consequently the operative parts of the attachment will become stationary when not in use.

Having thus described my invention, I desire to claim—

1. The re-enforcing-thread attachment for knitting-machines, consisting of the thread-carrier H *h*, rock-shaft G, link E, crank F, crank-head C^2, wheel C^1, and cogged sector D, combined and arranged substantially as described.

2. The post B, supporting the table B′, and carrying the shaft C eccentrically to the axis of its own rotation, in combination with the supporting-frames A and A′, cogged sector D, wheel C^1, crank-head C^2, crank F, link E, rock-shaft G, and thread-carrier H *h*, substantially as described.

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Witnesses:
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