(No Model.)

3 Sheets—Sheet 1.

W. BEATTIE.

MACHINE FOR SEWING KNIT FABRICS.

No. 370,446. Patented Sept. 27, 1887.

Fig. 1.

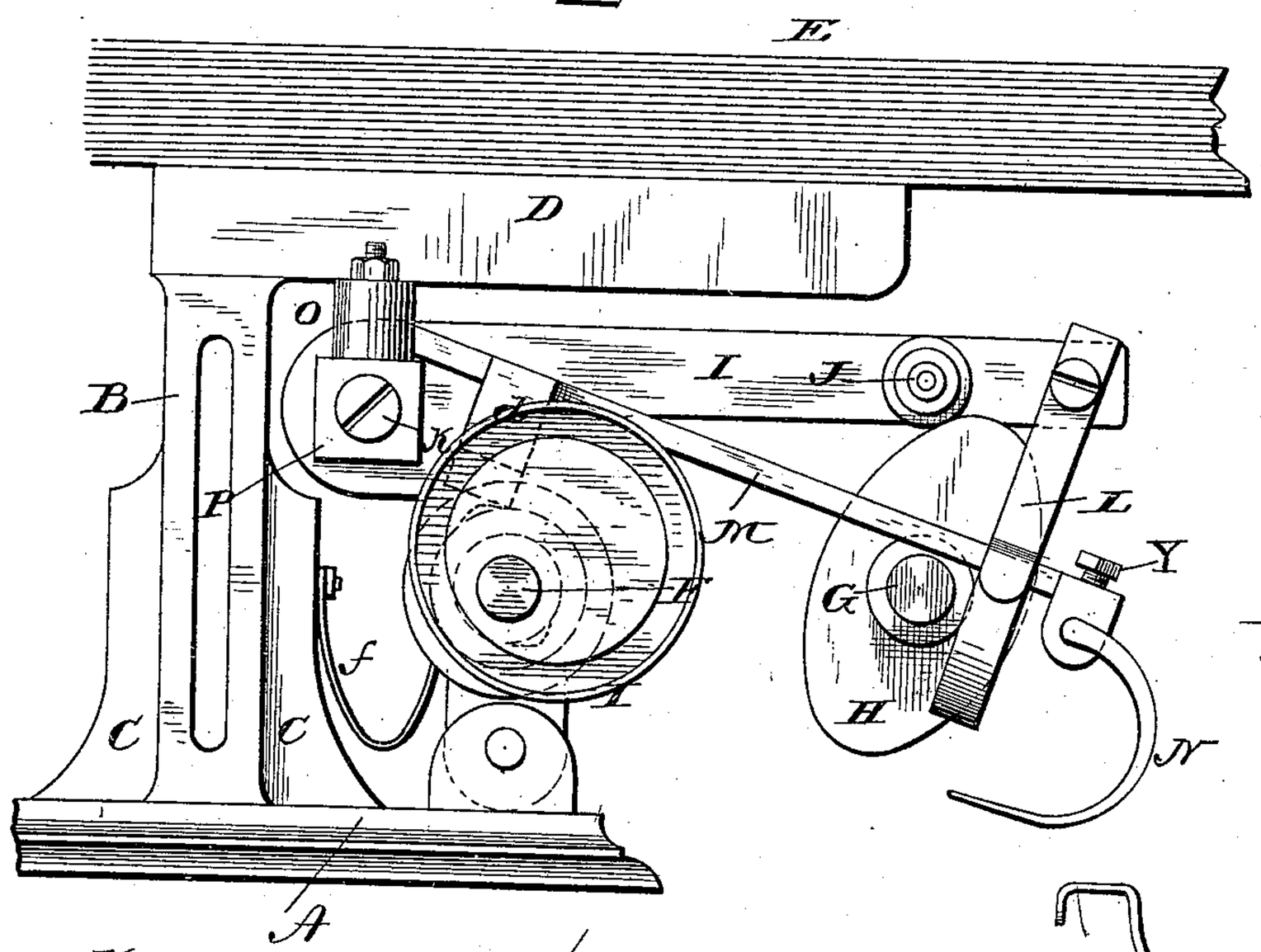


Fig. 4.

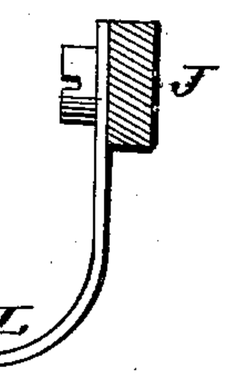


Fig. 2.

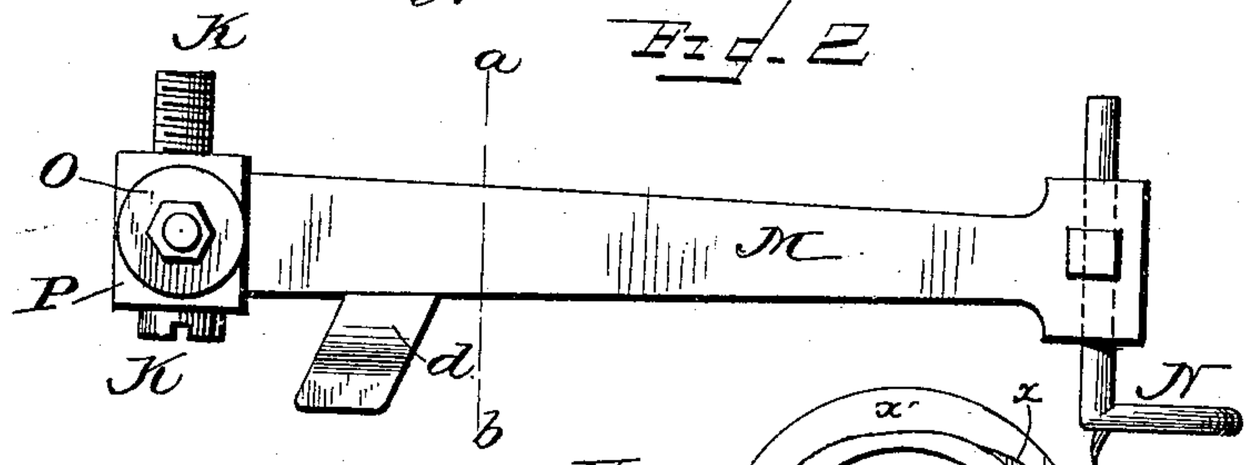
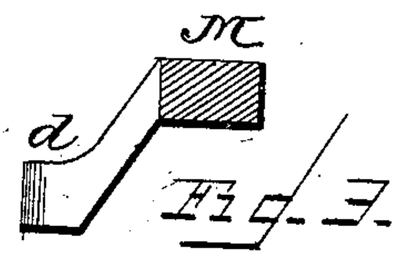


Fig. 3.



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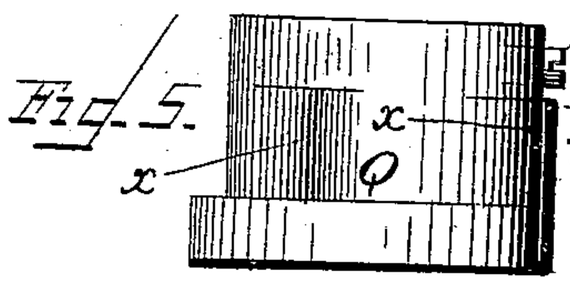


Fig. 6.

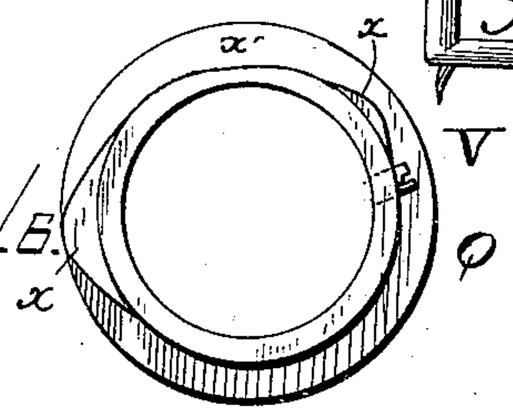


Fig. 7.

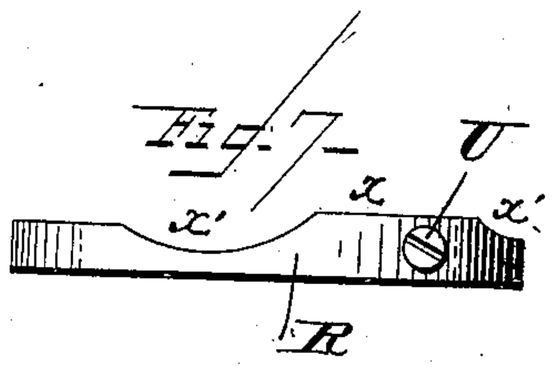
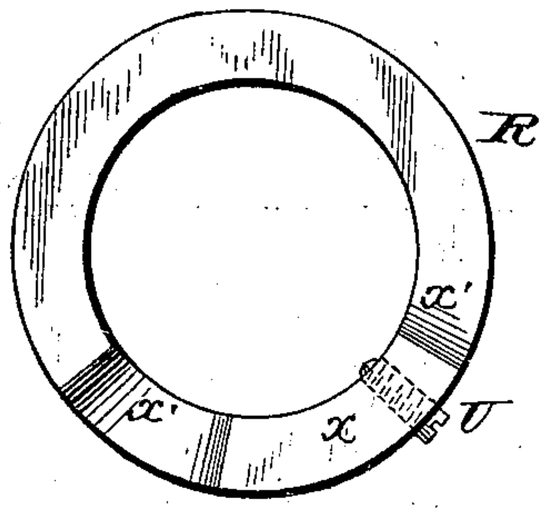


Fig. 8.



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(No Model.) 3 Sheets—Sheet 2.

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Fig. 9.

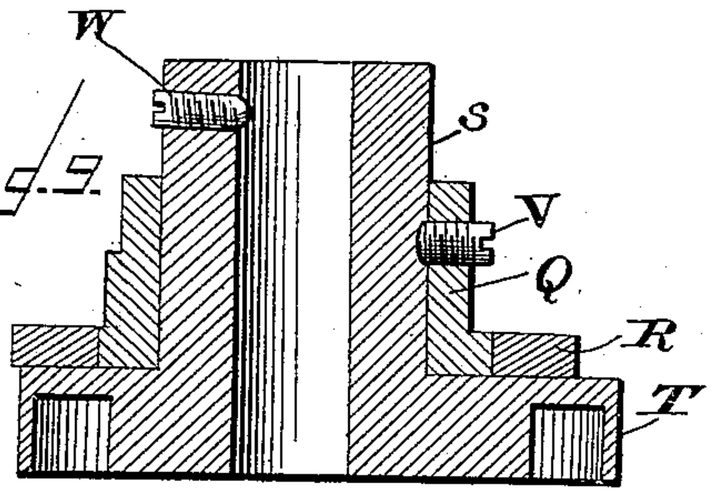


Fig. 10.

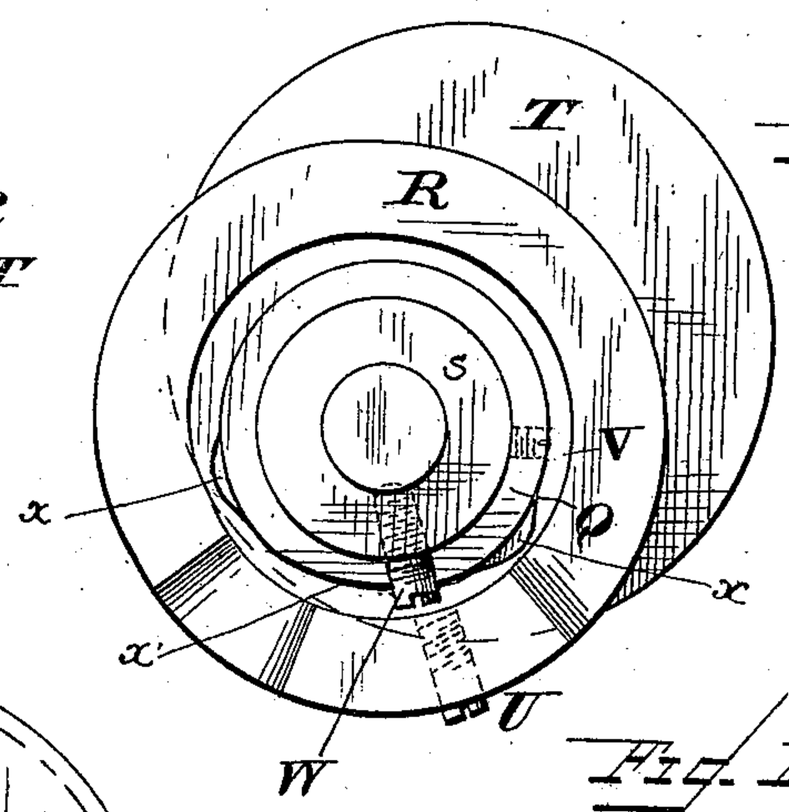


Fig. 11.

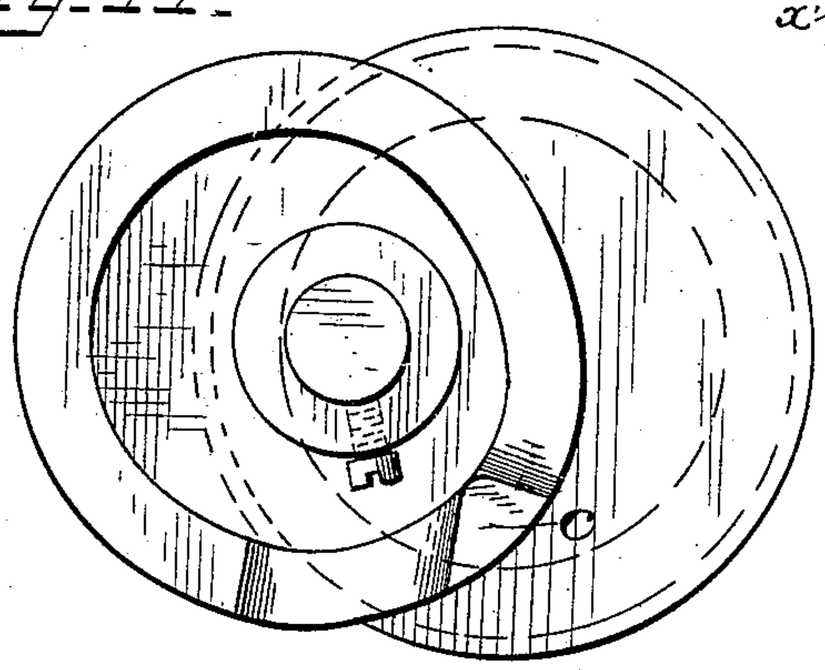


Fig. 12.

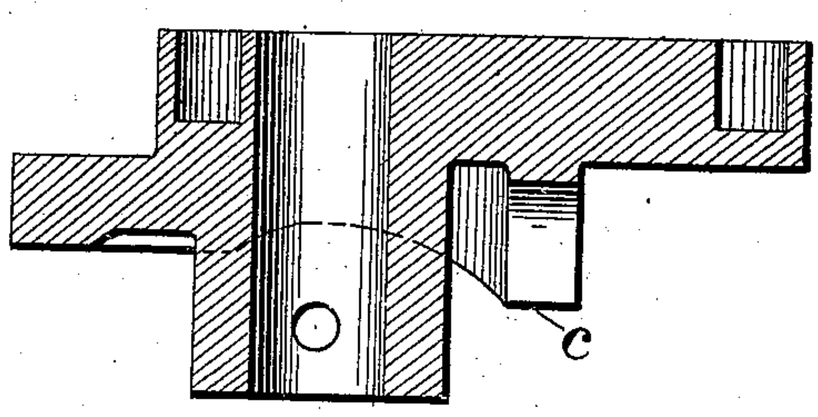


Fig. 13.

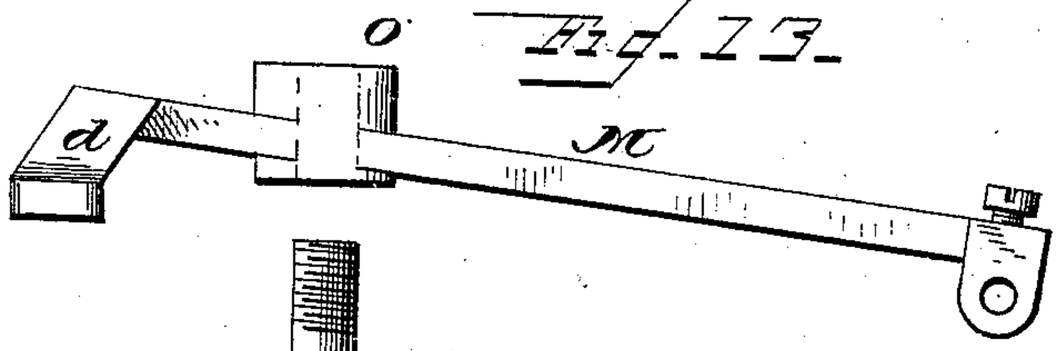
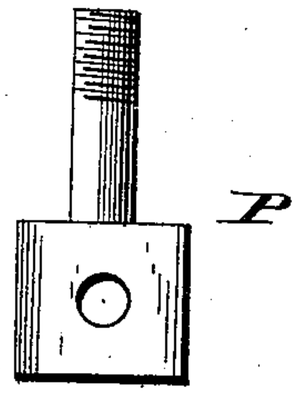


Fig. 14.



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(No Model.) 3 Sheets—Sheet 3.

W. BEATTIE.

MACHINE FOR SEWING KNIT FABRICS.

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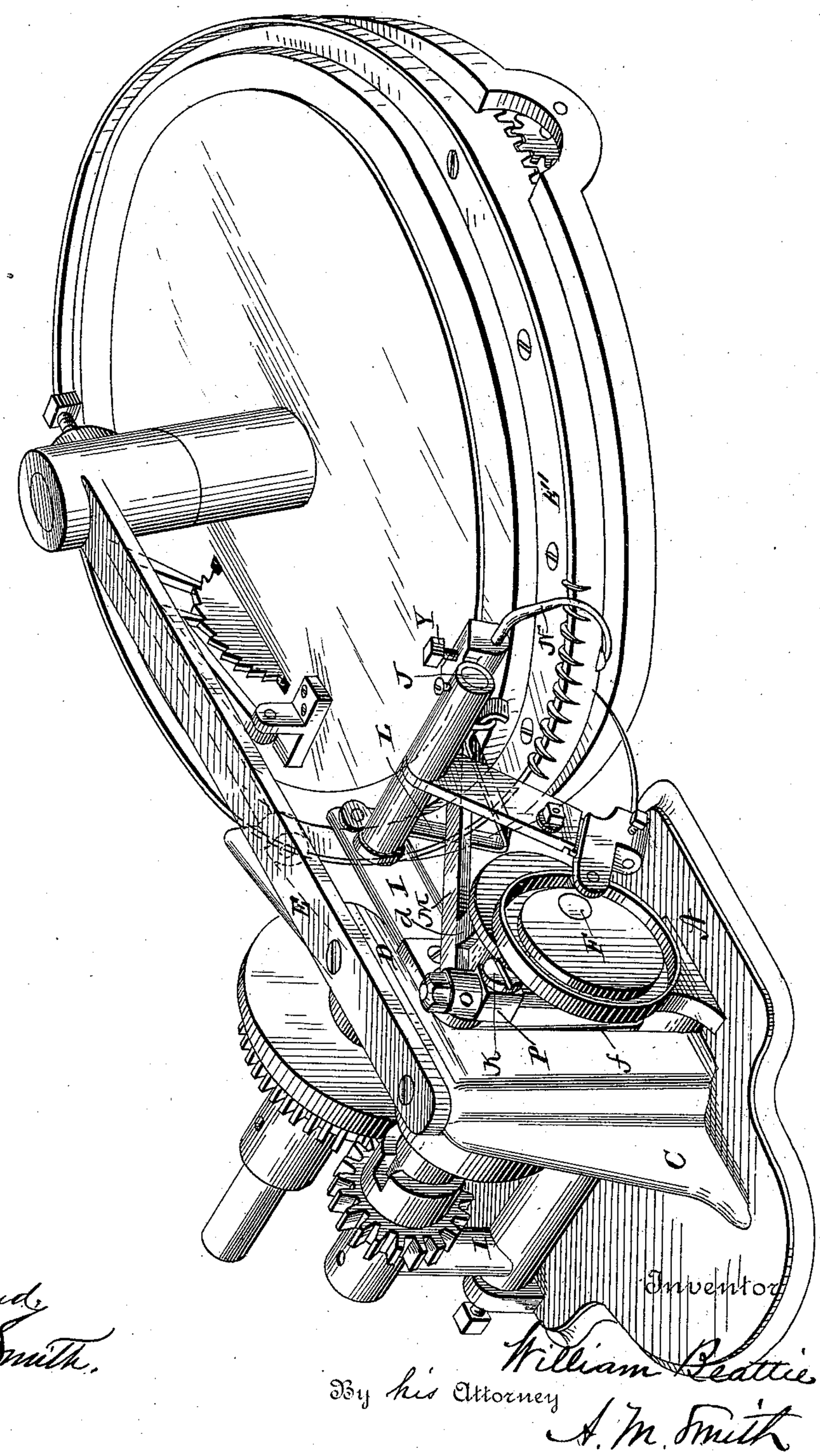

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UNITED STATES PATENT OFFICE.

WILLIAM BEATTIE, OF COHOES, NEW YORK.

MACHINE FOR SEWING KNIT FABRICS.

SPECIFICATION forming part of Letters Patent No. 370,446, dated September 27, 1887.

Application filed June 26, 1886. Serial No. 206,373. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM BEATTIE, of Cohoes, county of Albany, and State of New York, have invented a new and useful Improvement in Machines for Uniting Knit Fabrics, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to an improvement in that class of machines for uniting knit fabrics described in Letters Patent No. 228,802, dated June 15, 1880, and No. 354,374, dated December 14, 1886; and it consists of a looper arm or lever attached to the machine by a universal joint and operated by a suitable cam or by a cam and spring or springs.

My invention further consists of an improved adjustable looper-cam to be used in combination with a suitable spring or springs to give motion to the looper-arm, in which adjustable cam the working-faces and projections are formed on the movable rings concentric with the hub of the needle-cam, the movable rings being secured to each other and to the hub by set-screws or other suitable device.

In the accompanying drawings, Figure 1 is a side elevation of certain parts of a machine for uniting knit fabrics, showing the looper-arm, looper-spring, and universal joint. Fig. 2 is a plan view of the looper-arm and looper and details of the universal joint. Fig. 3 is part section on the line *a b* of Fig. 2, showing the form of the lug. Fig. 4 is an edge view of the looper-spring. Figs. 5, 6, 7, and 8 are details of the adjustable looper-cam. Fig. 9 is a vertical section, and Fig. 10 a side elevation, of the same. Fig. 11 is a side elevation of the looper-cam and needle-arm cam heretofore in general use in machines of this class. Fig. 12 is a vertical section of the same. Fig. 13 is a side elevation of a modified form of my improved looper-arm. Fig. 14 is a part of the universal joint; and Fig. 15 represents a perspective view of the machine, showing the revolving cylinder, which carries the goods or material to be sewed, the means for operating the same, and the several parts of the machine, the stitch-forming means, and relative positions of the parts of the machine.

It will be seen by comparing the details of my adjustable looper-cam (shown in the drawings, Figs. 5 to 10, inclusive,) with that in ordinary use, (shown in Figs. 11 and 12,) that the inequalities constituting the working-faces and projections are much less prominent in the former than in the latter. The looper-arm in general use with the cam, Figs. 11 and 12, moves endwise on a stud a distance equal to the whole height of the projection *c*, and requires so much time to return that the number of stitches made per minute is limited thereby, and when the motion is at its maximum of rapidity the return blow of the looper-arm lug makes a loud and disagreeable noise. In my invention, by the employment of a lever with arms of unequal length, the several motions of the looper are secured by less movement of the lug *d*, derived from the face of my improved cam, and a more noiseless and rapid motion is thereby secured, which result is the object of my invention.

In the drawings, A is the stationary base of the machine.

B is a vertical standard or column, having strengthening-ribs C C and a rigid arm, D, supporting the arm E, which holds the cylinder E′.

F and G are the parallel axles of the machine, axle F carrying the needle and looper-cams.

H is the trip-cam, and *f* is a spring, not necessary to an understanding of this invention.

I is the oscillating hanger, carrying the axle F, the needle-arm stud J, the universal-joint stud K, and spring L. These details of a machine for uniting knit fabrics are introduced for the purpose of explaining my invention, which may be applied to any machine of the class. Other details are omitted as being too well known to require description here.

M is the looper-arm, consisting of a lever of any class in which any motion imparted by the cam to a suitable lug or bearing point or face, *d*, will give a greater motion to the extremity of the arm carrying the looper N, the fulcrum of the looper-arm being in a universal joint attached to the hanger I or to any suitable part of the machine.

In Fig. 1 the looper-arm M is provided with a hub or socket-piece, O, carried by the socket-stud P, which is supported by and vibrates

upon the universal-joint stud K, which is screwed into the hanger I. A universal joint is thus formed, constituting the fulcrum of the looper-arm M; but the universal joint may be constructed in any suitable manner.

The looper-cams in this class of machines are generally formed in one piece with the needle-cam, and my newly invented looper-arm may be operated by a cam so constructed; but I prefer to form the looper-cam separately and in two or more pieces, Q and R, bored concentrically with the hub *s* of the needle-cam T, the piece Q fitting the hub and the piece R fitting the piece Q. The relative position of the pieces is thus rendered easy of adjustment, and the parts are secured in the desired positions by the set-screws U and V. The needle-cam T is secured to the extremity of the shaft F by set-screws W in the usual manner, in such position that the projections and depressions *x x'* will impart the required motion to the looper-arm when the lug *d* is held against the working-faces of the cam by any suitable device or by the pressure downward and outward of a suitable spring or suitable springs, L. The looper N is secured to the extremity of arm M by means of a socket and set-screw, Y, or in any other suitable manner.

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

1. The combination, with the stitch-forming mechanism in a machine for uniting knit fabrics, of the looper-arm attached by a universal-joint connection to a pivoted oscillating hanger, a looper-cam mounted on a shaft journaled in said hanger, the bearing plate or lug formed upon or secured to said looper-arm, and the flat spring also attached to the hanger and serving to keep said bearing-plate and lug always in operative engagement with said looper-cam, and suitable mechanism for imparting motion to the looper cam and arm and to the hanger upon which said parts are mounted, substantially as described.

2. The combination, with the stitch-forming mechanism in a machine for uniting knit fabrics, of the looper-cam, composed of two or more separate rings fitting one upon and surrounding another, and adapted to be adjusted one ring relatively to and upon or around another, for the purpose substantially as described, and set-screws for retaining the different parts of the cam in their adjusted positions and relations and for securing the entire cam to its shaft, as specified.

3. In a machine for uniting knit fabrics, the looper-arm attached to the machine-frame by a universal-joint connection, in combination with a looper-cam for actuating the same, and the flat U-shaped pressure-spring for holding said looper-arm to its engagement with the looper-cam, and the needle-arm and needle, all arranged to operate substantially as specified.

4. In a machine for uniting knit fabrics, the looper-cam consisting of separate parts provided with both radially and laterally extending cam-faces, in combination with the looper-arm attached to the machine-frame by a universal-joint connection, whereby both circular or vertical and lateral motions may be imparted thereto by said looper-cam, and means for actuating the latter, for the purpose set forth.

In testimony whereof I have hereunto set my hand this 24th day of June, A. D. 1886.

WILLIAM BEATTIE.

Witnesses:
T. E. HUMPHREYS,
DAVID R. SMITH.