No. 875,593. PATENTED DEC. 31, 1907.

L. ONDERDONK.

LOOPER OPERATING MECHANISM FOR SEWING MACHINES.

APPLICATION FILED JUNE 3, 1904.

3 SHEETS—SHEET 1.

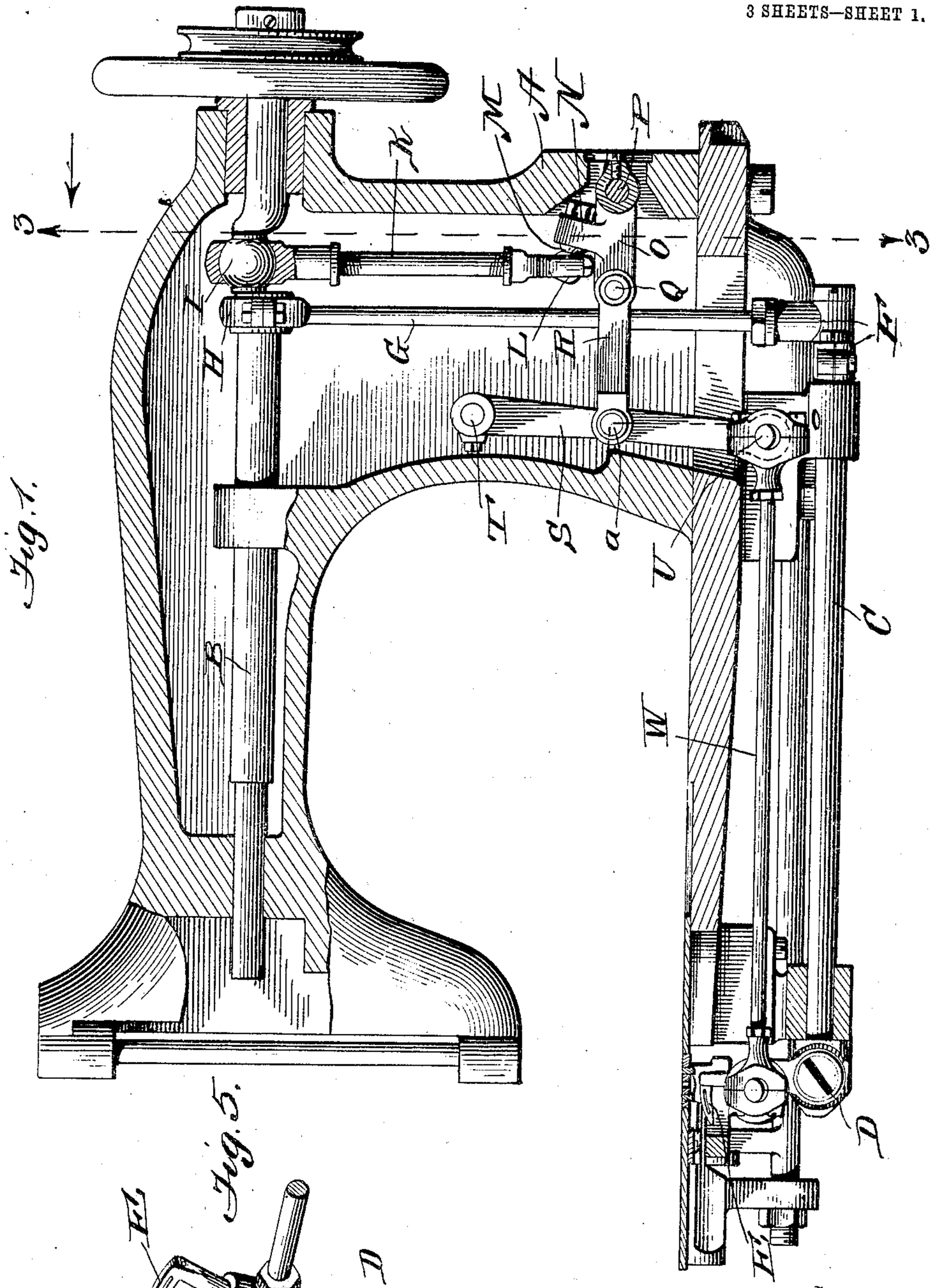

Fig. 1.

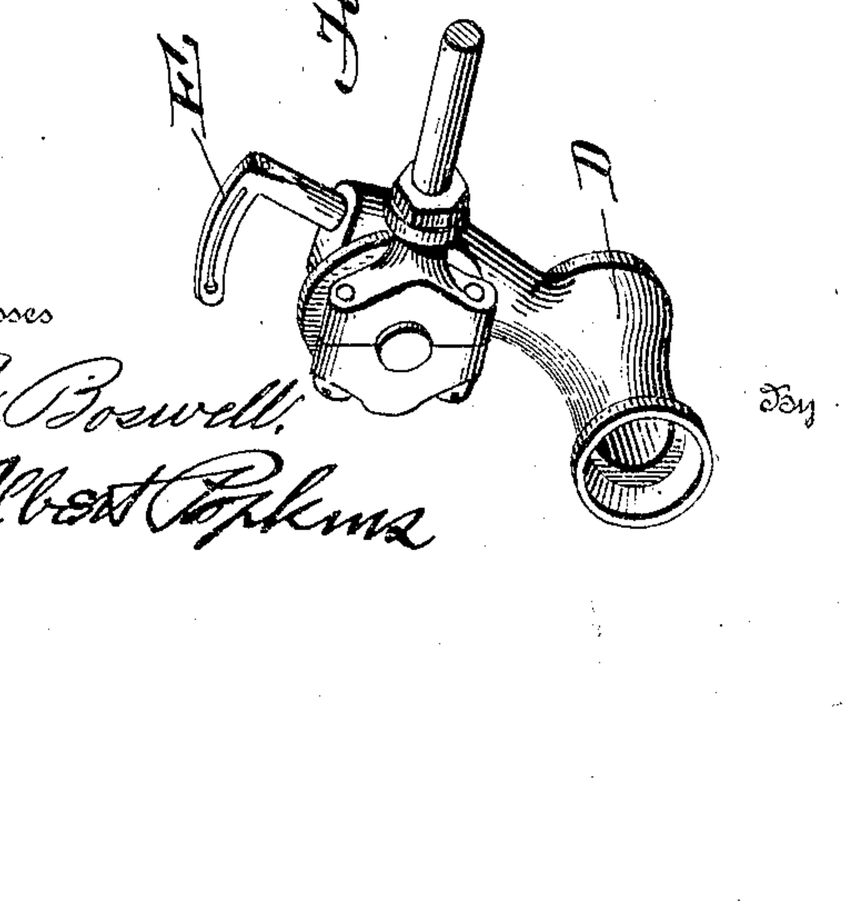

Fig. 5.

Witnesses

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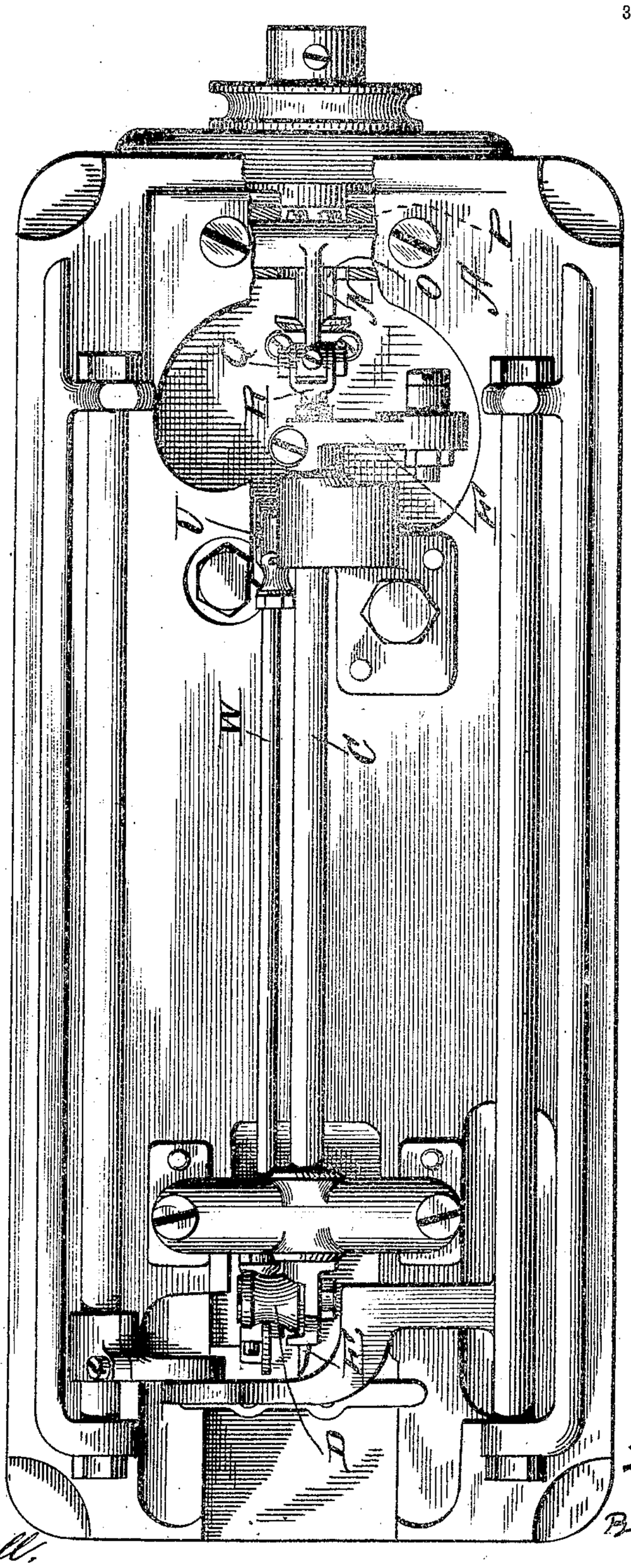

Fig. 2.

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3 SHEETS—SHEET 3.

Fig. 4.

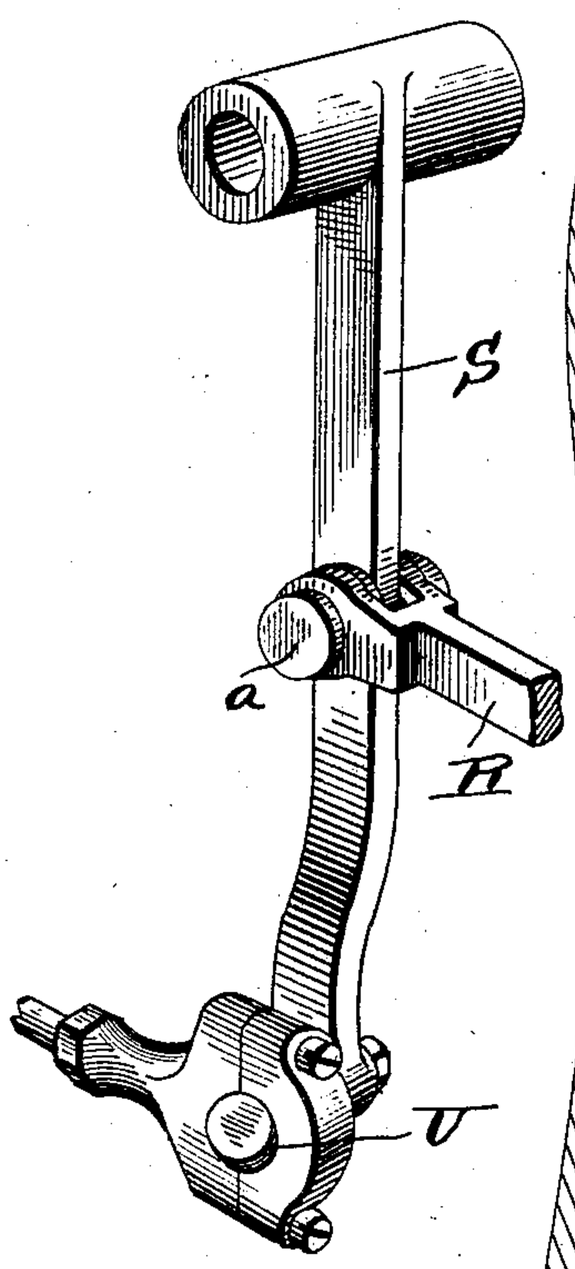
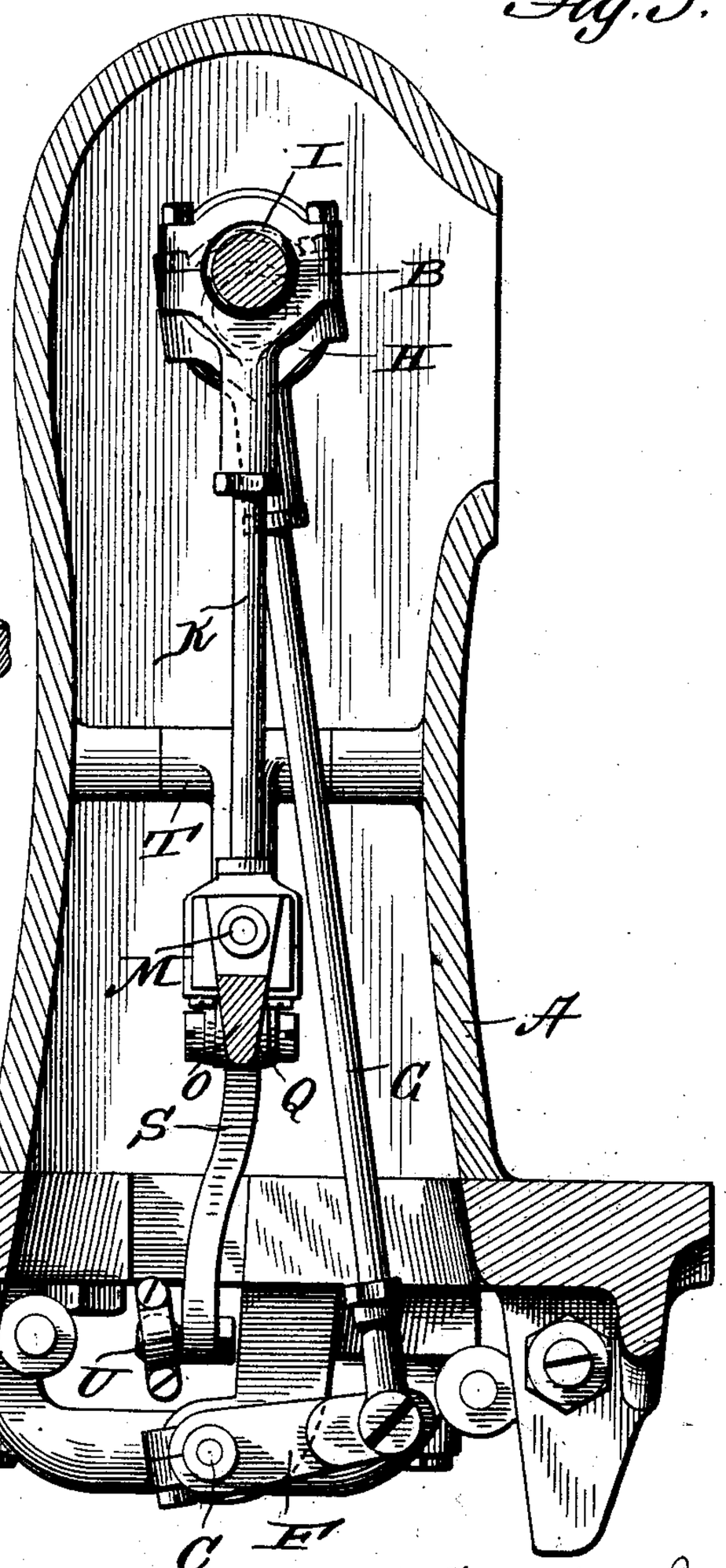


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

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LOOPER-OPERATING MECHANISM FOR SEWING-MACHINES.

No. 875,593. Specification of Letters Patent. Patented Dec. 31, 1907.

Application filed June 3, 1904. Serial No. 211,058.

To all whom it may concern:

Be it known that I, LANSING ONDERDONK, a citizen of the United States, residing at New York, in the county of New York, State of New York, have invented certain new and useful Improvements in Looper-Operating Mechanism for Sewing-Machines, of which the following is a description, reference being had to the accompanying drawing and to the letters and figures of reference marked thereon.

My invention relates to an improvement in sewing machines, and particularly to a looper operating mechanism for chain stitch sewing machines, employing an upper rotary shaft.

The object of the invention is to provide a looper operating mechanism for a chain stitch sewing machine, which shall be capable of running at extremely high speed, which shall be simple and effective, not likely to get out of order, and which shall impart to the looper the necessary variable movements to give the proper dwell to the looper, after it has taken the needle loop and is swinging over in its needle-avoiding movement.

The invention, therefore, consists in the matters hereinafter described and referred to in the appended claims.

The invention is illustrated in the accompanying drawings, in which,

Figure 1 is a sectional side view of a sewing machine, embodying the invention, parts of the operating mechanism of the machine, other than the looper movement, being removed; Fig. 2 is a bottom plan view; Fig. 3 is a view on line 3—3, Fig. 1; Fig. 4 is a detail view of the vertical lever; and Fig. 5 a detail view of the looper support.

In these drawings, A represents the frame of a sewing machine of a suitable type, in the goose neck or upper part of which is journaled the rotary driving shaft B.

C represents the looper-supporting shaft, which is journaled in bearings on the under side of the bed of the machine, and said shaft has at its forward end an arm extending at an angle to the shaft on which is mounted the looper rocker D, upon which the looper E is secured.

The shaft C is rocked in its bearings, to give the side-wise or needle-avoiding movement to the looper, by means of the crank F, secured to the shaft C, and having a pitman connection G with the eccentric H on the driving shaft.

The main feature of my invention consists in the mechanism for imparting to the looper its forward and backward movement in the direction of its length, with the proper timing of such movement to give a dwell, while the needle-avoiding movement is taking place.

Upon the main shaft is a ball crank I, embraced by the upper end of a pitman connecting rod K, which at its lower end embraces a ball L on the end of the stud M, received into the lug N projecting upwardly from the link or bracket O, which is pivoted on the short shaft P, mounted in the rear of the base of the machine.

The bracket or link O, is pivoted on a stud Q, to which is also pivoted the forked end of the link R, which at its opposite end is forked and pivoted to the vertical lever S, by means of the stud *a*. This vertical lever S, at its upper end is secured to a short rocking shaft T, while at the lower end it has a ball and stud connection U with the pitman rod W, by which motion is imparted to the looper rocker, to give the forward and backward movement to the looper.

It will be seen that the links O and R form a toggle and as they alternately straighten and flex, they impart to the vertical lever S a swinging movement, and, therefore, a forward and backward movement to the looper; and as when the links are straight no movement is imparted to the looper, the parts are so timed that the straightening of the links takes place when the looper is at the extreme of its forward movement, thus causing the dwell in the reciprocation of the looper in the direction of its length, while it is accomplishing the needle-avoiding movement.

I am aware that it is not new to provide for reciprocating a looper by alternately straightening and flexing toggles. When the toggles act directly upon the looper rod, or shaft, the construction is not practicable because it causes a strain and bind upon the bearings of the shaft, thus causing wear, and interfering with high speed. By providing the pivoted vertical lever S, an intermediate connection between the toggles and the looper rod is provided, which avoids any vertical strain, and enables the looper rod to be driven back and forth in a straight line, without vertical movement.

The throw of the looper may be adjusted by adjusting the length of the pitman K.

This is accomplished by providing the central rod of the pitman with right and left hand screw threads, which engage corresponding threads in the connecting parts. By turning the rod one way or the other, the pitman is lengthened or shortened. This change in the length of the pitman causes a change in position of angular movement of the toggle links, and thus the throw of the looper is changed.

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

1. In a sewing machine, a driving shaft, a looper supporting shaft, a looper carried thereby and means for operating the shaft, to give the looper a needle-avoiding movement, a looper operating rod to give the looper a forward and backward movement in the direction of its length, and means for operating said looper operating rod, comprising a series of pivoted links, with connections to the driving shaft for operating them, and an intermediate connection between the links and the looper-operating rod and means independent of the looper rod, for supporting said connection; substantially as described.

2. In a sewing machine; a driving shaft, a looper supporting shaft, a looper carried thereby and means for operating the shaft, to give the looper a needle-avoiding movement, a looper-operating rod to give the looper a forward and backward movement in the direction of its length, and means for operating said looper-operating rod, comprising a series of pivoted links, with connections to the driving shaft for operating them, and an intermediate connection between the links and the looper-operating rod, and means for adjusting the vibrating position of said links; substantially as described.

3. In a sewing machine, a driving shaft, a looper-supporting shaft, a looper carried thereby and means for operating the shaft, to give the looper a needle-avoiding movement, a looper-operating rod to give the looper a forward and backward movement in the direction of its length, and means for operating said looper-operating rod, comprising a link or bracket pivoted at one end to the machine frame, a second link pivoted thereto at one end, and a vertical swinging lever, to which the other end of the second link is pivoted, and connections between said vertical lever and the looper-operating rod; substantially as described.

4. In a sewing machine, a main shaft, a looper support and a looper carried thereby, means for imparting a needle-avoiding movement to the looper, and means for imparting a forward and backward movement to the looper, said latter means comprising toggle links, an adjustable connection between the toggle links and the main shaft, and a connection between the toggle links and the looper support, including a swinging connection having one end connected to the machine frame, the other end connected to the looper and connected to the toggle links intermediate its ends; substantially as described.

5. In a sewing machine, a driving shaft, a looper supporting shaft a looper carried thereby and means for operating the shaft, to give the looper a needle-avoiding movement, a looper-operating rod to give the looper a forward and backward movement in the direction of its length, and means for operating said looper-operating rod, comprising a series of pivoted links, with connections to the driving shaft for operating them, and an intermediate connection between the links and the looper-operating rod, and means independent of the looper rod for supporting said intermediate connection; substantially as described.

6. In a sewing machine, a driving shaft and a looper, means for vibrating said looper laterally and means for imparting a forward and backward movement to said looper comprising a series of pivoted links with connections to the driving shaft for operating them, and a vertical swinging lever pivoted to the machine frame with connections between the vertical lever and the looper and a connection between said lever and one of the pivoted links; substantially as described.

7. In a sewing machine, a looper and a driving shaft, means operatively connected to the driving shaft for giving the looper sidewise movements, and means for giving the looper forward and backward movements, comprising toggle links, a swinging lever, one end of said toggle links being connected to the swinging lever intermediate its end, and the other end of said toggle links being connected to the machine frame, a link operatively connecting the toggle links with the driving shaft, and a rod having one end connected to the looper and the other end connected to and supported by the swinging lever.

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

LANSING ONDERDONK.

Witnesses:

W. L. SWIFT,

E. T. ALLAN.