

W. H. JOHNSON.  
Wax-Thread Sewing-Machines.

No. 135,431. Patented Feb. 4, 1873.

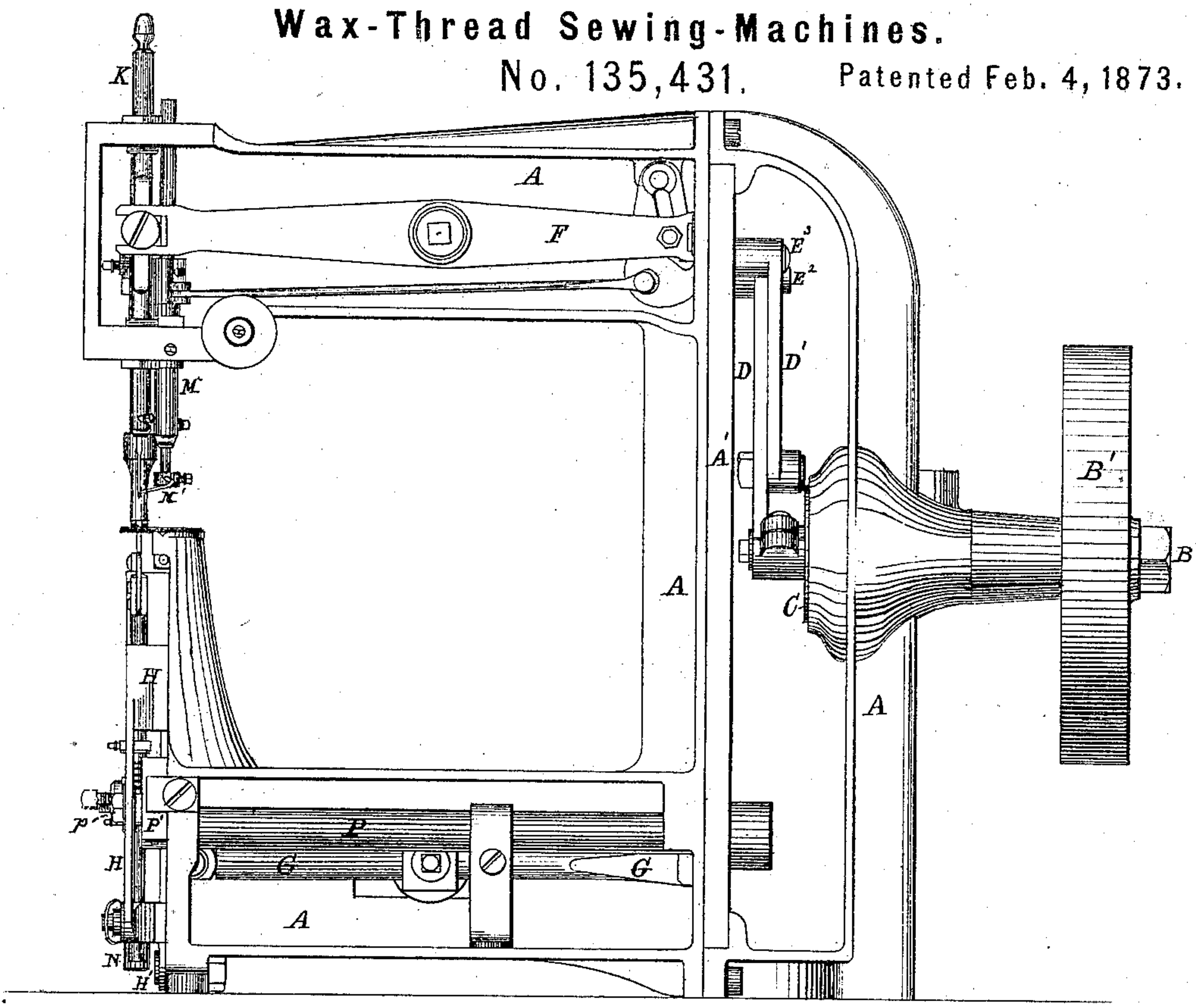


FIG. 1.

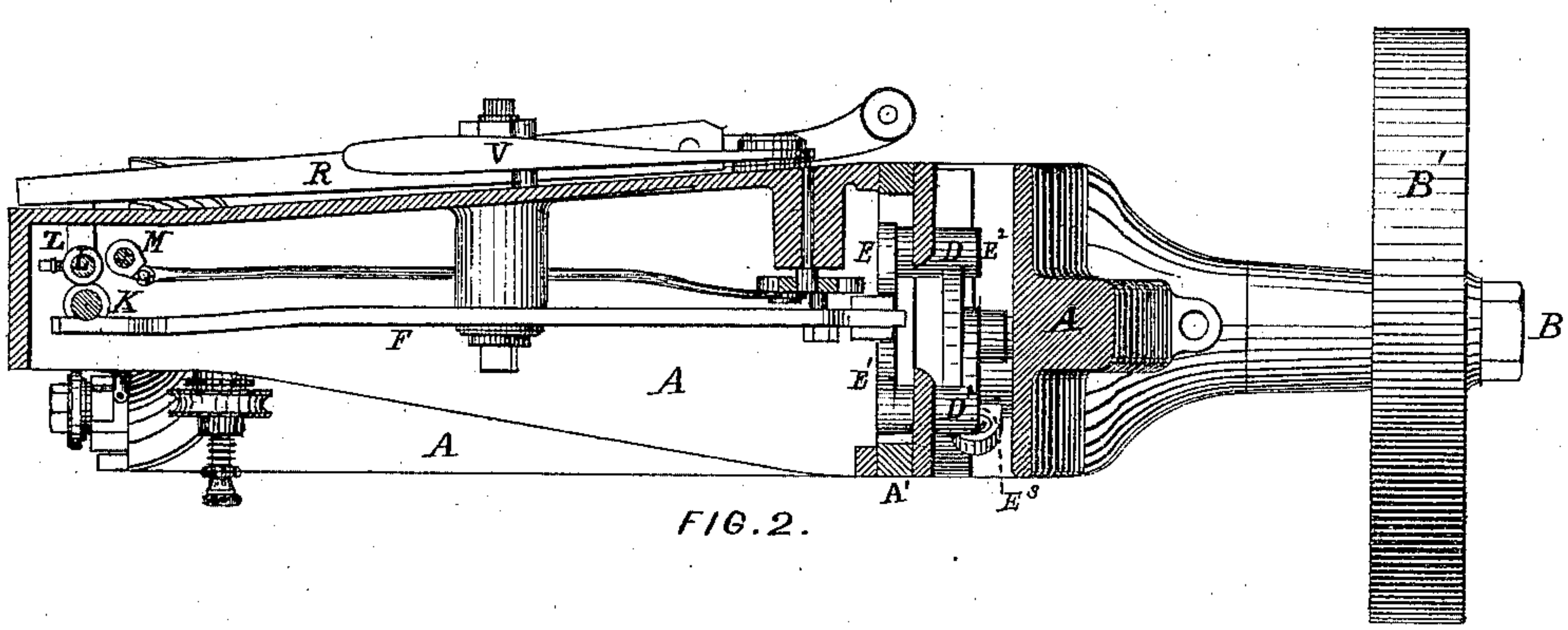


FIG. 2.

WITNESSES.

*J. A. Wood.*  
*A. E. Downs.*

INVENTOR.

*Wm H. Johnson by*  
*his Atty. Wm. C. Hibbard*

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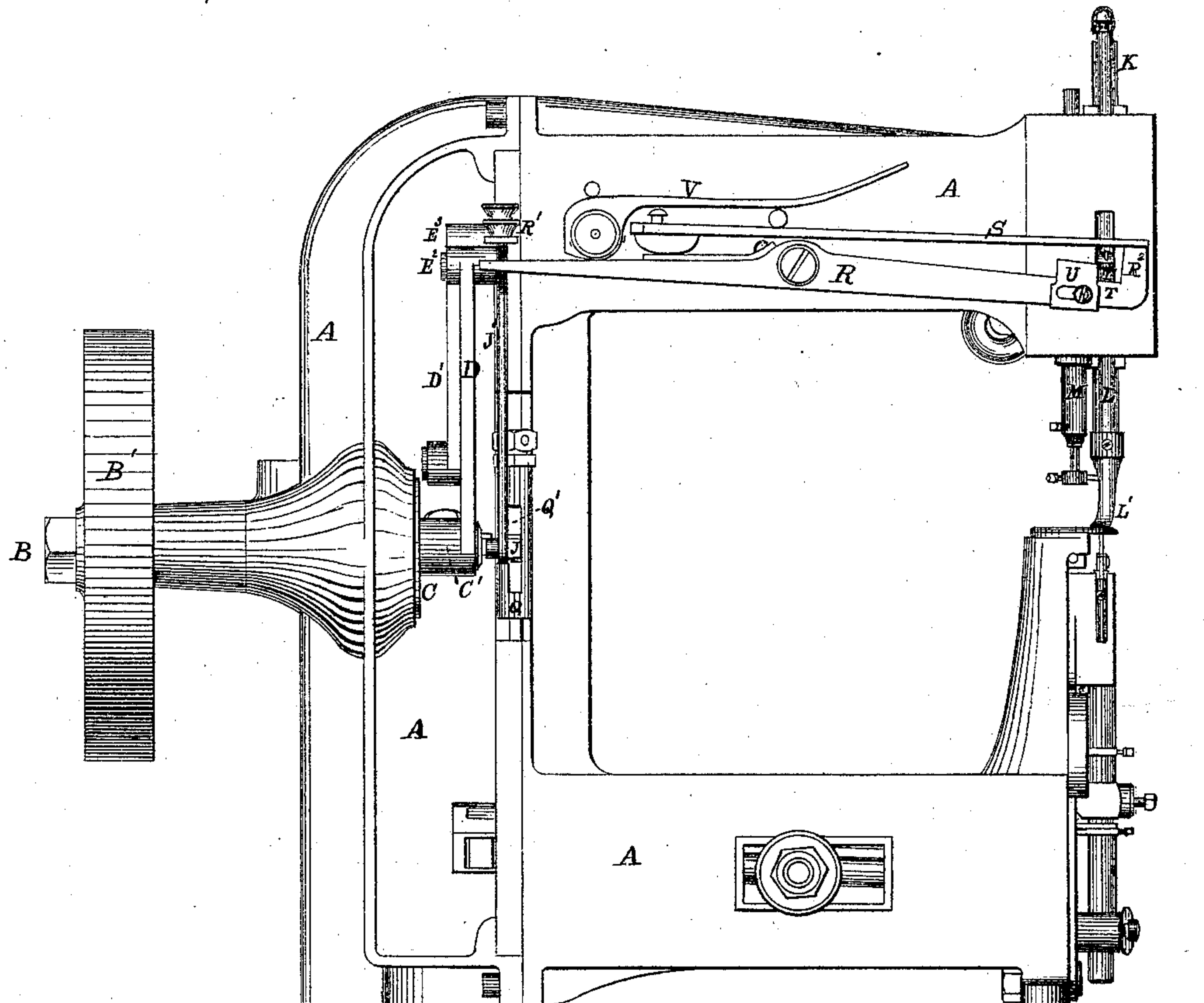


FIG. 3.

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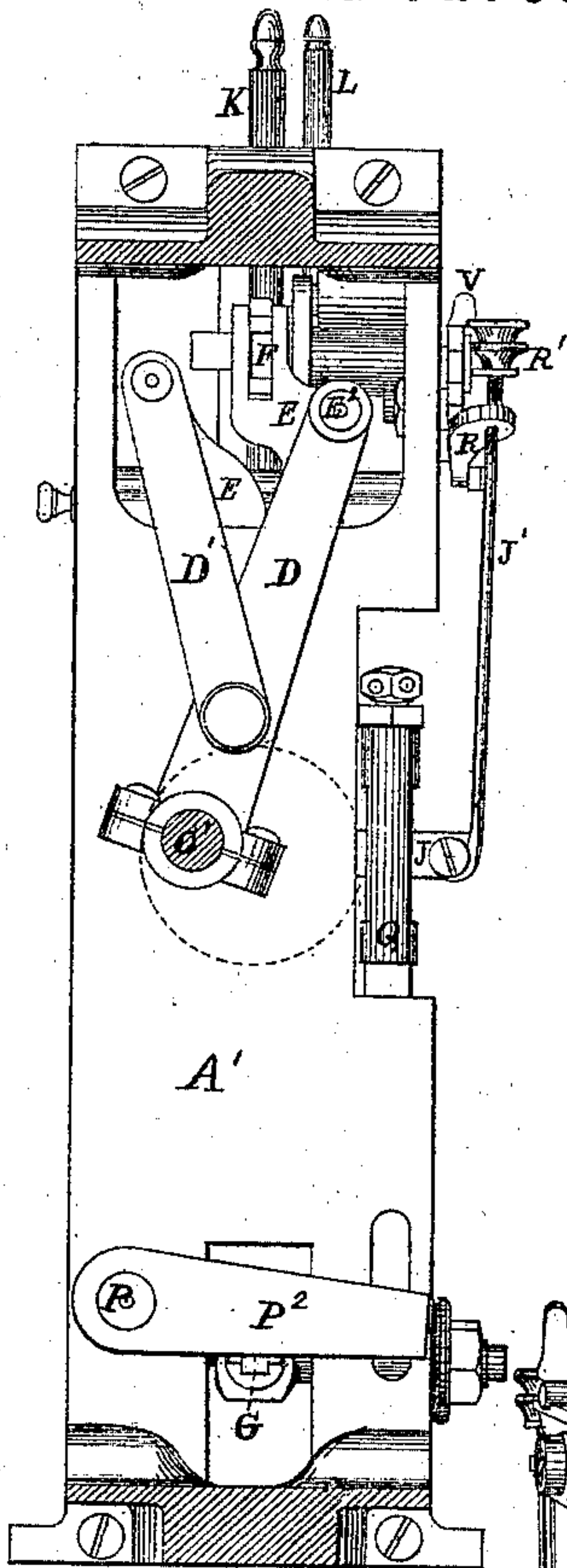


FIG. 6.

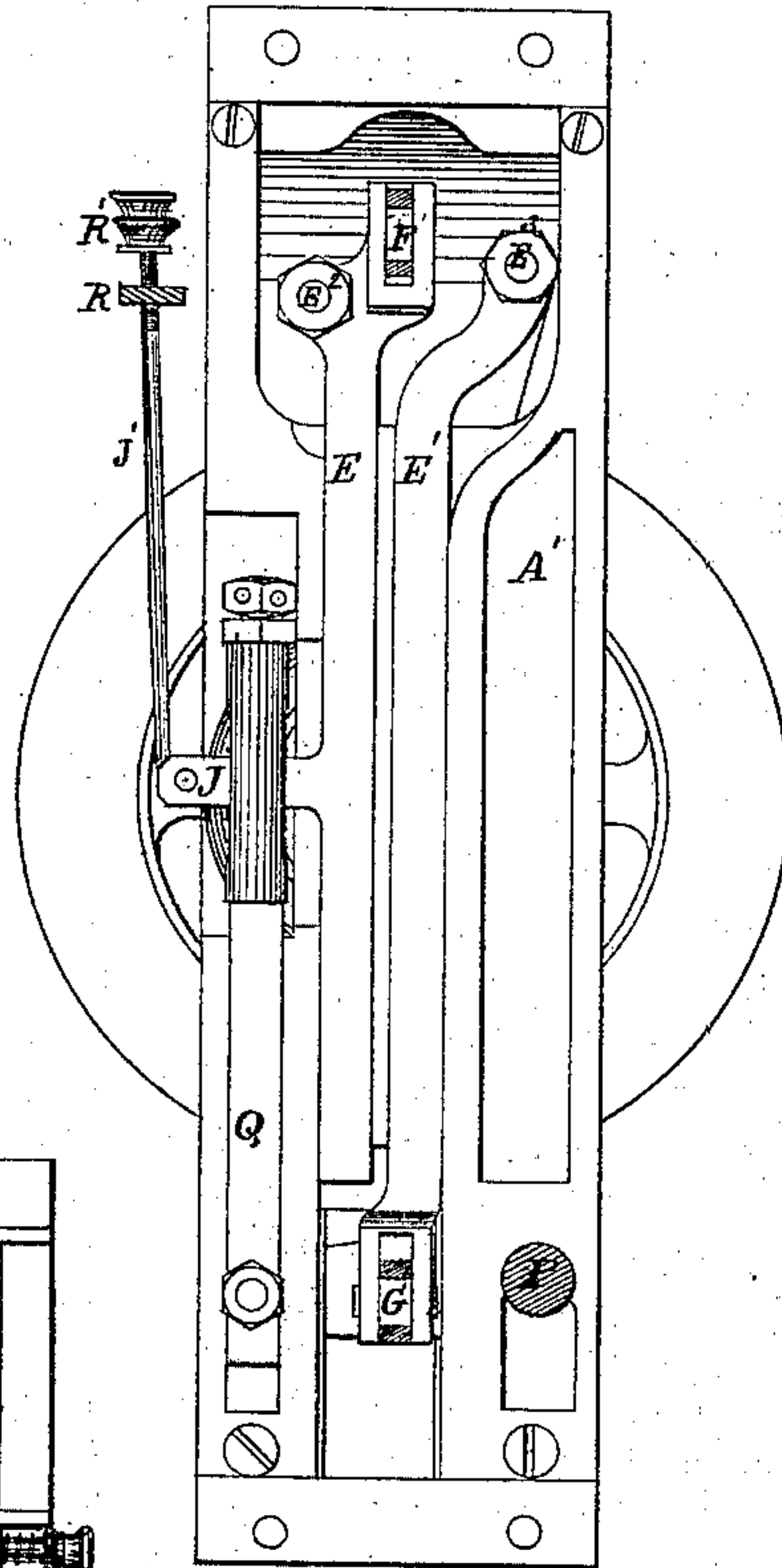


FIG. 5.

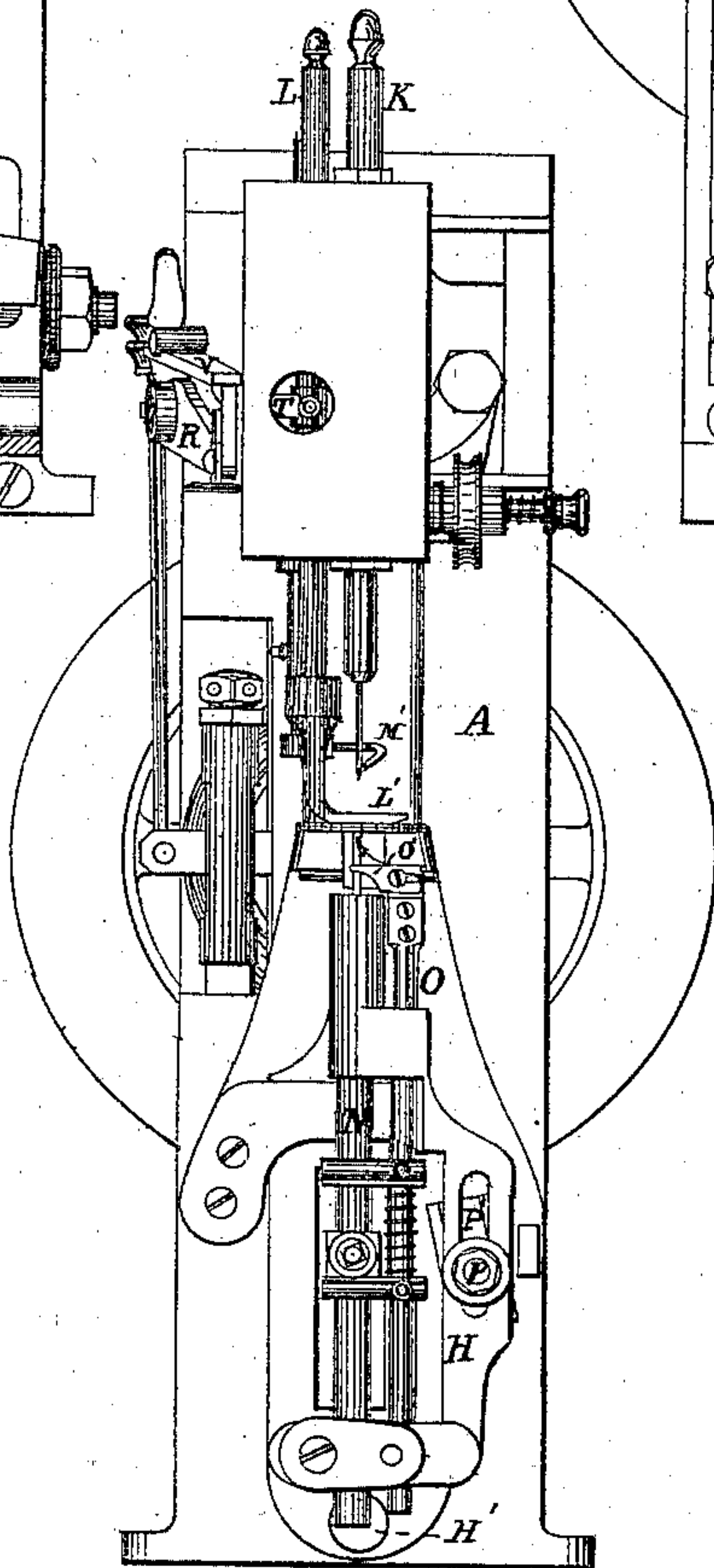


FIG. 4.

WITNESSES.

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# UNITED STATES PATENT OFFICE.

WILLIAM H. JOHNSON, OF SPRINGFIELD, MASSACHUSETTS.

## IMPROVEMENT IN WAX-THREAD SEWING-MACHINES.

Specification forming part of Letters Patent No. 135,431, dated February 4, 1873.

*To all whom it may concern:*

Be it known that I, WILLIAM H. JOHNSON, of Springfield, in the county of Hampden and State of Massachusetts, have invented certain Improvements in Sewing-Machines, of which the following is a specification:

My invention relates to the mode of constructing and arranging the mechanism by which the necessary motions are given to the several devices which co-operate to form the seam in what are called wax-thread sewing-machines, and which mode of construction, modified in form, may be used in other sewing-machines. The devices referred to are the needle and its accessories, the awl and its accessories, and the feeding mechanism. My invention consists in a combination and arrangement of parts whereby all the movements of these several parts are derived from a single crank acting through two diverging connecting-rods, which are arranged in a peculiar manner to be described, by which the easy reciprocating motion imparted by a crank is attained, and the use of driving-cams is avoided, and at the same time the movements imparted thereby are so modified from the simple crank motion by the devices connected therewith as to enable them to give to the needle, awl, and feeding devices the modified motions required in the machine; and it also consists in several minor modifications of structure, which will be more particularly set forth in the description of the machine.

In the drawing, Figure 1 is a side elevation of the machine. Fig. 2 is a sectional plan. Fig. 3 is an elevation of the opposite side of the machine. Fig. 4 is a front-end elevation. Fig. 5 is a transverse sectional elevation, showing the parallel slides; and Fig. 6 is also a transverse sectional elevation, showing the arrangement of the diverging connecting-rods and some other parts.

A is the frame of the machine, not materially unlike in form the wax-thread sewing-machines now in use, except so far as it is modified to receive my improvements. B is the main driving-shaft, having a balance-wheel, B', as usual, upon the outer end, and upon the inner end the crank C, which has a crank-pin, C', from which all the movements of the machine are derived. D and D' are connecting-rods, the second one of which, D', for greater

convenience, works upon a wrist-pin, fixed in the rod D near the crank-pin; but instead of this, both rods might be made to work upon the same crank-pin. The outer end of the rod D works upon a wrist-pin, E<sup>2</sup>, fixed in the upper end of the sliding bar E and the outer end of the rod D' in a similar manner works upon a wrist-pin, E<sup>3</sup>, in the upper end of the sliding-bar E<sup>1</sup>. These bars E and E<sup>1</sup> work in guides A' attached to the frame, as shown, and move longitudinally parallel with each other, which causes the lines of motion of the two wrist-pins E<sup>2</sup> and E<sup>3</sup> to be also parallel, but each to be tangent to a circle of which the main shaft is the center, but upon opposite sides of the central line of the same. By this arrangement each slide E E<sup>1</sup> and the mechanism connected therewith has a separate movement different in time and relative velocity in different parts of its movement from the other, the nature of which can be readily comprehended from an inspection of the drawing. The slide E at its upper end is connected with the end of the balance-lever F, which, at the opposite end, actuates the end of the needle or awl bar K in the usual way, and the slide E<sup>1</sup> at its lower end is connected with the balance-lever G, which, at its other end, works the needle or hook-bar N also in the usual way. The bar N works in boxes attached to the plate H, which is made to oscillate a short distance upon the fulcrum-pin H' to feed the work along. O is the sliding bar, which carries the "cast-off" O', as usual. L is the sliding rod that carries the presser-foot L', and M is the rod that carries the thread-guide M'.

The general operation of these devices, which manipulate the thread to form the seam, is substantially the same in this machine as in others, and therefore need not be particularly described in setting forth my invention, except when they are thereby modified.

P is a rocking-shaft, arranged as shown, upon the front end of which is a slotted arm, P<sup>1</sup>, which receives an adjustable wrist-pin, p, which is fixed in the vibrating plate H, and by means of which the oscillations of the plate and its attachments are produced to feed the material through the machine in a well-known manner. Upon the opposite end of the rocking shaft P is an arm, P<sup>2</sup>, which, at its outer



end, is jointed to the sliding bar Q, which slides vertically in guides in the piece A', as is seen in Fig. 5. The slide Q has at its upper end a long mortise, Q', through it, through which the arm J passes, which is attached to the slide-bar E, and which carries the slide Q up and down a short distance, when it strikes the ends of the mortise Q'. The ends of the mortise are packed with leather to prevent noise. To the outer end of the arm J is attached a rod, J', which extends upward through an eye in the back end of the lever R, and is provided with an adjustable collar, R<sup>1</sup>, and a leather washer. The opposite end of the lever R is bent upward at R<sup>2</sup>, and bears against the under side of the spring S, which holds down the presser-foot and raises it off from the stud T which is fixed to the rod L of the presser-foot, as shown. By this means the pressure of the presser-foot upon the work is relieved at the time of feeding, without the foot being raised from the work, and avoids the effect upon the eyes of the operator that is experienced when the presser-foot is raised at every stitch. But if it is preferred to raise the presser-foot off of the work at each stitch it can be done by sliding the block U outward and under the stud T, when the presser-foot will be raised with the lever R. V is a cam-lever for raising the presser-foot and holding it up.

By the arrangement of mechanism shown both the awl and the hook-needle are passed through the material at the proper times, and when the awl is withdrawn the needle follows it closely and almost in contact with it, through the same hole. After the awl is drawn out of the material the hook, needle, and awl separate by the peculiar movements imparted by the crank, diverging connecting-rods, and slides, arranged as has been described, which have the effect to make the limits of the reciprocating motions of the awl and hook, respectively, occur at different points in the rev-

olution, and also to accelerate their motion during one-half of the revolution, and retard it during the other half, which brings the several operations of the machine to co-operate at the proper time to form the stitches, and also to feed the work along by the hook by a motion derived from the mechanism that drives the awl. Thus, all of the motions of the machine are derived from the crank through two systems of mechanism leading therefrom in oblique or divergent directions, as described.

What I claim is—

1. The combination of the driving-crank, the diagonal connecting-rod, and the slide, with the lever that works the awl, substantially as described.

2. The combination of the driving-crank, the diagonal connecting-rod, and the slide, with the lever that works the hook-needle, substantially as described.

3. The combination of the diagonal connecting-rods and the slides that work the awl and hook-needle, respectively, set obliquely to each other and actuated by the same crank, substantially as described.

4. The combination, with the hook-needle, of the rocker-shaft P, or its equivalent, when it is actuated by the mechanism that carries the awl, as described, so that it will feed the material along while the hook is in the material, substantially as described.

5. The combination, with the presser-foot, of the lever R, and spring S, as described, so that the spring will be raised from the presser-foot without raising the foot, substantially as described.

6. The adjustable block U, in combination with the lever R and the stud T, operating substantially as described.

Executed October 14, 1872.

WILLIAM H. JOHNSON.

Witnesses:

T. M. BROWN,  
E. M. COATS.