

(No Model.)

4 Sheets—Sheet 1.

E. Z. TAYLOR.

SEWING MACHINE FOR BARRING BUTTONHOLES.

No. 509,970.

Patented Dec. 5, 1893.

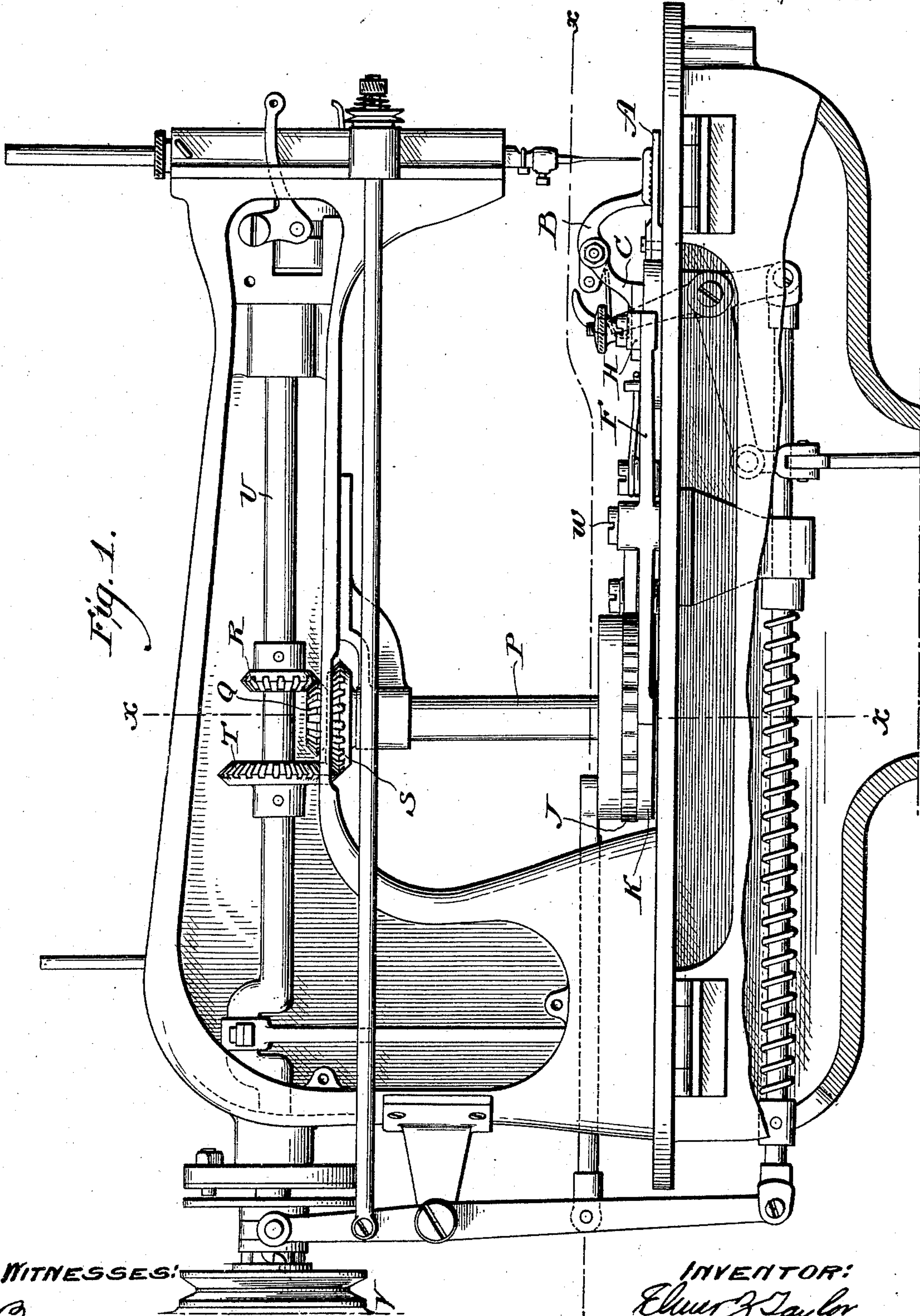


Fig. 1.

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INVENTOR:

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Shafelbatt

(No Model.)

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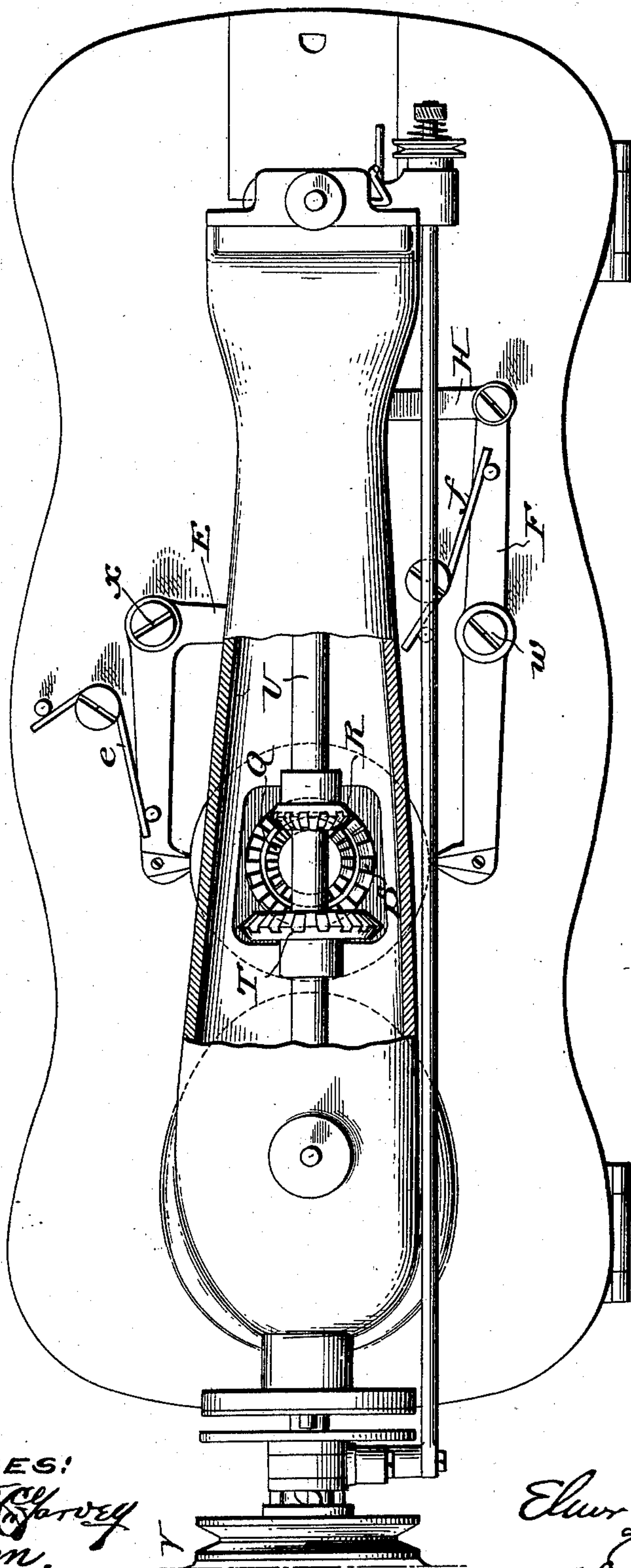
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Fig. 2.



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(No Model.)

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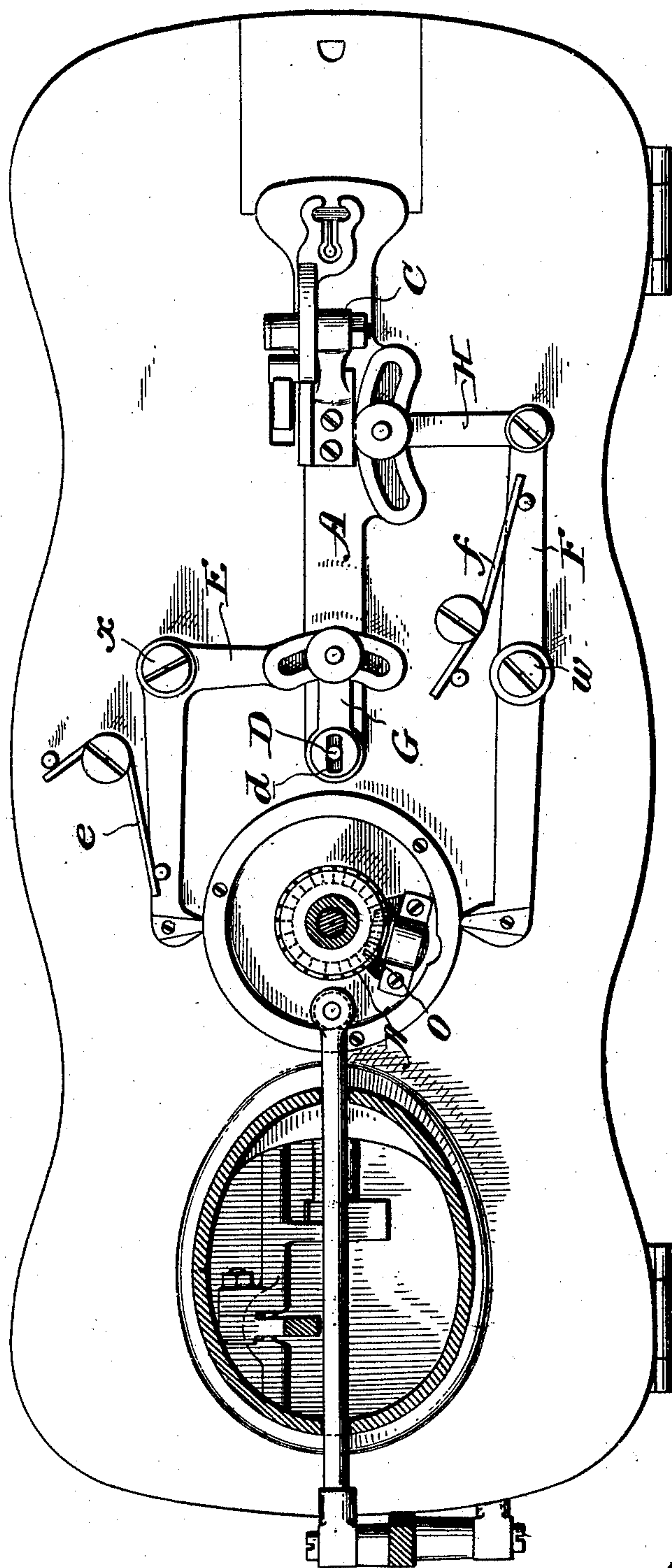
E. Z. TAYLOR.

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Fig. 3.



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(No Model.)

4 Sheets—Sheet 4.

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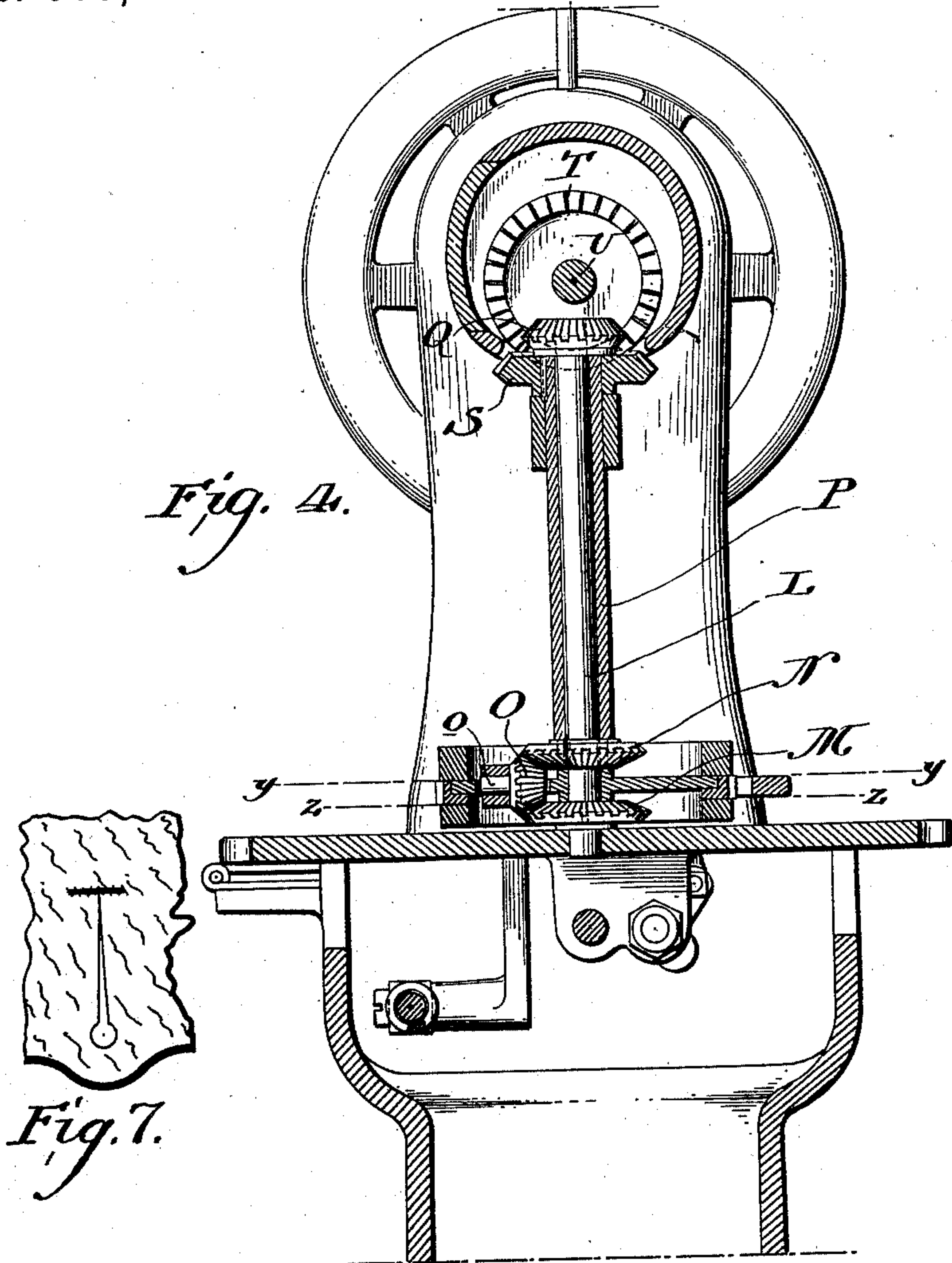


Fig. 5.

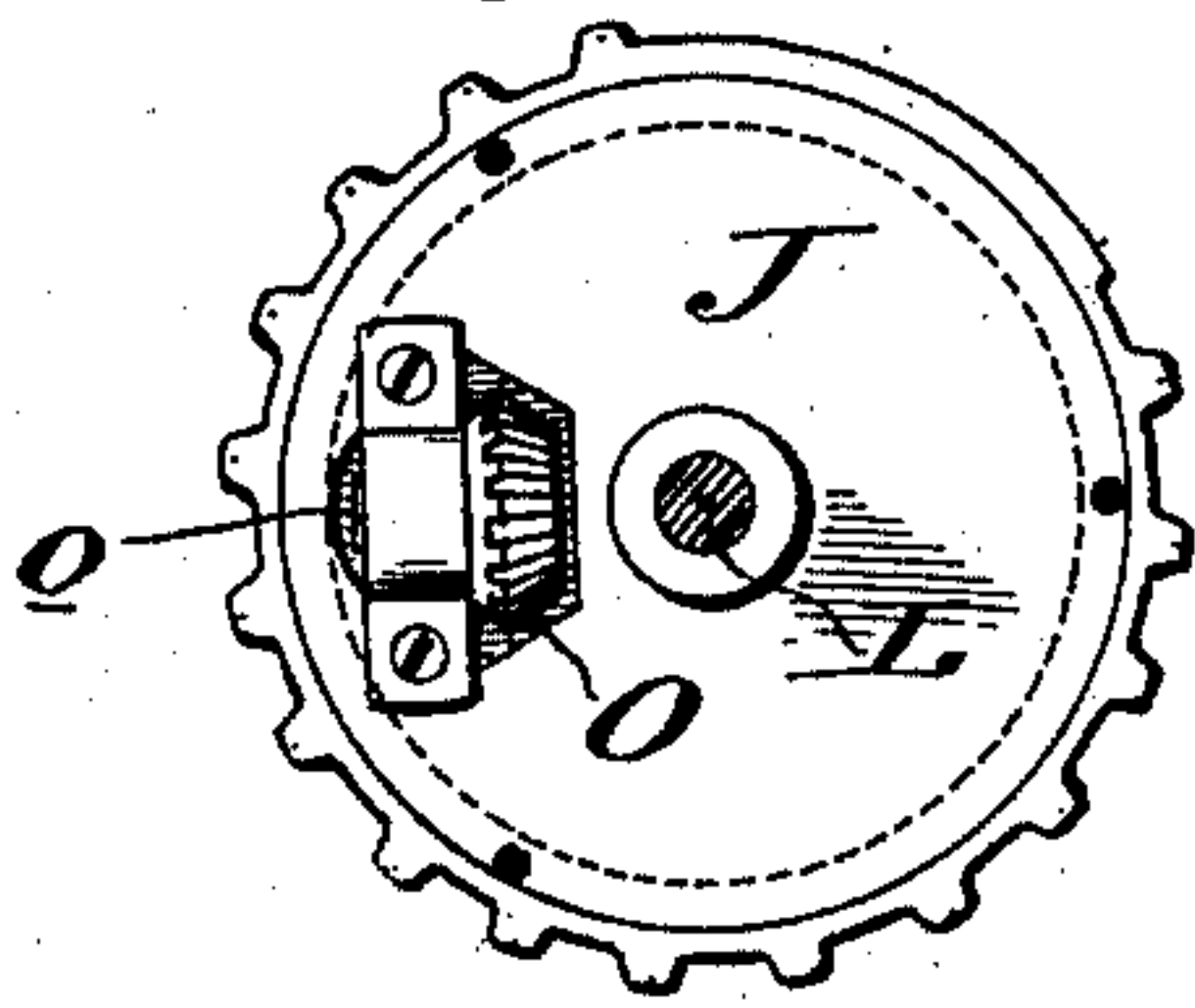
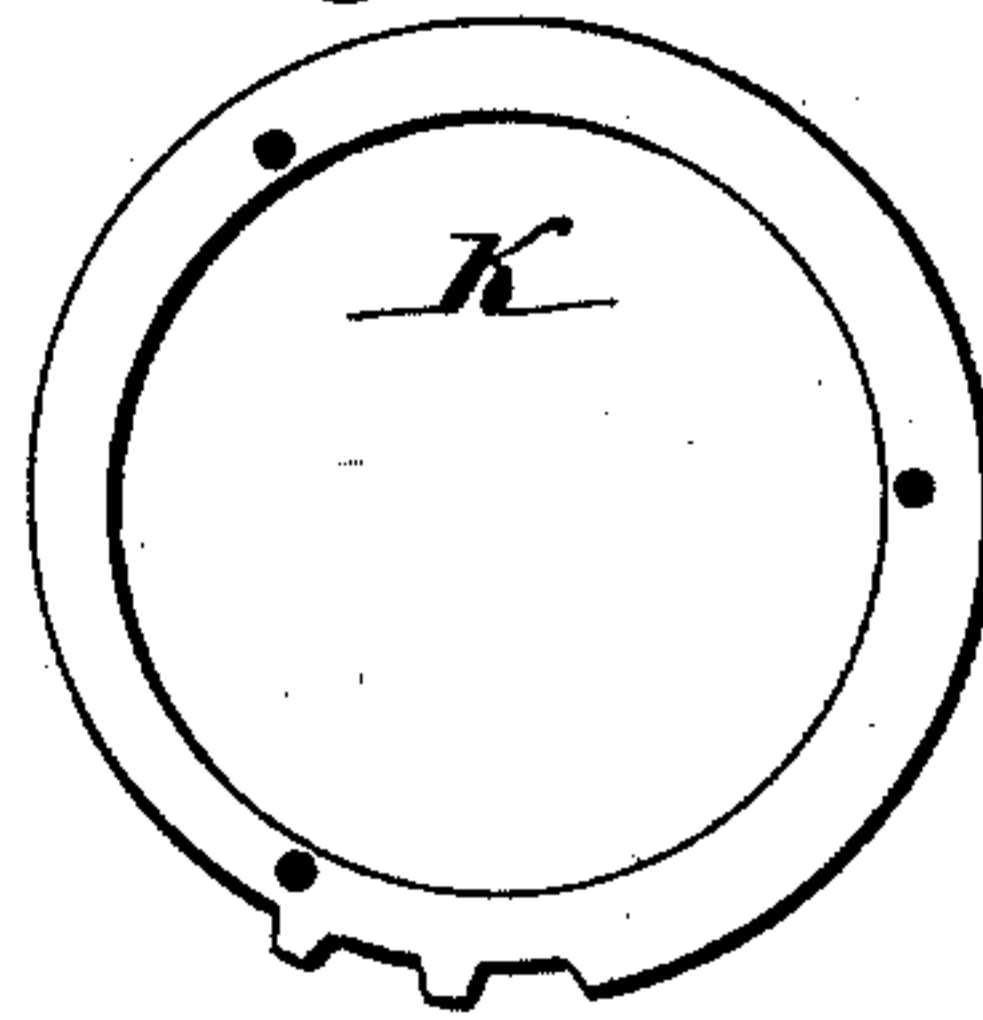


Fig. 6.



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UNITED STATES PATENT OFFICE.

ELMER Z. TAYLOR, OF PHILADELPHIA, PENNSYLVANIA.

SEWING-MACHINE FOR BARRING BUTTONHOLES.

SPECIFICATION forming part of Letters Patent No. 509,970, dated December 5, 1893.

Application filed January 31, 1893. Serial No. 460,461. (No model.)

To all whom it may concern:

Be it known that I, ELMER Z. TAYLOR, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Sewing-Machines for Barring Buttonholes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form part of this specification.

In the drawings: Figure 1, represents a side elevation of the device complete, with parts of the arm and support removed to show the mechanism. Fig. 2, is a plan view with part of the arm removed showing mechanism therein, and parts of mechanism upon the bed-plate or table, looking down from above. Fig. 3, is a plan view of the machine (with the arm entirely removed), showing mechanism on top of bed-plate or table, looking down from above. Fig. 4, is a section through the lines *xx*, Fig. 1, looking toward the elbow of arm. Fig. 5, is a view of the profile of cam J, detached. Fig. 6, is a view of the profile of cam K, detached. Fig. 7, is a magnified illustration of a buttonhole barred.

Similar letters refer in the several drawings to similar parts.

This invention consists of a machine for finishing the ends of buttonholes, pockets, &c., and embodies means for securely holding and guiding the material to be operated upon, so that the needle and thread will stitch a substantial seam or bar, across the unfinished end of the buttonhole or pocket.

The bar made by this machine consists of a series of long stitches the full length of the bar, laid at right angles to the length of the buttonhole or pocket, which series is afterward overseamed or stitched down by a series of short stitches laid close together and substantially at right angles to the long series, and continuing over the entire length thereof, and returning a short distance from the last finished end of the bar to form a tie or stay to the work. This combination of stitches is accomplished by having the goods carrier A, perform certain movements under the needle, which always descends and rises in the same straight line, passing through the goods and operating in the shuttle beneath.

In the drawings a "Singer" machine is shown with my contrivance. The material

is firmly held to one end of the carrier A by the clamp B, pivoted to the projection C of the carrier A. At the other end of the carrier A is a longitudinal slot *d* through which the pin D passes, thereby allowing the carrier A to move longitudinally and transversely.

At convenient points on the bed plate Z are pivoted the levers E and F. One end of the lever E is firmly pressed, by the spring *e* to the cam wheel J, and the other end thereof is connected with the carrier A by the adjustable link G. One end of the lever F is firmly held in contact with the cam K by the spring *f*, and the other end thereof is connected with the carrier A by the adjustable link H. The cams J and K are concentric and are firmly secured together, one, J, on top of the other, K, and revolve freely and loosely on the shaft L, as a center. Keyed to the lower end of the shaft L is the bevel gear wheel M meshing with the bevel gear wheel O. The point of contact is at the lowest place on the periphery of the bevel gear wheel O.

On the lower end of the hollow shaft P is keyed the bevel gear wheel N, meshing with the aforesaid bevel gear wheel O, the point of contact in this case, however, being at the highest part of the periphery of the bevel gear wheel O, diametrically opposite to the other. The wheel O revolves freely on the lug *o* projecting within an opening in the interior of the disk composed of the cams J and K. The lug *o* extends radially, with relation to the said cam disk, and is in the plane thereof.

To the upper end of the shaft L is keyed the bevel gear wheel Q meshing with the bevel gear wheel R; to the upper end of the hollow shaft P is keyed the bevel gear wheel S, meshing with the bevel gear wheel T. The shaft L passes through the hollow shaft P, and revolves freely and independently thereof. The bevel gear wheels Q and S, so also bevel gear wheels M and N, are of course concentric. The bevel gear wheels R and T are keyed to the main driving shaft U.

The operation of the machine is as follows:— Power being applied to the pulley V on the main driving shaft U, causes it to revolve, thus turning the bevels R and T, which rotate the gears Q and S, the shafts L and P

and the bevel gear wheels M and N. As the meshing points respectively of Q and R and S and T are on opposite sides of the common center of Q and S, the directions of the movements of the gear wheels Q and S, of the shafts L and P and of the lower bevel gear wheels M and N are contrary. If the wheels M and N had equal velocities in opposite directions, the wheel O would revolve freely on the lug o, and the lug o and the cams J and K to which it is fastened must remain stationary, because the points of contact of wheel O with wheels M and N have equal velocities. But as the object is to have the cams J and K slowly revolve about the center shaft L, the proportions between the gear pairs Q R and S T are so varied that Q will revolve either more rapidly or more slowly than S. As example, in the machine from which my drawings have been made, the bevel gear wheels Q and R have the same number of teeth, whereas the bevel gear wheel T has thirty-one teeth and the bevel gear wheel S has but twenty-nine. Consequently the gear S revolves thirty-one times while T revolves twenty-nine times, and as T, R, and Q have equal revolutions S revolves thirty-one times while Q is making twenty-nine revolutions. Therefore N revolving in unison with S, and M with Q, the bevel gear wheels M and N will revolve in the same proportions. As M and N therefore revolve in opposite directions at different speeds, the bevel O while revolving freely upon its axis o, will be forced around the center L, with a speed equal to one-half the difference between the velocities of the gear wheels M and N, carrying with it the cam J K. These cams operate the levers E and F and aided by the springs e and f, cause said levers to vibrate at the desired times. These vibrations are carried through the links G and H to the carrier A holding the fabric which is thus given the movements necessary to make the bar or stay. The movements (two distinct sets, viz.:—first, vibratory transversely; secondly, vibratory longitudinally, and at the same time progressing transversely), are caused by the appropriate profiles of the cams J and K, (Figs. 5 and 6.) These can be made to perform any required combination of transverse and longitudinal stitches.

In the machine represented in the drawings the cam K causes the carrier A to oscillate transversely four times, and the cam J causes the said carrier to vibrate longitudinally thirty-one times, while the cam K is also causing the carrier A to slowly progress transversely. This machine will therefore make a bar of thirty-five stitches. The length of all stitches is fundamentally regulated by the original placing of the fulcrum on the levers E and F, and by the depth of the cam profiles, but a sufficient adjustment of size can be accomplished by shifting the links G and H, to or from the pivots x and D respectively.

Having fully described my invention, what

I claim, and desire to protect by Letters Patent, is—

1. In a barring machine, in combination, a carrier adapted to move longitudinally and transversely, two bevel gear wheels revolving at different speeds in opposite directions, a third bevel gear wheel, two cams supporting said third bevel gear wheel and rotated thereby, said third bevel gear wheel meshing with and rotated by both of aforesaid bevel gear wheels, and means to rotate two first mentioned bevel gear wheels, connections between said cams and said carrier substantially as described.

2. In a button hole barring machine in combination a driving shaft, a hollow shaft, a solid shaft passing through said hollow shaft, said hollow shaft and said solid shaft revolving at different speeds in opposite directions, two meshing pairs of bevel gear wheels, one gear wheel of each pair secured to said driving shaft, the remaining gear wheel of one pair secured to said solid shaft, the remaining gear wheel of the other pair secured to said hollow shaft, three other bevel gear wheels, one of which is secured to said hollow shaft, another of which is secured to said solid shaft, both of which mesh with the third bevel gear wheel, said third bevel gear wheel adapted to move around said two former bevel gear wheels, two cams carried by said third bevel gear wheel, a carrier adapted to move longitudinally and transversely, connections between said carrier and said cams substantially as described.

3. In a buttonhole barring machine, in combination a driving shaft, a hollow shaft, a solid shaft passing through said hollow shaft, said hollow and said solid shafts revolving at different speeds in opposite directions, two meshing pairs of bevel gear wheels, one gear wheel of each secured to said driving shaft, the remaining gear wheel of one pair secured to said solid shaft, the remaining gear wheel of the other pair secured to said hollow shaft, three other bevel gear wheels, one of which is secured to said hollow shaft, another of which is secured to said solid shaft, both of which mesh with the third bevel gear wheel, said third bevel gear wheel adapted to move around two former bevel gear wheels, two cams carried by said third bevel gear wheel, a carrier adapted to move longitudinally and transversely, a lever one end of which presses upon one of said cams, an adjusting link connecting other end of said lever with said carrier, another lever one end of which presses upon the other of said cams, another adjusting link connecting other end of last mentioned lever with said carrier, means substantially as described to revolve said cams.

In testimony of which invention I have hereunto set my hand.

ELMER Z. TAYLOR.

Witnesses:

THOS. J. HUNT,
JOHN F. GRADY.