

(Model.)

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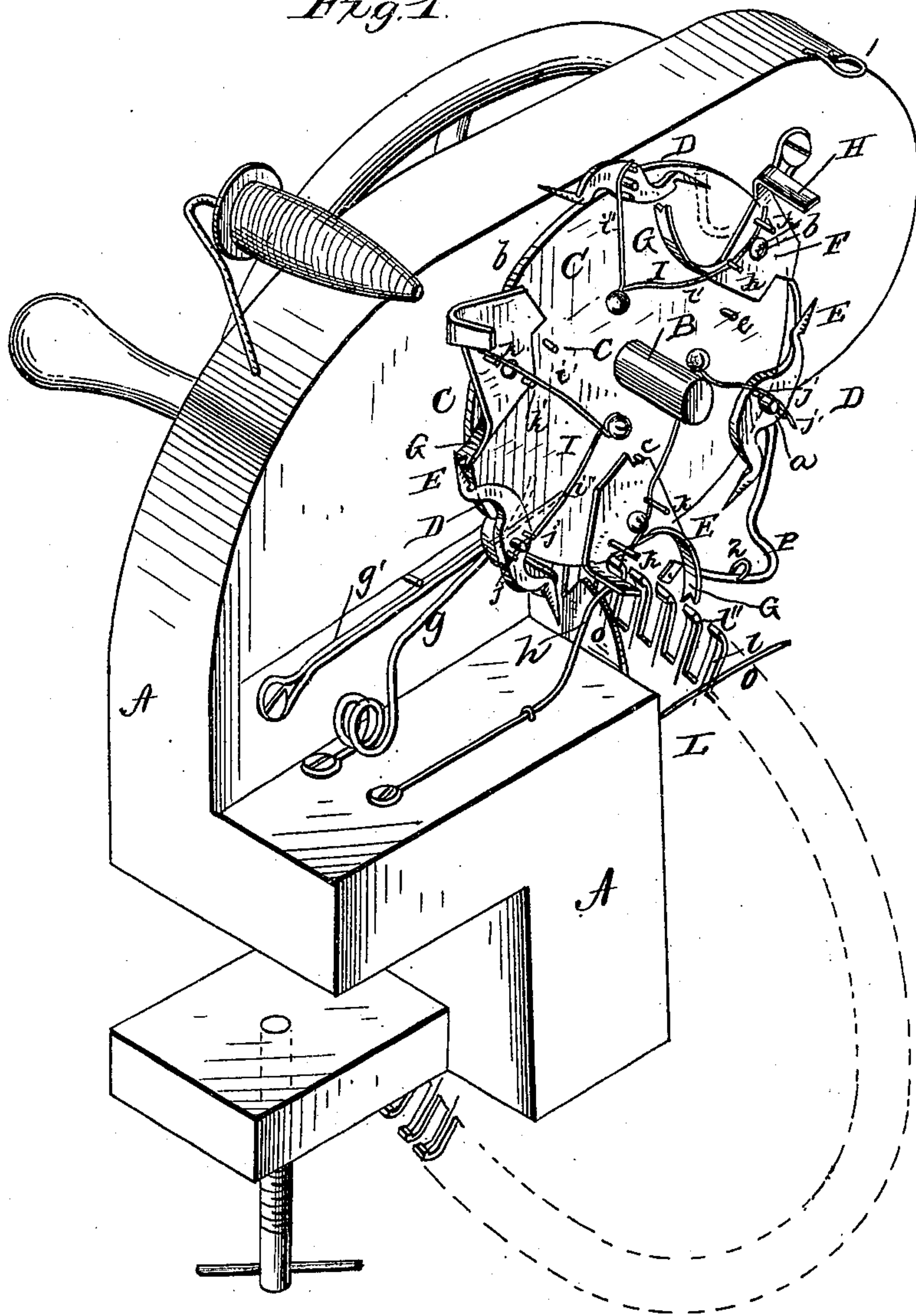
W. H. H. HOLLEN.

KNITTING MACHINE.

No. 245,599.

Patented Aug. 9, 1881.

Fig. 1.



Witnesses.
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(Model.)

3 Sheets—Sheet 2.

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Fig. 5.

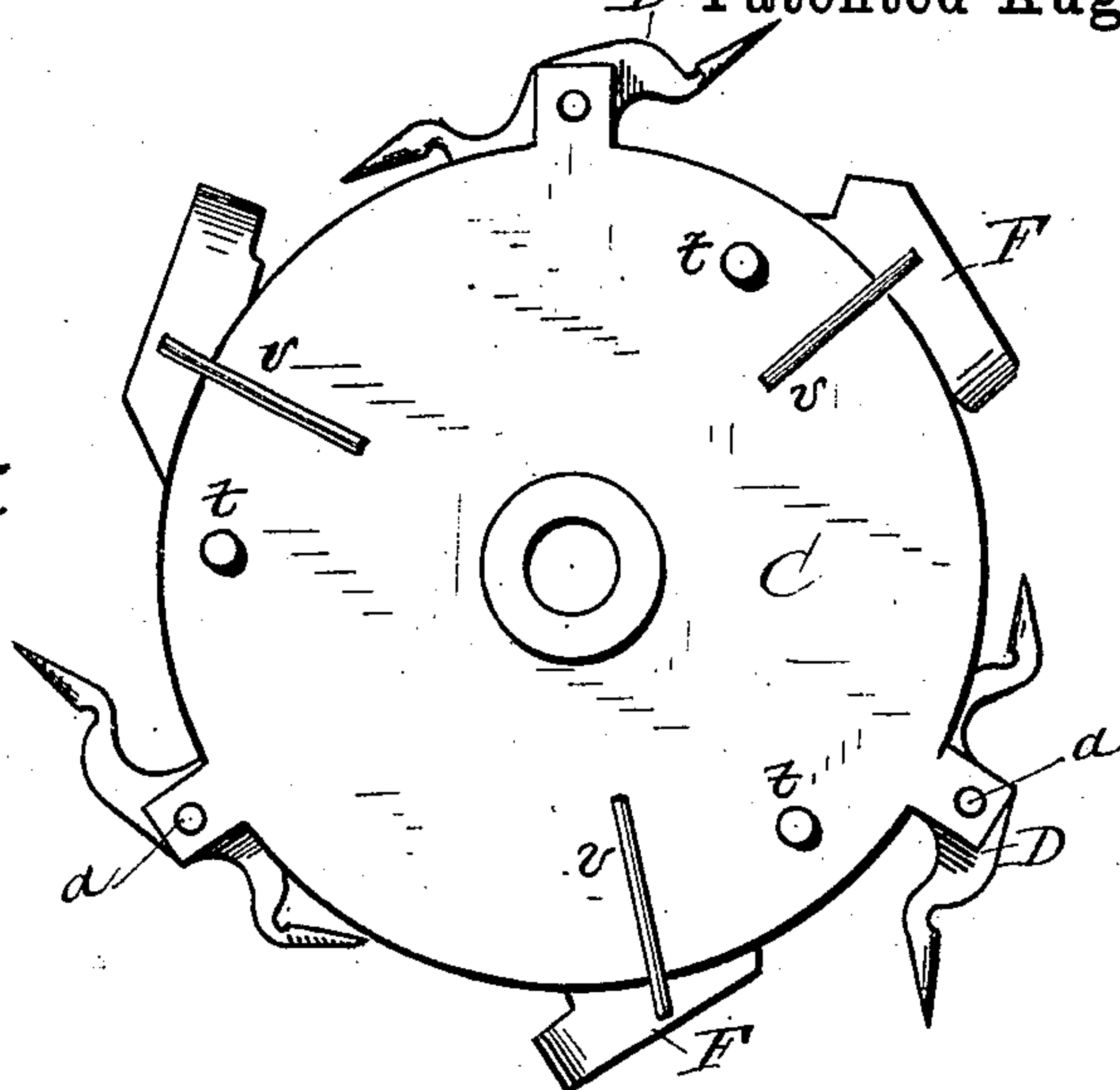


Fig. 6.

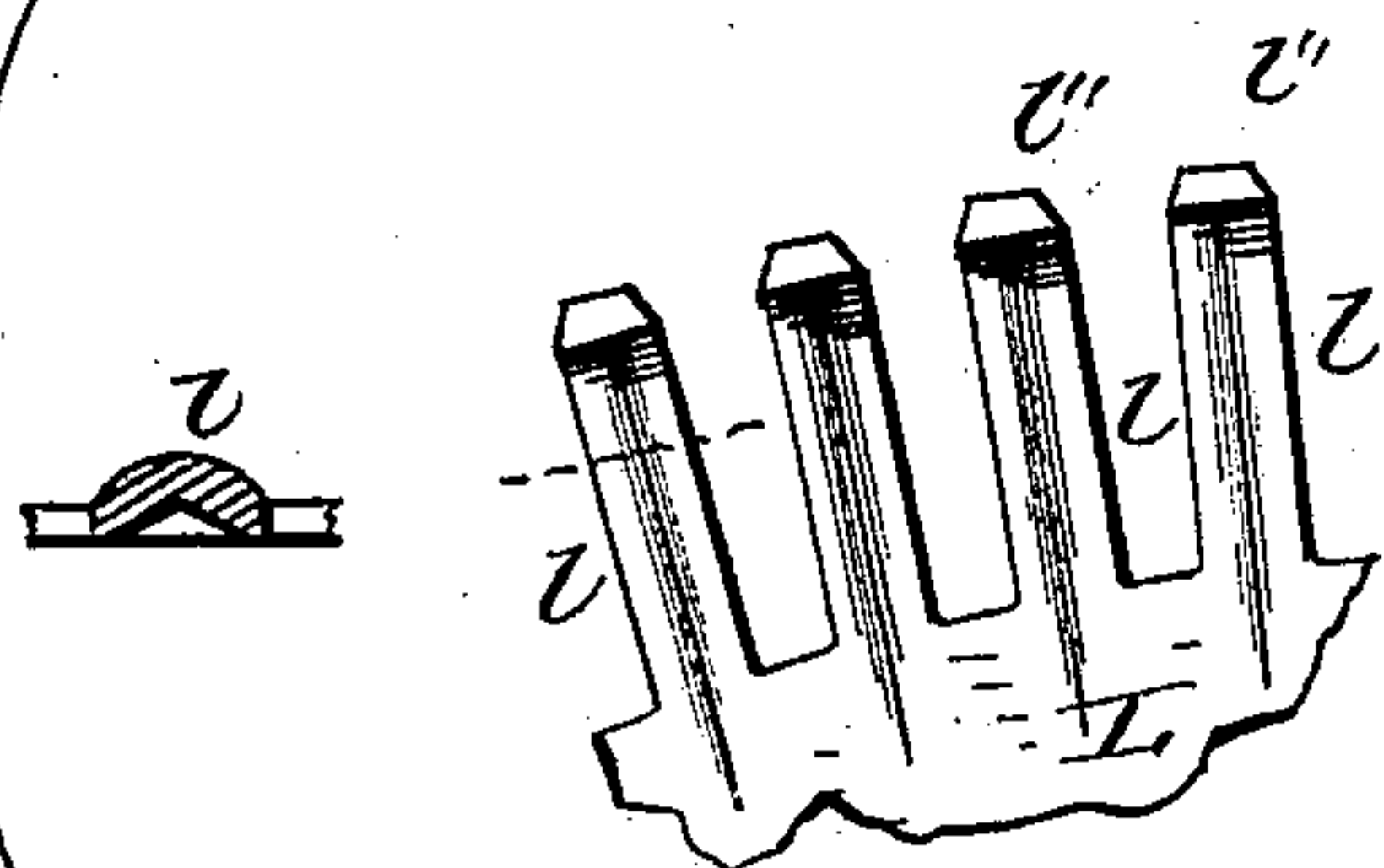


Fig. 8.

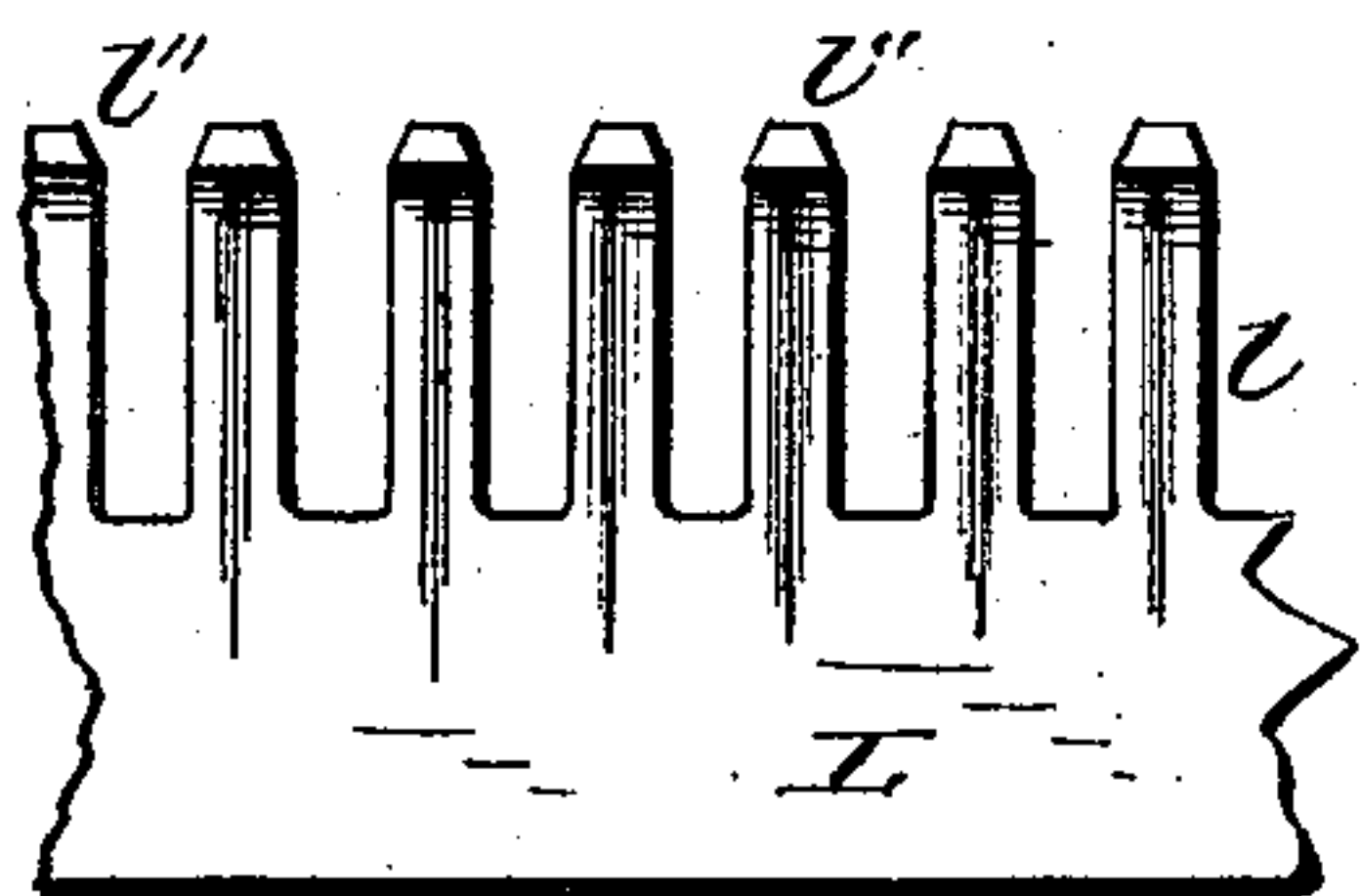
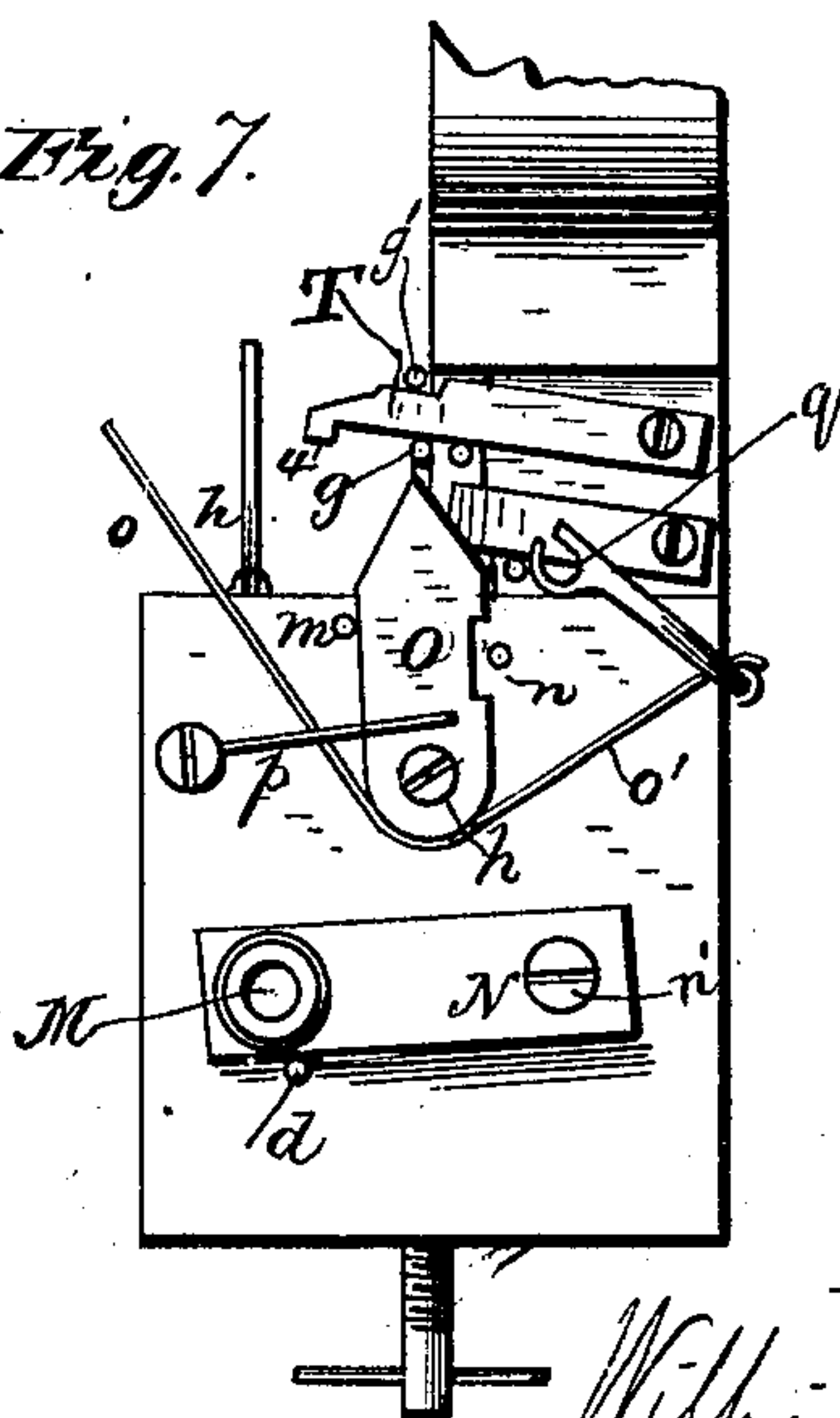


Fig. 7.



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(Model.)

3 Sheets—Sheet 3.

W. H. H. HOLLEN.
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Fig. 2.

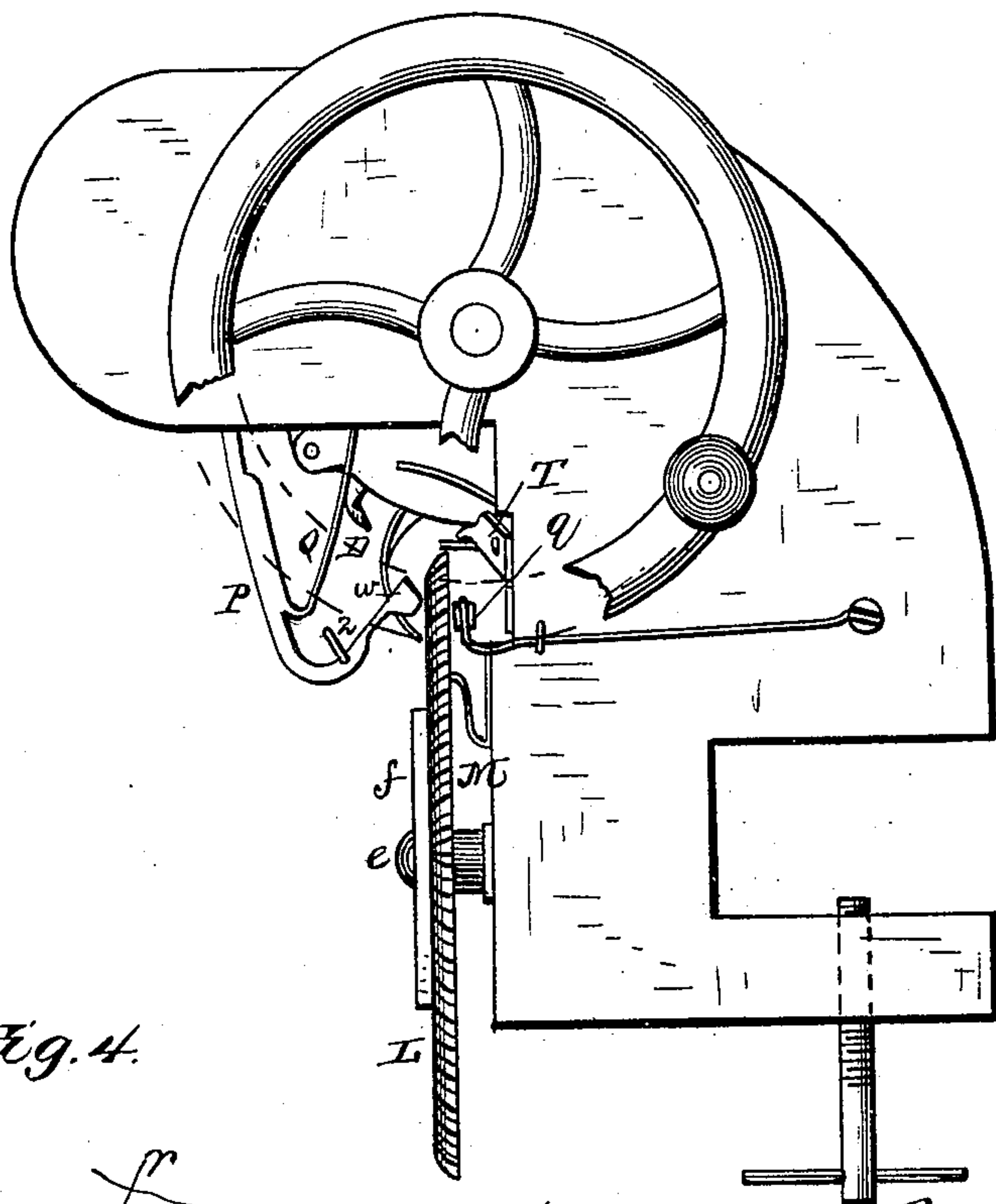


Fig. 4.

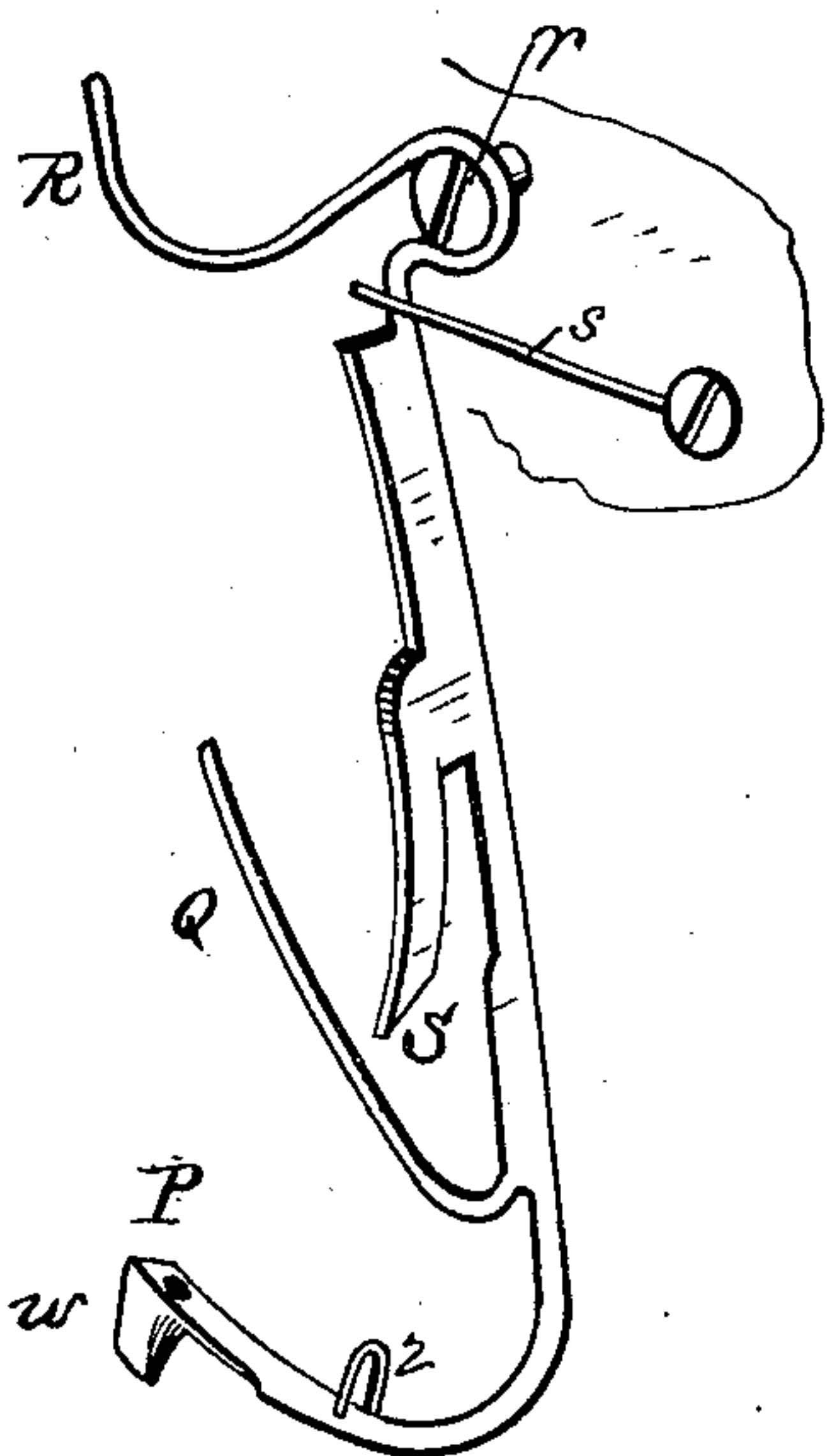
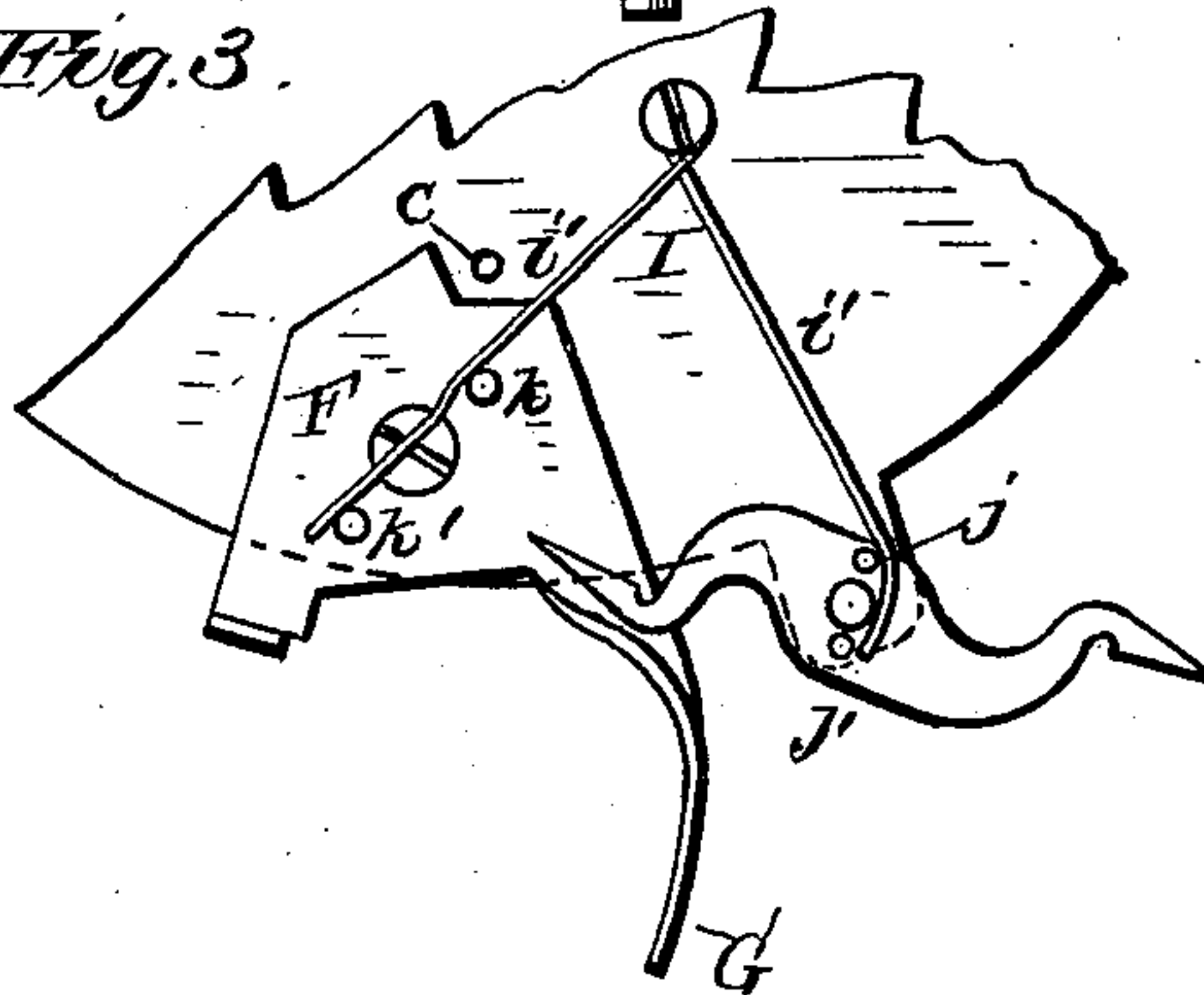


Fig. 3.



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UNITED STATES PATENT OFFICE.

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TO CALEB GUYER, OF TYRONE, PENNSYLVANIA.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 245,599, dated August 9, 1881.

Application filed May 11, 1881. (Model.)

To all whom it may concern:

Be it known that I, WILLIAM H. H. HOLLEN, a citizen of the United States, residing at Antes Township, in the county of Blair and State of Pennsylvania, have invented certain new and useful Improvements in Knitting-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to a machine adapted to the knitting of tubular goods, or tubular and straight articles, such as stockings and similar garments, as also to the knitting of straight goods of different widths; and it consists of the combinations of parts hereinafter set forth.

In the accompanying drawings, Figure 1 is a perspective view showing the machine in position for use, a stitch-lifter being in position to take a stitch. It is to be understood that in using the machine the operator would sit to the right of the figure, as shown, so as to bring the handle to his right hand. Fig. 2 is a fragmentary view showing the back of the carrying-plate with the stitch-making devices in the same position as in Fig. 1. Fig. 3 is a detached view showing a stitch-lifter and stitch-presser when the latter is acting on the stitch. Fig. 4 is a detached view, in perspective, showing the thread-carrier complete. Fig. 5 is a rear view of the carrying-plate *c*, as hereinafter described. Fig. 6 is an enlarged view of several teeth of the toothed plate, as hereinafter described. Fig. 7 is a front view of a part of the machine, the toothed plate being removed. Fig. 8 is a modification of the invention, showing a straight-toothed plate.

Similar letters of reference indicate similar parts in all the views.

A is a frame of any suitable construction on which the mechanism is mounted. It may be adapted, as shown, to be secured to a table or other convenient place.

B is a rotating shaft, on which is secured the

circular wheel or plate C, which carries a series of stitch-lifters, D. These lifters are each severally centered on a pin or pivot, *a*, and have similar points or hooks E, of substantially the form shown, at each extremity, and are adapted when the machine is in operation to make a complete revolution on their respective centers, each hook performing its duty in turn. On the same plate C there is placed a series of plates, F, as many in number as there are lifters D, and each capable of a partial revolution on a center-pin, *b*. Each of these plates has a presser, G, for the purpose of pressing down upon the prongs of the toothed plate the loops or stitches of the fabric as made, and each of these pressers is notched, as shown, at its extremity to cause the presser to ride centrally on the prong in the act of pressing down a stitch. Each plate F has a lateral projection, H, serving as a trip to impart motion at the desired period to the presser by coming in contact with a projection on the spring *h*, which serves to turn the plate upon its center, the reacting spring *i* restoring the plate to its normal position after it has been tripped. A spring, I, having two arms, *i'* *i''*, secured to the rotating plate C, has its ends adapted to bear upon pins or projections *jj'* and *k k'*, respectively upon the stitch-lifter D and plate F, for the purpose of restoring and holding them to their proper positions for the time being after they have been actuated, as hereinafter stated. Pins or projections *c* on the face of the rotating plate C serve to limit the positive motion of the stitch-presser in one direction, the spring subsequently returning it to its original position.

L is a circular rotating plate having a series of radial teeth or prongs, *l*, each projecting an equal distance from the center of the plate. Each of these prongs is grooved on its inner or under side to cause the stitch-lifter to catch the stitch more readily. These grooves are pressed into the teeth, and they thus also strengthen them where they merge into the plate.

At the extremity of each prong, and on the same side with the groove, is a knob or projection, *l''*, for the purpose of keeping the thread

from being trailed over the point of the tooth by the action of the stitch-lifter. This plate, with its prongs, knobs, and grooves, may be integral and readily made from sheet metal.

5 These knobs are formed by bending the top of the teeth inward and cutting the bent part down to the required size.

The plate L is mounted on a journal, M, which is upon an adjustable plate, N, which is 10 pivoted on the screw n' , and by it may be secured in any desired position. A stop, d , limits the range of adjustment, so that the prongs may be adjusted nearer to or farther from the other stitch-making mechanism, as may be desired in any case. The plate L is held by means 15 of a centering-screw, e , and pressure-plate f , and is intermittently rotated by means of a spring-rod, g , which is pressed down between the prongs of the plate, and then moved laterally by riding or glancing down the one side 20 of a cam, O, on the front face of the frame A in the rear of the plate L. This cam O has double inclines, upon one or the other of which the spring-rod g may bear at option for the purpose of imparting motion to the toothed plate 25 L in either direction at will, whereby a reversing action may be had in the act of knitting, or whereby tubular goods may be knitted, whether the plate L rotates in one or in the 30 other direction. This cam-plate O is centered at h , and has a limited motion between two stops, m and n , and has also attached to it bent rods o and o' , which may be of any length desired, their bent-up extremities serving, by receiving motion from any impediment, such as 35 a cork or plug, which may be placed between any two adjacent prongs of the toothed plate, to shift the cam-plate O and reverse the knitting, as the character of the work may demand— 40 as, for instance, in making the heel of a stocking, or in knitting a straight web. A spring, p , serves to bear down upon the face of this cam-plate to hold it better for working action.

A spring-detent, q , secured to the frame A 45 in any desirable position, is adapted to rest gently between the ends of any two adjacent prongs of the toothed plate to hold the plate sufficiently steady while a stitch is being made, the pressure not, however, being sufficient to 50 interfere with its proper revolution.

The thread-carrier P swings on a center, r , and is held against the side of the frame by a light spring, s . It is lifted by means of a cam or incline, Q, upon it, and actuated by one of 55 a series of pins or projections, t , on the inner face of the rotating plate C. It is lowered by means of another pin or projection on the inner side of the plate C coming in contact with another cam, R, on the thread-carrier. A lateral movement is also given to the thread-carrier 60 at the proper period by a third pin or projection, v , on the circular plate C, bearing against another incline, S, on the thread-carrier; or the cam may be formed on the plate C 65 and operate in connection with a pin or projection on the thread-carrier.

The thread-carrier has an eye, w , at its extremity to receive the yarn, and is made with a knob or projection, such as to insure the proper 70 delivery of the yarn between the prongs of the toothed plate, being sufficiently cut away back of the eye so that neither it nor the pronged plate shall interfere with the other.

Any appropriate thread guides or eyes may be placed upon the frame and thread-carrier, 75 as desired—as, for instance, at 1 and 2. 3 is any suitable support to hold the bobbin.

The spring-rod g is actuated by means of a spring-arm, g' , which receives its action from a pin or projection on the inner face of the circular plate C, which arm g' bears against a 80 vibrating plate, T, which plate pushes the spring-rod g down one or the other of the inclines of the cam O, a projection, 4, at the outer extremity of this plate, limiting the outward lateral play of the spring-rod g . A corresponding projection may also limit its lateral play in the opposite direction. Any appropriate stop or stops, adjustable, if desired, 85 may also limit the swinging movement of the plate T for the purpose of insuring the accurate intermittent movement of the toothed 90 plate.

The toothed or pronged plate may, as already mentioned, be straight instead of circular, 95 and of any length desired, according to the width of the fabric to be knitted. Its teeth would be formed precisely like those in the circular plate described.

I consider the modification of straight plate 100 shown in Fig. 8 the equivalent of the circular plate shown in the other figures, and the description of whose construction and operation has been hereinbefore fully set forth. The incorporation of such straight plate in a machine 105 of the character herein described would be a matter readily effected by a person skilled in the art to which this invention appertains. The use of such straight plate instead of the circular plate would involve merely minor 110 changes in details of construction.

The stitch-lifters may, if desired, be made single-pronged, actuated by a spring, instead of double-pronged. The shafts of the stitch-lifters may extend through the wheel or plate 115 C, so that the springs I, for holding them in position, can be attached to the back of the wheel.

The operation of making the stitches is as follows: As the stitch-lifter is moved forward 120 by the motion of the carrying-wheel the point is brought in contact with one of the teeth in the stitch-carrying plate above the stitch, and glances down the groove, passing under the stitch. The thread-carrier is then forced between 125 the teeth. A pin in the rim of the carrying-wheel then comes in contact with a cam fastened on the stem of the thread-carrier, and forces it sidewise. It is then forced out by a pin on the inner side of the carrying-wheel 130 coming against a fork of the thread-carrier, thus passing the thread around the tooth. Now,

as the stitch-lifter moves forward, it levers the stitch up over the tooth, but leaves the thread on. The rear end of the cloth-presser is caught by a spring, which forces the forward end of such presser down on top of the stitch-lifter, near the point, thus keeping the stitch more sure from sliding off the lifter if it should slip the notch. When the lifter clears the tooth the spring draws the forward end of the presser back against the tooth, causing it to slide down the same, thus pressing the stitch down to the base of the tooth, when the new stitch is complete.

Any appropriate slide may be fixed on the lower part of the frame, so as to be lowered or raised to suit the size of plate used, to which the plate should be held by a shoulder-screw.

I claim as my invention—

1. The double-pointed stitch-lifter D, substantially as described, pivoted at the center, and provided with stops, in combination with the plate C, toothed plate L, and a detaining-spring, whereby its rotary motion is intermitted at each half-revolution, substantially as set forth.

2. The pivoted reciprocating stitch-presser, provided with a notched or grooved extremity, and with a trip or lateral projection, and with stops or pins, and a detaining-spring, in combination with the plate C, toothed plate L, spring *h*, and a pin to limit its range of motion, substantially as set forth.

3. The toothed plate L, provided with a series of bent and undergrooved prongs, as de-

scribed, combined with the circular plate C, carrying a series of plates, F, each plate being formed with a presser, G, substantially as specified.

4. The thread-carrier constructed substantially as described, hinged or swung with a capacity for sidewise or lateral movement, and provided with the cams or projections S Q R, combined with the detaining-spring *s*, and the plate C, provided with pins or projections, substantially as and for the purposes specified.

5. The double inclined shifting cam O, provided with the rods *o' o'*, the removable wedges or blocks, and the frictional bearing-spring *p*, combined with the toothed plate L, spring *g*, spring-arm *g'*, and the vibrating plate T, having projections, all substantially as specified.

6. The combination of the plate C, stitch-lifters D, the stitch presser-plates and pressers F G, combined with the springs I, having arms *i' i''*, substantially as shown and described.

7. The combination, with the circular tooth-plate L, of its pivoted bearing or support, and an adjustable plate, N, substantially as and for the purpose described.

8. The combination of the circular plate C, series of plates F, having trips H, and pressers G, and spring *h*, substantially as specified.

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

WILLIAM H. H. HOLLEN.

Witnesses:

JOHN OAKWOOD,
J. M. CALDERWOOD.