

(No Model.)

4 Sheets—Sheet 1.

G. HOOPER, 2d.
SHOE SEWING MACHINE.

No. 474,450.

Patented May 10, 1892.

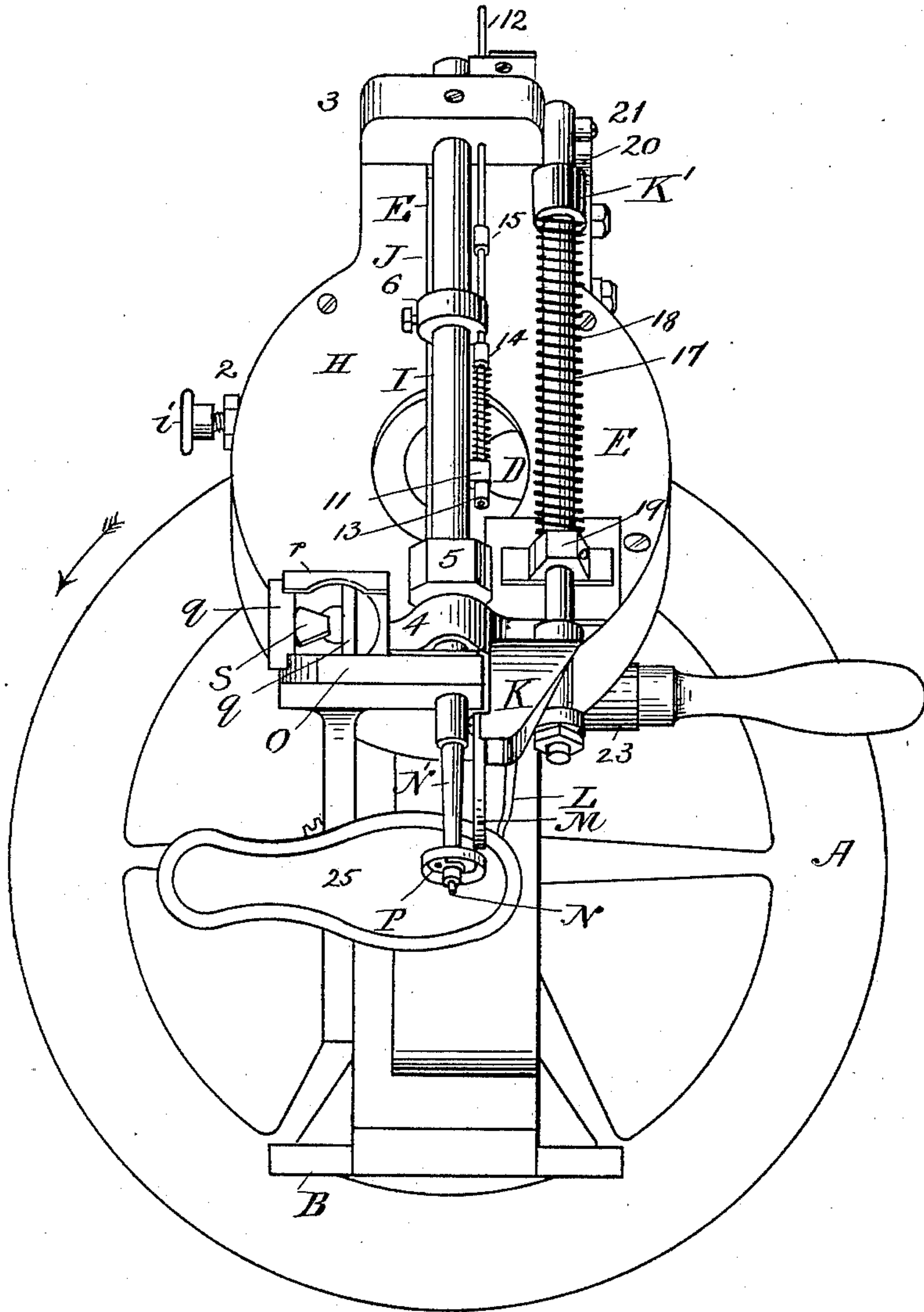


Fig. 1.

WITNESSES

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his Atty.

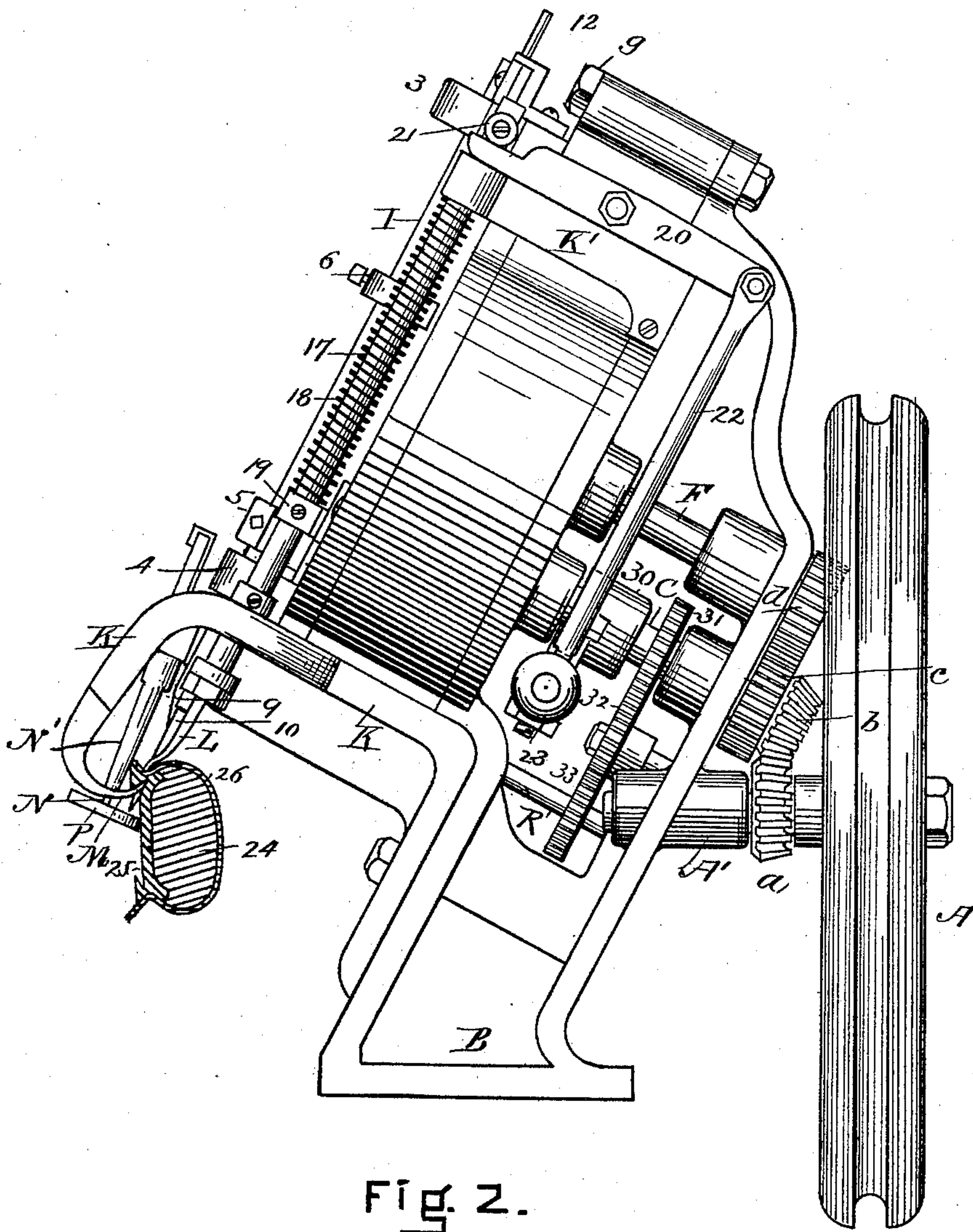
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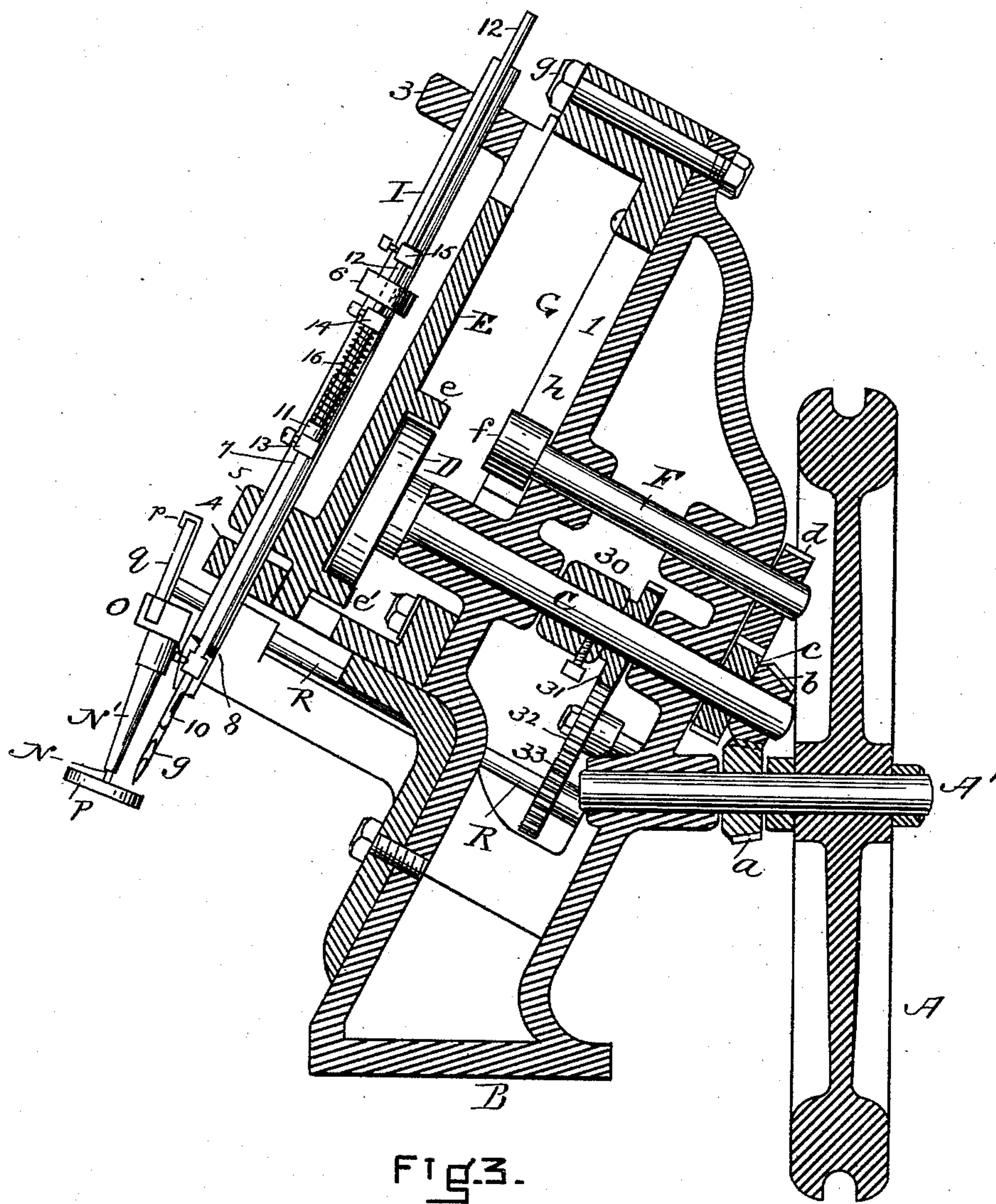
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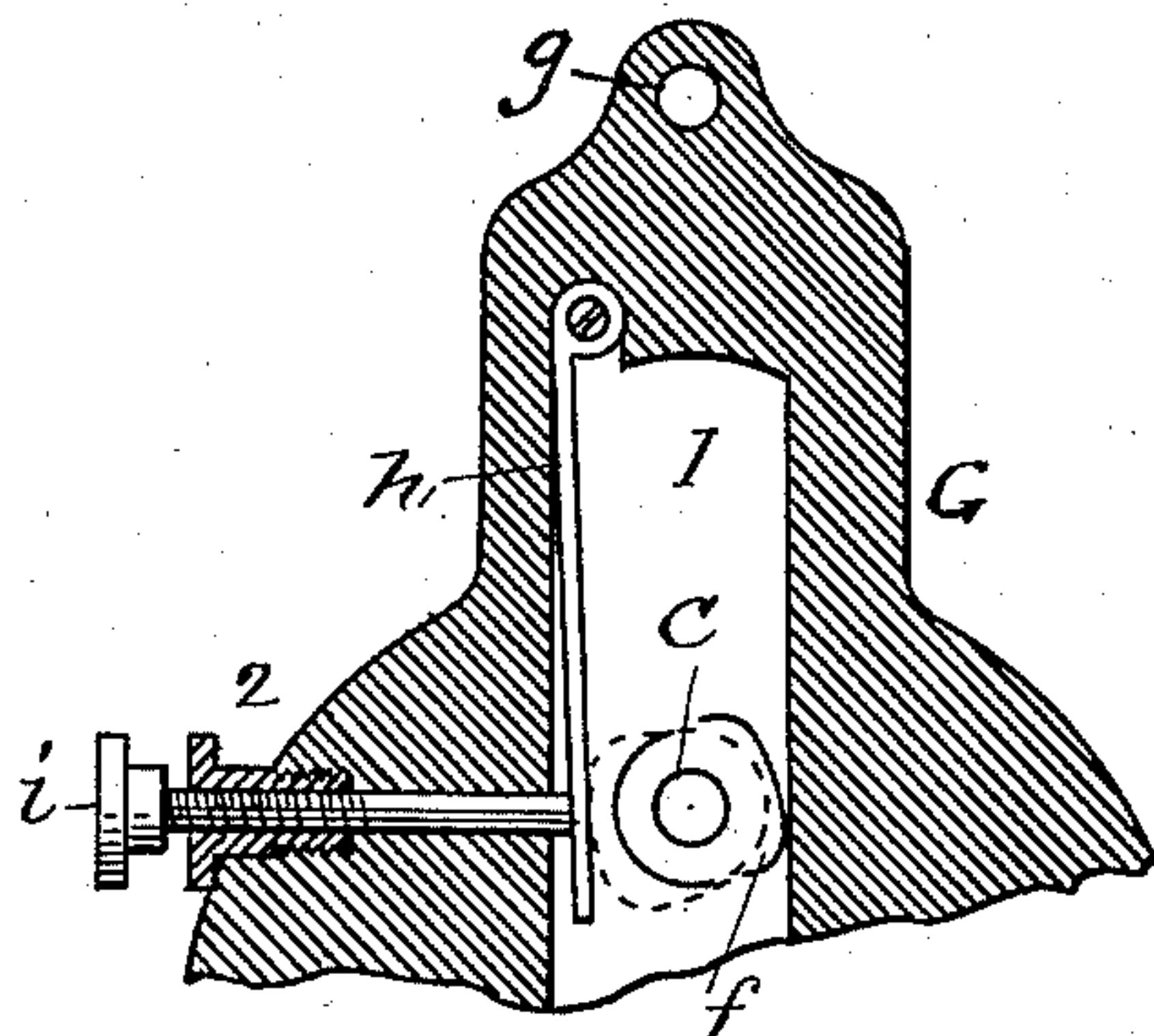


Fig. 4.

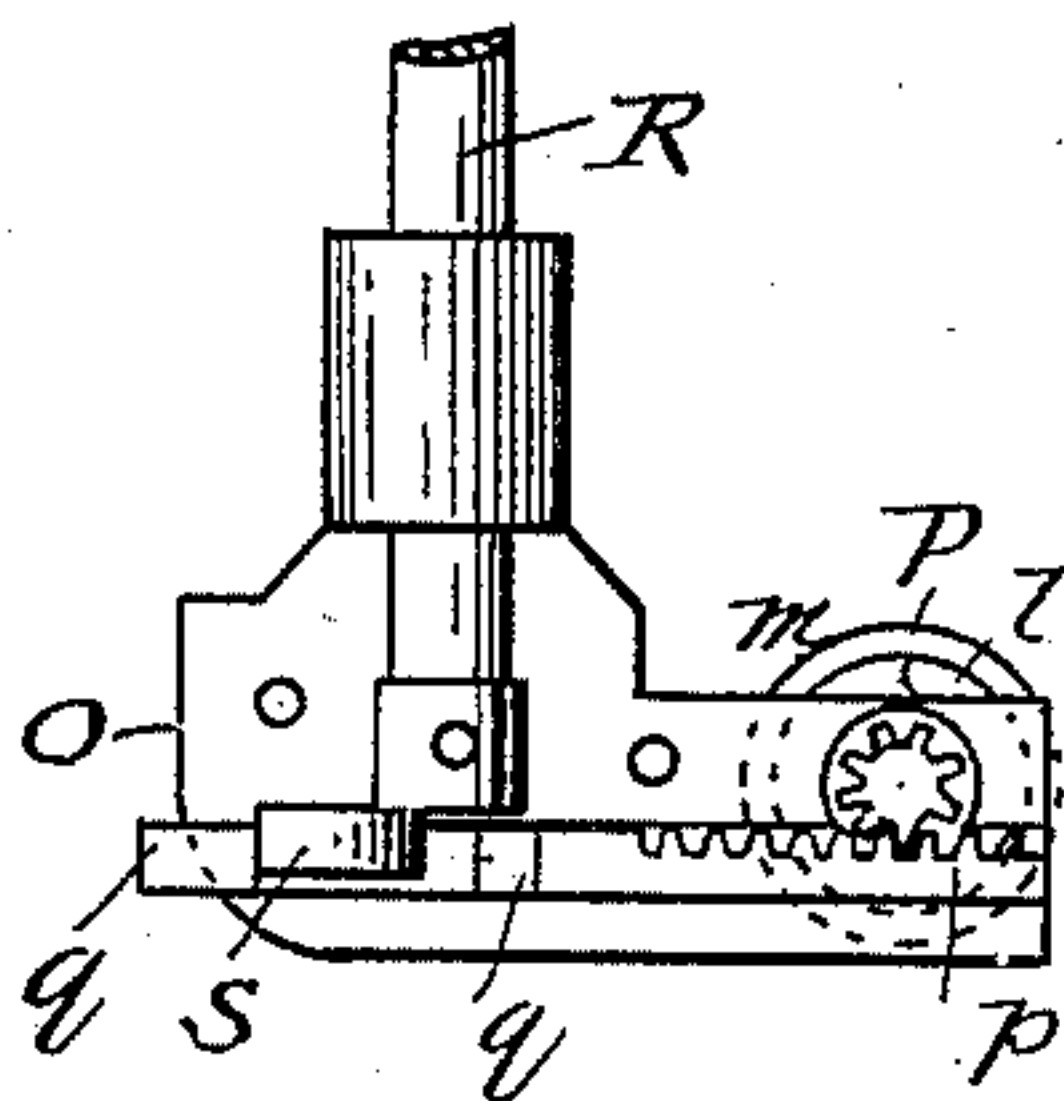


Fig. 5.

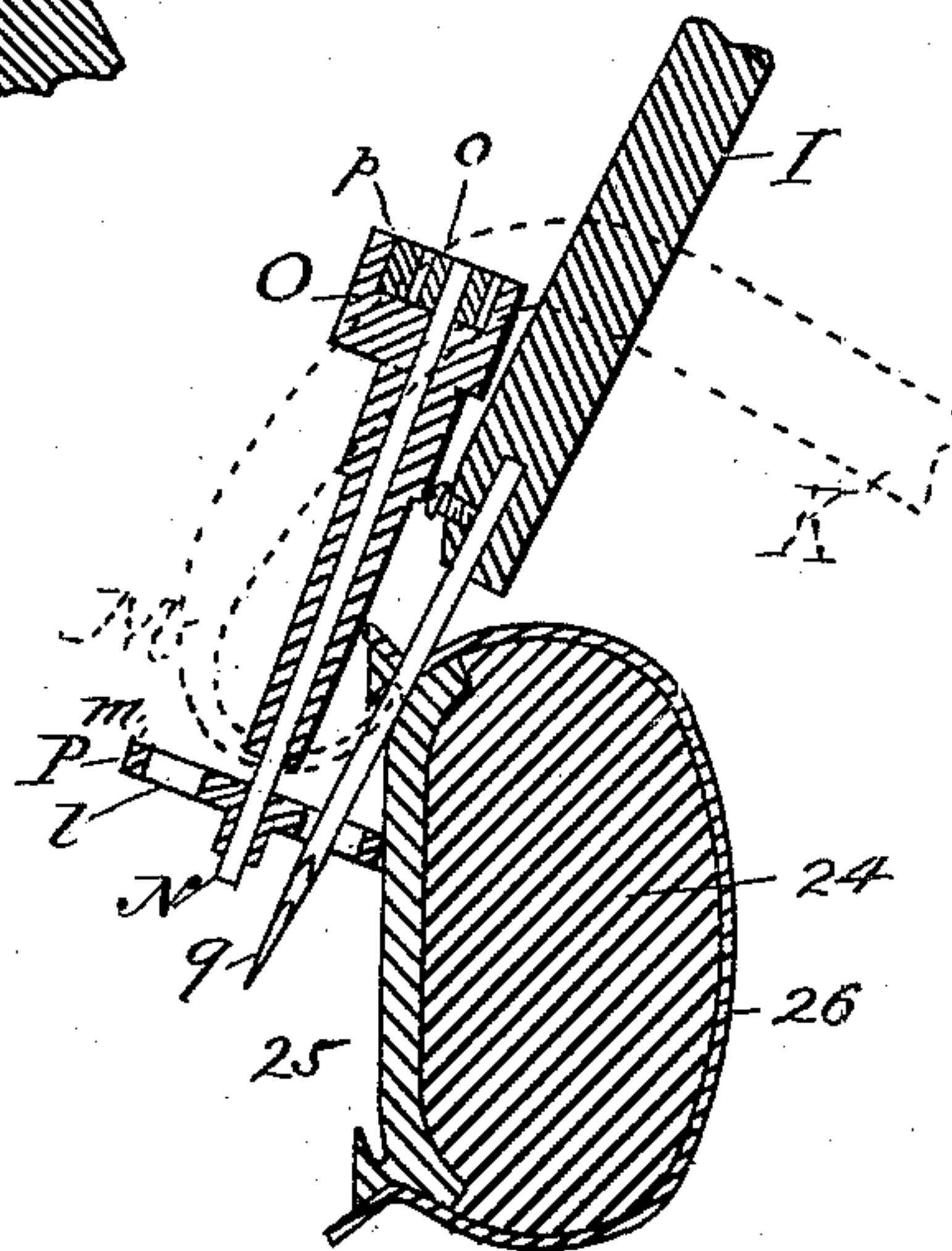


Fig. 6.

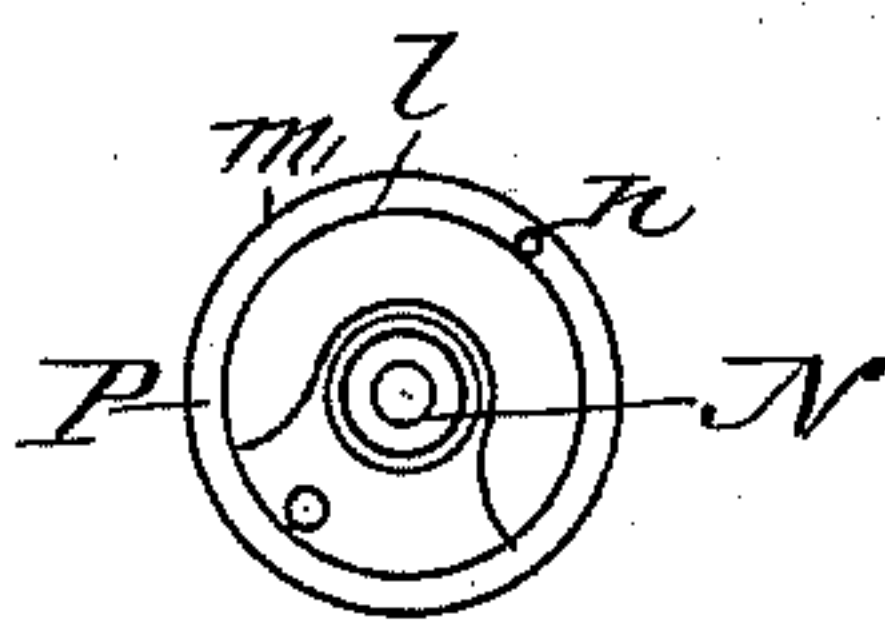


Fig. 7.

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UNITED STATES PATENT OFFICE.

GEORGE HOOPER, 2d, OF MARBLEHEAD, MASSACHUSETTS.

SHOE-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 474,450, dated May 10, 1892.

Application filed March 30, 1891. Serial No. 386,927. (No model.)

To all whom it may concern:

Be it known that I, GEORGE HOOPER, 2d, of Marblehead, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Machines for Sewing Shoes; and I do hereby declare that the following is a full, clear, and exact description of the invention which 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 letters and numerals of reference marked thereon, which form a part of this specification.

My invention relates to sewing-machines for sewing shoes or other articles made from leather or other kindred material, and it is more particularly adapted for sewing the uppers to the soles of shoes.

My present invention is designed to be an improvement on the patents granted to Bartlett and Wiggin, No. 397,579, dated February 12, 1889, No. 399,818, dated March 19, 1889, and No. 400,037, dated March 26, 1889.

In the constructions of sewing-machines for sewing turned shoes, as shown and described in the above-stated patents, the horn or support on which the shoe-sole is adapted to rest, with the horn in the channel of the sole, is a vertical standard extending upward from the base of the machine. With such construction it is necessary to hold the lasted shoe with the sole away from the operator, as the vertical position of the horn would prevent the shoe being held between said horn and the rest of the machine at the proper angle for the needle to pass through the sole and upper in the proper places. In this construction and while sewing a shoe with the upper and last of the shoe between the operator and the shoe-sole it is impossible to see where the needle comes out after passing through the sole, and it is therefore difficult, as the course of the needle cannot be followed, to hold and guide the shoe just in its proper positions to have the needle always come out at the right places.

It is the principal object of my invention to avoid the above-named difficulties by providing means whereby the shoe to be stitched can be held with the sole toward the operator and at any desired angles.

My invention also consists in certain other

features and details, as more particularly hereinafter described.

In the accompanying drawings, Figure 1 illustrates a front view of a sewing-machine made in accordance with my invention with a shoe in the proper position to be stitched. Fig. 2 is a side elevation of the same with the shoe shown in cross-section. Fig. 3 is a vertical section from the front to the rear of the machine. Figs. 4, 5, 6, and 7 are details.

Similar letters and numerals represent like parts in all the figures.

The machine proper inclines backward somewhat, as shown in Figs. 1, 2, and 3, in order that the needle and other parts of the machine may work the more practically and smoothly when the shoe is held in the proper position to be stitched.

A is the large driving-wheel, which is preferably journaled in a vertical position in order to somewhat balance the rest of the machine, which is adapted to be secured to a table by its base-plate B. Keyed to the shaft A' of the driving-wheel A is a bevel-gear *a*, and engaging with said gear is another bevel-gear *b*, to the shaft C of which at its other end is secured the cam D, which operates reciprocally the sliding needle-bar carrier E by bearing alternately against the upper and lower studs *e e'*, extending from said carrier.

F is a shaft journaled above and parallel with the shaft C and which is rotated by means of a gear *c* on the shaft C engaging with a gear *d* on the shaft F. On the forward end of said shaft F is a cam *f*, which is inclosed in a vertical channel 1 of the swinging frame G, said frame being pivoted at *g* to the upper portion of the machine-frame. The greater diameter of the cam *f* is somewhat less than the width of the channel 1 to enable said cam to revolve freely within said channel and to allow the frame G to be oscillated by said cam. A strip of metal or a spring *h* is suspended by its upper end, so as to hang down on one side of the channel 1 opposite the periphery of the cam *f*, and a set-screw *i*, passing through a bushing 2 in the side of the frame G, bears against the strip *h* and is adapted to regulate the play of the cam *f* by increasing or diminishing the distance between said strip *h* and the opposite side of the recess 1, and also to regulate the amount

of play of the oscillating frame G, and consequently to regulate the feed and the length of the stitch, which feed is given by the needle and needle-bar swinging to the left on
5 said frame when the needle is in the goods.

H is the cover of the swinging or oscillating frame G and which supports the needle-bar I and adjacent mechanism. The needle-bar I is adapted to be held and to slide through
10 holes in the brackets 3 and 4, which form a part of the cover H.

J is a longitudinal vertical slot extending through the cover H and in which the sliding needle-bar carrier E is adapted to slide. Secured near the lower end of said carrier is a
15 sleeve 5, which extends outward from the carrier and through which the needle-bar passes.

6 is a sleeve, which is adjustably attached to the needle-bar I between the upper brackets 3 and the sleeve 5. The needle-bar I has a longitudinal groove or slot in its side, in which the cast-off bar 7 rests, and which allows the needle-bar and cast-off bar to slide longitudinally relatively to each other. This
20 groove extends down said bar to within a short distance of the lower end, and at the point at which said groove terminates the rod is cut away for a short distance, so as to form a shoulder 8, against which a projection or a
25 shoulder near the lower end of the cast-off bar is adapted to strike. The needle 9 and cast-off 10 are attached to the needle-bar and cast-off bar, respectively. Secured to the upper end of the cast-off bar 7 is a small sleeve
30 11, which projects out beyond the slot in the needle-bar I.

12 is a small rod, which is parallel with the needle-bar and which passes through said sleeve 11, the sleeve 6, and the bracket 3.

13, 14, and 15 are three sleeves adjustably attached to the rod 12, the sleeve 13 being attached to the lower end of said rod below the sleeve 11, 14 and 15 being attached to said rod, one on each side of the sleeve 6 at a sufficient distance to allow a small play of the sleeve 6 between the sleeves 14 and 15. A coil-spring 16 encircles the rod between the sleeve 11 and the sleeve 14, so as to keep the sleeves 11 and 13 in contact, and consequently
45 to keep the rod 12 firmly in place.

K K' are brackets extending out beyond the front of the machine, and through vertical holes in the ends of these brackets the presser-foot bar 17 is adapted to slide. The
55 presser-foot L, which is of peculiar form and which will be described more particularly hereinafter, is attached to the presser-foot bar in any appropriate manner. A coil-spring 18 encircles the bar 17, between the bracket
60 K' and an adjustable sleeve 19 on said bar. The function of the spring is to press the presser-foot down upon the horn upon which the goods are to be placed and sewed. Pivoted to the bracket K' is a lever 20, one end
65 of which has a concave recess upon its upper side, which is adapted to press against the under side of a roller 21, journaled to the bar

17 above the bracket K'. To the other end of the lever 20 is loosely pivoted a vertical rod 22.

23 is a hand-lever, which is pivoted to the machine-frame on the other side of the shaft C from the rod 22, and this lever has a hole through which the lower end of the rod 22 passes and which is large enough to allow of
75 a free movement of the rod in said hole. The lower end of the rod 22 is screw-threaded, and has a nut below the lever 23 to keep the rod and lever together and to adjust them relatively to each other. The lever 23 passes under the cam 30 and is adapted to be held
80 against said cam by a nut on the end of the rod 22.

The bracket K extends a slight distance in front of the bar 17, and then downward, and finally curves upward and slightly backward, the latter portion of the curve M tapering to its extremity, where it terminates to the right of the course of the needle 9 in an edge transverse with the length of the machine, and
85 which edged extremity constitutes the horn or rest upon which the shoe is to be held while being stitched. The presser-foot L extends from the lower end of the bar 17 to a position a little above the edge of the horn
90 M and terminates at its lower end in an edge parallel with the edge of said horn. This edge I prefer to roughen or corrugate, in order to more firmly hold the shoe in place on the horn M and prevent its slipping on said horn.
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The above-described construction is principally for the purpose of permitting the lasted shoe 24 to be held with the sole 25 toward the operator, so that he can see the course of the needle through the upper and through
105 the channel of the sole when the shoe is properly held with the edge of the horn M in the lower channel of the sole and the edge of the presser-foot L bearing down upon the upper 26 and in the edge channel, and thus holding the shoe firmly in place. (See Fig. 2.)
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N is a shaft suspended in a sleeve N', which is secured at its upper end to a portion O of the machine-frame which extends transversely in front of and across the needle-bar
115 I. This shaft N extends downward and to the left of and close to the horn M, and below said horn it is provided with a circular reciprocating thread-carrier whirl P. This whirl is cut through at *l* for about two-thirds
120 of its area, leaving a circular rim *m* entirely surrounding it, as shown in Fig. 7, the cut-away portion *l* being for the purpose of permitting the needle to pass through the whirl and also to permit the partial revolution of
125 the latter when said needle is through the same. A hole *n* is made in the rim *m* to guide the thread into its proper position to be taken up by the hooked needle 9 on its upstroke.

To the upper end of the shaft N is keyed a pinion *o*, and a rack *p*, which has a reciprocating motion in guideways in the part O of the machine-frame, engages with said pinion.
130

To the left or outer end of said rack *p* is a rectangular yoke *q*, the lower portion of which also is guided in the ways of the part *O*, and the upper part of said yoke being guided in parallel ways *r*.

R is a shaft extending below the shaft *C* and parallel with the same, and on the front end of said shaft *R* is a cam *s*, which works within the yoke *q*, and by alternately bearing against either side of said yoke gives a reciprocating motion to the same and to the rack *p*, pinion *o*, shaft *N*, and whirl *P*. The shaft *R* derives its motion from the driving-wheel *A* and from the intermediate gears *a*, *b*, 31, 32, and 33.

The operation is as follows: The thread having been passed through the hole *n* in the whirl *P* the presser-foot *L* is raised by the handle-lever 23 and the lasted shoe 24 is placed upon the edge of the horn *M*, with said edge inserted in the under channel of the shoe-sole. The presser-foot *L* is then released so as to drop with its lower edge bearing against the upper 26 in the edge channel of the sole, and the lasted shoe will be held firmly between the horn *M* and spring presser-foot *L*, with the sole 25 facing outward or toward the operator, as shown in Figs. 1, 2, and 6. The machine is now ready to stitch the upper on the shoe-sole. The revolution of the driving-wheel *A* from right to left while facing the machine, or in the direction of the arrow in Fig. 1, will, through the intermediate gearing, rotate the shaft *C* and the cam *D* to reciprocate the needle-bar carrier *E* and the needle-bar *I*, and also through the intermediate gearing to rotate the shaft *R* and cam *s* to horizontally reciprocate the rack *p* and pinion *o*, and by this means give a partial revolution to the shaft *N* and whirl *P*, bringing the open portion *l* of said whirl under the needle at the time the latter descends through the shoe and below the same and to the left of the horn *M*. The needle 9 will take up the thread, which will be drawn from the hole *n* across the opening *l*. A little further revolution of the wheel *A* will, through the intermediate gearing, cause the shaft *F* and cam *f* to revolve, and will swing the frame *G*, needle-bar, and needle to the left, and at the same time the presser-foot *L* will be raised by the cam 30, bearing against the lever 23, releasing the shoe, and the latter will be fed by the needle the distance of one stitch. The needle-bar *I* and needle 9 will then rise up through the shoe, carrying the thread through the pre-

viously-made loop, the whirl *P* will return to its first position, and at the end of the upward stroke of the needle-bar and needle the cam *f* will operate to swing the carrier, needle-bar, and needle to the right, the descending needle will pass through the shoe, and the previous operation will be repeated.

It is to be noted that by my improved construction the operator can see the entire course of the needle and thread, and can readily guide the shoe so that the needle will always enter and pass out at the proper place, this being an advantage that cannot be accomplished by a machine constructed so that the sole of the shoe is hid from the operator by the upper and last.

What I claim as my invention is—

1. The combination, with the straight needle and means for reciprocating said needle in a right line, of a work-supporting horn suspended from the machine and having the upturned end upon which the work is adapted to rest and said end being at one side of the course of the needle and in the line of feed, all as set forth.

2. The combination, with stitch-forming mechanism and the suspended horn *M*, having its upwardly-extending free end terminating in an edge for supporting the work and which is to one side of the course of the needle and in the line of feed, of the presser-foot *L*, terminating at its lower end in an edge which is parallel with and above the edge of the horn, as set forth.

3. The combination, with the reciprocating needle-bar and needle, of a downwardly-extending suspended shaft, the circular thread carrier or whirl *P*, secured to said shaft below its point of suspension and said carrier having the opening *l* and hole *n*, and means for reciprocally rotating said shaft and whirl, all as set forth.

4. The combination, with stitch-forming mechanism, of the thread carrier or whirl *P*, supported on a depending shaft, a pinion secured to the upper end of said shaft, the rack *p*, gearing with said pinion, the yoke *q*, secured to said rack, and a rotary cam inclosed within said yoke and adapted to bear alternately on the opposite faces of the same and to give the yoke and rack a reciprocating motion, all as set forth.

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Witnesses:

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FRANK GARRITY.