

G. P. Farmer

Sticking Needles into Paper

N^o 35748.

Patented

Jul. 1. 1862.

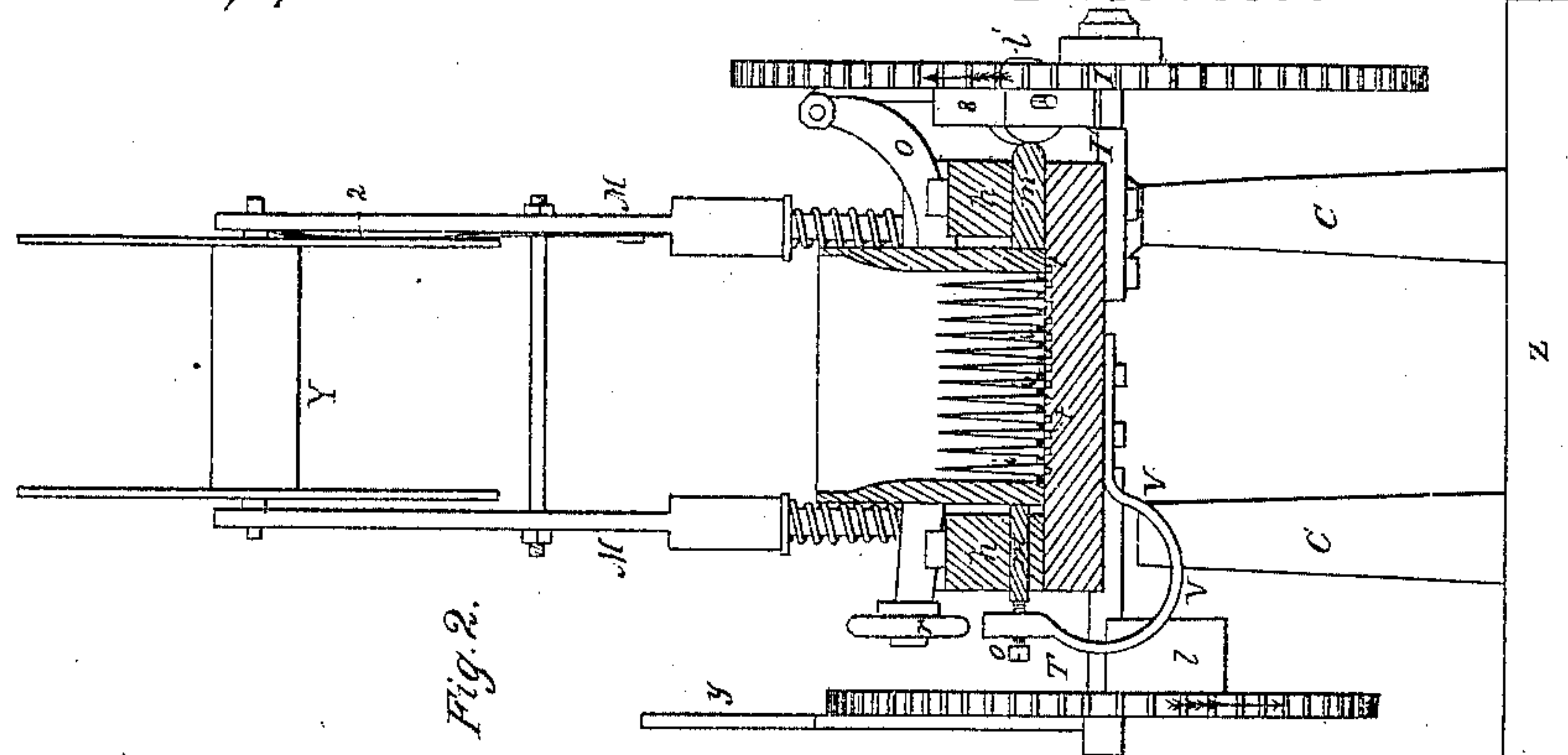


Fig. 2.

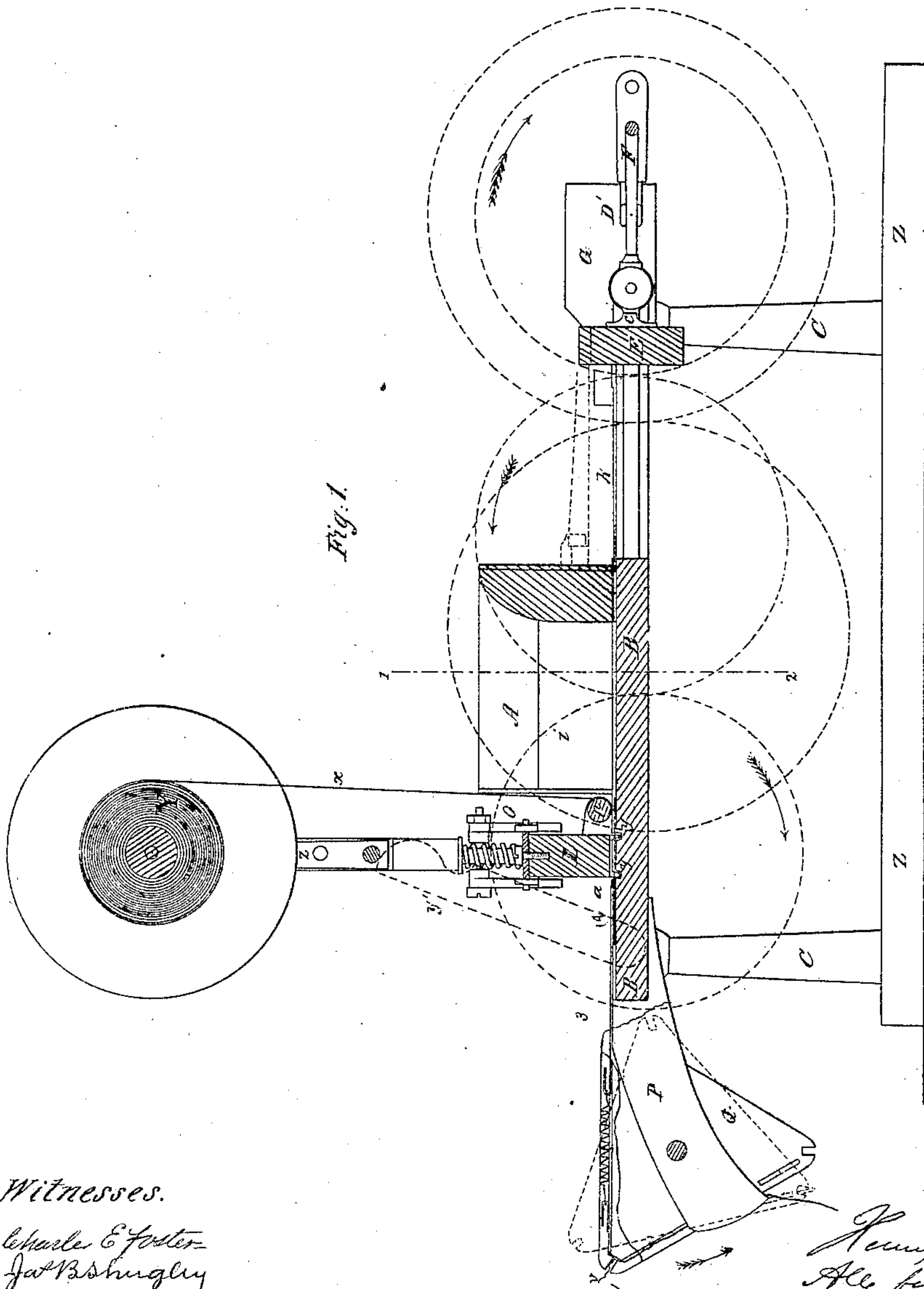


Fig. 1.

Witnesses.

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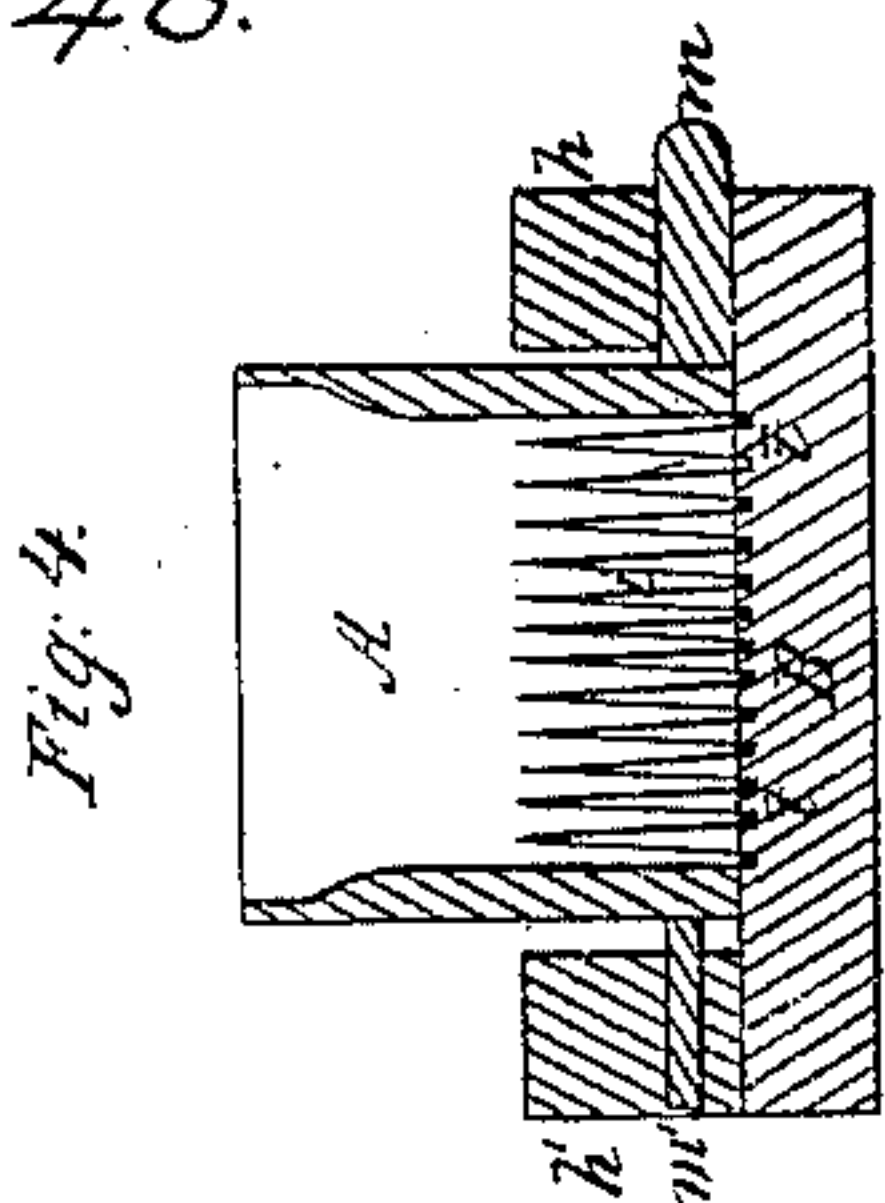


Fig. 4.

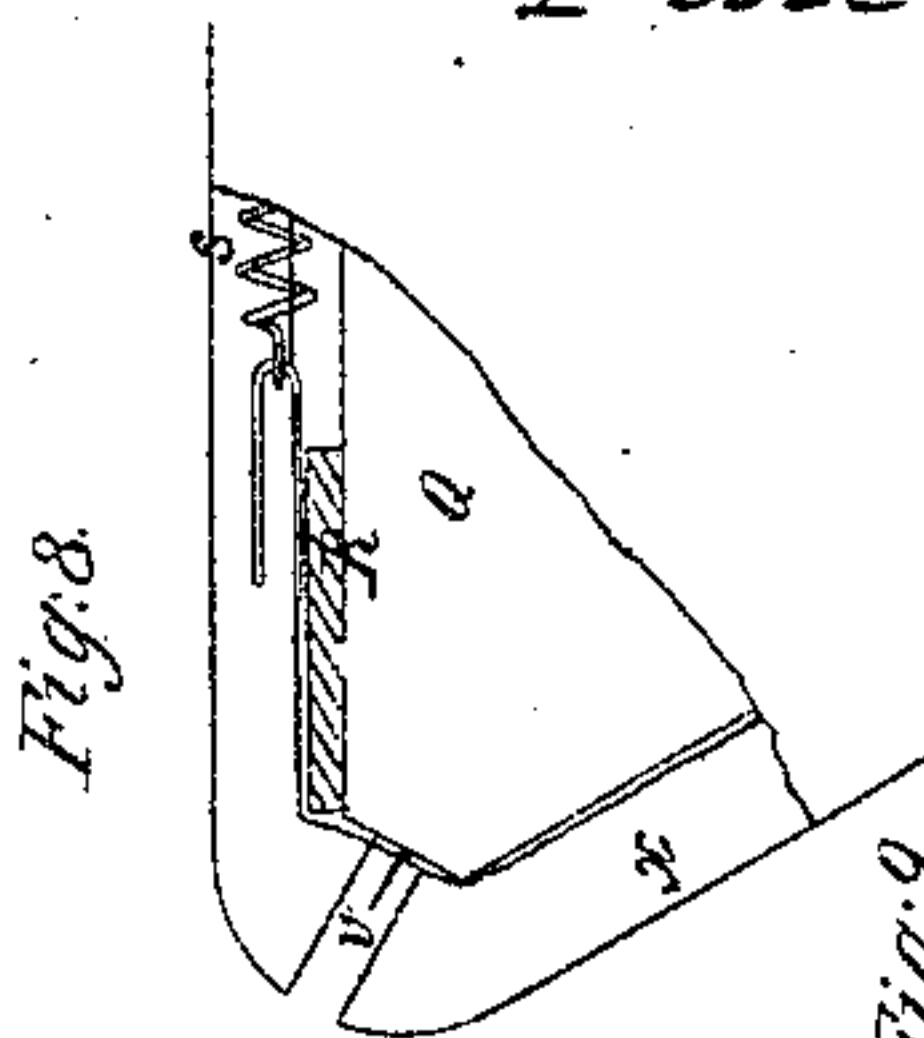


Fig. 8.

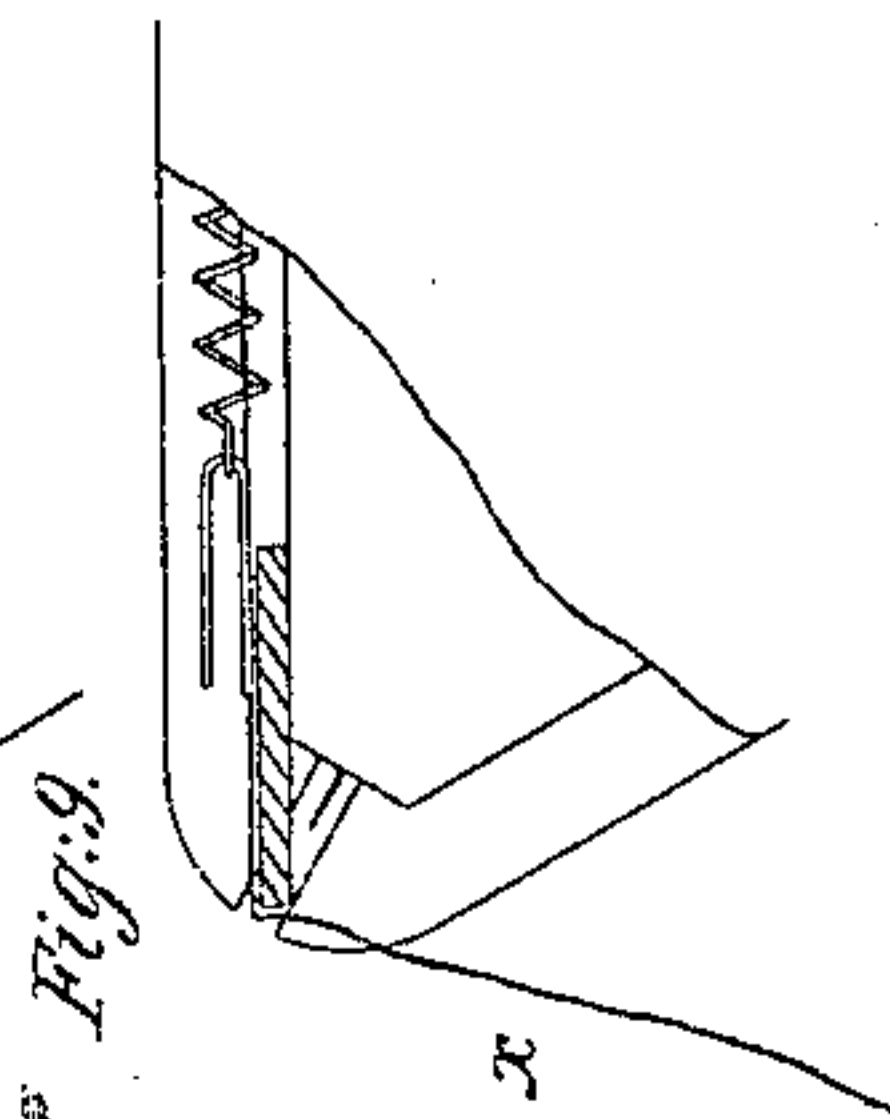


Fig. 9.

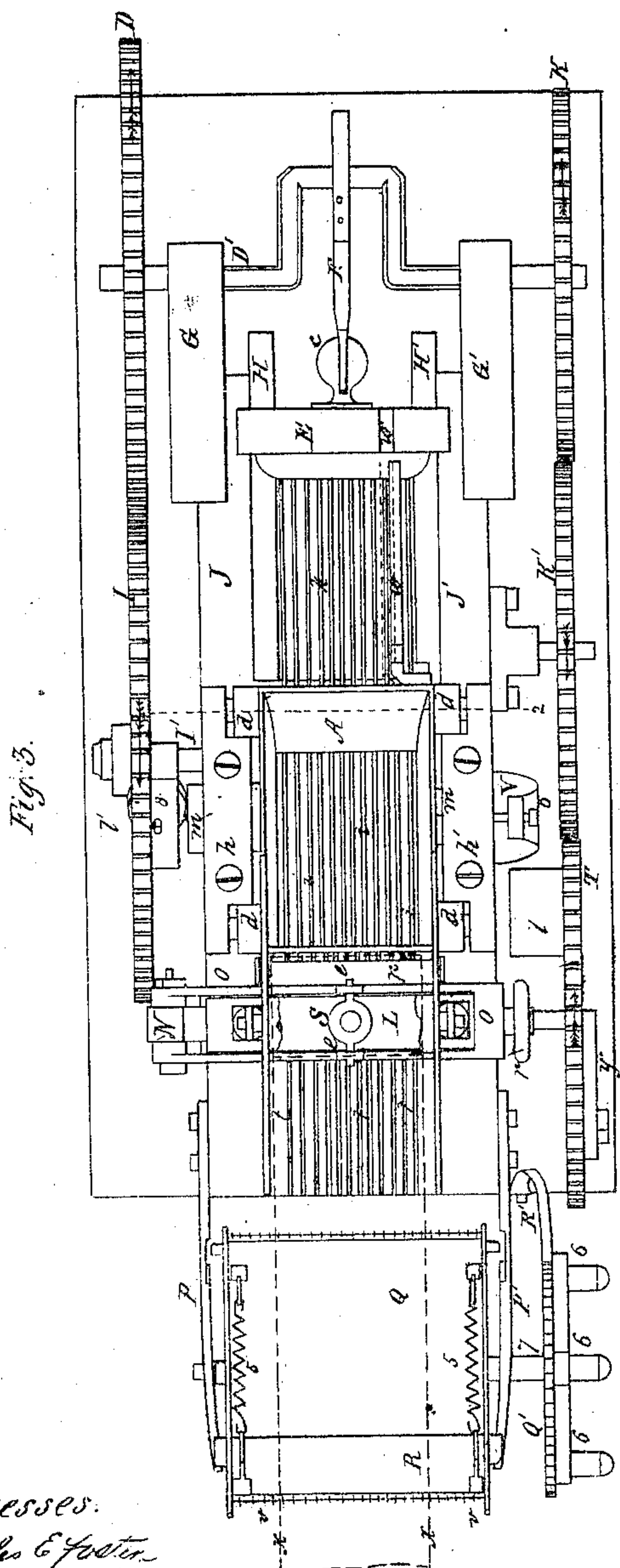


Fig. 3.

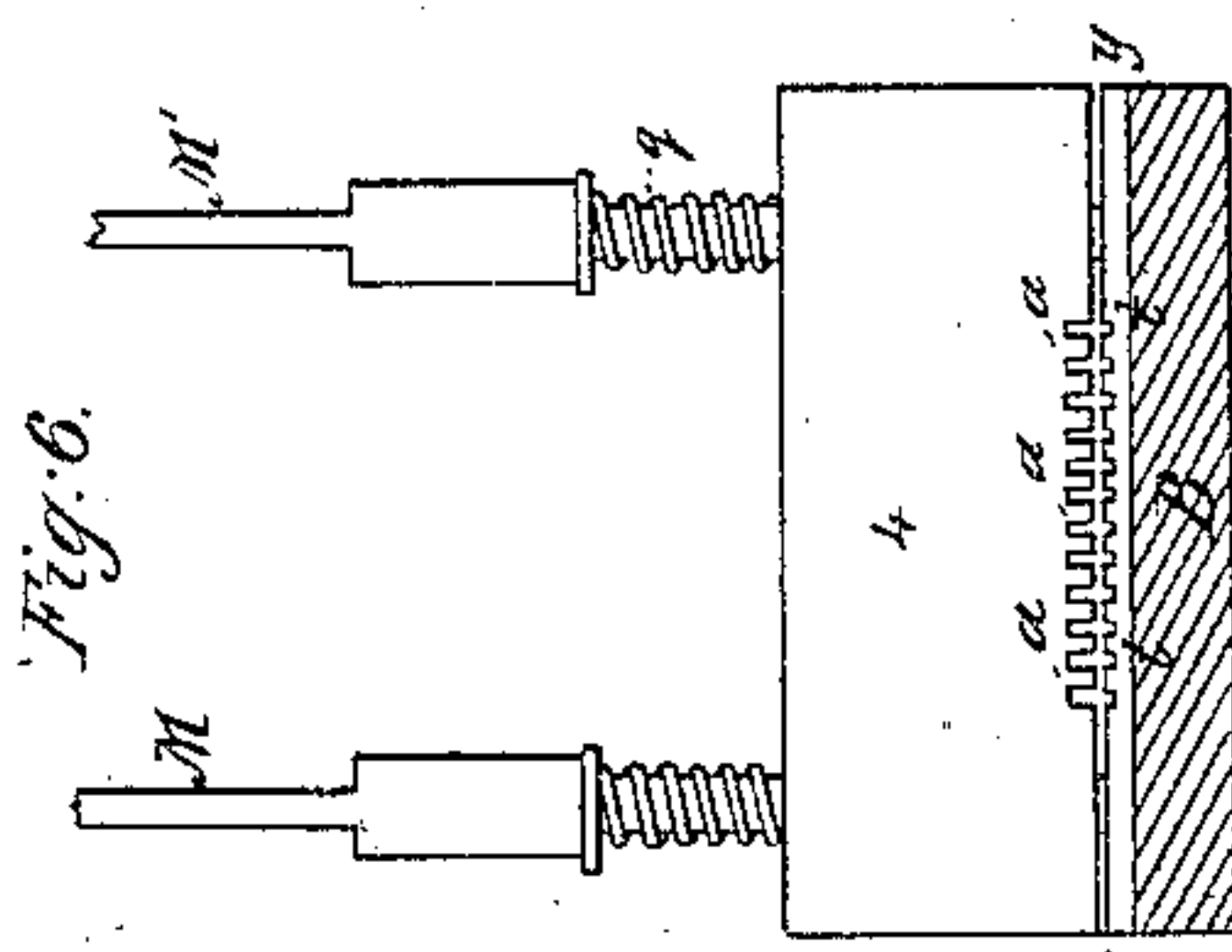


Fig. 6.

Fig. 5.

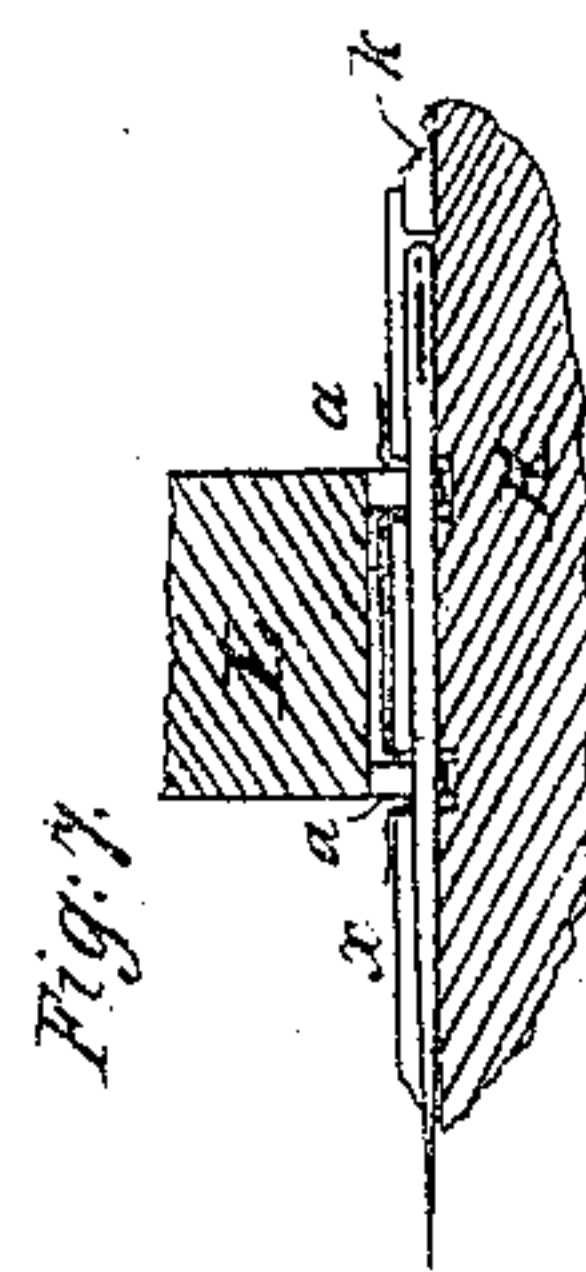
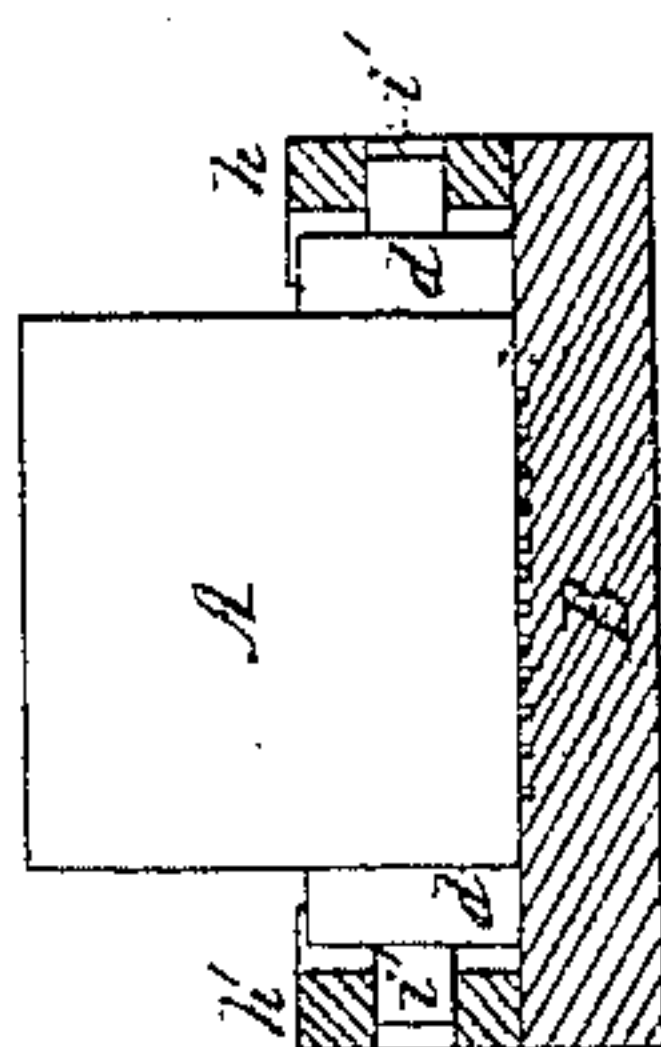


Fig. 7.

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UNITED STATES PATENT OFFICE.

GEORGE P. FARMER, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR STICKING NEEDLES INTO PAPER.

Specification forming part of Letters Patent No. 35,748, dated July 1, 1862.

To all whom it may concern:

Be it known that I, GEORGE P. FARMER, of Philadelphia, Pennsylvania, have invented a Machine for Sticking Needles in Paper; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists of certain mechanism, fully described hereinafter, for the sticking of uniform rows of needles in ridges formed on a continuous strip of paper, the several rows being arranged at uniform distances from each other.

In order to enable others to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is a sectional elevation of my machine for sticking needles into strips of paper; Fig. 2, a transverse vertical section on the line 1 2, Fig. 1; Fig. 3, a plan view; Figs. 4, 5, and 6, detached views of parts of the machine; Figs. 7, 8, and 9, detached views drawn to an enlarged scale.

Similar letters refer to similar parts throughout the several views.

A is an oblong box or hopper resting on a table or platform, B, which is supported by suitable legs, C C C C, secured to the base plate Z. In the lower portion of the hopper A a number of longitudinal partitions, *i i*, are arranged at equal distances apart from each other, the space between the bases of two adjacent partitions being sufficient to admit one needle only, and each partition being beveled from the base to the top, where it is reduced to a sharp edge, as seen in Fig. 2. Near each lower corner of the hopper is a lug, *d*, and from these lugs project pins *i*, the latter fitting snugly in suitable openings in blocks *h* and *h'*, secured to the table B. These blocks are so arranged in respect to the lugs *d d* that the former serve to guide the latter during a slight lateral movement which has to be imparted to the hopper, as described hereinafter.

From one side of the hopper projects the bar *m*, which passes through an opening in the block *h*, a somewhat similar bar, *m'*, pro-

jecting from the opposite side of the hopper and passing through an opening in the block *h'*. (See Figs. 2 and 4.) A set-screw, *o*, in the head of the curved spring V (the latter being secured to the table B) presses against the end of the block *m'*, and tends to maintain the hopper in the position shown in Fig. 2.

The greater part of the rear end of the table B is so cut away as to leave only the narrow side strips, J J', along the inner sides of which are attached the guide-rods H H'. Secured to and projecting from the ends of the strips J and J' are the brackets G and G', in which the journals of the cranked shaft D' have their bearings, and on one end of this crank-shaft is the cog-wheel D, which gears into a similar cog-wheel, I, hung loosely on a stationary pin, Y, attached to and projecting from the side of the table B. The opposite end of the crank-shaft D carries the cog-wheel K, which gears into a similar cog-wheel, K', the latter gearing into a like wheel, T, the two latter wheels being hung on pins secured to the side of the table B.

The several cog-wheels are shown by simple red lines in Fig. 1.

To the crank of the shaft D' is connected one end of the rod F, the opposite end of which is jointed to a projection, *c*, on the cross-head E, which is guided by the rods H and H', and to which a reciprocating motion is imparted by the crank-shaft. From the cross-head E project a number of rods, *k*, the outer ends of which rest in channels *t* cut longitudinally in the table B, one rod in each channel, the channels and rods being, as regards number and their distance apart, the same as the spaces between the beveled partitions *i* in the hopper A.

On the table B in front of the hopper are erected the standards M and M', in the upper ends of which turns the flanged spool Y for containing the roll of paper into which the needles have to be stuck. A spring, 2, is attached to the inside of one of the standards M or M', and is arranged to bear against the side of the spool, so as to impart a suitable friction to the latter. The lower ends of the standards pass through and act as guides for the crimping-block L, which is acted on by springs *q q*, coiled round the standards and bearing at

one end on collars formed on the said standard and at the other end upon the upper surface of the block.

Directly beneath the crimper L and across the table are cut two grooves, *yy*, Figs. 1 and 6, situated at right angles to and deeper than the channels *t*, and into these grooves *y* fit the projections *a* on the under side of the crimping-block L, these projections being so arranged as not to obstruct the channels *t* when the block is depressed, but to enter the grooves *y* at points between the channels. (See Fig. 6.)

To the top of the block L is attached a plate, S, projections on which carry pulleys *ee*, bearing upon the upper edge of a yoke, O, which passes round the block and is jointed at one end to a stationary arm, N, secured to the side of the table B, the opposite end of the yoke being provided with a pulley, *r*. From the side of the block L nearest to the hopper project brackets, in which turns the roller *p*, the object of which will be explained hereinafter.

To the end of the table B are secured the arms P and P', in the ends of which turn the journals of the triangular block Q. From each corner of the latter project a series of fine, sharp points, *v*, and on each face of this block near one edge is a flat plate, R, the ends of which project through and are guided by slots in the sides of the block, and near each end of this plate is fastened a hook, to which is secured one end of a spiral spring, 5, the other end of the spring being held by a hook on the face of and near the opposite edge of the block. The ends of the arms P and P' are rounded off to the shape illustrated in Fig. 1, for a purpose explained hereinafter. The end of the axle 7 of the triangular block Q carries a ratchet-wheel, Q', into the teeth of which engages the end of a flat spring, R', secured to the base-plate Z, and on the outer face of the ratchet-wheel are placed at regular distances from each other three pins carrying the friction-rollers 6 6 6. On the outer face of the wheel T is secured an arm or lever, *y'*, and on the inner face a cam-block, *l*. In a projection, 8, on the inner face of the wheel I turns a pulley, *l'*, the object of which will be rendered apparent hereinafter.

Operation: The different parts of the machine being in the relative positions illustrated in Figs. 1, 2 and 3, the end of the roll of paper *x* (shown by blue lines) on the spool Y is passed down beneath the roller *p*, Fig. 1, under the crimping-block L, along the face of the table B, over the upper face of the triangular block Q and its sliding plate R, and over the outer row of sharp points *v* on the edge of the block. (See Fig. 8.) The paper is thus held at one end by the points, suitable tension being imparted to it by the friction of the spring 2 against the spool. The needles are then thrown into the hopper A, care being taken that their points shall be directed toward the crimper L, those needles first thrown in being directed by the beveled partition *i* to the bottom of the spaces

between the said partitions onto the face of the table B, where they rest at points between the channels *t t* of the said table. (See Fig. 2.) The machine is set in motion by turning the wheel D in the direction of its arrow, when the following operations will be accomplished: As the wheel I turns, the pulley *l* is brought in contact with the block *m*, thereby pushing the hopper transversely across the table and causing the spaces between the partitions *i* of the hopper to coincide with the channels *t*, Fig. 4, so that the needles, which are also pushed laterally, must drop one needle into each channel. As the wheel I continues its revolution, however, the pulley *l'* recedes from the block *m*, when the hopper is immediately forced laterally by the spring V to its former position, so that the partitions *i* are directly above the row of needles, which are thus inclosed in covered channels. The cross-head E is then moved forward by the crank-shaft D', and the ends of the rods *k*, striking the heads of the needles, push them along the channels *t*, beneath the crimping-block L, and between the projections *a* of the said block to the position shown by the red line 9, Fig. 1. Prior to the forward movement of the row of needles the paper *x* has been pressed down by the projections *a* of the crimper into the grooves *y*, thereby forming two ridges, which are penetrated by the points of the needles as they move along the channels *t*, as may be seen more distinctly in the enlarged view Fig. 7. As the rods *k* are drawn back by the crank-shaft the face of the cam-block *l* on the wheel T moves beneath and raises the pulley *r*, and with it the yoke O and crimping-block L, which bears on the yoke through the medium of the friction-wheels *e*. While the block L is being elevated, the end of the arm *y'*, on the outside of the wheel T, strikes the nearest projection 6 on the face of the ratchet-wheel Q', thereby causing the triangular block Q to move to the extent of one-third of a revolution in the direction of its arrow, and to draw from the spool and from beneath the crimping-block a quantity of paper equal in length to that of one face of the block Q. The rods *k* are then moved to the limit of their backward movement, the block L drops by the action of the spring V, and the movements are continued as before until the triangular block Q is again caused to make a part of a revolution by the arm *y'*. As this block revolves in the direction of its arrow, and the corner to which the paper is held by the points *v* passes the ends of the arms P, the projecting ends of the plate R strike the rounded ends of the said arms, thereby pushing the plate forward to the position shown in Fig. 9, so as to strip the paper from the points *v*, the points on the opposite corner of the triangular block having in the meantime entered the paper at 3, Fig. 1, so as to hold it while the block turns, and draws it forward until one face of the block is level with that of the table B, in which posi-

tion the paper remains stationary for a sufficient length of time to allow the needles to penetrate the ridges to the extent desired.

It will be observed that a rod, *w*, projects from the rear of the hopper A, and that there is a slot, *w'*, in the cross-head E. As long as the needles are properly directed from the hopper into the channels *t*, the rod *w'* presents no obstruction to the uniform reciprocating motion of the cross-head; but should one or more of the needles remain partly in the hopper and partly in the channels, the lateral position of the hopper would be such that on the forward movement of the cross-head the slot *w'* would not coincide with the rod *w*, the latter consequently obstructing the movement of the cross-head, and thereby stopping the machine.

It will now be seen without further description that the result of the above operations is the sticking of uniform rows of needles in ridges formed on a continuous strip of paper, the rows being at equal distance apart from each other.

Without confining myself to the precise gearing and other mechanism herein described for operating the moving parts of the machine, or to the precise arrangement of these parts, I claim as my invention and desire to secure by Letters Patent—

1. The use of the partitions *i i* in the hopper A, for the purpose of separating the needles from each other, arranging them in a row, and determining the number contained in each row.

2. The hopper A, with its partitions *i*, in combination with the channels *t t* in the ta-

ble B, when a lateral motion is imparted to the hopper by the devices described or their equivalents, for the purpose specified.

3. The reciprocating rods *k*, adapted to the channels *t t* of the tables B and arranged in respect to the hopper A and its partitions and operating substantially as specified.

4. The crimping-block L, with its projections *a*, the channels *t t*, and transverse grooves *y*, the whole being arranged so as to act on the paper, substantially as and for the purpose herein set forth.

5. The use of a block, Q, having three or any other convenient number of sides, with points *v* at the corners, and having an intermittent revolving motion for the purpose of drawing the paper forward and determining the distance apart of the rows of needles to be stuck into the paper.

6. The plates R, arranged on the block Q, and operating so as to strip the paper from the points *v*, substantially as specified.

7. Providing the hopper A with the rod *w* or its equivalent, the same being so constructed and arranged in respect to the cross-head E that should the partitions in the hopper fail to direct the needles to their destination the said rod will at once retard the further movement of the machine.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE P. FARMER.

Witnesses.

CHARLES E. FOSTER,
CHAS. HOWSON.