

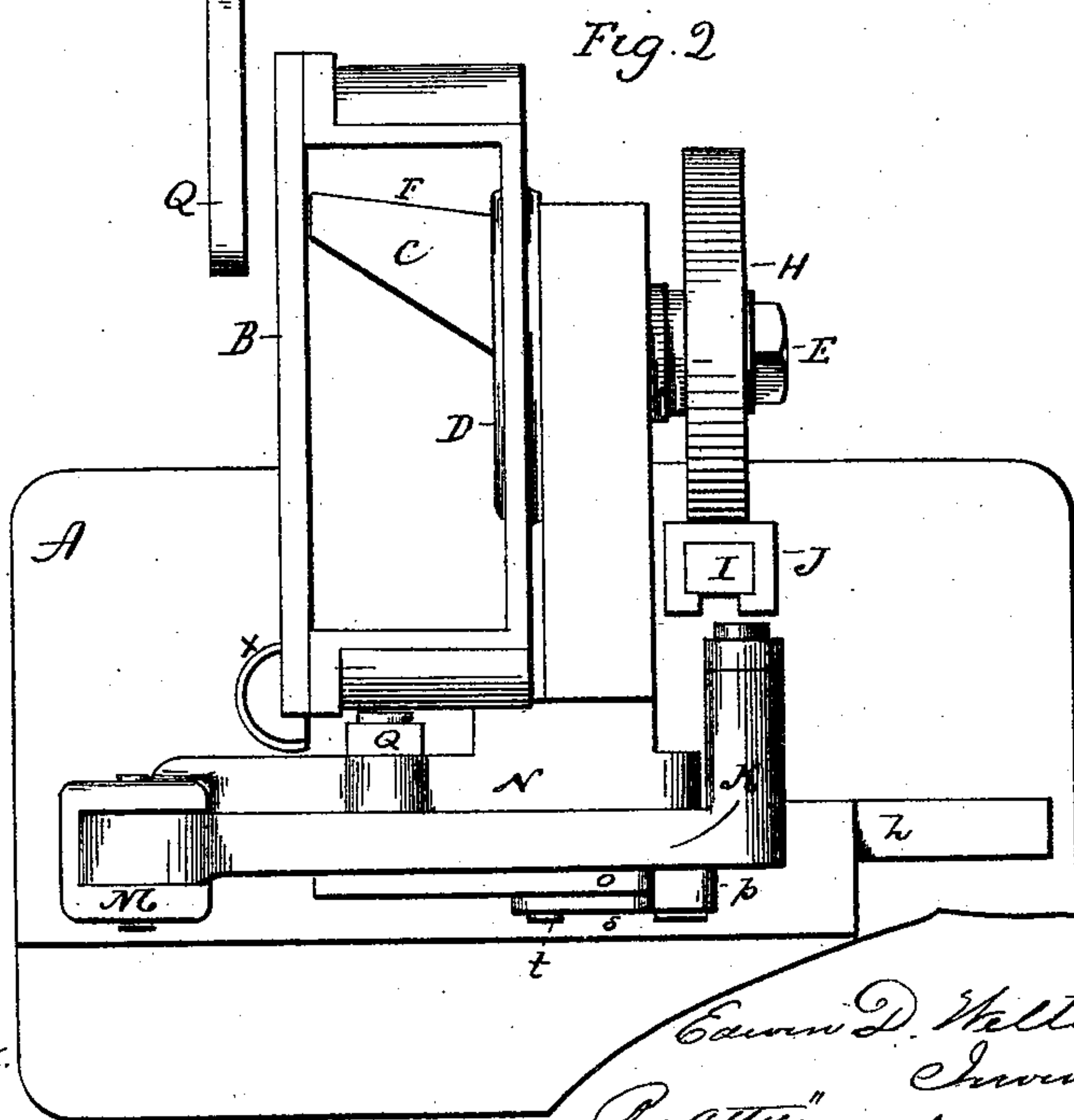
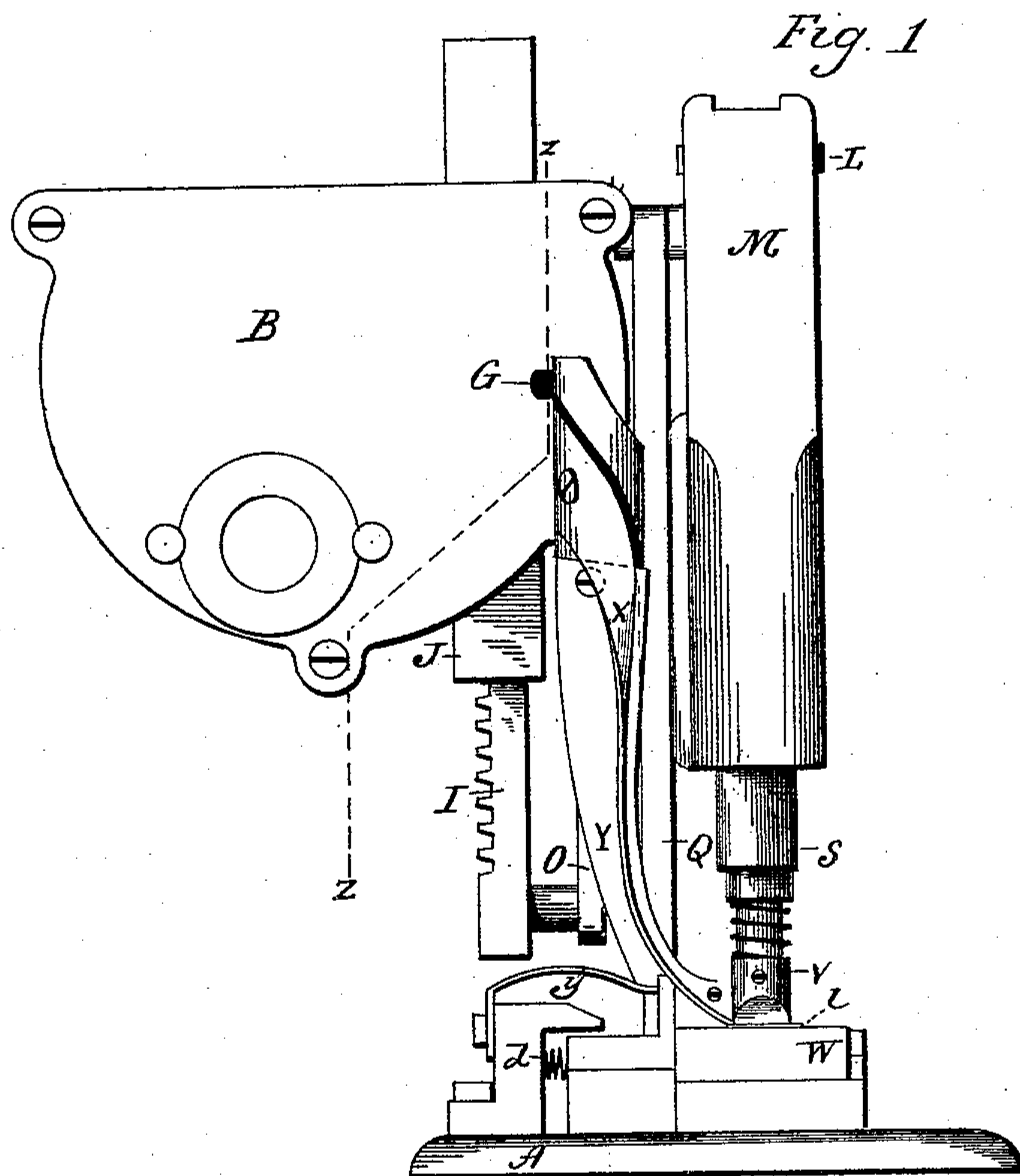
(No Model.)

5 Sheets—Sheet 1.

E. D. WELTON.
MACHINE FOR SETTING LACING STUDS.

No. 477,852.

Patented June 28, 1892.



Witnesses.
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F. W. Pick

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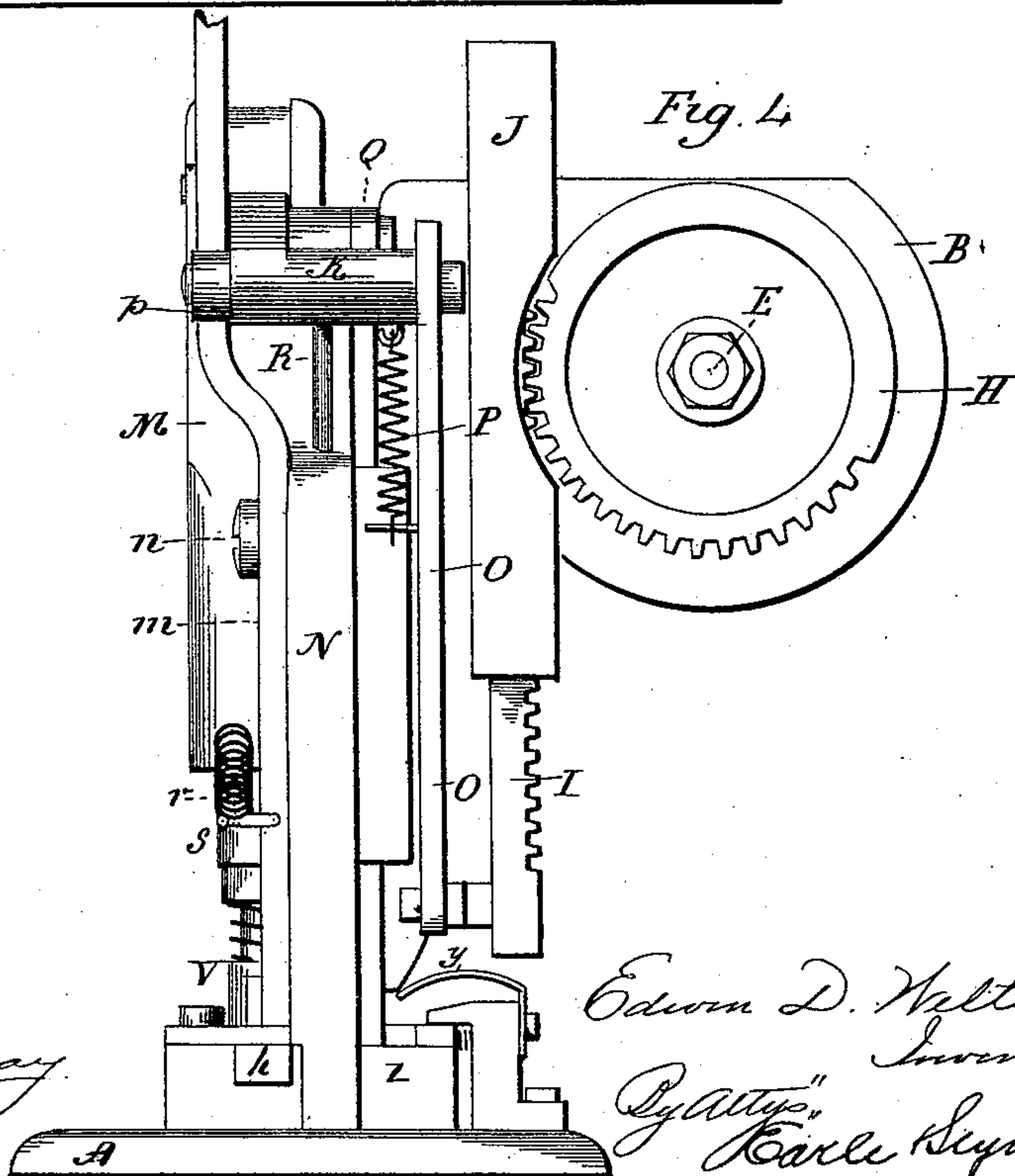
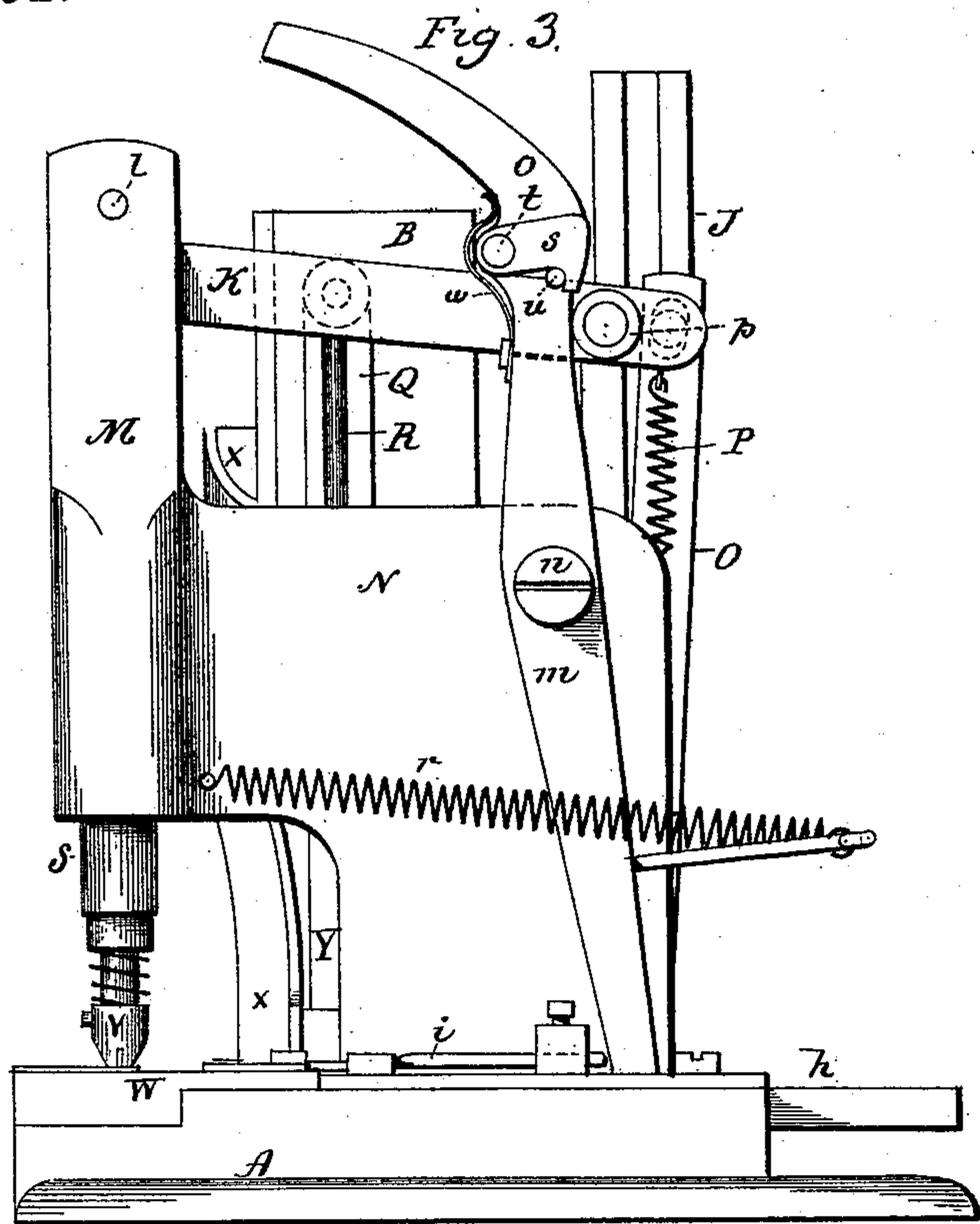
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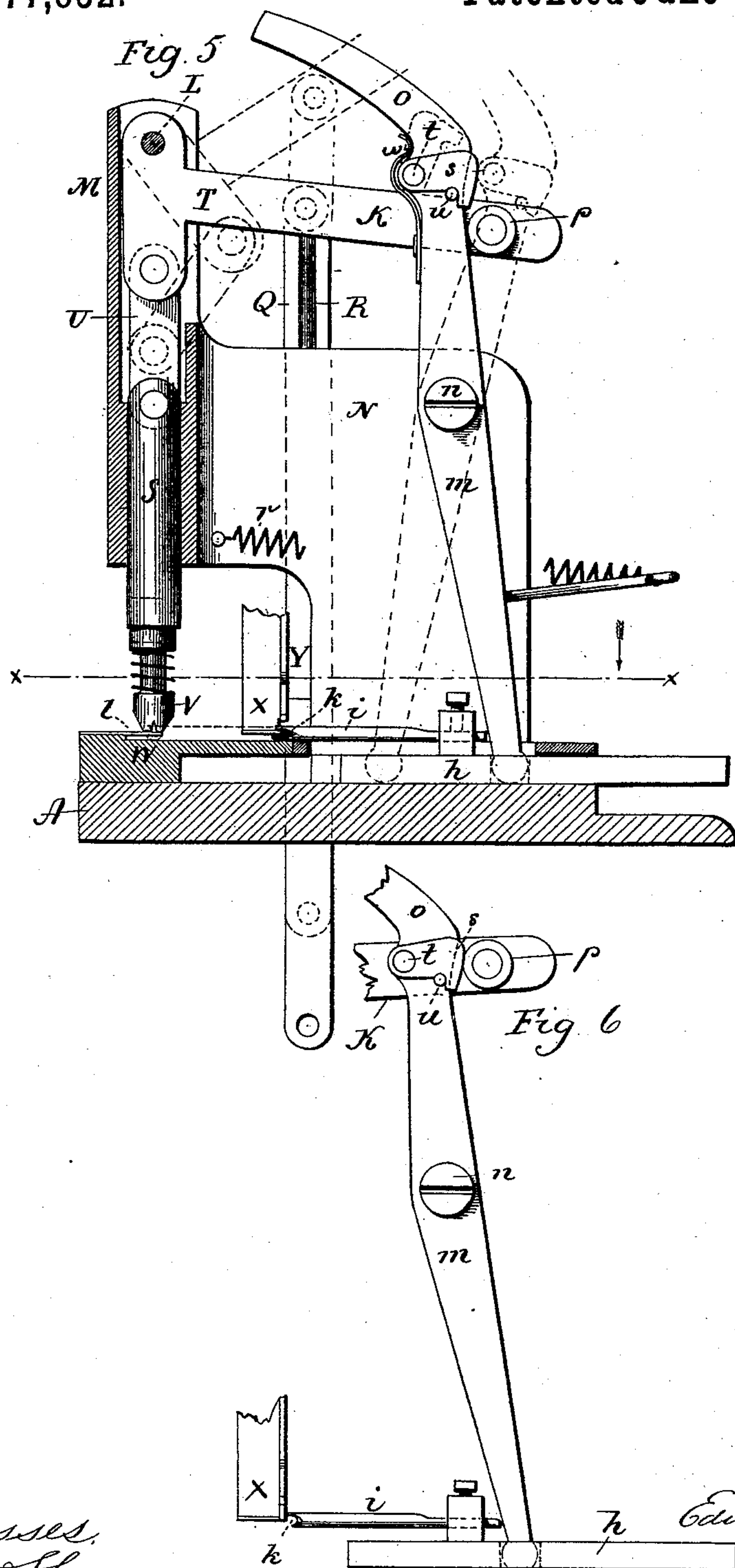
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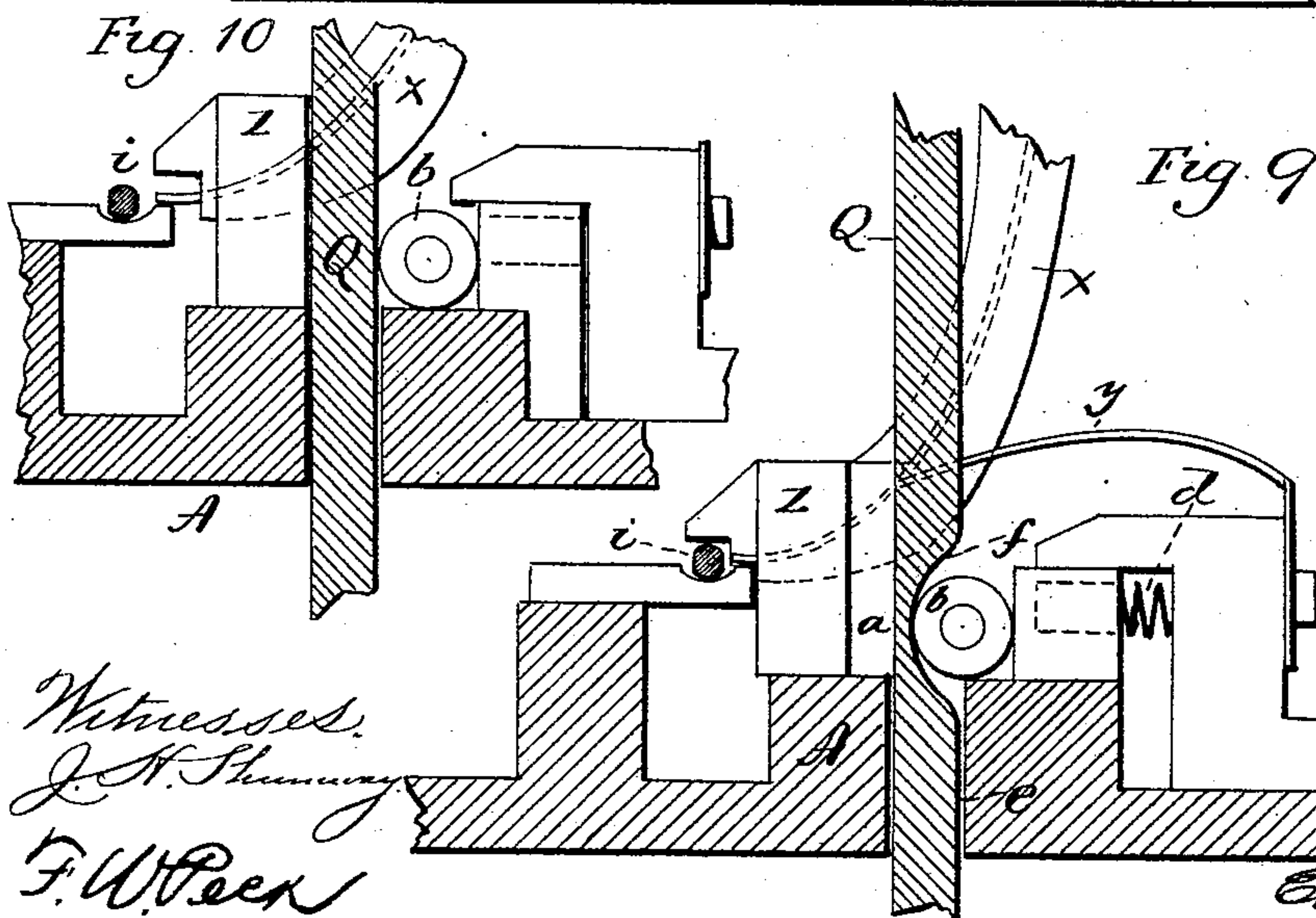
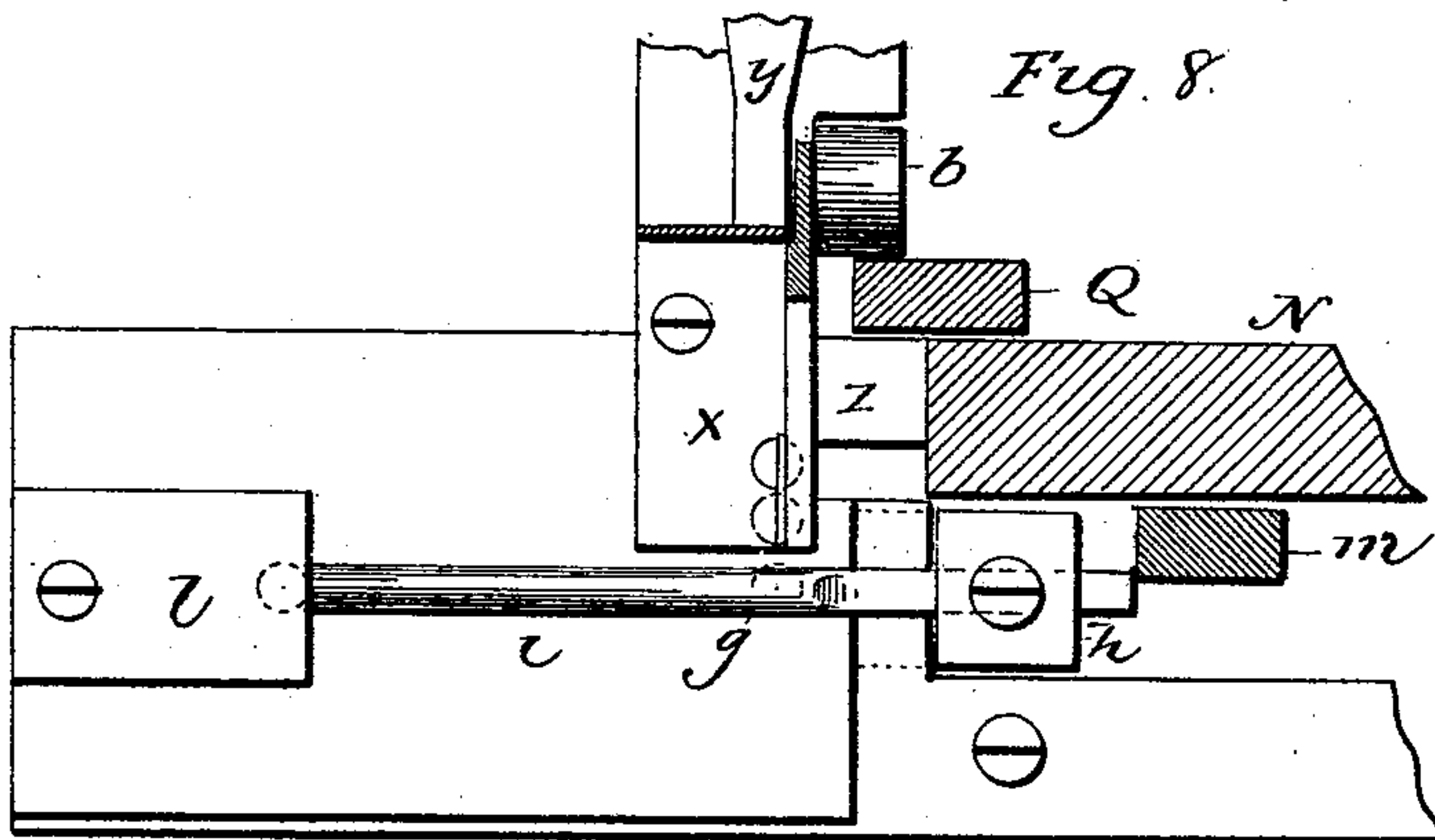
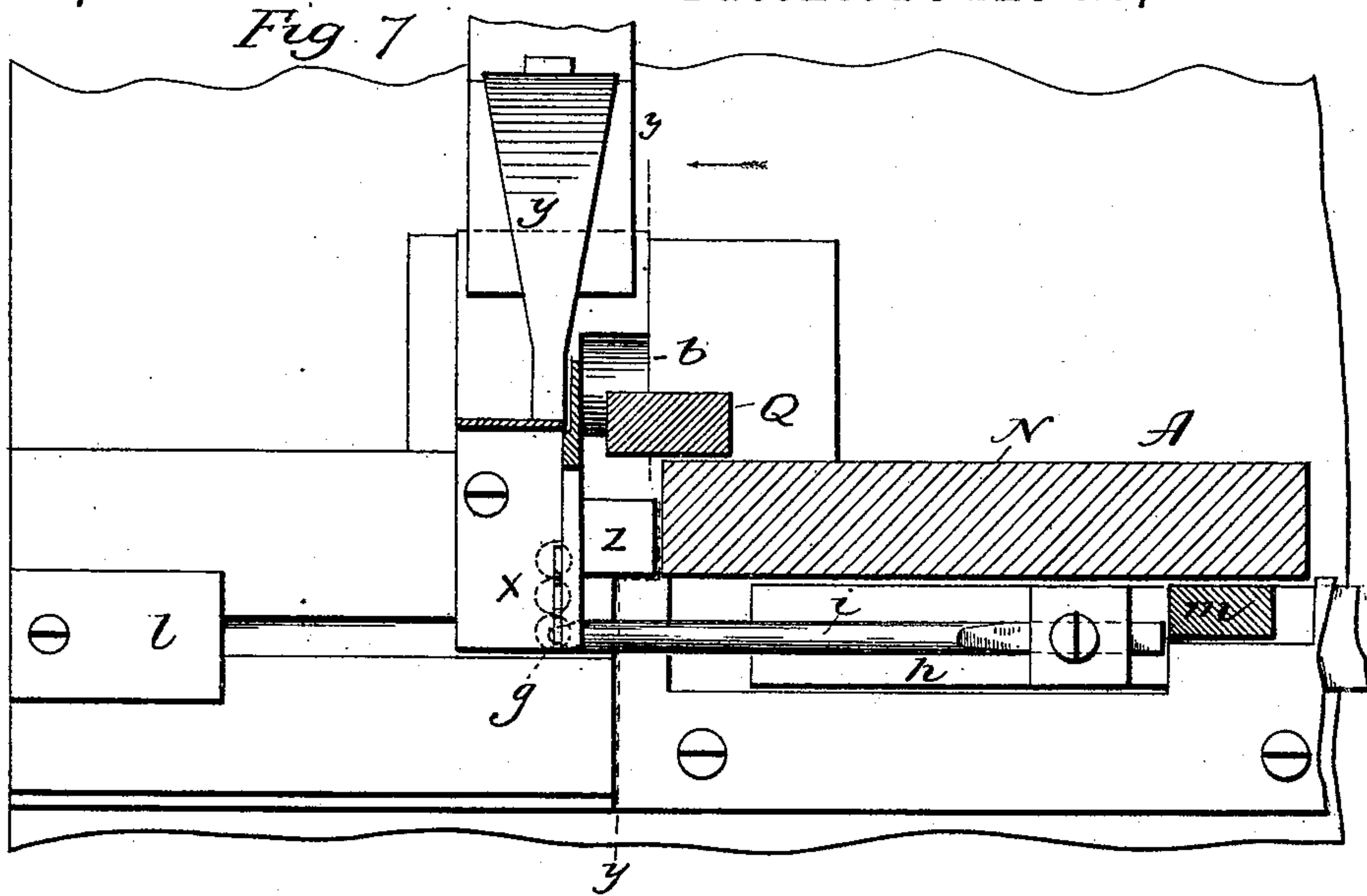
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5 Sheets—Sheet 5.

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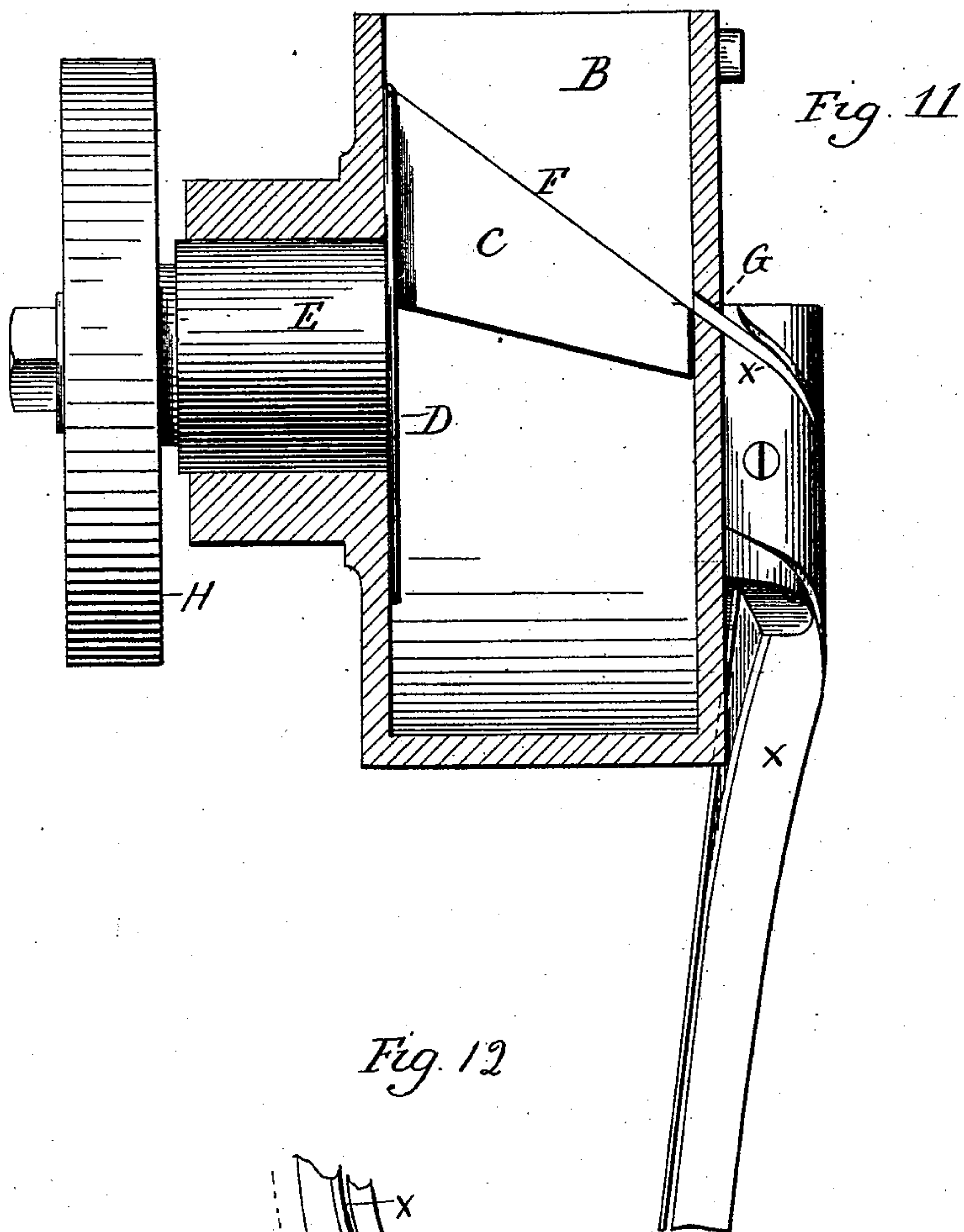
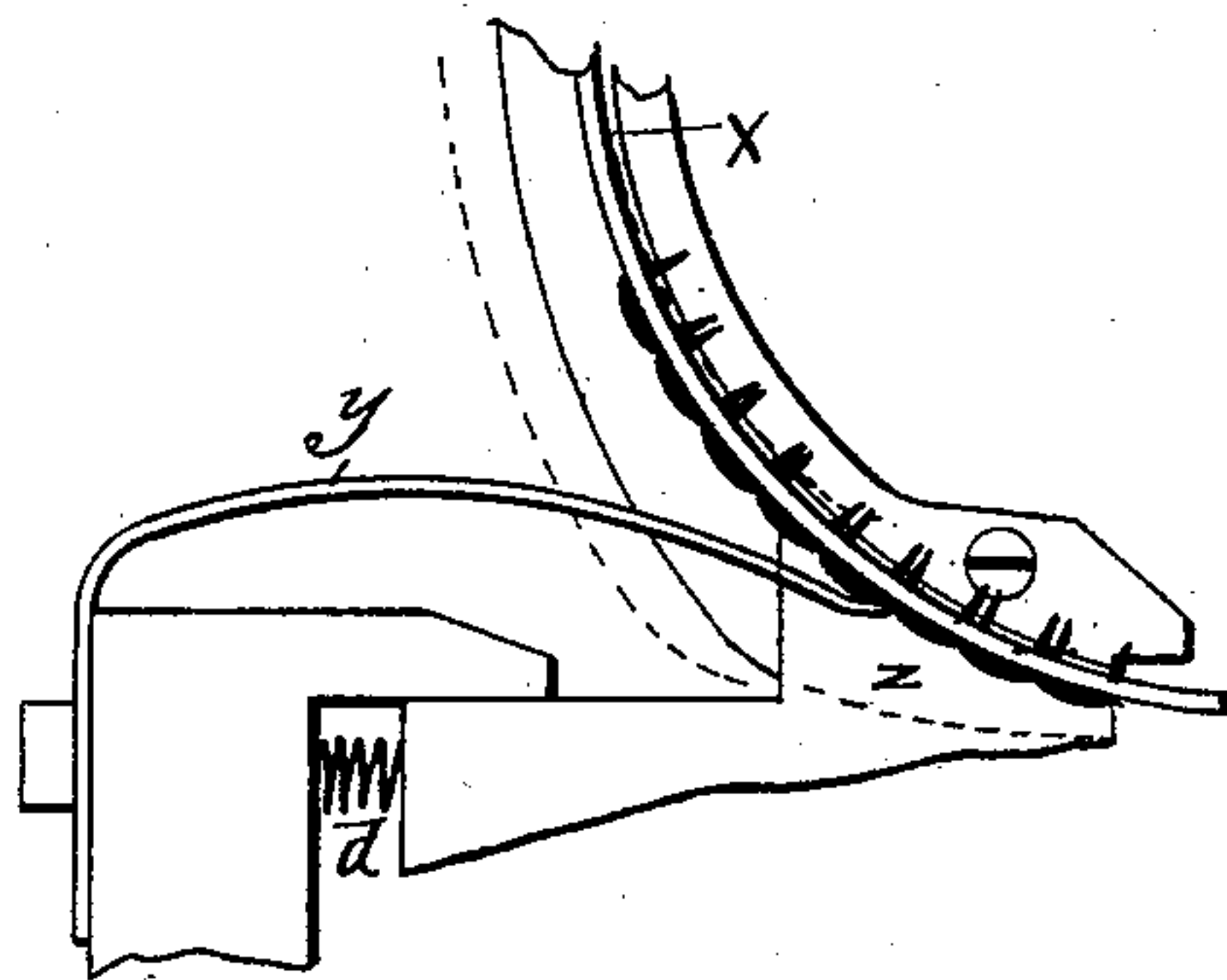


Fig. 12



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UNITED STATES PATENT OFFICE.

EDWIN D. WELTON, OF WATERBURY, CONNECTICUT, ASSIGNOR TO THE
SCOVILL MANUFACTURING COMPANY, OF SAME PLACE.

MACHINE FOR SETTING LACING-STUDS.

SPECIFICATION forming part of Letters Patent No. 477,852, dated June 28, 1892.

Application filed August 31, 1891. Serial No. 404,199. (No model.)

To all whom it may concern:

Be it known that I, EDWIN D. WELTON, of Waterbury, in the county of New Haven and State of Connecticut, have invented a new Improvement in Machines for Setting Lacing-Studs; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in--

Figure 1, a front view of the machine; Fig. 2, a top or plan view of the same; Fig. 3, a side view looking from the right of Fig. 1; Fig. 4, a rear view of the machine; Fig. 5, a sectional side view illustrating the operation of the transferring-finger; Fig. 6, a side view of the transferring-finger, showing a portion of the conductor and the finger-operating lever and representing the finger as in the extreme rear position; Fig. 7, a horizontal sectional plan view on line $x x$ of Fig. 5, looking downward, showing the conductor in the advance position and the finger as taking the first stud; Fig. 8, the same as Fig. 7, representing the conductor as having retreated and the finger advanced to deliver the stud to the setting mechanism; Fig. 9, a transverse vertical section of Fig. 5, illustrating the mechanism for imparting the reciprocating movement to the lower end of the conductor, showing the conductor in its advanced position; Fig. 10, the same as Fig. 9, showing the conductor as in the retreating position; Fig. 11, a vertical section cutting on line $z z$ of Fig. 1; Fig. 12, a detached view of the lower portion of the conductor, illustrating the operation of the dog, Figs. 7 to 12, inclusive, being enlarged.

This invention relates to the construction of a machine for setting that class of lacing-studs which are of hook shape, the base or body of the hook having prongs projecting therefrom adapted to extend through the material, so that, the base of the hook bearing upon the face-surface, the prongs may be turned down upon the reverse side as a means for securing the hook in place. Upon the reverse side a plate or collar is set over the projecting prongs before the prongs are turned down, and so that the prongs being turned

down upon the plate clamps the material between the plate and the base of the hook, leaving the hook projecting on the face of the material to which it is attached, the object of the invention being a simple construction of machine which, receiving the studs in succession from a mass, will deliver the studs successively to the setting mechanism in proper position to be applied to the material to which they are to be attached; and the invention consists in the combination of mechanism, as hereinafter described, and particularly recited in the claims.

A represents the base or bed which supports the operative mechanism.

B represents the hopper, which is open at the top and adapted to receive a mass of studs. This hopper is of cylindrical shape, (the axis being horizontal,) except that the upper portion of the cylinder is removed to form the opening into the hopper.

C represents the feeding-blade in the hopper, (see Fig. 11,) and is attached to a disk D, made fast to a shaft E, arranged in suitable bearings concentric with the axis of the hopper. The blade C is in a plane substantially parallel with the axis, but so that as the hopper revolves the edge of the blade will pass through the mass of studs in the lower part of the hopper, the edge being adapted to enter the open side of the studs and so as to engage more or less of the studs as they pass through the mass. The edge F of the blade is inclined to the axis of the hopper and extends across the hopper, as seen in Fig. 11, and so that when in the up position the edge is inclined to an opening G in the side of the hopper, and so that the studs on the edge of the blade will by their own gravity slide down on that inclined edge and pass out through that opening G in similar manner to the operation of the blades in the hopper of Patent No. 455,552, granted to me July 7, 1891.

An intermittent rotation is imparted to the blade in the hopper by means of a toothed wheel H on the end of the shaft E, which carries the blade, this wheel being arranged upon the end of the shaft opposite the blade, as seen in Fig. 11, and also seen in Fig. 4. At the side of this toothed wheel H a vertically-sliding rack I is arranged in a suitable guide

J, and so as to receive a reciprocating up-and-down movement, the teeth of the rack being adapted to work in the teeth of the segment, and so that by such reciprocation of the rack
 5 an oscillating movement will be imparted to the blade, causing it to pass back and forth through the mass of studs, the forward movement being adapted to take studs from the mass, as before described, and present them
 10 into line with the aperture G.

The reciprocating movement is imparted to the rack I from a lever K, hung upon a fulcrum L in the head M of the machine, this head being formed as a part of an upright M,
 15 extending upward from the base. The lever K swings in a vertical plane, as indicated in broken lines, Fig. 5, and it is joined to the rack I by means of a connecting-rod O, (see Fig. 4,) so that the up-and-down vibratory
 20 movement of the lever K imparts corresponding reciprocating movement to the rack I. The connection between the rod O and the lever K is slotted, as indicated in broken lines, Fig. 3, and between the lever K and the rod
 25 O is a spring P, which permits the movement or operation of the blade in the hopper to be yielding to some extent. As here represented the vibratory movement is imparted to the lever K through a rod Q, which may be con-
 30 nected to a foot-pedal or with other power for the operation of the machine—that is, which will give to the lever the requisite up-and-down swinging movement.

Below the lever K is a stationary stop R,
 35 which the lever will strike as it reaches its down position, as seen in Fig. 3. This stop may be adjustable, it being understood that the blade is brought up to present the studs to the aperture G when the lever K is in such
 40 down position.

In the head M is a vertical slide S, guided and arranged to move freely up and down, and to impart such reciprocating movement to the slide S the forward end of the lever K
 45 is constructed with a downward extension, forming, substantially, one link T of a toggle. A second link U, connected with the link T, joins the toggle to the slide S, and so that in the up-and-down swinging movement of the
 50 lever K a corresponding vertical reciprocating movement may be imparted to the slide S, and as indicated in broken lines, Fig. 5. The slide S carries at its lower end the setter V, the bed having an anvil W below, and so
 55 that the stud presented upon the anvil below with the prongs upward the prongs will be closed as the setter V comes thereon in its descent.

From the aperture G of the hopper a conductor X leads to a point on the bed and in
 60 rear of the setting mechanism, as seen in Fig. 5. This conductor presents an edge at the opening G, which corresponds to the edge of the blade when at the opening, and so as to
 65 form substantially a continuation of the edge of the blade, and so that studs sliding from the inclined edge of the blade will pass onto the edge

of the conductor X and be thereby led to the position to be transferred to the setting devices. The studs are presented by the blade C to the
 70 conductor with the opening of the stud downward—that is, in a vertical plane—but the conductor is curved, so that as the studs pass down the conductor they will be turned from
 75 this vertical plane into a horizontal plane at the lower end of the conductor and with the prongs upward, as seen in Fig. 5. A guard Y is arranged adjacent to the working edge of the conductor, which stands against the
 80 heads of the studs, so as to prevent their escape from the conductor.

The lower part of the conductor is arranged to vibrate toward and from the transferring mechanism. To accomplish this movement, the lower part of the conductor X is made
 85 fast to a horizontal slide Z. (See Figs. 9 and 10.) The slide Z is hinged in guides, so as to be moved toward and from the setting devices, as from the position in Fig. 10 to that
 90 in Fig. 9 and return, and such reciprocating movement is imparted to the slide Z by means of the vertical rod Q, the said rod working through a vertical slot *a* in the slide against an anti-friction roller *b* or other suitable bearing at the rear, a spring *d* being provided at
 95 the rear of the slide, the tendency of which is to force it to its forward position, as seen in Fig. 9, but to yield to a rearward force. The rod Q is guided through a corresponding opening *e* in the bed A, as seen in Figs. 9 and
 100 10, and is constructed on the bearing side with a cam-recess *f*, which, when corresponding to the anti-friction roll *b* or whatever the bearing may be, will permit the spring *d* to react and force the slide into the advanced
 105 position, as seen in Fig. 9; but as the rod rises this cam-recess *f* passes above the bearing and, operating thereon, forces the slide to the rear position, as seen in Fig. 10. The conductor is constructed to yield for such movement of
 110 the slide Z, and so that the lower end of the conductor will be moved backward and forward with the said slide. The conductor at its lower end presents the first stud into the position for transfer, as seen in Fig. 7; but in
 115 so doing it stands between the stud and the setting mechanism. Consequently the conductor must be withdrawn in order for the transfer of the stud to the setting mechanism. The reciprocating movement of the lower
 120 end of the conductor, as just described, withdraws the conductor from the position seen in Fig. 7 to that in Fig. 8, leaving the first stud on the bed in rear of the setting mechanism, and as indicated in Fig. 8, *g*, broken
 125 lines, Figs. 7 and 8, indicating the first stud so delivered. To transfer the stud thus delivered by the conductor to the setting mechanism, a longitudinal slide *h* is arranged on the bed in guides, so as to work forward and
 130 backward—that is, toward and from the setting mechanism—in a path at right angles to the path of reciprocation of the lower end of the conductor, and as seen in Fig. 3; also

seen in Figs. 7 and 8. The slide *h* carries a finger *i*, projecting forward therefrom. The forward end of this finger is constructed with a transverse recess *k*, which is adapted to engage the first stud as it stands on the conductor, and as seen in Fig. 5, the shape of the recess *k* being such that it will project between the prongs and also engage the head, so that the stud once engaged by the finger it will be held in the same position in which it is presented by the conductor, and so that as the finger then advances it will force the stud forward and beneath the setting mechanism, as seen in Fig. 5, and as also seen in Fig. 8, the opening of the stud being forward. Between the anvil and the setter a plate *l* is arranged, which corresponds to the opening of the stud, and so that as the finger *i* comes forward with the stud it will carry the stud with its open side onto the plate *l*, and as seen in Figs. 5 and 8. The reciprocating movement is imparted to the slide *h* and the finger *i*, which it carries, through a lever *m*, hung upon a fulcrum *n*, so as to swing in a vertical plane and parallel with the path of movement required for the slide *h*, the lower arm of the said lever being engaged with the slide, as seen in Fig. 5. The other arm, extending upward, is bent forward to form a cam *o*, against which an anti-friction roller *p* (or may be a stud) on the lever *K* will work, and so that when the lever *K* is down the upper arm of the lever will be in the forward position, while the lower arm will stand in the rear position, as seen in Fig. 5; but as the lever *K* rises it passes over the cam *o*, as seen in Fig. 5, permitting the lever *m* to turn under the action of a spring *r*, so that the slide *h*, with its finger, will be forced forward by the power of the said spring. Then as the lever *K* returns it will operate upon the cam surface *o* and force the lever and the slide to the rear position, extending the spring *r* accordingly. In order that the forward end of the finger *i* may pass between the prongs of the stud presented thereto on the conductor, it is necessary that the finger retreat so far as to take the extreme forward end of the finger to the rear of the stud, and as seen in Fig. 6; but as the conductor must move out of the way before the stud can be advanced it is necessary that the finger *i* should engage the stud before the conductor retreats, so that the stud may be surely left in position for transfer as the conductor withdraws. To accomplish this object, a swinging cam *s* is hung upon a pivot *t* on the lever *m* at a point above the stud or roller *p* on the lever *K* when that lever *K* is in the down position, as seen in Fig. 5. The surface of this cam *s* projects beyond the rear surface of that part of the lever to which it is hung, and so that the stud or roller *p* may work against the face of the said cam *s*, and thereby give to the lever *m* a greater rearward swinging movement than would be imparted to it were the cam *s* not present. Hence as the lever *K* moves downward it passes over the

face of the cam *s*, as seen in Fig. 6, and gives to the lever *m* the additional rear swinging movement before mentioned, and so as to take the forward end of the finger to the rear of the stud then standing on the conductor. The cam *s* is held against downward movement by a stop *u* on the lever, but is free to swing upward. Consequently as the lever *K* approaches its down position the additional rear movement of the finger *i* is produced, and then as the stud or roller *p* passes from the cam *s* the lever *m* will swing until it comes to a bearing on the stud or roller *p*, and as seen in Fig. 5, which will permit the finger to move forward from the position seen in Fig. 6 to that seen in Fig. 5, and thus engage the stud. Then as the lever *K* rises the stud or roller *p* will strike the cam *s*, and that cam, being free to swing upward, will turn, as indicated in broken lines, Fig. 5, permitting the stud or roller to work against the surface of the lever without effect from the cam *s*, thus leaving the finger engaged with the stud, the lever *m* and finger resting after it has been thus engaged until the conductor has been withdrawn so far as to leave the stud free from the conductor, but engaged with the finger *i*, and then as the lever *K* continues its upward movement the finger *i* advances, taking with it the stud, as before described, and as seen in Figs. 5 and 8, to properly present the stud to the setting mechanism. As the stud is thus presented to the setting device the material to which the button is to be attached is placed over the prongs, the prongs readily piercing that material. Then the correspondingly-pierced plate or washer, if that be employed is placed over the prongs and the setting mechanism comes into operation and closes the prongs down upon the washer, and so as to clamp the material between the base of the stud and the washer, and thereby secure the stud to the material, this method of securing being that in common use. The cam *s* is provided with a spring *w*, which will tend to force it to its down position after the stud or roller *p* shall have escaped therefrom.

To insure the proper feeding of the column of studs on the conductor and that the lowest or most advanced stud may be properly presented to the finger *i*, a dog *y* is arranged in rear of the conductor, which projects forward toward the conductor, but upon the under side, as seen in Fig. 1. This dog stands in such position that as the conductor moves rearward from the position seen in Fig. 9 to that seen in Fig. 10, and, as indicated in broken lines, Fig. 12, the dog will strike the head of one of the studs in the column and arrest the retreat of the studs then below the nose of the dog, and so that as the conductor completes its rearward movement, as indicated in broken lines, Fig. 12, the studs below the nose of the dog will be correspondingly moved forward on the conductor, so as to bring the lowest stud into the position at the end of the conductor required for the proper

engagement of the finger when the conductor next advances. The arrangement of this dog therefore insures the proper presentation of a stud to the transferring-finger.

5 I have already stated that the blade of the hopper which delivers the studs to the conductor is similar in its operation to that of my patent before referred to; but in that patent a continuous rotation was necessary for the
10 blades, and consequently several blades were employed, they successively passing through the mass of studs. In the present construction the blade receives an oscillating or backward-and-forward movement, so as to pass
15 through the mass in both directions and more thoroughly disturbing them, so as to insure the engagement of more or less of the studs as the blade advances through the mass.

I claim—

20 1. In a machine for setting lacing-studs, a hopper, a conductor leading from said hopper, mechanism in said hopper adapted to deliver studs from the hopper to said conductor, mechanism substantially such as described to im-
25 part to the delivery end of the conductor a reciprocating movement, and a finger arranged to reciprocate in a path at right angles to the path of reciprocation of the said lower end of the conductor, the said finger constructed with
30 a transverse recess at its forward end to engage a stud on the said conductor with a setting mechanism, the said finger being adapted to transfer a stud from the said conductor to the said setting mechanism, substantially as
35 and for the purpose described.

2. The combination of a conductor X, adapted to receive a succession of hook-shaped studs

upon one of its edges and present the same with the prongs upward, the said conductor being adapted at its delivery end to receive a
40 reciprocating movement, a finger *i*, arranged to reciprocate in a path at right angles to the path of reciprocation of said conductor and at its forward end constructed to engage a
45 stud on the conductor and between the prongs of the stud, a lever *m* in connection with said finger, the said lever extending upward above its fulcrum and at a point above its fulcrum
50 provided with a swinging cam *s*, and a vertically-swinging lever *K*, provided with a bearing *p*, adapted to engage the said swinging cam *s* with setting mechanism, all substantially as and for the purpose described.

3. In a machine for setting lacing-studs, a conductor adapted to receive a succession of
55 lacing-studs and deliver them with their prongs upward, the said conductor having a reciprocating movement imparted to its lower end at its delivery end, and the stationary dog *y* in rear of said conductor and over the nose of which
60 the conductor passes in its retreat, the said dog being adapted to engage the lowermost studs in such retreat, combined with transferring and setting mechanisms, substantially
65 such as described, and all as and for the purpose specified.

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

EDWIN D. WELTON.

Witnesses:

C. W. DE MOTT,
J. H. PILLING.