(No Model.)

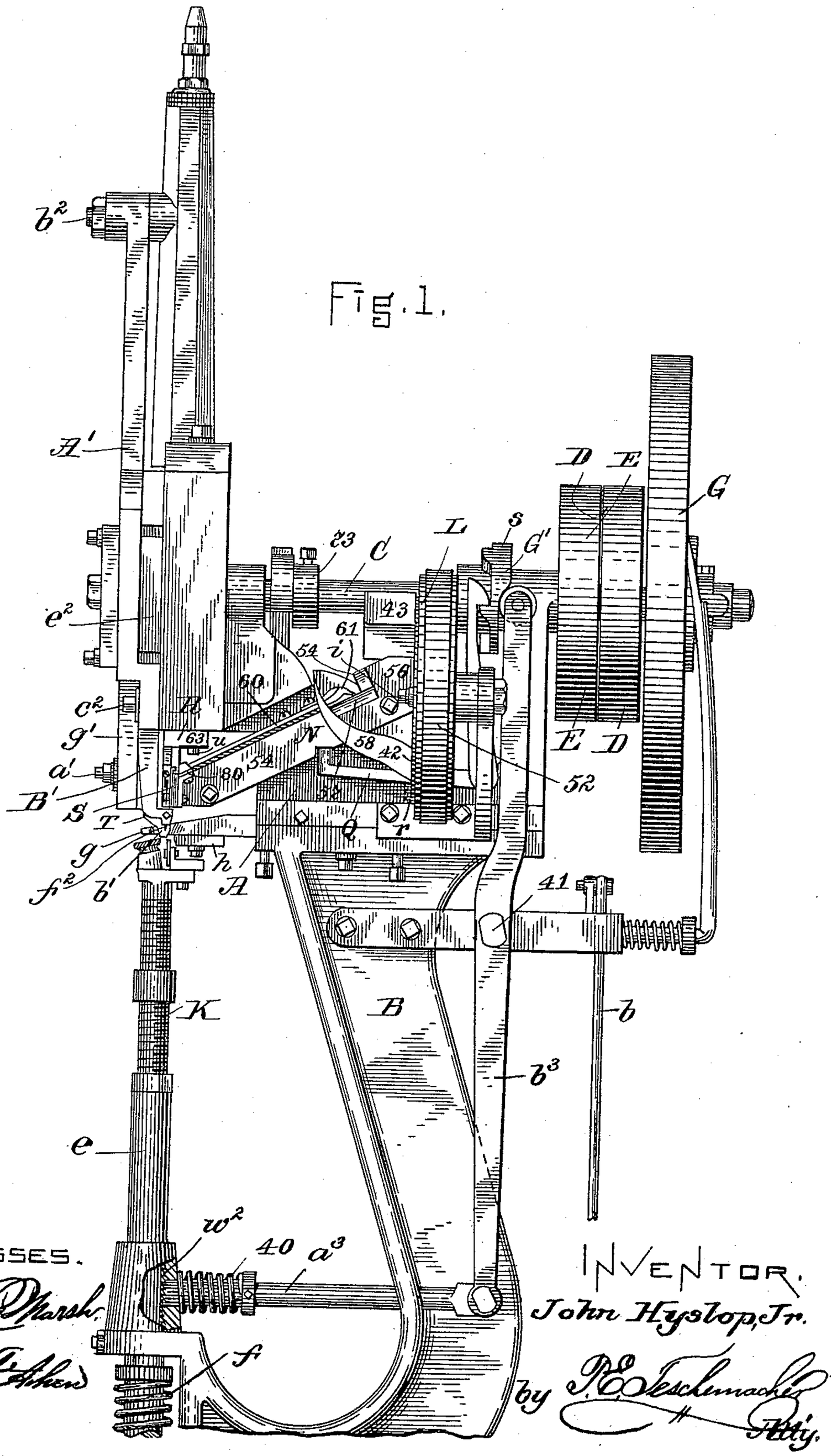
8 Sheets—Sheet 1.

J. HYSLOP, Jr.

NAILING MACHINE.

No. 467,104. Patented Jan. 12, 1892.

Fig. 1.



WITNESSES.

R. Sidney Marsh.

Harry H. Gibbons

INVENTOR.

John Hyslop, Jr.

by P. E. Teschemacher

Atty.

(No Model.) 8 Sheets—Sheet 2.

J. HYSLOP, Jr.

NAILING MACHINE.

No. 467,104. Patented Jan. 12, 1892.

Fig. 2.

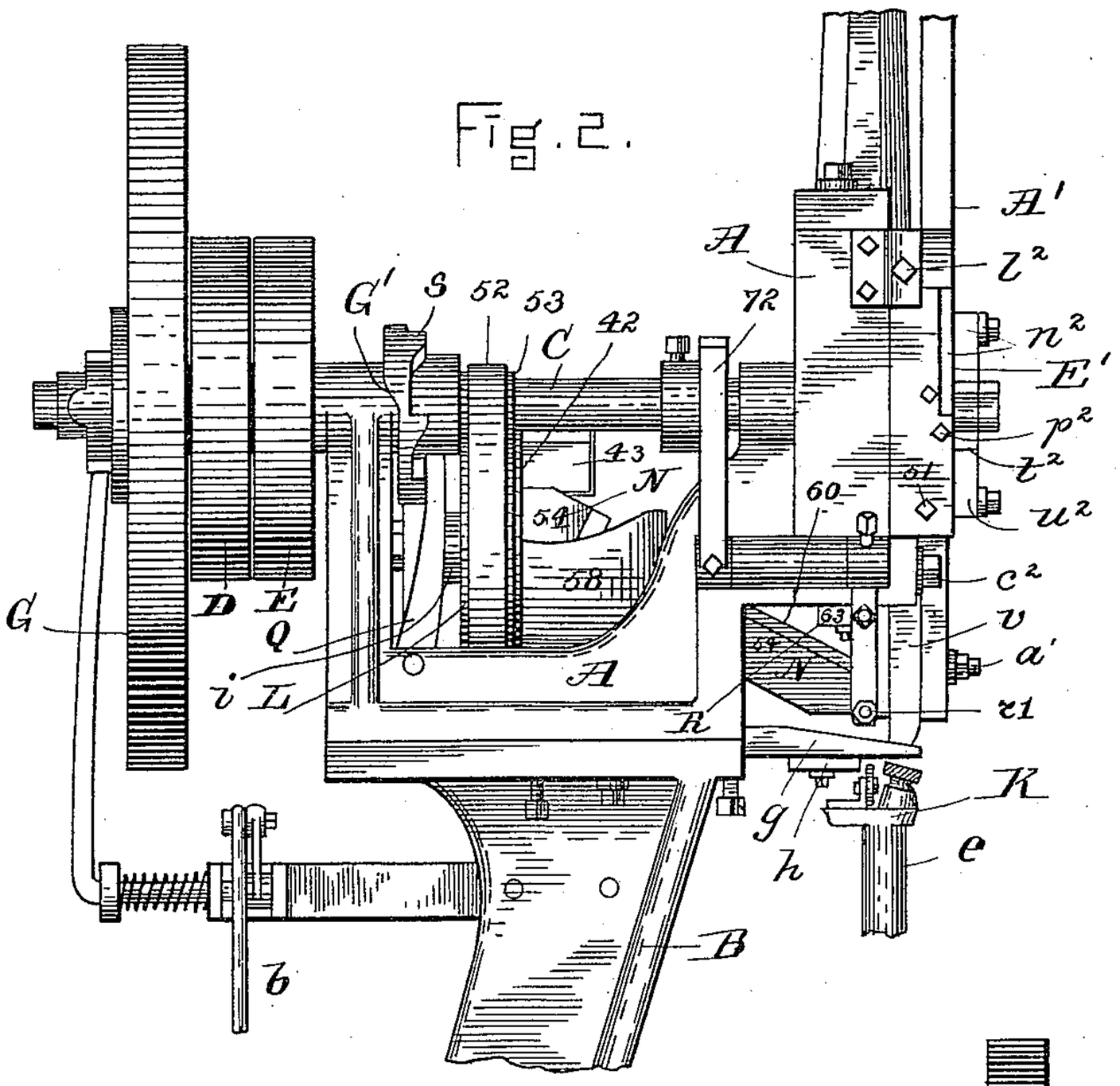
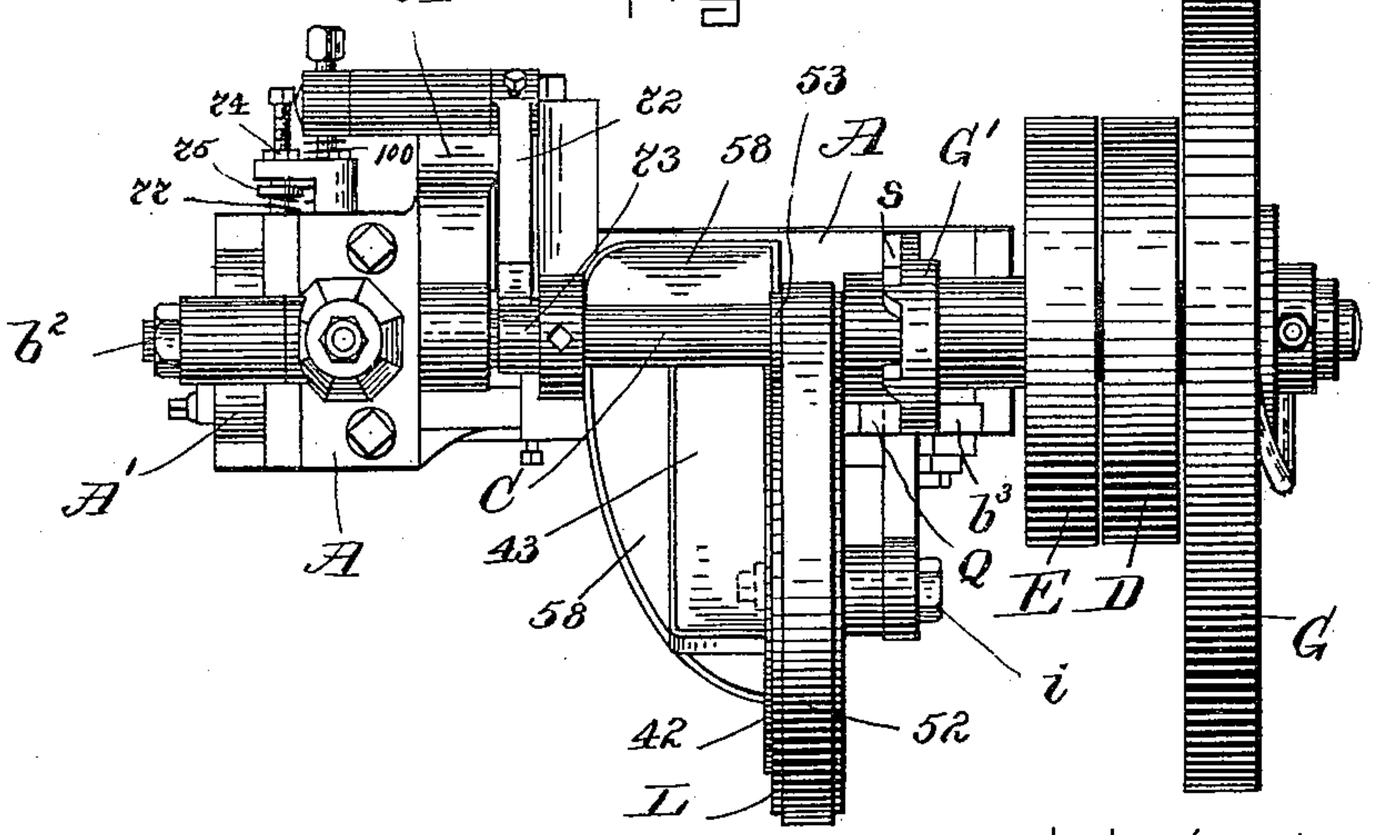


Fig. 3.



WITNESSES.

C. F. Henry Marsh.

Harry H. Aiken

INVENTOR.

John Hyslop Jr.

by D. C. Tschemacher Atty.

(No Model.) 8 Sheets—Sheet 3.

J. HYSLOP, Jr.

NAILING MACHINE.

No. 467,104. Patented Jan. 12, 1892.

Fig. 4.

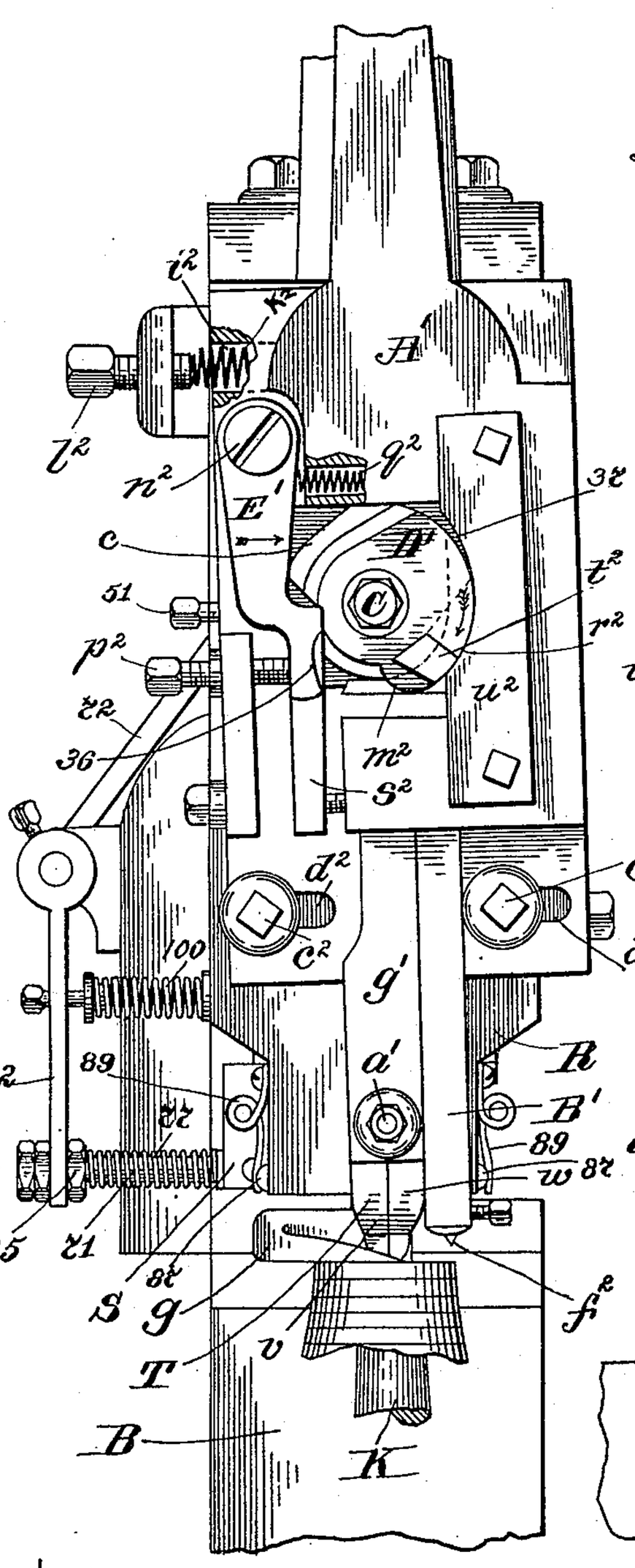
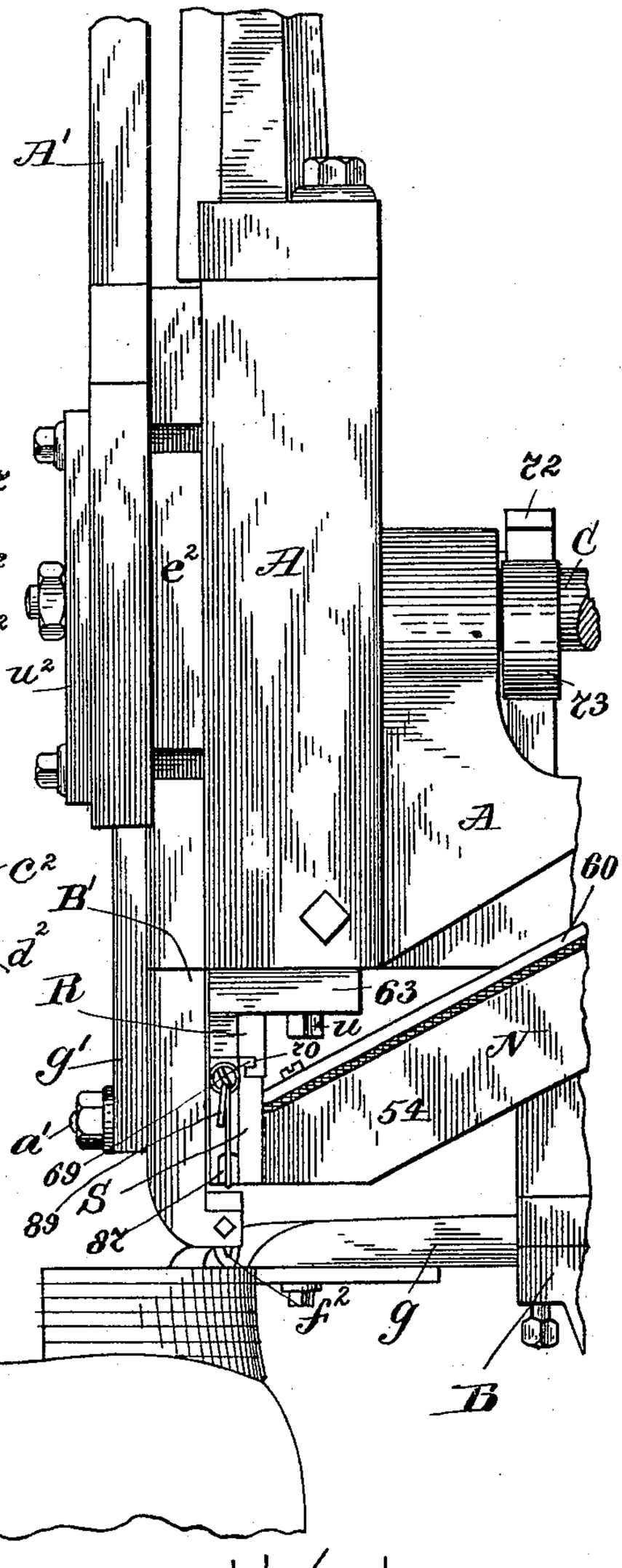


Fig. 5.



WITNESSES.

R. Henry Marsh.

Mary H. Aitken

INVENTOR.

John Hyslop Jr.

by P. E. Teschemacher

Atty.

(No Model.) 8 Sheets—Sheet 4.

J. HYSLOP, Jr.

NAILING MACHINE.

No. 467,104. Patented Jan. 12, 1892.

Fig. 10.

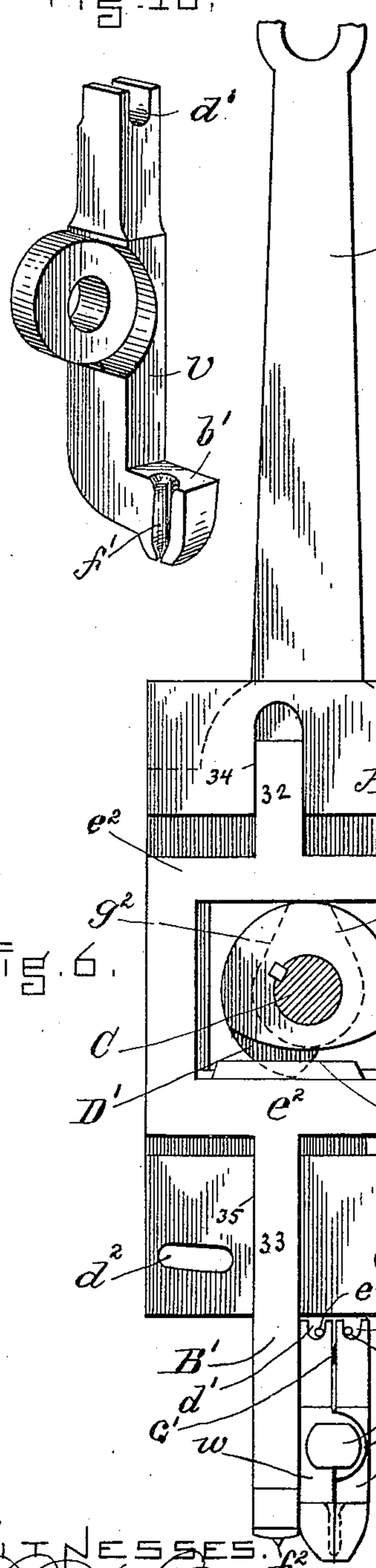


Fig. 21.

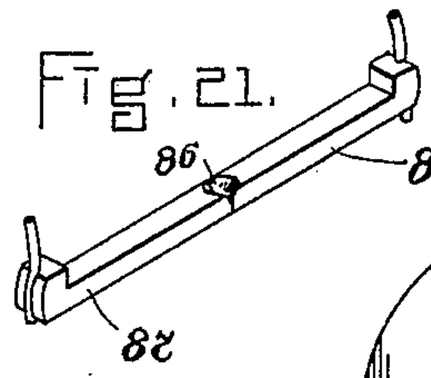


Fig. 9.

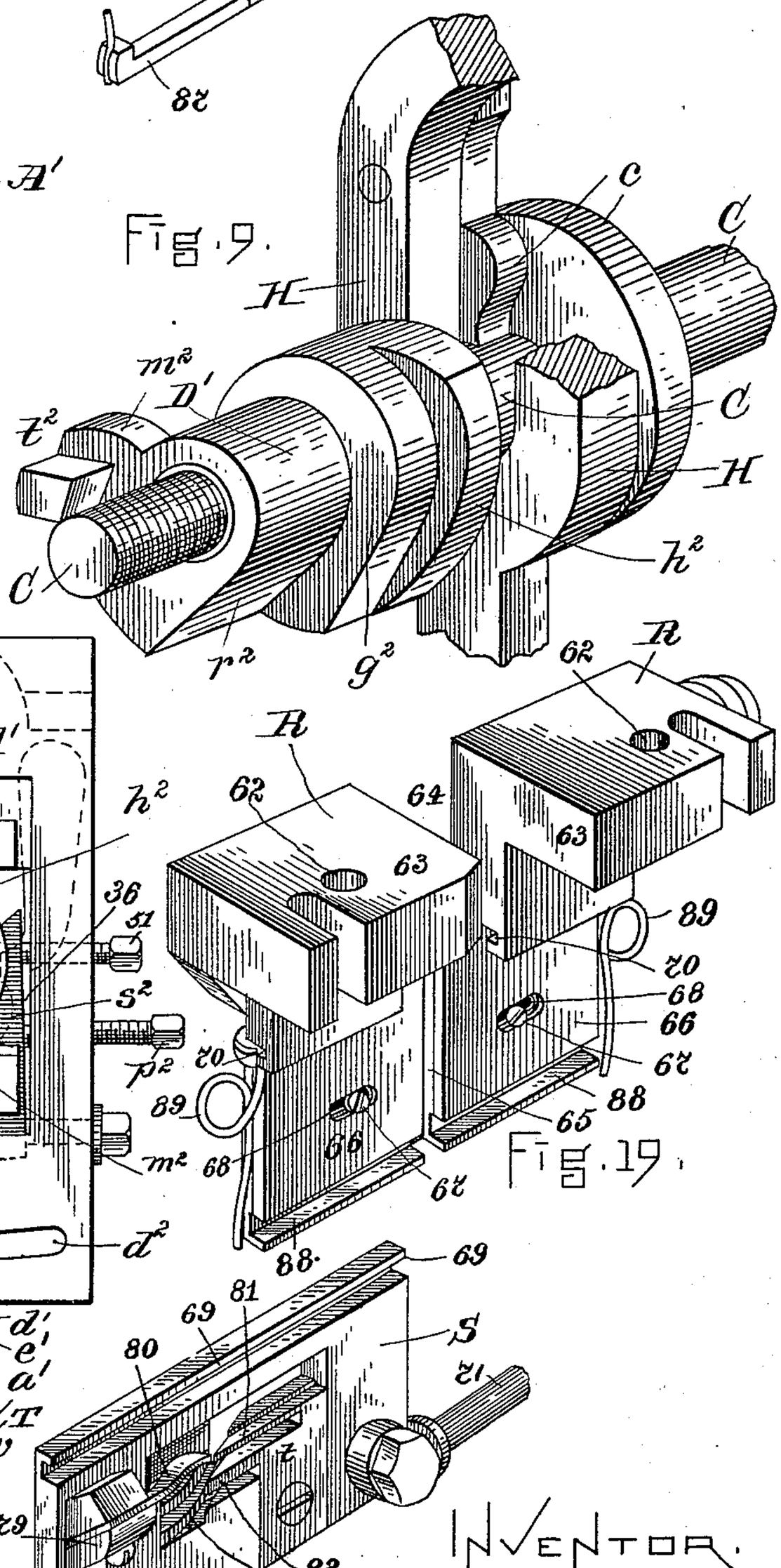


Fig. 19.

Fig. 20.

WITNESSES.

G. Henry Marsh.

Harry F. Aiken.

INVENTOR.

John Hyslop Jr.

by P. E. Teschemacher Atty.

(No Model.)

8 Sheets—Sheet 5.

J. HYSLOP, Jr.

NAILING MACHINE.

No. 467,104. Patented Jan. 12, 1892.

Fig. 7

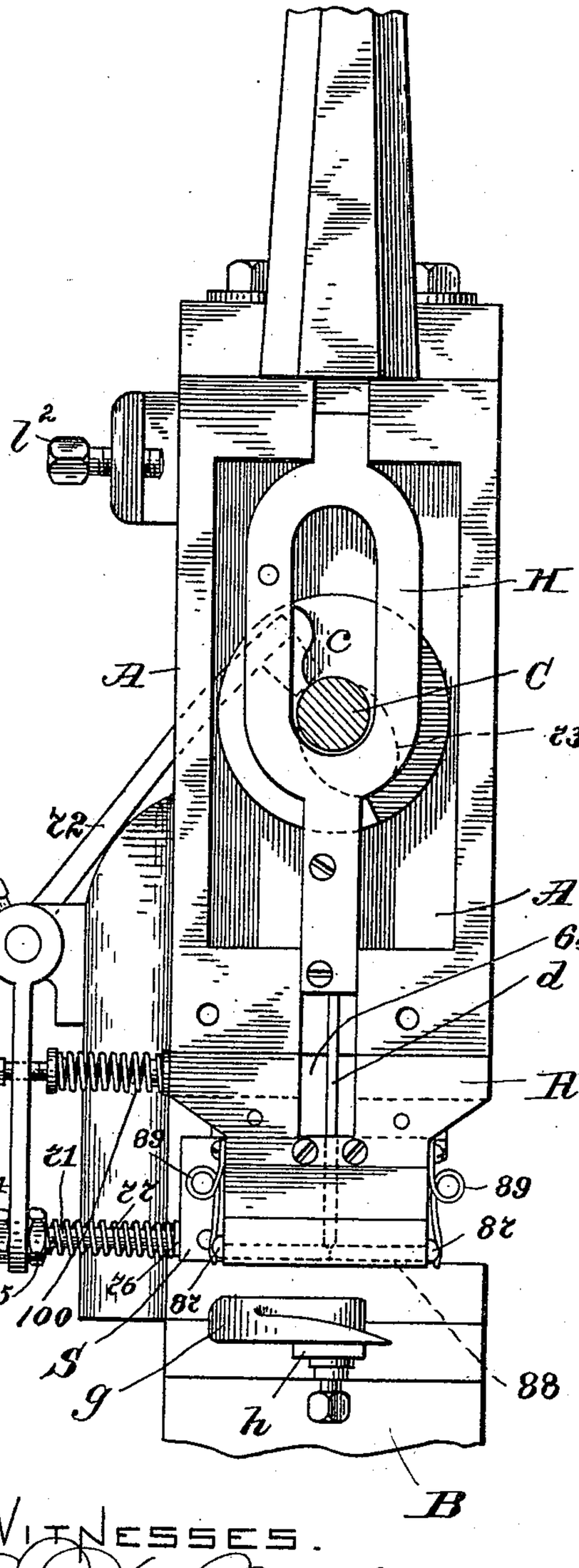
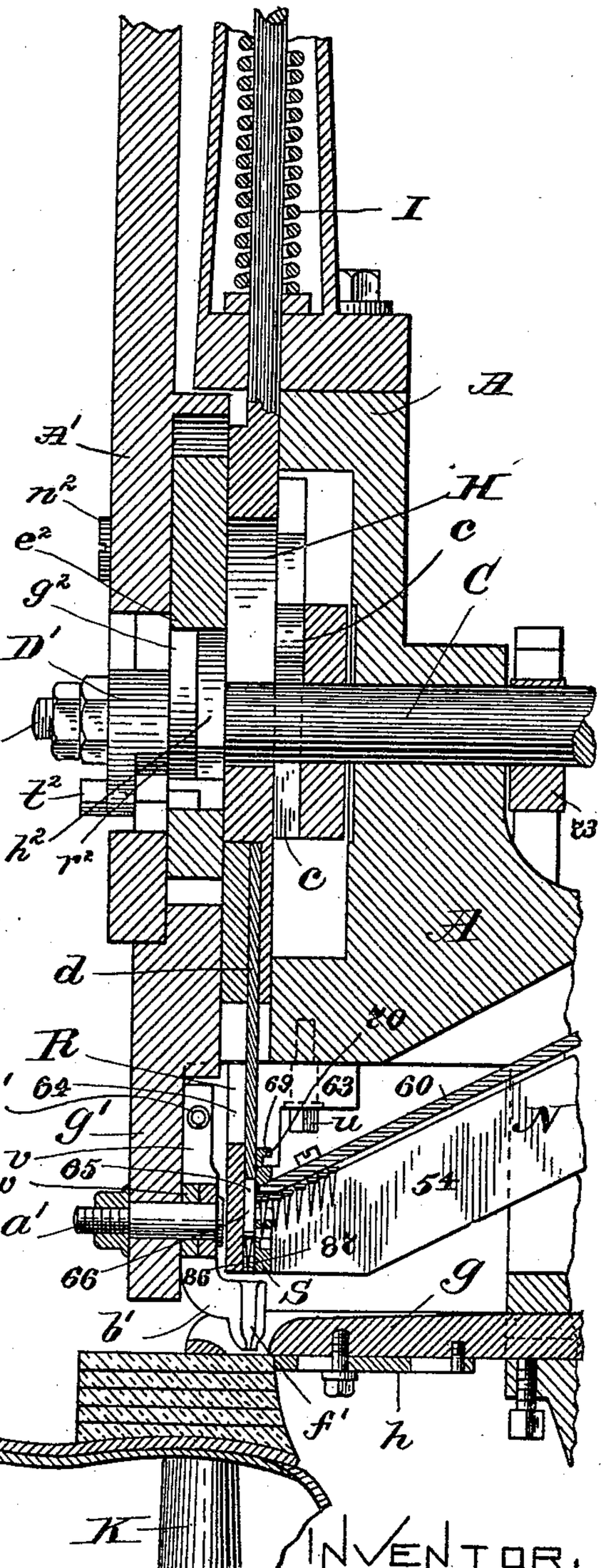


Fig. 8.



WITNESSES.

H. Henry Marsh.

Harry T. Aiken

INVENTOR,

John Hyslop Jr.

by P. G. Leschenmacher

Atty.

(No Model.) 8 Sheets—Sheet 6.

J. HYSLOP, Jr.

NAILING MACHINE.

No. 467,104. Patented Jan. 12, 1892.

Fig. 12.

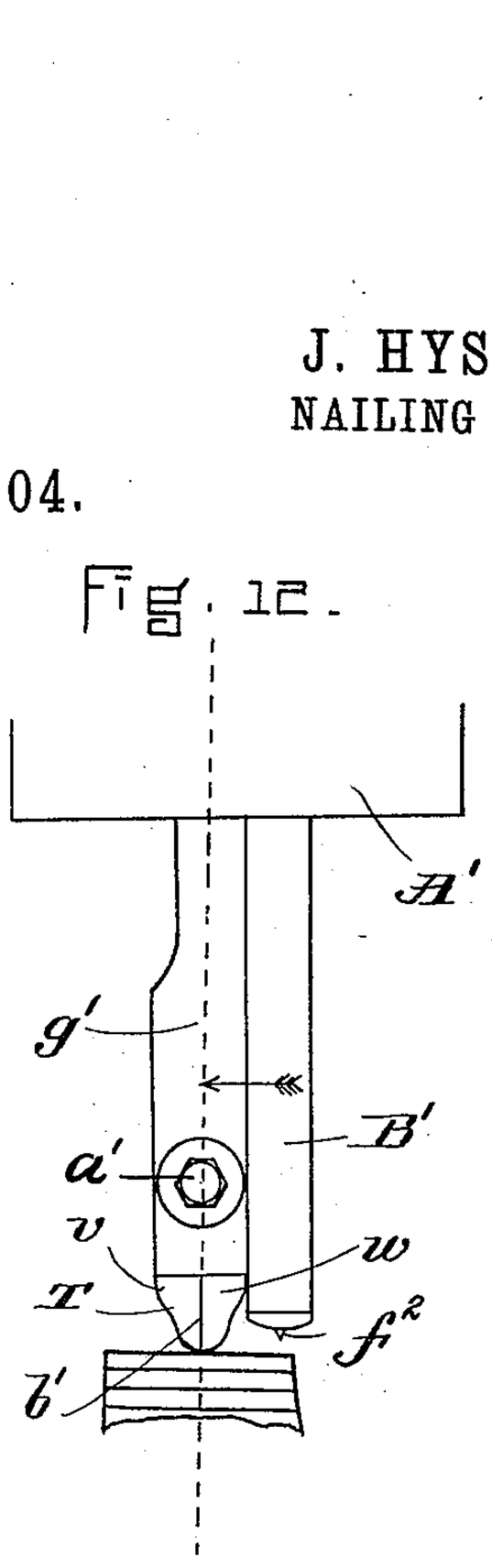


Fig. 13.

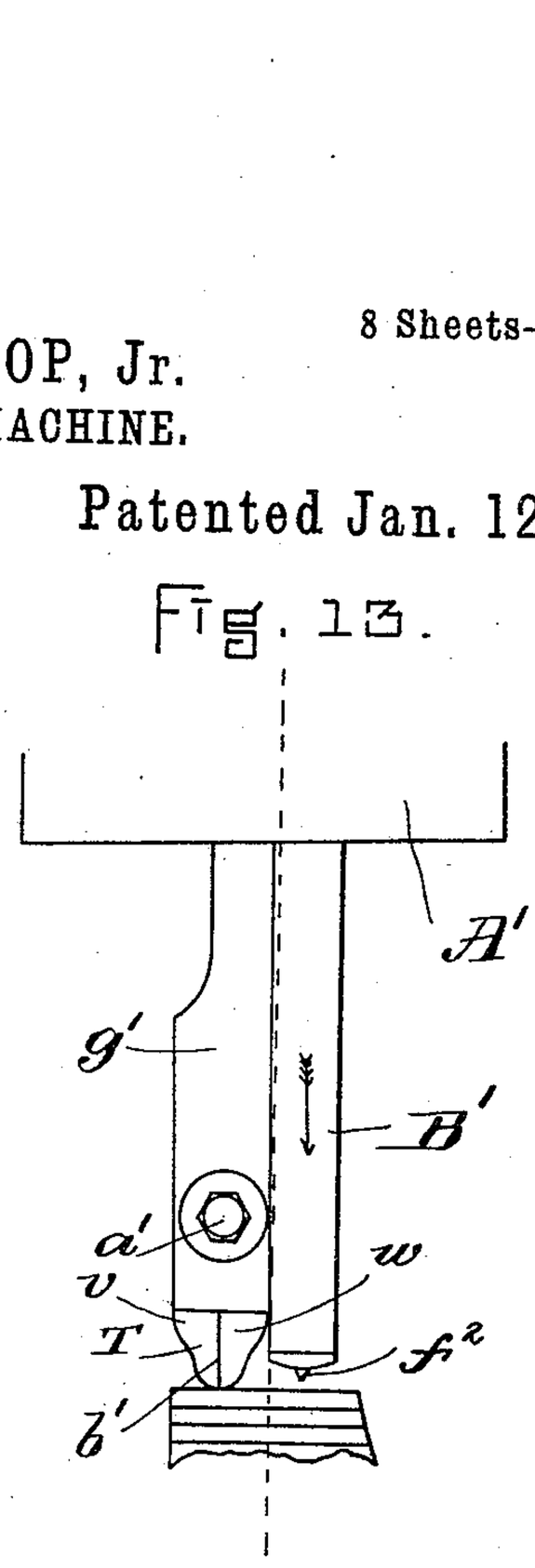


Fig. 14.

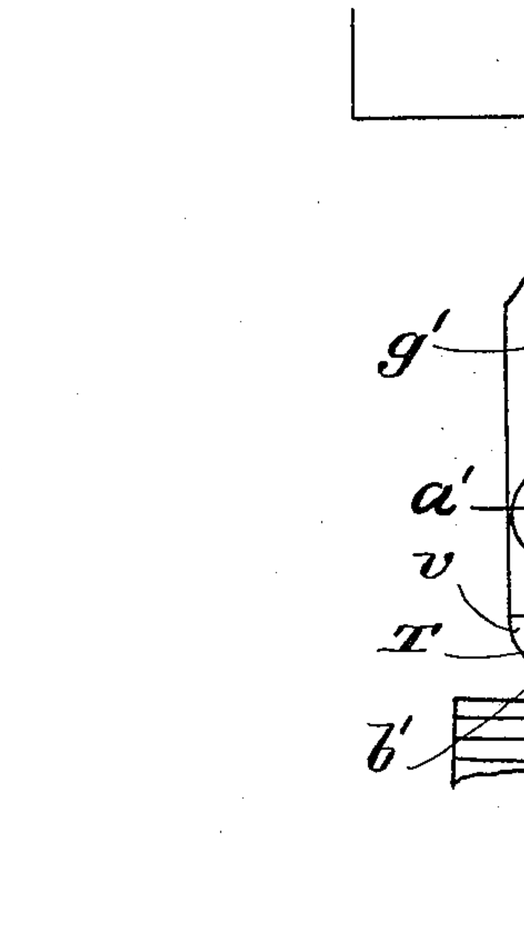
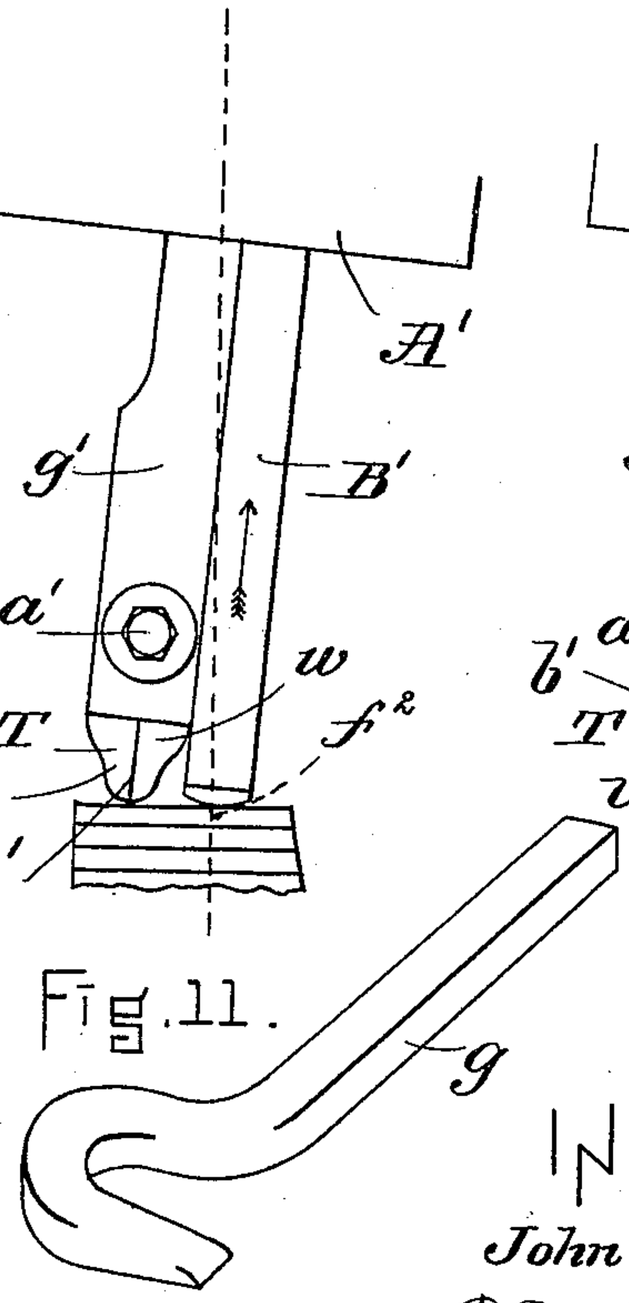


Fig. 15.

Fig. 16.

Fig. 11.



WITNESSES.

R. Henry Marsh.

Harry H. Aiken.

INVENTOR.

John Hyslop, Jr.

by F. O. Tieschemacher

Atty.

(No Model.) 8 Sheets—Sheet 7.

J. HYSLOP, Jr.

NAILING MACHINE.

No. 467,104. Patented Jan. 12, 1892.

Fig. 17.

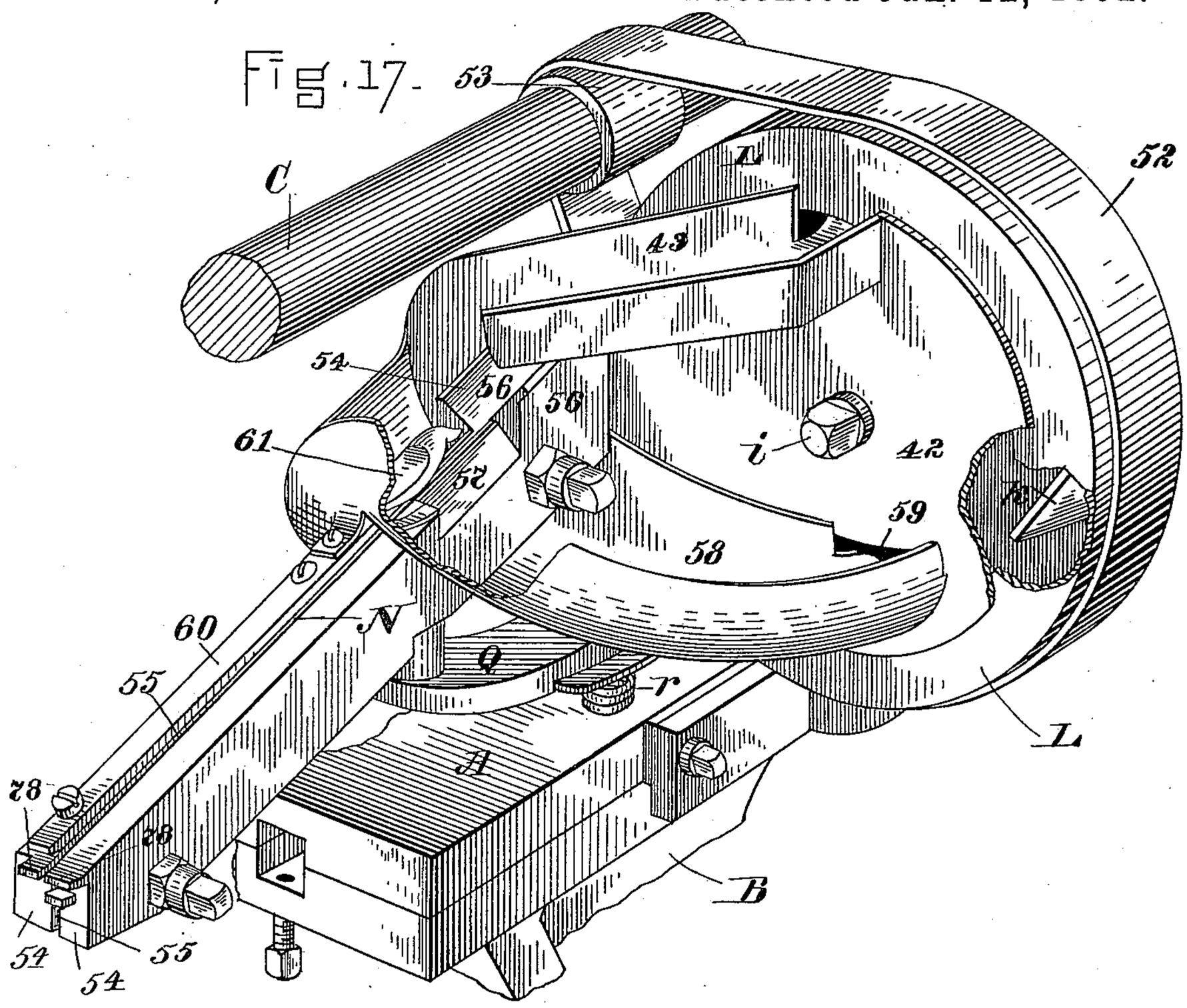
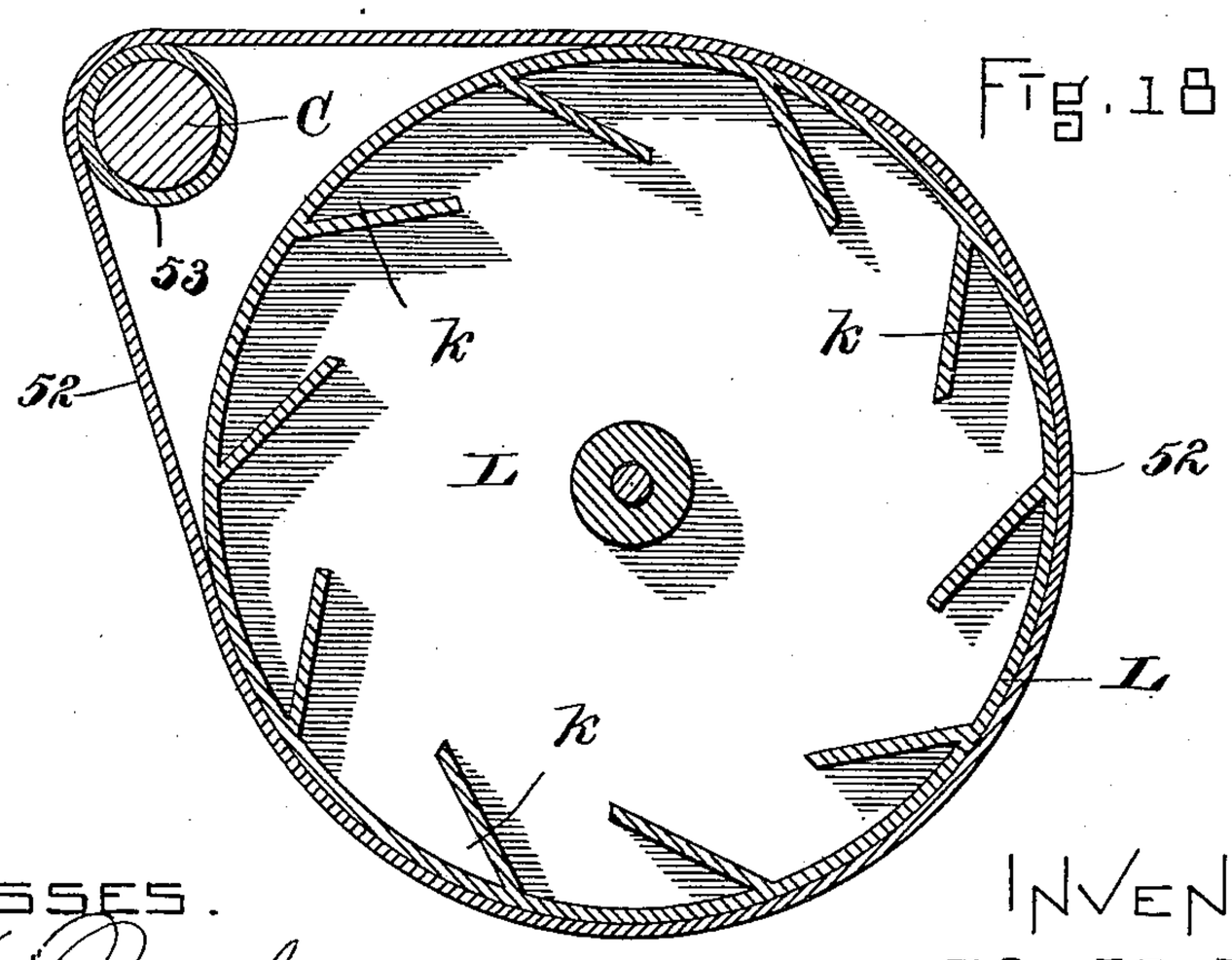


Fig. 18.



WITNESSES.

R. Henry Marsh.

Louis H. Aitken.

INVENTOR.

John Hyslop Jr.

by F. O. Tieschemacher

Atty.

(No Model.)

8 Sheets—Sheet 8.

J. HYSLOP, Jr.

NAILING MACHINE.

No. 467,104. Patented Jan. 12, 1892.

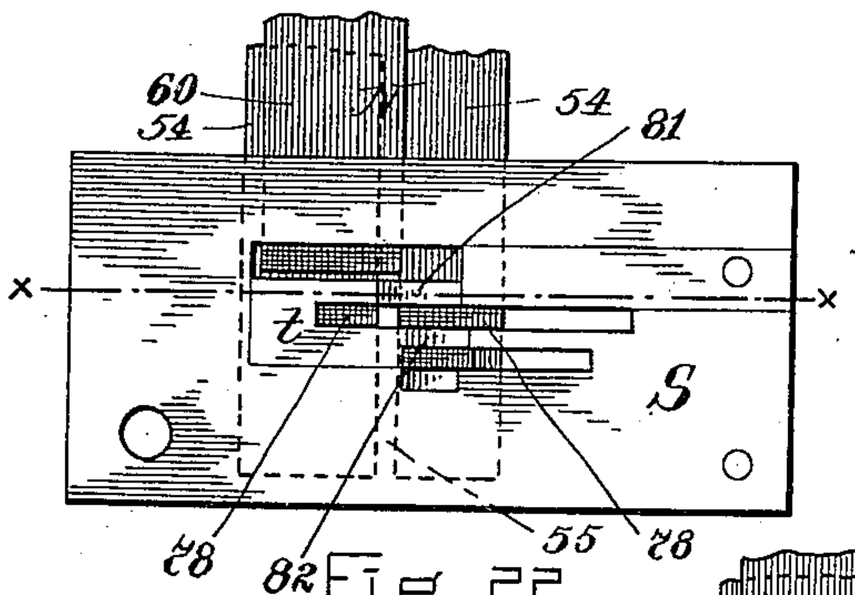


Fig. 22.

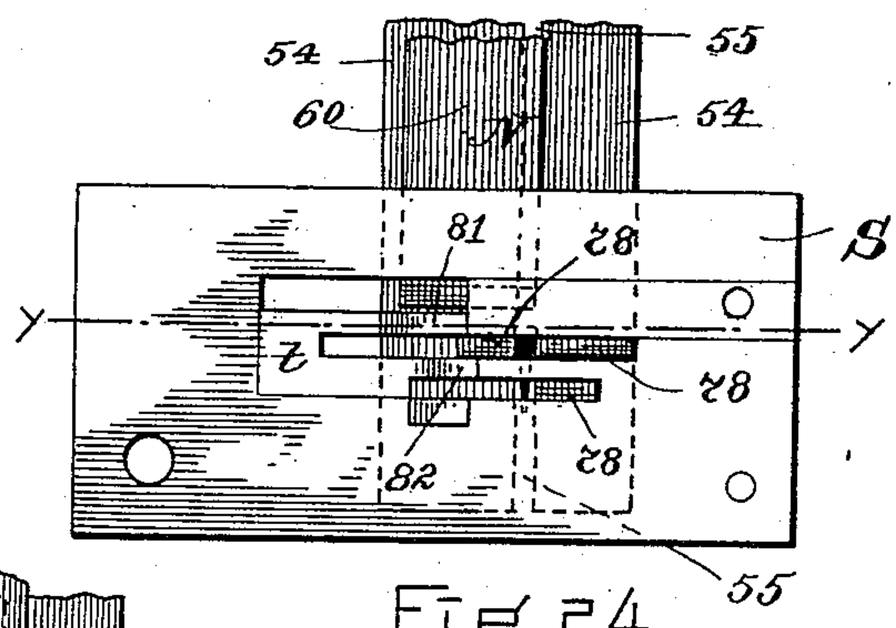


Fig. 24.

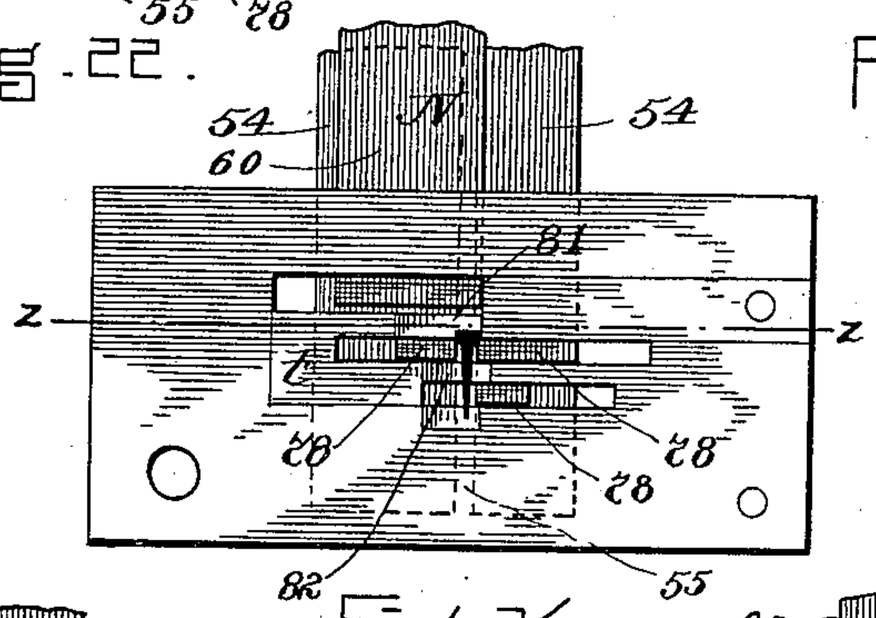


Fig. 26.

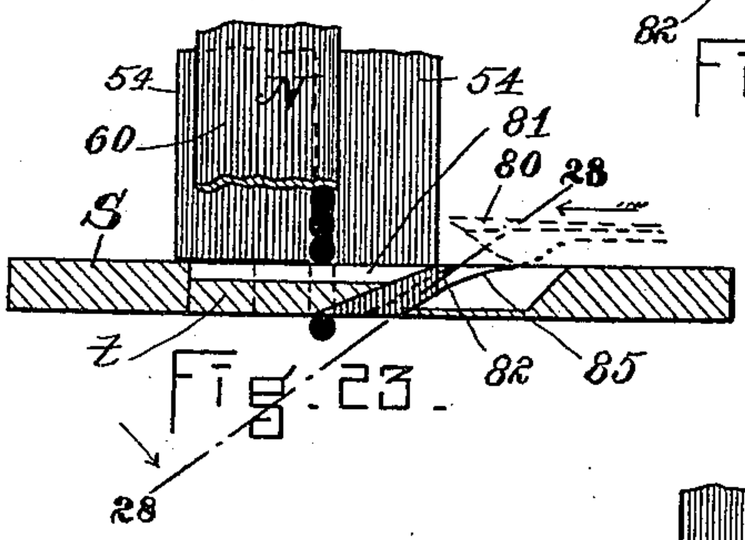


Fig. 23.

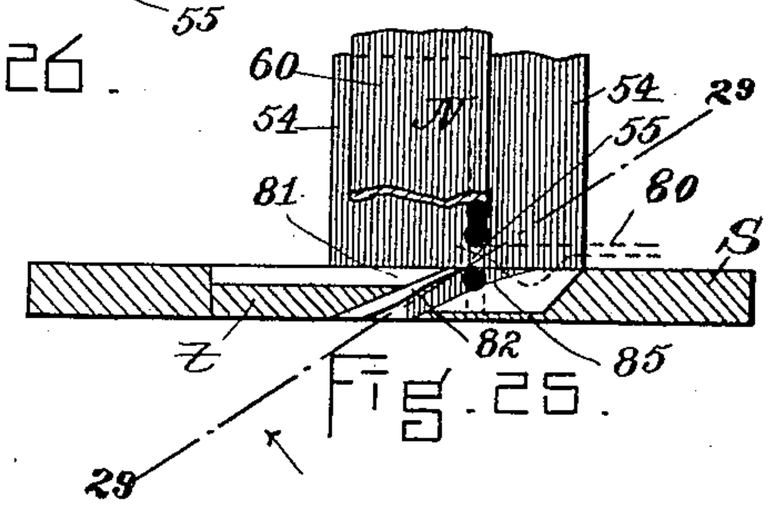


Fig. 25.

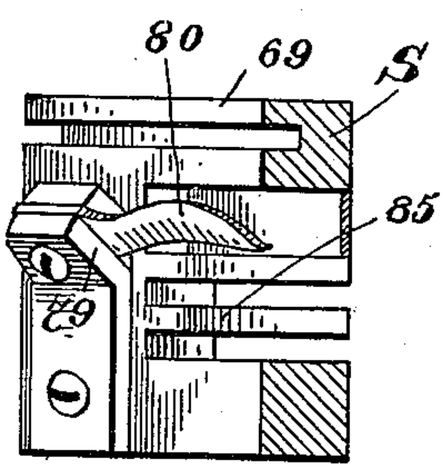


Fig. 28.

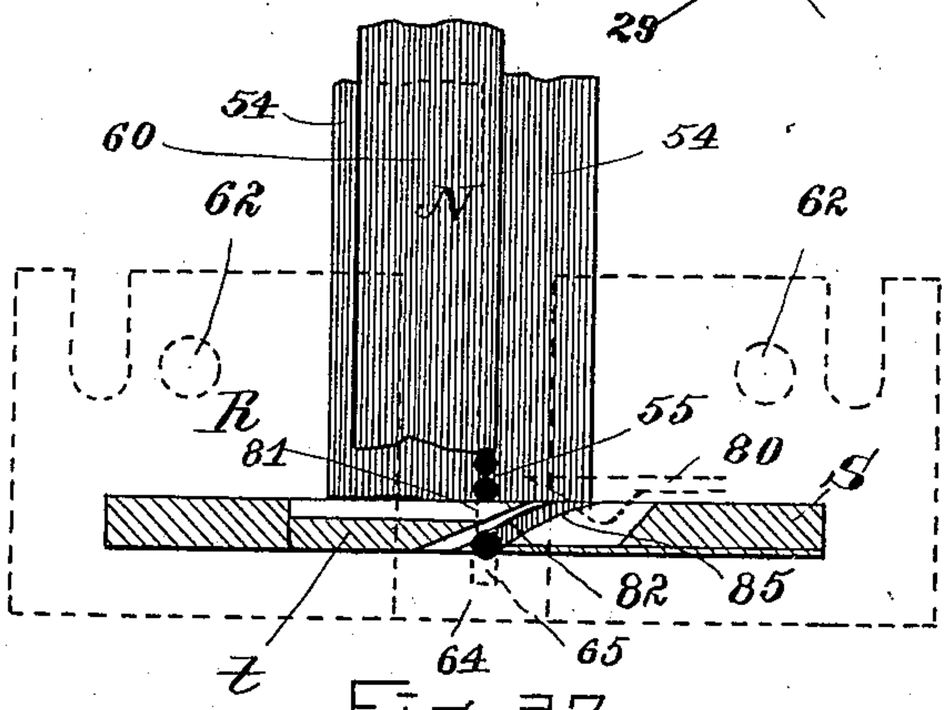


Fig. 27.

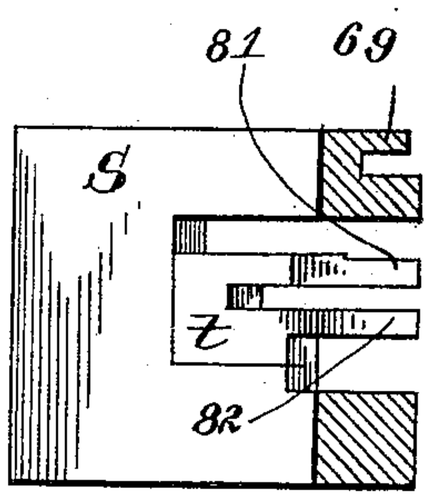


Fig. 29.

WITNESSES.

R. Henry Marsh.

Harry H. Aiken.

INVENTOR.

John Hyslop Jr.

by F. C. Fischenmacher

Atty.

UNITED STATES PATENT OFFICE.

JOHN HYSLOP, JR., OF ABINGTON, MASSACHUSETTS.

NAILING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 467,104, dated January 12, 1892.

Application filed February 24, 1891. Serial No. 382,643. (No model.)

To all whom it may concern:

Be it known that I, JOHN HYSLOP, Jr., a citizen of the United States, residing at Abington, in the county of Plymouth and State of Massachusetts, have invented certain Improvements in Nailing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is an elevation of one side of a nailing-machine constructed in accordance with my invention. Fig. 2 is an elevation of the opposite side of the same. Fig. 3 is a plan of the same. Fig. 4 is an elevation of the front end of the machine and the parts adjacent thereto, enlarged. Fig. 5 is a side elevation of the same similar to that shown in Fig. 2. Fig. 6 is a rear view of the swinging head of the machine. Fig. 7 is an elevation of the front end of the machine with the swinging head and parts carried thereby removed. Fig. 8 is a longitudinal vertical section of the front end of the machine, showing the nail in the upper nail-channel ready to be driven by the driver. Fig. 9 is an enlarged perspective view of the cam-shaft with the cams in their relative positions when the driver-bar is lifted its entire height. Fig. 10 is an enlarged perspective view of one of the jaws of the nail-centering device. Fig. 11 is a perspective view of the presser-foot; Figs. 12, 13, 14, 15, and 16, diagrams illustrating the operation of the feeding device by means of which the stock, after each nail has been driven, is moved in the proper position for the next nail. Fig. 17 is an enlarged perspective view of the nail-receiving drum or reservoir, the nail-chute, and parts immediately connected therewith. Fig. 18 is a vertical section through the nail drum or reservoir, its driving-pulley, and the belt which passes over the said pulley and drum. Fig. 19 is an enlarged perspective view of the block within which is formed the nail-receiving channel and upon which moves the sliding plate which carries the pickers or devices by means of which the nails are separated and fed one by one to the nail-channel. Fig. 20 is a view of the sliding plate which carries the pickers or nail separating and feeding devices. Fig. 21 is a detail of the nail-clamping holders by which the nail is supported at the bottom of the nail-channel. Fig. 22 is a front elevation of the picker-carrying plate, showing the lower end of the nail-chute and the pickers. Fig. 23 is a horizontal section on the line $x\ x$ of Fig. 22, showing a nail in the nail-channel and the lowermost nails in the nail-chute above. Fig. 24 is a front elevation of the picker-carrying plate, showing the pickers and the nail in the positions which they occupy when the lowermost nail is separated from the line of nails above. Fig. 25 is a horizontal section on the line $y\ y$ of Fig. 24. Fig. 26 is a front elevation of the picker-carrying plate, showing the position of the pickers and the nail just before the latter is pushed into the nail-channel. Fig. 27 is a horizontal section on the line $z\ z$ of Fig. 26. Fig. 28 is a vertical section on the line 28 28 of Fig. 23. Fig. 29 is a vertical section on the line 29 29 of Fig. 25.

My invention has for its object to improve the construction of nailing-machines which are adapted for driving loose nails of various sizes and shapes, my improved machine being particularly well adapted for driving nails with rectangular heads around the edges of heels, with the longer dimension of the nail-head pointing radially inward.

To this end my invention consists in certain novel combinations of parts and details of construction, as hereinafter set forth and specifically claimed.

In the said drawings, A represents the frame-work of the machine, which is of suitable shape to support the working parts, and is mounted, as usual, on a post or standard B, the upper portion only of which is shown.

C is the driving-shaft, which revolves in suitable bearings and carries the driving-pulley D and loose pulley E, the driving-pulley having secured to it a balance-wheel G, both being adapted to turn loosely upon the shaft C, except when connected therewith by a clutch mechanism, which is operated when the machine is to be started or stopped by means of a rod *b* and treadle (not shown) in a well-known manner. The shaft C has secured to it near its front end a lifting-cam *c*, Figs. 7, 8, and 9, of such shape as to lift the driver-bar H and at the proper time release the same to permit it to be thrown down quickly by its spring I, the nail-driver *d* at-

tached to the said driver-bar acting at such time to drive the nail, as hereinafter described.

K is the work-supporting horn or rest, which is removably secured to the upper end of a vertical rod *e*, sliding in guides in the standard B and surrounded by a spiral spring *f*, which forces the work up against a stationary presser-foot *g* of the form seen in Figs. 4, 5, 7, 8, and 11, said presser-foot being provided with a horizontally-adjustable gage *h*, against the front end of which the stock is held by the hand of the operator to regulate the distance of the nails from the edge of the work. The rod *e* is adapted to be depressed in a well-known manner against the resistance of the spring *f* by means of a treadle. (Not shown.)

L is the nail-receiving drum or reservoir, which is supported by and rotated upon a stud *i*, projecting from an arm bolted to the frame-work A. The entire front of the reservoir L is covered by a plate 42, through an aperture in which passes the upper end of a trough 43, as seen in Fig. 17. Within the drum L, around its inner periphery, are arranged a series of buckets *k*, which pick up the nails in small quantities as the drum revolves and drop them into the upper end of the trough 43, down which they slide, and by which they are delivered into the upper open end of an inclined chute or track N, to be hereinafter described, said upper end of the chute being located on one side of the center of the drum in a proper position to receive the nails as they drop from the said trough 43. The drum L is rotated continuously by a belt 52, passing over the periphery of the same and over a small pulley 53 on the driving-shaft.

The inclined chute or track N is composed of two adjustable parallel bars 54 54, secured to the frame-work A and set at such distance apart as to leave a space or raceway 55 between them for the reception of the shanks of the nails, the heads of which rest upon and are supported by the upper edges of the bars 54 of the raceway, by which they are guided as they slide down to the lower end thereof. The upper end of the chute N is enlarged and provided with inclined or flaring sides 56, which direct or guide the nails as they fall thereon into the space or raceway 55, those that fall into the right position being caught by the head, with the shank projecting down into the space 55 between the two side bars 54. Immediately below the flaring sides 56 the tops of the bars 54 are beveled off on opposite sides, as seen at 57, Fig. 17, so that when the surplus nails that have not entered the space 55 slide down between the slides 56 and reach the beveled portion 57 they will fall off on either side of the chute and drop down into an apron 58, placed under the upper portion of the chute N. The bottom of the apron 58 slopes down toward an aperture 59, through which the nails are returned to the drum L. The chute N is provided with a cap plate or cover 60, which is formed and screwed down thereon in such manner as to leave a space between it and the bars 54 to permit of the free passage of the heads of the nails as they slide down the chute, and at the same time prevent them from being displaced or thrown out by any jar or concussion to which they may be subjected. Immediately above the upper end of the cap 60, and, if desired, made integral therewith, is a plow-shaped finger 61, the point of which is located at or near the level of the raceway 55 and on one side of the same, as seen in Fig. 17. The nails which have not entered the space or raceway 55 on coming into contact with the point of this finger 61 are deflected thereby to one side or the other in such manner that they will fall off on either side of the beveled portion 57 of the chute, and in this manner the nails are prevented from sliding down the track crosswise and obstructing it, while as the point of the finger 61 is located a little to one side of the raceway it does not in any way interfere with the passage of the rightly-placed nails as they slide down the track and the bunching or clogging of the nails is thus effectually prevented.

Q, Fig. 2, is a hammer the arm or lever of which is pivoted to the frame-work and is pushed back against the resistance of a spring *r* by a cam *s* on the main shaft, said hammer when released being thrown by a spring *r* against the under side of the chute, the concussion thus produced keeping the nails in motion down the raceway, as required.

The nails are taken one by one from the lower end of the chute N and transferred to a position beneath the nail-driver by a suitable transferring device or mechanism. One device or mechanism which I have found to answer well for this purpose will now be described; but other devices or mechanism for transferring the nails from the chute to a position beneath the nail-driver may be employed, if preferred.

R is a block or piece which is immovably secured to the under side of the frame-work A in a position transversely across the bottom of the chute N by means of bolts *u*, which pass through holes 62, Fig. 19, in the upper horizontal portions 63 of said block, between which portions is formed a space or opening 64, into which the driver-bar H descends as the nail-driver is carried down into and through a nail-receiving channel 65, formed by leaving a vertical space between two plates 66 66, made horizontally adjustable on the rear face of the block R by means of screws and slots 67 68. This space 65, which I term the "upper nail-channel," is covered by a vertical plate S, Fig. 20, which is adapted to slide upon the plates 66 on the rear side of the block R, and is held in place by a lip 69 at its upper edge, which fits within a suitable guide-groove 70 in the block R, Fig. 19. This plate S carries the pickers or nail separating

or feeding devices to be hereinafter described and is reciprocated on the block R by means of a rod 71, pivoted thereto and connected at its outer end with a lever 72, the upper end of which is acted upon by a cam 73 on the driving-shaft, as seen in Figs. 1, 2, 3, 5, 7, and 8, a spring 100 serving to keep the said upper end of the lever constantly in contact with the cam. The lever 72 is secured to the rod 71 by screw-nuts 74 at the outer end of said rod, and between a loose washer 75 on the inner side of the lever 72 and a collar 76 on the rod 71 is a stiff spiral spring 77, which permits the lever to yield and slide over the end of the rod 72 in case of any obstruction which might prevent the longitudinal movement of the said rod, thus avoiding any breakage or injury to the parts which might otherwise occur.

The plate S is cut away, as seen in Fig. 20, to form recesses for the reception of the projections 78 at the lower end of the chute N, which fit therein, and to a lug or projection 79 at one end of the plate S is secured a single tooth or picker 80, (seen in full lines in Fig. 20, and dotted in Figs. 23, 25, and 27,) which is on a level with the upper surface of the chute N, and is adapted to be moved backward and forward transversely across the same by the reciprocating slide S, to which it is attached. Opposite to the picker 80, and fitted within a recess in the plate S, is a double picker *t*, having an upper tooth 81 and a lower tooth 82, the upper tooth 81 being so placed as to be on a level with the top surface of the chute N at a point below the single picker-tooth 80, which latter is placed higher up on the inclined top of the chute and therefore slightly above the level of the upper tooth 81 of the double picker *t*. The lower picker-tooth 82 is adapted to slide beneath the projections 78 at the lower end of the chute N, Fig. 17, for a purpose to be presently explained.

The operation of the pickers is as follows: When the parts are in the position represented in Fig. 23, the upper and lower teeth 81 82 of the double picker *t* are in a position across the raceway of the chute N and serve to hold back the entire line of nails therein, the upper tooth 81 serving as a stop for the head of the lowermost nail and the lower tooth 82 acting as a stop for the same nail near its point, thus holding the nail in a vertical position and insuring its proper delivery into the upper nail-channel. On the movement of the slide S in the direction of the arrow the single picker-tooth 80 passes between the heads of the two lower nails, as shown by dotted lines in Fig. 25, thus separating them and acting as a stop to hold back the entire line of nails above the lower one at the same time that its beveled opposite side pushes the nail forward into a space between the teeth 81 and 82, and the opposite inclined side 85 of the plate S, as seen in Fig. 25. The direction of motion of the sliding plate S is now reversed, when the inwardly-inclined teeth 81 82 of the double picker *t* will carry the nail inward into the position seen in Fig. 27, and finally force it into the nail-channel 65, as seen in Fig. 23, the entire line of nails in the raceway above being then held back by the teeth 81 82 of the double picker, as before described. The slide S is then again moved in the direction of the arrow, when another nail is separated or selected from the line in the chute by the single picker, and the operation continues as before, the movements of the slide and its pickers being so timed as to cause the nail to be forced into the nail-channel at the proper moment to be acted upon by the nail-driver. As soon as the nail reaches the upper nail-channel 65 it drops down therein and is caught in a tapering nail-holding recess or aperture 86, formed between the abutting ends of two horizontal clamping bars or holders 87, Fig. 21, which fit and slide within horizontal ways 88, Fig. 19, at the lower edge of the block R and between it and the plate S, by which they are covered. The bars 87 are acted upon by springs 89, Fig. 19, which keep them together in a proper central position, but nevertheless permit them to be separated as the nail is forced down between them by the nail-driver, which in its descent forces the nail down through the nail-holding recess or aperture 86, formed between them. These bars 87 serve to clamp and support the nail until the nail-driver reaches it in its descent.

The upper nail-receiving channel 65 is of rectangular form in horizontal section, with its longer dimension in the direction of the length of the machine, which enables it to receive and hold nails having rectangular heads, which are thus prevented from turning in said channel, and by adjusting the plates 66 at different distances from each other, as before described, the nail-channel can be adapted for nails of different sizes and shapes.

T represents the nail-centering device, which is composed of a pair of levers *v w*, jointed together near the center of their length by a bolt or stud *a'*, by which they are also supported and secured in place upon the lower portion of a swinging head, to be hereinafter described. The lower ends of these levers terminate in jaws *b'*, which project beneath the upper nail-channel 65, and are properly arranged to receive the nails from the said nail-channel as they are forced by the nail-driver through the aperture or recess 86 between the ends of the bars 87. The upper ends of the levers *v w* are forced apart by a spring *c'*, and each lever has an open slot *d'*, within which fits a pin *e'*, which is of such diameter as to permit of a slight movement of the upper ends of the levers toward each other as is necessary when the jaws *b'* are opened, as hereinafter described; but when the jaws are closed together by the spring *c'*, each pin *e'* will lie against the inner wall of

its slot d', as seen in Fig. 6, causing the two levers to be held in a central vertical position, as required. The jaws b' are each provided with a groove or recess, the two grooves forming a nail-centering recess f' of the form seen in Figs. 8 and 10, which causes the nail to be properly centered over the work, the nail-driver as it descends passing through the upper nail-channel and the recess or aperture 86 between the bars 87 and into and through the recess f', forcing the nail down between the lower ends of the jaws b' of the centering device, which are thus separated against the resistance of the spring c' to allow of the passage of the nail into the stock on the work-supporting horn or rest beneath, the jaws b' being closed together or returned to their normal positions by the said spring on the ascent of the nail-driver. The bottom of the recess f' terminates in a point, which forms a guide for the point of the nail, which is thus caused to lie directly under the head, thereby insuring the nail being driven into the stock or material perfectly straight, as is essential to produce perfect work.

I will now describe the feeding device by means of which the stock, after each nail has been driven, is moved into the proper position for the next nail, the feed of the stock being produced by the movement of the awl-bar, which carries an awl or sharp point which penetrates the leather and makes the hole for the reception of the point of the nail to be driven.

To the front end of the machine, above the shaft C, is pivoted at b^2 a swinging head A′ of the form shown in Figs. 1, 4, and 6, which is adapted to be vibrated a fixed distance at each revolution of the shaft C by mechanism to be hereinafter described, its lower portion being steadied and held up against the front of the machine by screw-bolts c^2, passing through curved slots d^2, and said lower portion having a central downwardly-projecting bar or portion g', to which is pivoted the nail-centering device T, previously described, which lies on one side of the awl-bar, as seen in Figs. 4 and 6. The central portion of the head A′ is cut away or made open for the reception of the rectangular yoke-shaped central portion e^2 of the awl-bar B′, the upper and lower portions 32 33 of which slide in guide-grooves 34 35, Fig. 6, in the head A′. The awl-bar B′ has a vertically-reciprocating movement independently of the head A′, but swings laterally therewith and carries at its lower end a wedge-shaped point or awl f^2, which penetrates the stock on the descent of the awl-bar and makes a hole for the nail to be driven down by the nail-driver. The vertical movement of the awl-bar is effected by means of two cams g^2 h^2, Figs. 6 and 9, on the shaft C, which act against the upper and lower bars of the yoke e^2 and serve to alternately depress and raise the awl-bar at the required times, the shape of the yoke permitting the cams to operate while the awl-bar is being vibrated from side to side with the head A′.

On the left-hand side of the swinging head is a horizontal recess i^2, within which is placed a stiff spiral spring k^2, against the outer projecting end of which bears a set-screw l^2, by which the force of the said spring may be regulated, as desired. The spring k^2 acts to swing or force the head A′ to the right as far as permitted by the guide-slots d^2 and screw-bolts c^2. The swinging of the head to the left against the resistance of the spring k^2 is effected by the central portion m^2 of a three-part cam D′, Figs. 4, 6, and 9, which is secured to the outer end of the driving-shaft C, the portion m^2 acting against a projection 36 at the lower end of a lever E′, Fig. 4, pivoted at n^2 to the head A′, and made adjustable by means of a set-screw p^2, by which it is forced inward against the stress of a spring q^2, which serves to keep it in contact with the end of the screw p^2, as seen in Fig. 4. The first movement of the head A′ with the awl-bar and awl to the left from the position seen in Fig. 12 to the position shown in Fig. 13 is thus effected by the portion m^2 of the cam D′, at the termination of which the awl-bar is forced down, causing the awl to penetrate the leather to make a hole for the nail, as seen in Fig. 14, the head A′ remaining stationary while the awl is being forced into the material. This fixes the point where the feed is to commence, as the balance of the movement of the head A′ to the left to the end of its throw causes the stock or material to be moved or fed by the awl which still remains therein, causing the work to be moved forward with the awl into the position seen in Fig. 15, the awl-bar remaining down until the swinging head has finished its movement to the left, when the awl will be directly under the nail-driver. This remaining movement of the head A′ to the left to produce the feed is effected by the inner portion r^2 of the cam D′, which, as soon as the portion m^2 has passed out of contact with the lever E′, strikes an adjustable bearing-piece or anvil s^2, Figs. 4 and 6, on the inner side of the open portion of the head A′ and moves the said head with the awl-bar to the end of its throw, as seen in Fig. 15. The bearing-piece or anvil s^2 is made adjustable by means of two screws 50 and 51 to insure the nail-centering device T coming directly over the hole made by the awl and immediately under and in line with the nail-driver. As soon as the feed has taken place the awl-bar is raised to withdraw the awl from the stock, as seen in Fig. 16, the head A′ remaining stationary until the awl is entirely withdrawn. As the cam D′ continues to revolve the head A′ is swung over to the right and returned to its original position, as shown in Fig. 12, with the nail-centering device directly under the nail-driver, by the spring k^2, the outer portion l^2 of the cam D′ moving in contact with the concentrically-curved side or

bearing-surface 37 of a stationary plate u^2, secured to the outer surface of the head A′, while the smaller concentric portion 38 of the cam m^2 bears against the piece s^2 on the opposite side, the two thus serving to hold the head rigidly and positively in place while the nail is being driven, with the nail-centering device directly under and in line with the nail-driver. The nail is driven immediately after the head has been swung back to the end of its throw into the position seen in Fig. 12, the nail-driver d at that instant descending and forcing the nail through the recess 86 between the bars 87 at the bottom of the upper nail-channel 65 into the recess f' between the jaws b' of the centering device T, and down therethrough into the material beneath. If the spring k^2 should fail to force the head A′ over to its proper place the cam t^2 will insure the proper movement, and thus prevent any liability of derangement of the parts.

The length of the feed is regulated and controlled with the greatest nicety by adjusting the position of the lever E′, against which the portion m^2 of the cam D′ strikes, whereby the time which intervenes between the commencement of the movement of the head A′ to the left and the descent of the awl into the stock is varied and the amount of swinging movement of the awl before it descends into the stock increased or diminished. For instance, if a short feed is required the lower end of the lever E′ is moved inward by its screw p^2 in the direction of the arrow, Fig. 4, which causes the cam m^2 to sooner come into contact therewith, and consequently the awl-bar is swung over farther to the left before it descends to force the awl into the stock. Hence the remainder of the movement of the awl-bar to the left (which movement always terminates at the same point) is shorter, and the stock is thus carried or fed forward a less distance, as required, causing the nails to be driven closer together. On the other hand, when a longer feed is required to increase the length of the spaces between the nails, the set-screw p^2 is moved in a proper direction to permit the lower end of the lever E′ to be moved outward by its spring q^2, which will delay the contact of the cam m^2 therewith and the commencement of the movement of the head A′ until shortly before the awl-bar descends to force in the awl, and consequently the awl will carry the stock with it during a much greater portion of its movement to the left. The outer portion t^2 of the cam D′ must clear the plate u^2 before the central portion m^2 of the said cam commences to act upon the lever E′. Otherwise the variation of the feed could not be effected.

The work-supporting horn K is temporarily locked and made rigid at the time of the descent of the awl to enable the latter to penetrate the leather if very hard, and again released at the time of the feed and before the nail is driven, in the following manner: The vertical rod e, which carries the work-supporting horn, is provided on one side with teeth w^2, Fig. 1, which are adapted to be engaged by the correspondingly-toothed end of a horizontal locking-bar a^3, which slides in an aperture in the guide of the standard B, through which the rod e slides, a spiral spring 40 encircling the bar a^3 and bearing at one end against the standard B and at the opposite end against a collar on the bar a^3, said spring acting to normally keep the teeth of the said bar a^3 out of contact with the teeth w^2 of the rod e. The bar a^3 is jointed at its outer end to a lever b^3, fulcrumed at 41 and actuated in one direction by a cam-wheel G′ on the driving-shaft C and in the opposite direction by the spring 40, whereby the bar a^3 is forced forward to engage the rod e and lock the same rigidly, as required, and withdrawn at the proper time to release the said bar to render the work-supporting horn elastic or yielding while the feed is taking place and the nail is being driven, as is desirable.

The teeth w^2 extend over a sufficient portion of the length of the rod e to cause a portion of them to be always in a position to be engaged by the locking-bar a^3 should the horn or support K be raised or lowered while the machine is in operation to conform to the varying thickness of the material or work, and the movement of this locking-bar is so timed that whenever the machine is not in operation it will be withdrawn by the spring 40 to leave the work-supporting horn or rest K free to be moved, as desired, the machine being so constructed that it will always stop with the nail-driver down.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a nailing-machine, the combination, with the nail-driver, the block having the nail-channel, and the nail-chute, of the sliding plate S, covering one side of the said nail-channel, said plate having the lower end of the chute fitted thereto and being provided with the single picker-tooth 80 and the double picker-tooth t, arranged with relation to each other as described, the former being adapted to select the lowermost nail and push it forward into a position to be acted upon by the double picker, by which it is finally fed into the nail-channel, substantially as set forth.

2. In a nailing-machine, the combination, with the block or piece R, having the vertical nail-channel 65 formed therein, of the horizontal clamping-bars 87, sliding in ways or grooves in said block R and having a nail-holding aperture or recess 86 formed between their inner abutting ends, and the actuating-springs 89, bearing on the outer ends of said bars to keep their inner ends in contact and permit of their separation by the downward passage of the nail-driver between them, substantially as set forth.

3. In a nailing-machine, the combination, with the nail-delivering devices and nail-driver, of the nail-centering device T, composed of a pair of levers v w, jointed together

and provided with a spring c' and jaws b', projecting beneath the nail-channel and having a recess f' for centering the nail as it is driven from the nail-channel, said levers v w being held in a central vertical position by slots d' and pins e', substantially as set forth.

4. In a nailing-machine, the combination, with the nail-chute N, having an open portion at its upper end to receive the nails and a beveled portion located immediately below the same, of the intercepting-finger 61, located at the upper end of the cap plate or cover of the chute and projecting over said beveled portion and having its point at or near the level of the track or raceway of the chute and on one side of the same, whereby the nails which have not properly entered the track or raceway are deflected and caused to fall off on either side of the said beveled portion of the chute, substantially as described.

5. In a nailing-machine, the combination, with the laterally-swinging head A′, having a positively-fixed lateral movement in one direction and having its movement in the opposite direction divided into two separate movements, with a period of rest between said movements, said two movements and the period of rest between the same forming the entire movement in said direction, the actuating-cam D′, and the vertically-reciprocating awl-bar and awl, carried by said head A′, as described, of the lever E′, pivoted to the swinging head A′ and made adjustable toward and from the portion m^2 of the cam D′, substantially as set forth.

6. In a nailing-machine, the combination, with the spring-operated driver-bar and nail-driver and the laterally-swinging awl-bar and awl, of the yielding work-supporting horn or rest K, mounted upon a shaft e, having a vertical movement toward and from the nail-driver and awl and forced toward the same by means of a spring, said shaft e being provided with teeth or notches w^2, and the locking-bar a^3, adapted to engage with the teeth of the bar e, and means for actuating the locking-bar, substantially as described.

7. In a nailing-machine, the combination of the laterally-swinging head A′, with its vertically-reciprocating awl-bar and awl and nail-centering device T, the block having the upper nail-channel 65, with its nail-holding clamping-bars 87, the work-supporting horn or rest K, and the spring-operated driver-bar and nail-driver, substantially as described.

8. In a nailing-machine, the spring-operated driver-bar and nail-driver, a yielding nail holding or clamping device at or near the lower end of the upper nail-channel 65, the nail chute or track N, and a device for transferring the nails one by one from the bottom of said chute to the said upper nail-channel, combined with the laterally-swinging head A′, having an adjustable actuating device, as described, the nail-centering device T, arranged directly beneath and in line with the upper nail-channel, and the vertically-reciprocating awl-bar and awl, substantially as set forth.

9. In a nailing-machine, the combination of the spring-operated driver-bar and nail-driver, the adjustable plates 66 66, having the nail-channel 65 formed between their inner ends, as described, a nail holding or clamping device at or near the lower end of said nail-channel 65, a device for transferring the nails one by one from the bottom of the nail-chute to the upper nail-channel, said device first separating the end nails by operating between their heads and afterward forcing the nail so separated into the nail-channel, the nail-reservoir L, the nail chute or track N for conducting the nails from the reservoir to the nail-channel, the laterally-swinging head A′, having an adjustable actuating device, as described, the nail-centering device T, arranged beneath and in line with the upper nail-channel, and the vertically-reciprocating awl-bar and awl, substantially as set forth.

Witness my hand this 17th day of February, A. D. 1891.

JOHN HYSLOP, JR.

In presence of—
NATHL. P. CARVER,
OTIS W. SOULE.