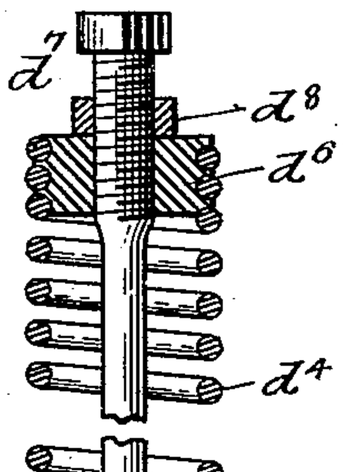
(No Model.) 6 Sheets—Sheet 1.

T. BARRETT.

WIRE PEGGING MACHINE.

No. 478,732. Patented July 12, 1892.



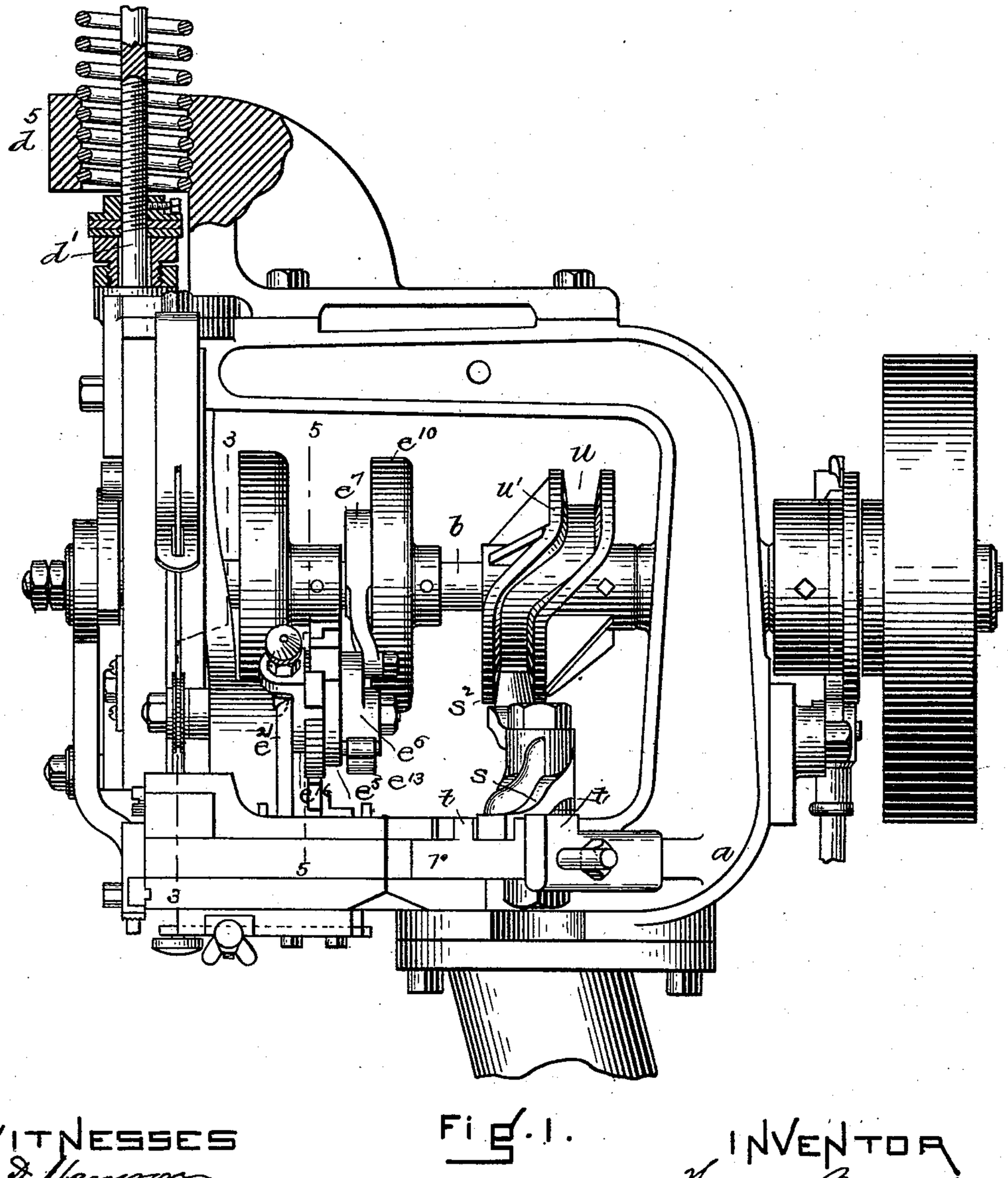


Fig. 1.

WITNESSES
A. D. Harrison
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(No Model.) 6 Sheets—Sheet 2.

T. BARRETT.

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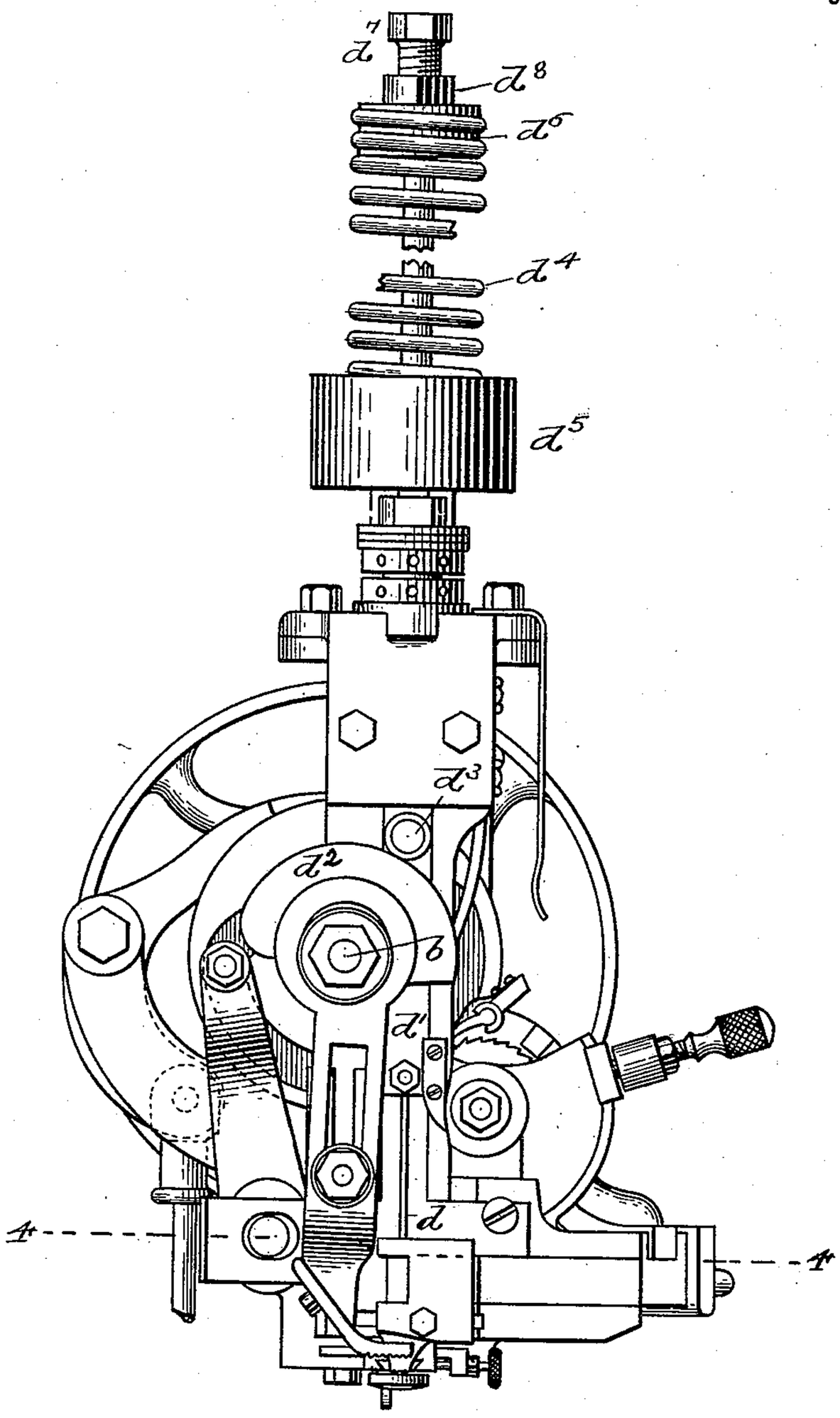

Fig. 2.

WITNESSES
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(No Model.) 6 Sheets—Sheet 3.

T. BARRETT.

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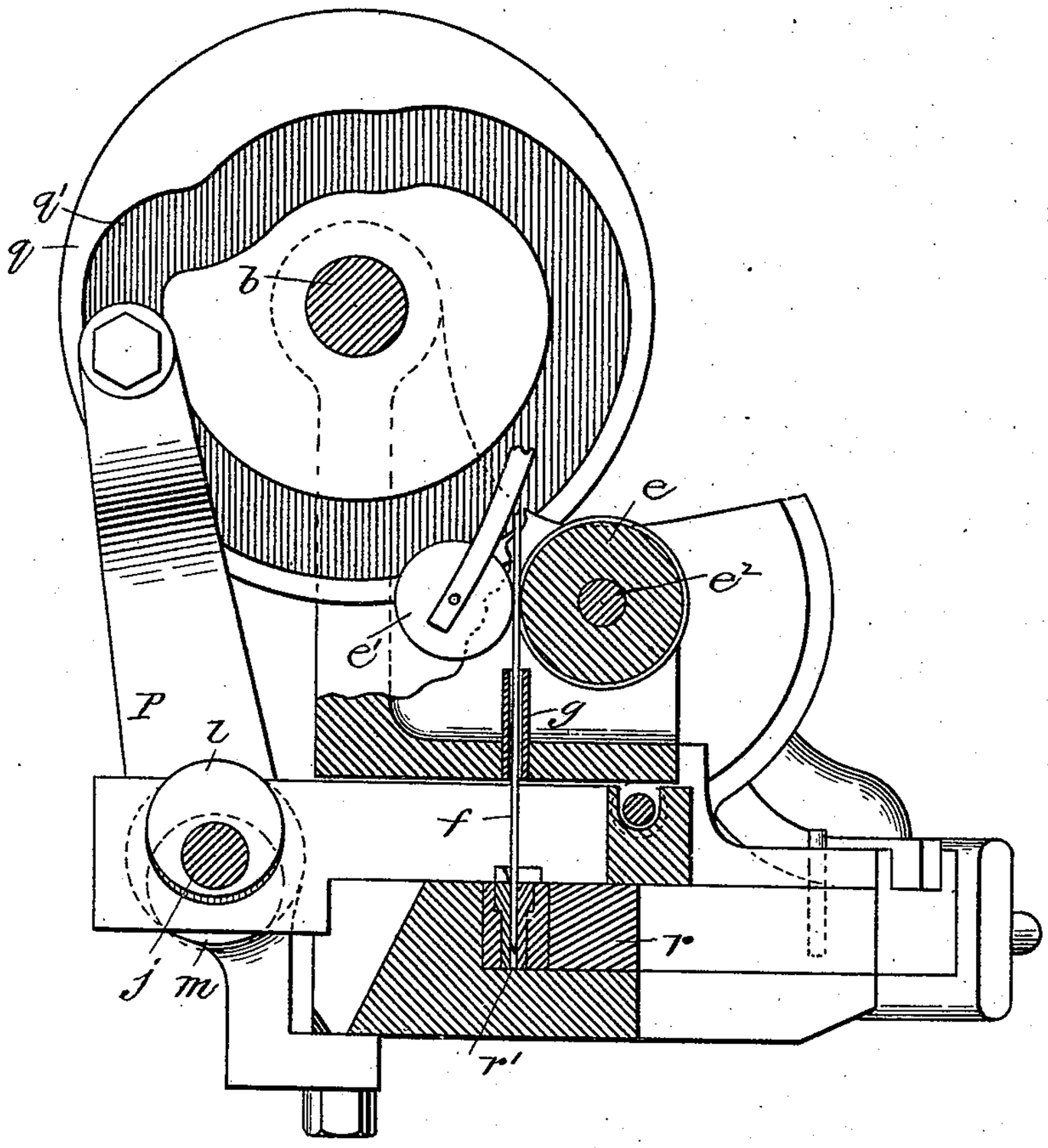

Fig. 3.

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(No Model.) 6 Sheets—Sheet 4.

T. BARRETT.

WIRE PEGGING MACHINE.

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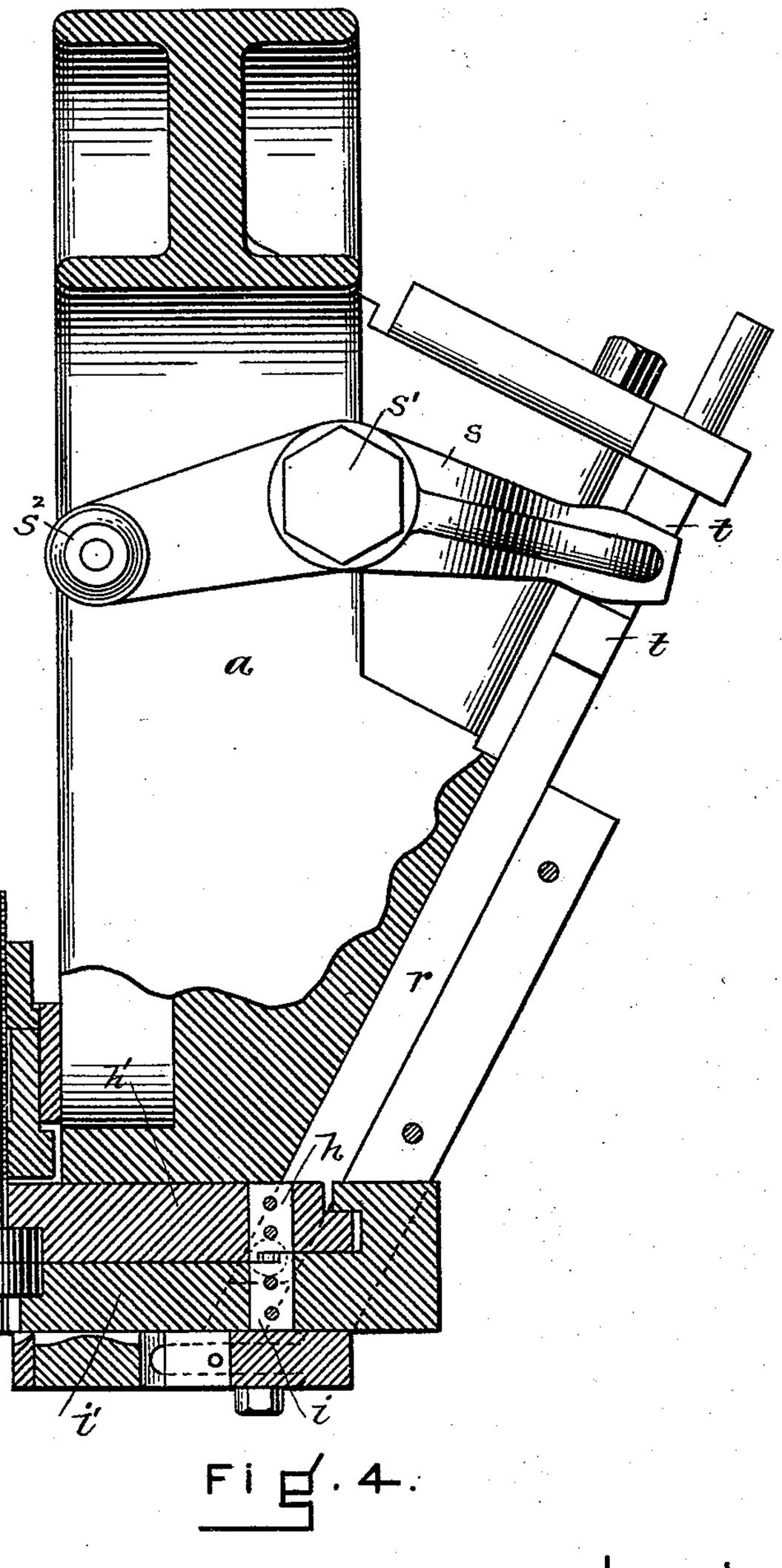

Fig. 4.

WITNESSES
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(No Model.) 6 Sheets—Sheet 5.

T. BARRETT.

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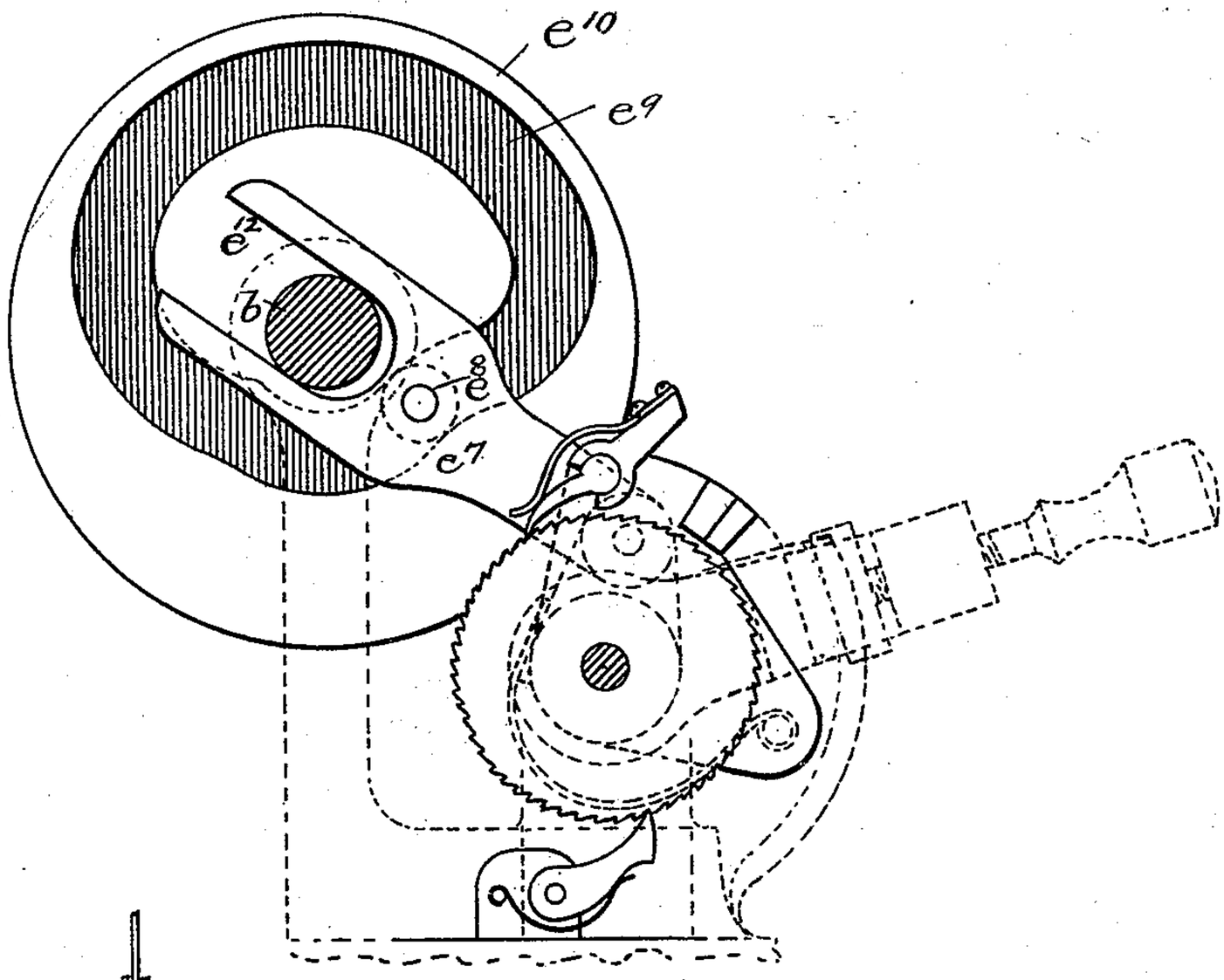

Fig. 5

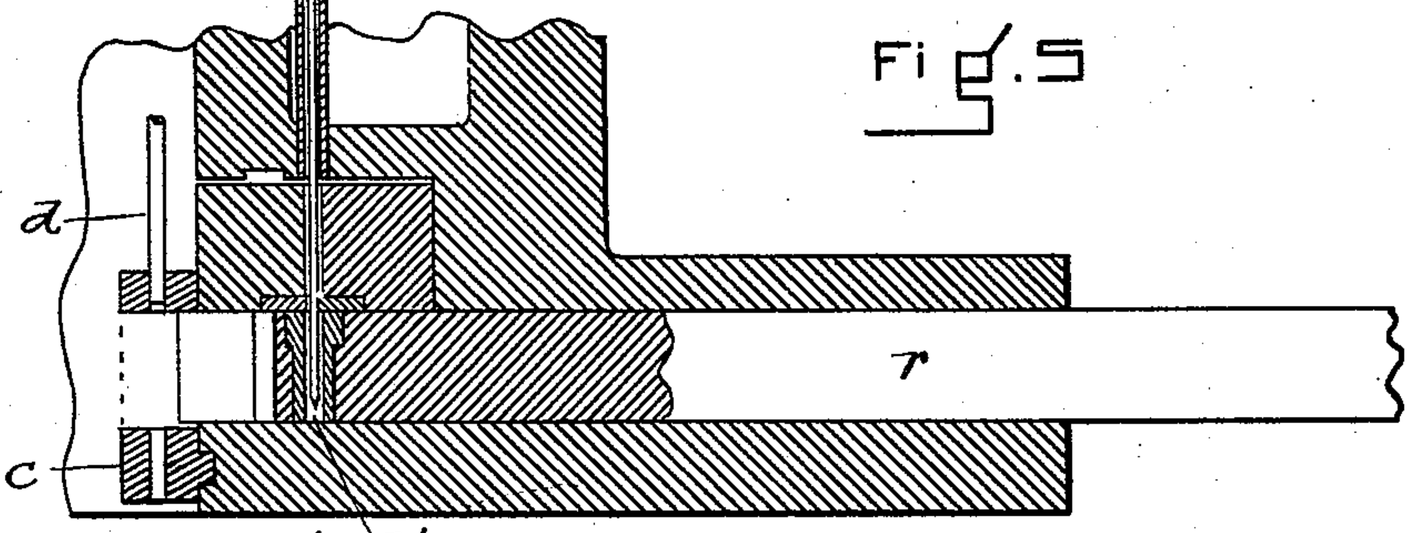

Fig. 6.

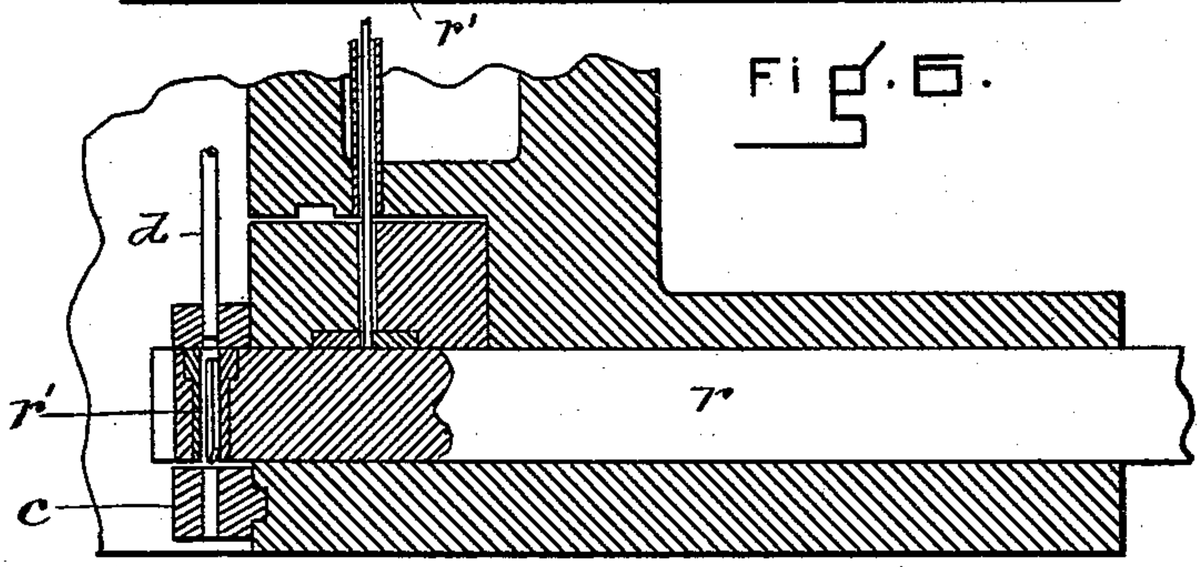

Fig. 7.

WITNESSES.
A. D. Hanson.
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(No Model.) 6 Sheets—Sheet 6.

T. BARRETT.

WIRE PEGGING MACHINE.

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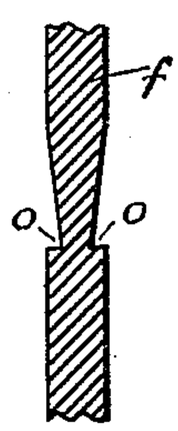

Fig. 8.

Fig. 9.

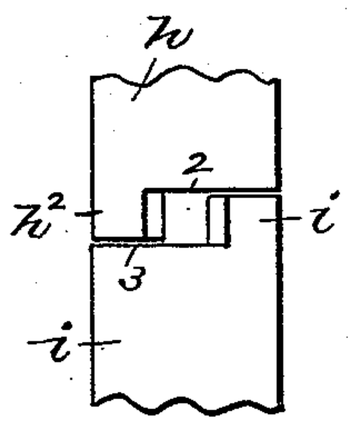

Fig. 11.

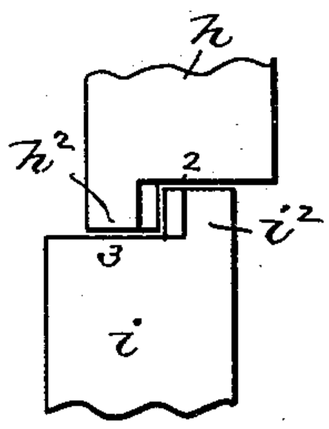

Fig. 10.

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Attys.

UNITED STATES PATENT OFFICE.

THOMAS BARRETT, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO BARRETT BROTHERS, OF SAME PLACE.

WIRE-PEGGING MACHINE.

SPECIFICATION forming part of Letters Patent No. 478,732, dated July 12, 1892.

Application filed May 26, 1891. Serial No. 394,107. (No model.)

To all whom it may concern:

Be it known that I, THOMAS BARRETT, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Boot or Shoe Nailing Machines, of which the following is a specification.

This invention relates to machines for making nails from continuous wire and driving the same into boot or shoe heels and soles; and it has for its object to provide a machine of this class with means for forming chisel-points on the nails by compression of the wire or material of which they are made instead of cutting away portions of said material.

The invention also has for its object to provide improved means for varying the length of the nails.

To these ends the invention consists in the improvements which I will now proceed to describe and claim.

In the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of a nailing-machine embodying my invention. Fig. 2 represents a front elevation of the same. Fig. 3 represents a section on line 3 3 of Fig. 1, looking toward the right. Fig. 4 represents a section on line 4 4 of Fig. 2 and a plan view of the parts below said line. Fig. 5 represents a section on line 5 5 of Fig. 1, looking toward the right. Fig. 6 represents a section on line 6 6, Fig. 4. Fig. 7 represents a section similar to Fig. 6, showing the nail-carrier in a different position. Fig. 8 represents an enlarged view of a portion of the wire, showing the manner of indenting the same to form the chisel-points of the nails. Fig. 9 represents a perspective view of said feed-regulating mechanism. Figs. 10 and 11 represent side views of the dies.

The same letters and numerals of reference indicate the same parts in all the figures.

In the drawings, *a* represents the supporting-frame of the machine, having bearings for the main driving-shaft *b*, said shaft carrying the various cams hereinafter referred to, which give motion to the operative parts of the machine.

c represents the throat, through which the nails formed by the machine are driven into the work, and *d* represents the driver, which is affixed to a vertically-reciprocating driver-bar *d'*. The driver-bar is elevated by means of a cam d^2 on the driving-shaft *b*, said cam co-operating with a roll d^3 on the driver-bar. A helical spring d^4 is provided to depress the driver-bar and give the driver its operative blow when the roll d^3 is released by the cam d^2. The lower end of said spring is affixed to a bracket d^5, affixed to the supporting-frame *a*, the engagement of said spring with the bracket being effected by screwing the lower convolutions of the spring into a helical groove or internal screw-thread formed in an orifice in said bracket, the convolutions of the spring constituting a screw-thread, which may be engaged with and withdrawn from the internal screw-thread in the bracket d^5 by giving the spring d^4 a rotary movement.

To the upper end of the spring d^4 is rigidly affixed a plug or nut d^6, having an internally-threaded bore, with which is engaged a set-screw d^7. Said set-screw extends downwardly through the spring and bears upon the upper end of the driver-bar *d'*, the latter projecting upwardly through the orifice in the bracket d^5. The set-screw d^7 may be adjusted by rotating it in the nut or plug d^6 so as to vary the tension or force of the spring d^4, the spring being normally formed to close or contract, and thus draw the set-screw downwardly against the driver-bar. Hence by turning the set-screw the nut or plug d^6 will be raised or lowered, as the case may be, thus expanding or contracting the spring. The nut or plug d^6 is prevented from turning accidentally upon the set-screw by means of a check-nut d^8.

The described means for connecting the spring d^4 to the frame of the machine and applying its force to the driver-bar are new with me, as I believe. It will be seen that by utilizing the convolutions of the spring as screw-threads to secure it to the supporting-frame I obtain a very secure and substantial connection of the spring, and enable a normally-closed spring to be employed, this form of spring being in many respects more desirable than a normally-open spring.

I do not limit myself to the employment of

the independent set-screw d^7 as the means for connecting the free upper end of the spring with the driver-bar, as in cases when the adjustment of the spring is not important the driver-bar may be extended upwardly to take the place of said set-screw, its upper end being engaged directly with the plug d^6.

The machine is provided with suitable mechanism for feeding and supporting the work presented to it; but as my invention relates, mainly, to the means for feeding the wire, for forming the chisel-points of the nails, for separating the nails from the continuous or main wire, and for carrying each nail forward into position to be driven I do not deem it necessary to describe in detail the parts of the machine not directly relating to my improvements, it being understood that the parts of the machine shown in the drawings and not specifically described are not of themselves parts of my invention.

e represents an intermittently-rotated feeding roll, which, in co-operation with a loose feed-roll *e'*, pressed toward said feed-roll *e* with a yielding pressure, feeds the wire *f* from a suitable reel supporting a coil of said wire through a fixed guide or tube *g* to the pointing-dies and carrier, hereinafter described. The feed-roll *e* is fixed to a shaft e^2, which is journaled in a fixed bearing in the frame of the machine, and is intermittently rotated by means hereinafter described to cause the roll *e* to alternately feed and arrest the wire.

h and *i* represent the pointing-dies, which are affixed, respectively, to slides *h'* and *i'*, adapted to move horizontally side by side in a guide or way in the supporting-frame, said slides being arranged close together, as shown in Fig. 4. The dies *h* and *i* are provided, respectively, with shoulders or projections h^2 and i^2, which are arranged so that they present two flat sides or faces at opposite sides of an opening between said shoulders, said sides or faces being beveled and arranged to act on opposite sides of the wire *f* when said wire is in the opening between the said shoulders. The slides *h'* and *i'* are moved simultaneously in opposite directions by means presently described, the dies *h* and *i* being thus caused to act simultaneously on the wire and alternately grasp and release the same, each slide being reciprocated so that the die carried by it is alternately moved toward and from the wire.

The preferred means for reciprocating the slides are as follows: *j* represents a rock-shaft, which is mounted to rotate in a fixed bearing *k* on the supporting-frame and is provided with two oppositely-arranged eccentrics *l* and *m*, which are rigidly affixed to said rock-shaft and are fitted in correspondingly-formed recesses in the slides *h' i'*, the eccentric *l* being in the slide *h'*, while the eccentric *m* is in the slide *i'*, as shown in Fig. 4. In speaking of the eccentrics *l* and *m* as "oppositely arranged" I mean that their relative arrangement is such that the greatest projection of one eccentric from the center of the rock-shaft is in the opposite direction to that of the greatest projection of the other eccentric, as shown in Fig. 3, so that when the rock-shaft is partially rotated one eccentric will move the slide with which it is engaged in one direction, while the other eccentric will move its slide in the opposite direction. It will be seen, therefore, that the dies *h* and *i* will alternately close upon and release the wire and that when they close upon the wire they form indentations *o o*, Fig. 8, in opposite sides of the wire, each indentation having a longer side, which is flat and diagonal to the length of the wire, and a shorter side, which is substantially at right angles with the length of the wire, said longer sides when the neck of wire left between the indentations is severed or broken, as hereinafter described, forming the sides of a chisel-point. The rock-shaft *j* is rocked or reversely rotated to give the slides and dies the described movements by means of an arm *p*, affixed to said rock-shaft, and a wheel or disk *q* on the driving-shaft *b*, said wheel or disk having a cam-groove *q'*, receiving a trundle-roll on the outer end of the arm *p*, said cam-groove being formed to oscillate the arm *p*. *r* represents a slide or carrier located below the dies *h* and *i* and adapted to slide back and forth in a guide or way in the frame *a* crosswise of the slides *h'* and *i'*, the upper surface of said carrier being in close contact with the under sides of the dies *h* and *i*. The carrier *r* is reciprocated by means presently described and is provided with a pocket *r'*, which when the carrier is at one extreme of its movement is directly under the opening between the acting portions of the dies *h i*, so that it receives the lower end of the wire projecting below said dies, as shown in Figs. 3 and 6. The carrier remains in said position while the wire is being fed by the feed-rolls and while it is being indented by the dies *h* and *i*, after which the carrier is moved to the position shown in Fig. 7. This movement of the carrier causes it to sever the neck of material left between the indentations *o o*, Fig. 8, in the wire, thus converting the portion of the wire within the pocket *r'* into a nail, the lower end of which had been previously pointed by the dies *h* and *i*. At the termination of the last-described movement of the carrier *r* the pocket *r'* registers with the orifice in the nail-throat *c* and with the driver *d*, so that when the driver descends it will eject the nail from the pocket and force it into the work held below said throat.

The means for reciprocating the carrier *r* are as follows: *s* represents a lever pivoted at *s'* to the supporting-frame *a* and having one arm engaged with two shoulders *t t* on the carrier *r*. The other arm of said lever has a trundle-roll s^2, which engages a cam-groove *u* in the wheel *u'* on the driving-shaft *b*. The lever *s* is oscillated by the rotation of said wheel and imparts a back-and-forth

movement to the carrier in a manner which will be readily understood.

The preferred means for intermittently rotating the feed-roll and for varying the extent of its rotation, and thus varying the length of the nails, are as follows: The shaft e^2 of the feed-roll e has affixed to it a ratchet e^3, with which an oscillating dog or pawl e^4 is engaged, said dog by its movements, hereinafter described, effecting an intermittent rotary movement of the ratchet and shaft, thus causing the feed-roll to feed the wire. The pawl e^4 is pivotally connected to an arm e^5, which is mounted to oscillate loosely upon the shaft e^2. e^6 represents an arm, which is also mounted loosely on the shaft e^2, and is connected at its outer end with a rod e^7, having a trundle-roll e^8, entering a cam-groove e^9 in a disk e^{10} on the driving-shaft b. Said arm e^7 has in its outer portion a slot e^{12}, which receives the driving-shaft b, the sides of said slot being in contact with the shaft, as shown in Fig. 5, so that the shaft guides the arm e^7 during the reciprocating movements that are imparted to it by the action of the cam-groove e^9 on the trundle-roll e^8. It will be seen that the rotation of the disk e^{10} causes the connecting-rod e^7 to reciprocate back and forth and thus oscillate the arm e^6. Said arm is connected by a spring e^{13} with a stud or pin e^{14} on the arm e^5, said spring being sufficiently stiff to impart to the arm e^5 the oscillating movements of the arm e^6 when there is no impediment or obstruction offered to the movement of the arm e^5, said spring yielding in the event of an impediment, so that the movement of the arm e^5 and of the pawl thereon may be stopped at any point in the movement of the arm e^6. e^{15} represents a movable stop or obstruction, which is a plug affixed to a lever e^{16}, which is mounted to swing loosely upon the shaft e^2. Said stop e^{15} is arranged so that one of its ends will abut against a shoulder e^{17} on the arm e^5 when the said arm is moving in the direction required to give the pawl e^4 a backward movement over the teeth of the ratchet e^3. When the shoulder e^{17} comes in contact with the stop e^{15}, the backward movement of the arm e^5 and the pawl thereon is arrested and the positively-oscillated arm e^6 completes its backward movement alone, the spring e^{13} yielding in a manner which will be readily understood. When the arm e^6 is moved in the opposite direction, it strikes an ear or projection on the arm e^5, and thus moves said arm and the pawl thereon positively forward to a given position, thus causing the pawl to impart a partial rotation to the ratchet and the feed-roll connected therewith. It will be seen, therefore, that the length of the feed-movement is determined wholly by the adjustment of the stop e^{15}, said stop covering the distance which the pawl is capable of moving back from the fixed position to which it is carried forward by contact of the arm e^6 with the ear e^{18}. The lever e^{16}, carrying the stop e^{15}, may be locked to hold said stop at any desired adjustment by means of a segmental block or gib e^{19}, carried by said lever and pressed by an adjusting-screw e^{20} against the segmental surface of a fixed flange e^{21} on the supporting-frame. By loosening the screw e^{20} the hold of the gib on said flange is released, when the lever may be freely moved in either direction to carry the stop e^{15} toward and from the forward limit of the movement of the pawl e^4. When the stop is adjusted, the screw e^{20} is turned inwardly and caused to rigidly bind the gib e^{19} upon the flange e^{21}. The flange e^{21} may have a series of marks or indentations suitably marked or numbered to indicate the length of nail that would be formed by any given adjustment of the stop e^{15}. It will be seen that the pawl e^4 is always in engagement with the ratchet. Hence there is not that liability of stripping the teeth of the ratchet which exists when the pawl is thrown out of engagement with the ratchet by a movable shield interposed between the ratchet and pawl, as in many forms of feed-adjusting mechanism now in use. When said shield is employed, the pawl has the same movement or travel in all cases and when abruptly brought into engagement with the teeth of the ratchet during its forward movement is very liable to break or strip the teeth with which it first comes in contact. This objection is entirely obviated by my improvement, in which the backward movement of the pawl varies, the pawl having no forward movement excepting that which takes place while it is engaged with the ratchet.

The general operation of the machine is as follows: The dies h and i being separated, as shown in Fig. 4, the wire is fed downwardly between said dies the required distance into the pocket r', the latter being in the position shown in Fig. 6. The dies are then closed upon the wire, thus forming the indentations o o therein, and while they remain thus closed the carrier r is moved to the position shown in Fig. 7, thus severing the nail from the wire and carrying said nail forward into position to be driven. The driver then descends and drives the nail and then rises, after which the carrier returns to the position shown in Fig. 6. When the carrier reaches the last-named position, the dies are opened and the wire is again fed downward, and thus the operation is continued. It will be seen that by compressing the wire to form a chisel-point I obtain a point which is stronger and less liable to break than one which is formed by cutting away portions of the opposite sides of the wire for the same purpose. I also avoid the waste of metal involved by cutting away the wire and the objectionable presence of the cuttings or chips thus removed, said cuttings being sharp and in the nature of splinters and liable to become lodged in various parts of the boots or shoes nailed by the machine. The dies h i are provided with inclined faces 2 3, as shown in Figs. 10 and 11, arranged to relieve or release the wire when

the dies are separated. When the dies are closed and indent the wire, the indented portion is crowded against the faces 2 3, and as the dies open said faces recede from the wire, so that there is no resistance to the separation of the dies caused by the binding of the wire on the faces 2 3. The dies *h i* may be adjusted to vary the thickness of the neck of metal left between the indentations *o o*, and therefore the thickness of the point which is formed by severing or breaking said neck. This adjustment is permitted by making the shaft *j* rotatable independently in the arm *p* and providing means for securing the shaft to said arm with the cams *l m* in different positions, so that when the arm *p* is in the position it occupies when the dies are at their closest approach to each other said dies may be more or less widely separated, as may be desirable. The means here shown for effecting this result are shown in Fig. 4 and comprise a screw-thread formed on the shaft *j*, an internally-screw-threaded socket p^5, formed in the arm *p* and engaging the screw-thread of the shaft, and a jam-nut *x*, screwed onto the shaft *j* and adapted to bear against one side of the arm *p*. When the shaft *j* is turned to the desired position, it may be secured by turning the nut *x* against the arm *p*, the nut being loosened when the shaft is being turned.

I claim—

1. In a nailing-machine, the combination, with a wire-feeding and nail-driving mechanism, of a pair of dies having flat beveled coacting faces arranged to act on the wire and form indentations in its opposite sides and having guide-faces at a substantial right angle to the indenting-faces, a reciprocating carrier arranged when at one end of its movement to receive the end of the wire below said dies, and means for reciprocating said carrier, whereby it is caused to sever said end from the body of the wire at the point of indentation by said dies, the severed end constituting a nail, and to carry said nail into position to be driven, as set forth.

2. In a nailing-machine, the combination, with wire-feeding and nail-driving mechanism, of a pair of dies having flat beveled coacting faces arranged to act on the wire and form indentations in its opposite sides and having guide-faces at a substantial right angle to the indenting-faces, mechanism for reciprocating said dies simultaneously in opposite directions, and thus cause the dies to alternately grasp and release the wire, and a reciprocating carrier which receives the end of the wire below said dies and by one of its movements severs said end from the wire as a completed nail and moves said nail laterally into position to be driven, as set forth.

3. In a nailing-machine, the combination, with wire-feeding and nail-driving mechanism, of the two slides *h' i'*, arranged side by side in a guide or way in the supporting-frame, said slides having flat-faced indenting-dies arranged to act simultaneously on opposite sides of a wire between said slides and having, also, guide-faces at a substantial right angle to the indenting-faces, a rock-shaft journaled in a fixed bearing and provided with two eccentrics, one of which is engaged with the slide *h'* and the other with the slide *i'*, said eccentrics being oppositely arranged, so that each movement of the rock-shaft causes the eccentrics to move the slides simultaneously in opposite directions, and means for rocking or oscillating said shaft, whereby the dies carried by said slides are caused to alternately approach and recede from each other, as set forth.

4. In a nailing-machine, the combination, with wire-feeding and nail-driving mechanism, of the slides *h' i'*, having dies provided with flat indenting-faces and side faces for guiding the wire and relatively arranged as described, the rock-shaft journaled in a fixed bearing and provided with two oppositely-arranged eccentrics, one engaged with the slide *h'* and the other with the slide *i'*, an arm affixed to said rock-shaft, and means, substantially as described, for oscillating said arm, and thereby causing the rock-shaft and its eccentrics to reciprocate the slides and their dies simultaneously in opposite directions, as set forth.

5. In a nailing-machine, the combination, with wire-feeding and nail-driving mechanism, of the point-forming flat-faced indenting-dies adapted to simultaneously indent opposite sides of the wire and having lateral guides for the wire, the carrier *r*, movable in a guide or way in the supporting-frame and having a pocket formed to receive the end of the wire projecting below said dies, a lever pivoted to the frame of the machine and engaged at one end with shoulders or projections on said carrier, and a cam on the driving-shaft of the machine engaged with the other end of said lever, as set forth.

6. In a nailing-machine, the combination of the driver-bar, the supporting-frame having an internally-screw-threaded or helically-grooved orifice surrounding the driver-bar, the normally-closed helical spring having the convolutions of its lower portion engaged with the thread or helical groove in said orifice, and connections between the free upper portion of said spring and the driver-bar, as set forth.

7. In a nailing-machine, the combination of the driver-bar, the supporting-frame having an internally-screw-threaded or helically-grooved orifice surrounding the driver-bar, the normally-closed helical spring having the convolutions of its lower portion engaged with the thread or helical groove in said orifice, a nut or plug affixed to the free upper end of said spring, and a screw adjustably engaged with said nut or plug and bearing on the driver-bar, as set forth.

8. In a nailing-machine, the combination, with a feed-roll, its shaft, and a ratchet on said shaft, of an arm loosely mounted on said

shaft and provided with a pawl engaged with said ratchet, another arm loosely mounted on said shaft and positively oscillated by the power of the machine, a yielding connection between the pawl-carrying arm and the positively-oscillated arm, whereby the latter is enabled to move independently of the former, and a movable stop arranged to abut against a shoulder on the pawl-carrying arm during the backward movement of the latter, and thereby arrest said movement, so that the backward movement of the pawl may be arrested at any desired point, the pawl remaining in engagement with the ratchet, as set forth.

9. In a nailing-machine, the combination, with a feed-roll, its shaft, and a ratchet on said shaft, of an arm loosely mounted on said shaft and provided with a pawl engaged with said ratchet, another arm loosely mounted on said shaft and positively oscillated by the power of the machine, a yielding connection between the pawl-carrying arm and the positively-oscillated arm, whereby the latter is enabled to move independently of the former, a movable stop arranged to abut against a shoulder on the pawl-carrying arm during the backward movement of the latter, a swinging arm carrying said stop, and means for locking said arm and stop in any position to which they may be adjusted, as set forth.

10. The combination, with the loosely-mounted pawl-carrying arm e^5, having the shoulder e^{17}, of the stop e^{15}, the swinging arm e^{16}, carrying said stop, the fixed segmental flange e^{21}, the movable gib e^{19} on the arm e^{16}, and the screw e^{20}, adapted to adjust said gib, as set forth.

11. The combination of the loosely-mounted pawl-carrying arm e^5, having the shoulders e^{17} and e^{18}, the positively-oscillated arm e^6, arranged to bear on the shoulder e^{18} during its forward movement, and thereby carry the pawl-carrying arm forward to a given position, the spring e^{13}, connecting the arms e^6 and e^5, and the adjustable stop e^{15}, arranged to strike the shoulder e^{17} and arrest the backward movement of the pawl-carrying arm, as set forth.

12. In a nailing-machine, the pointing-dies h i, having the acting shoulders h^2 i^2, and inclined faces 2 3, combined with means for closing and opening said dies, as set forth.

13. In a nailing-machine, the combination of the dies h i, the slides h' i', holding said dies, the rock-shaft having the oppositely-arranged eccentrics engaged with said slides, and means, substantially as described, for adjusting said shaft to vary the thickness of the nail-point, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 21st day of April, A. D. 1891.

THOMAS BARRETT.

Witnesses:
C. F. BROWN,
EWING W. HAMLEN.