(No Model.) 6 Sheets—Sheet 1.

E. E. BEAN.

PEGGING MACHINE.

No. 342,278. Patented May 18, 1886.

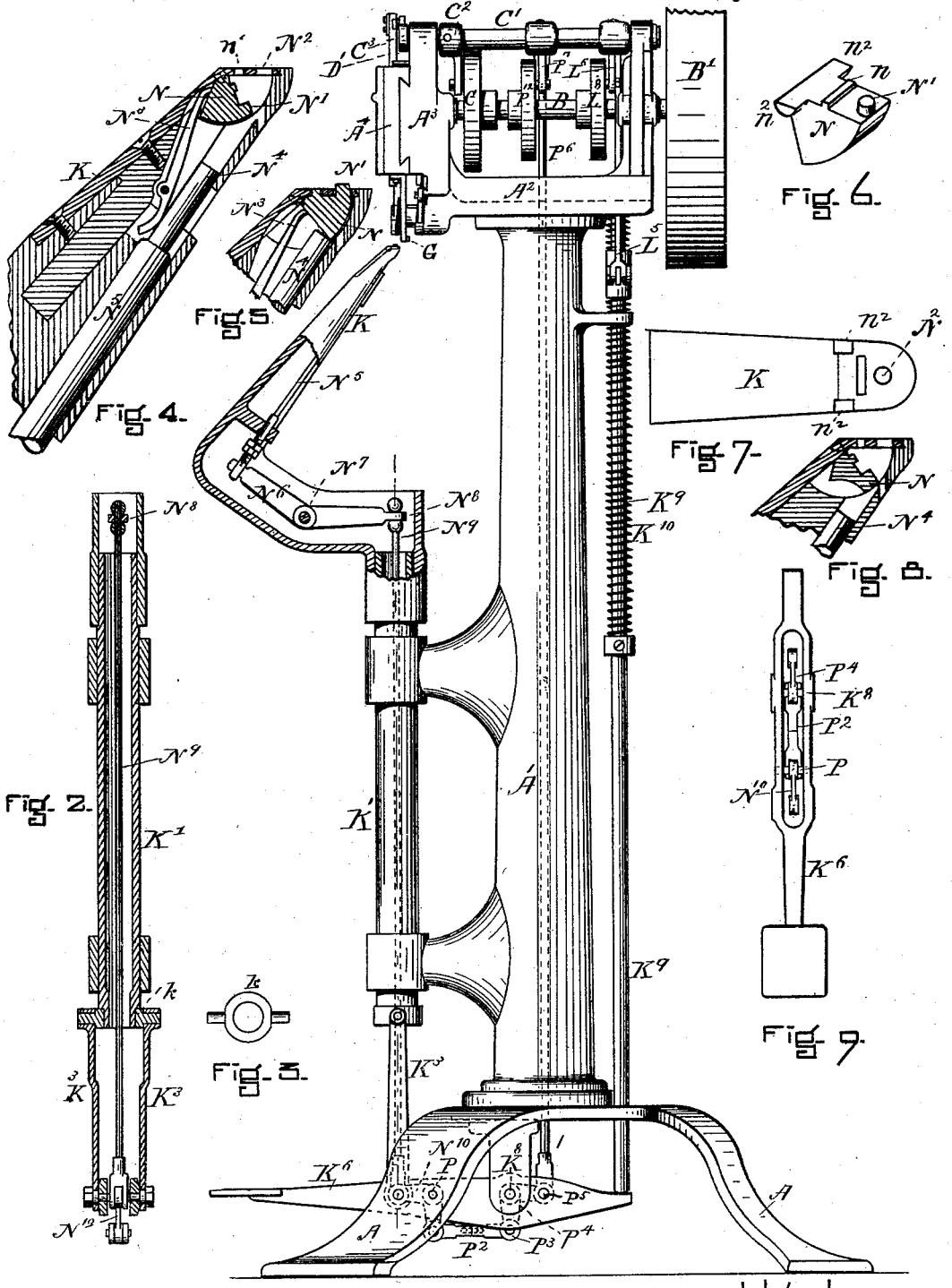

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

WITNESSES.

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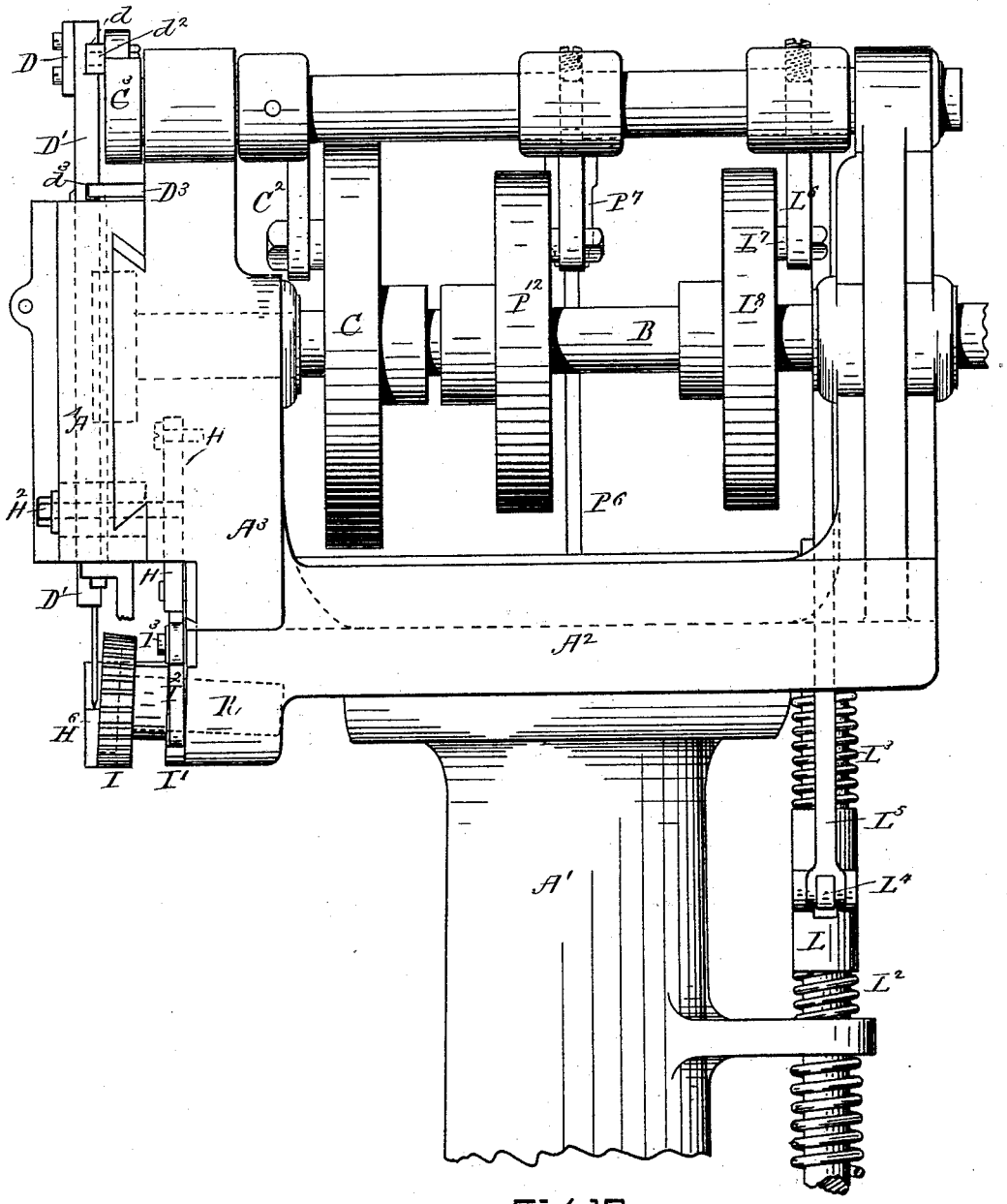

Fig. 10.

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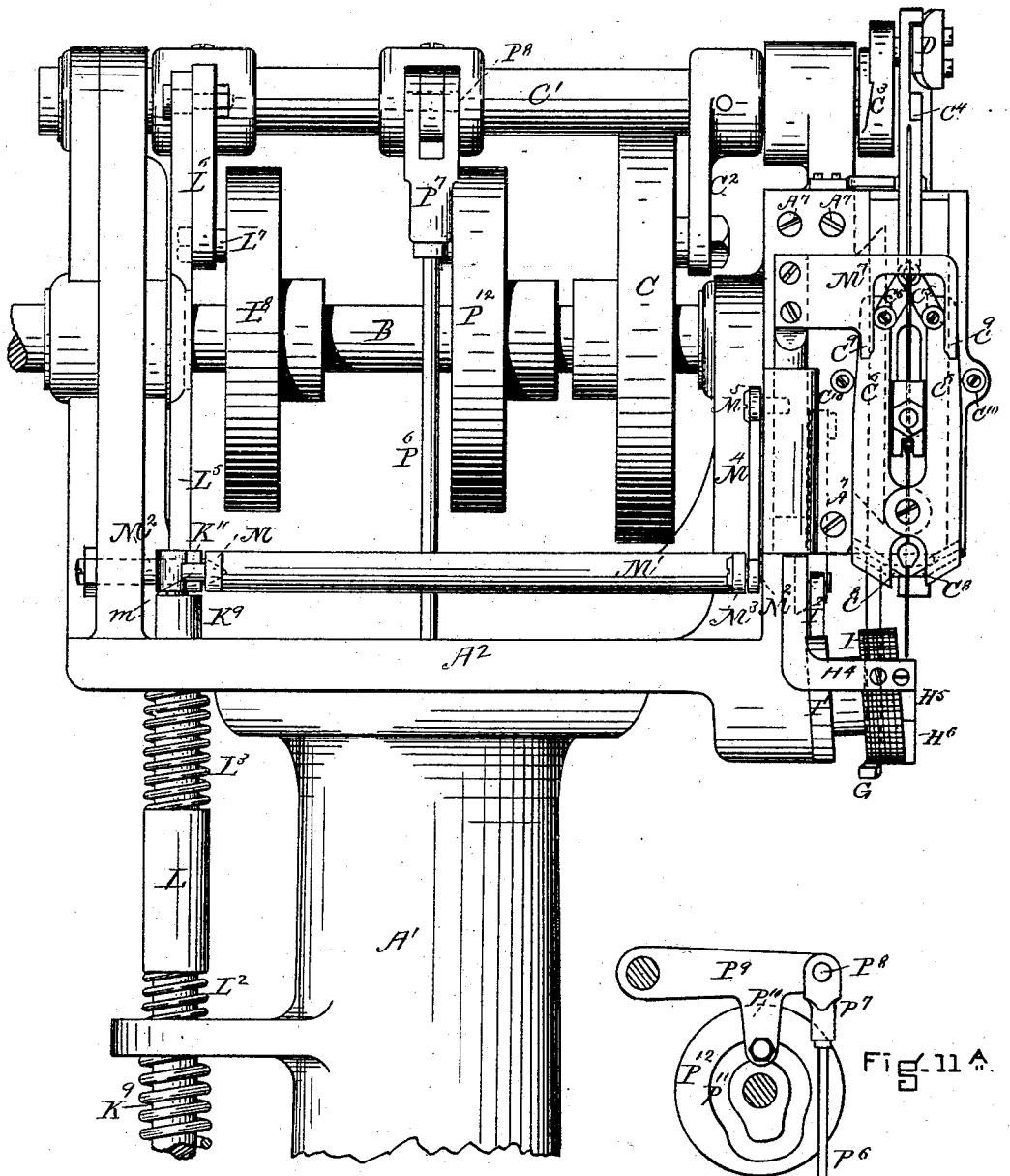

Fig. 11.

Fig. 11 A.

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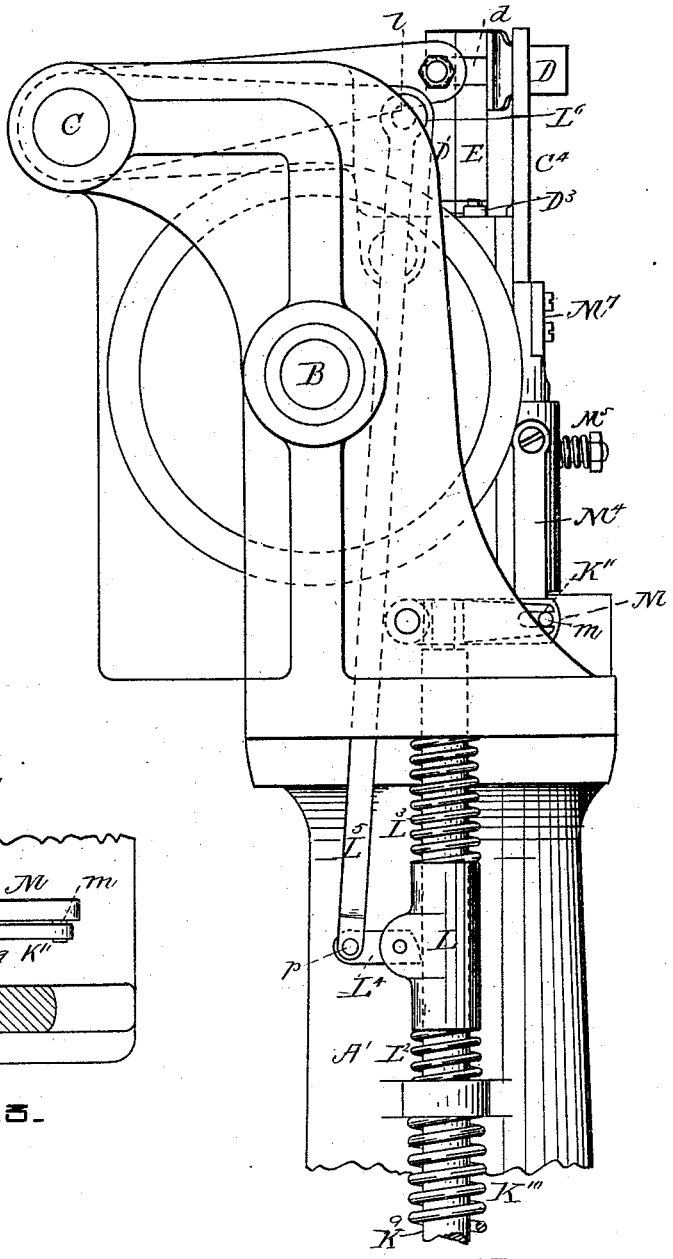

Fig. 12.

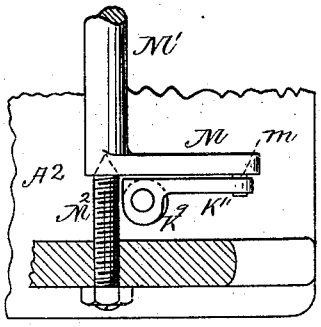

Fig. 13.

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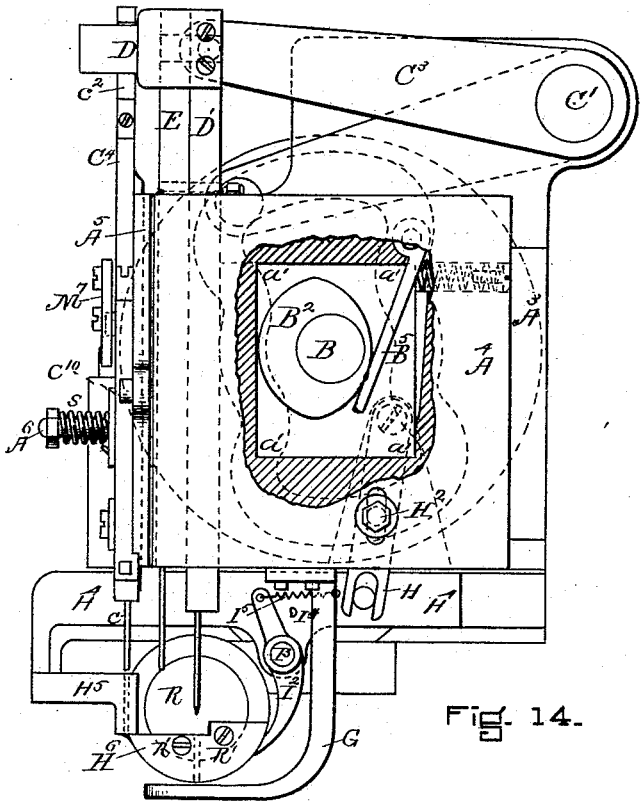

Fig. 14.

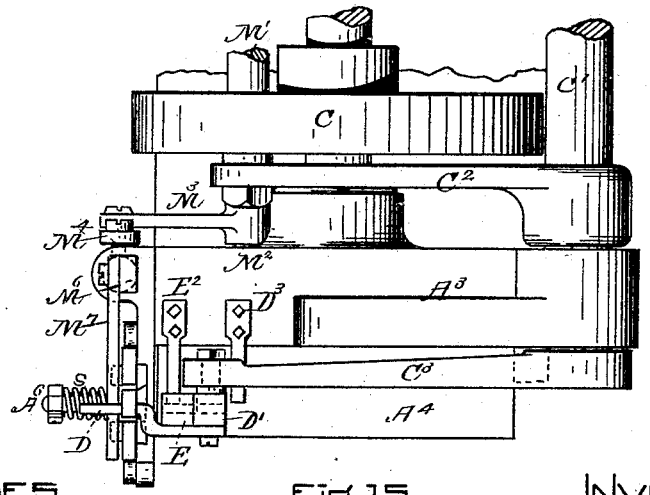

Fig 15.

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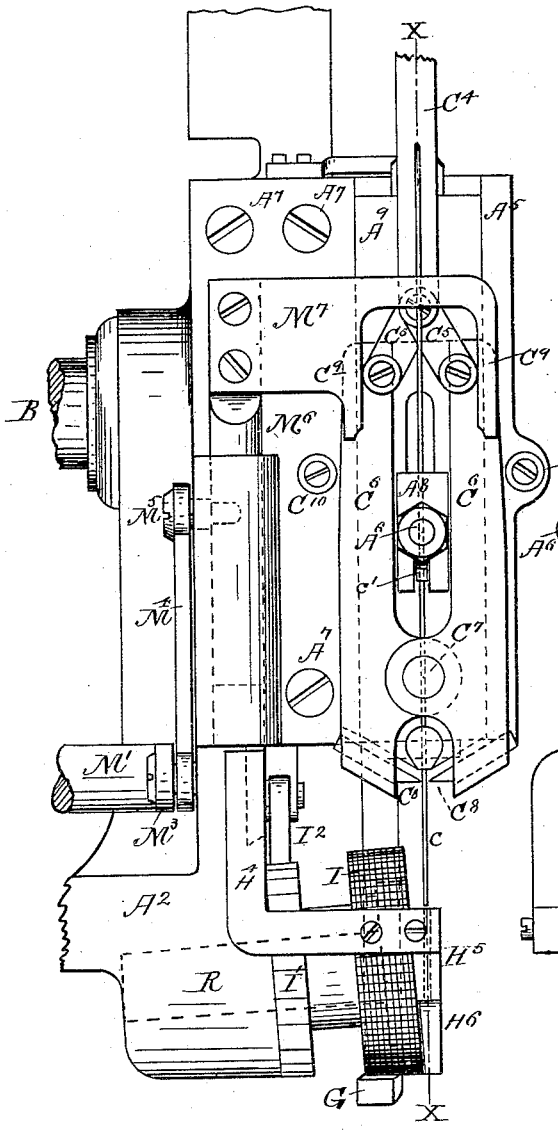

Fig. 16.

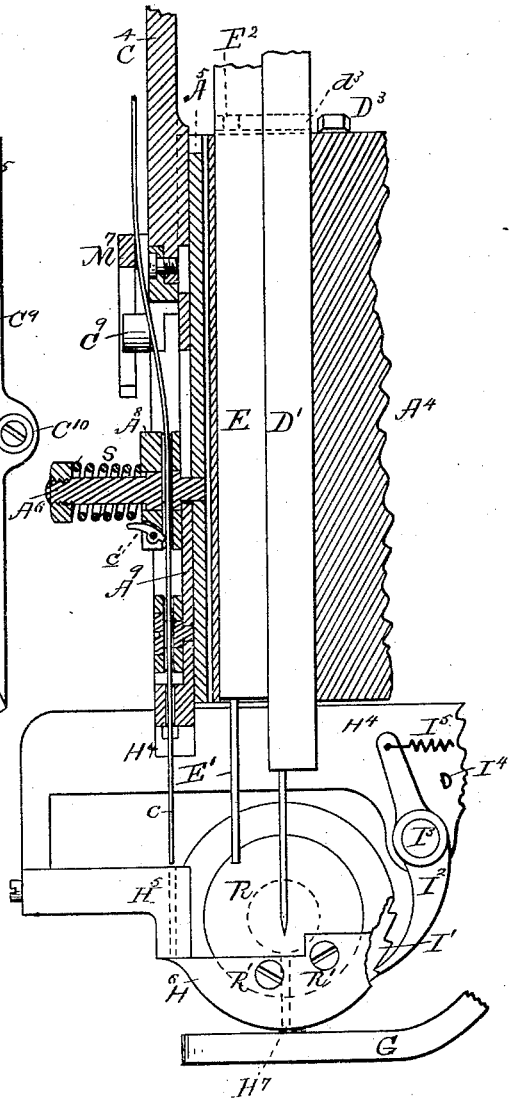

Fig. 17.

WITNESSES

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UNITED STATES PATENT OFFICE.

EDWIN E. BEAN, OF BOSTON, MASSACHUSETTS.

PEGGING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 342,278, dated May 18, 1886.

Application filed November 3, 1884. Serial No. 147,119. (No model.)

To all whom it may concern:

Be it known that I, EDWIN E. BEAN, of Boston, in the county of Suffolk and State of Massachusetts, a citizen of the United States, have invented certain new and useful Improvements in Pegging-Machines, of which the following is a specification.

My present invention relates to improvements in pegging-machines for boots and shoes, substantially of the character shown in Letters Patent No. 135,681, to Erastus Woodward; and it consists in improvements of machinery of that character, whereby its efficiency and usefulness are increased.

In machines of this class the work is held or supported on what is called a "horn," this horn being adapted to be swung partially or entirely around, so as to present all parts of the work successively to the action of the machine.

In the operation of the machine a hole is first punched in the work and a wire peg is cut off by the machine to a certain length from a longer piece of wire. Then this peg is carried over to and driven in the hole and there headed, clinched, or set, so as to make a secure and firm fastening. Finally, the work is fed along a proper distance for the next hole to be punched.

My present invention relates mainly, first, to improvements in the apparatus for feeding the wire and cutting off the peg; second, to improvements in the apparatus for carrying the cut peg under the driver and driving it; third, to improvements in the mechanism whereby the necessary motions are given to the punching and driving tools, and, fourth, to improvements in the construction of the machine whereby a clinching or heading of the peg on the inside is accomplished in a more effective manner than before.

Figure 1 is a side elevation of my machine. Figs. 2, 3, 4, 5, 6, 7, 8, and 9 are details of different parts. Fig. 10 is an enlarged side view of the upper part, taken from the same side that Fig. 1 is taken. Fig. 11 is an enlarged side view of the upper part, taken from the side opposite to that of Figs. 1 and 10. Fig. 11^a is a detail showing the cam and its immediate adjustments for operating the heading device. Fig. 12 is an enlarged rear view of the upper part of my machine. Fig. 13 is a detail. Fig. 14 is an enlarged front view of the upper part of my machine, a part of the sliding plate being cut out, so as to show the recess on its rear side and the cam that works it. Fig. 15 is a plan view of a part of the head of the machine. Fig. 16 is an enlarged side view of a part shown in Fig. 11, and relates particularly to the wire feeding and cutting-off mechanism. Fig. 17 is a section on line *x x* of Fig. 16.

The shaft B is the main source of power in the machine, power being applied through the pulley B′. The up-and-down motion of the awl, the carrier D′, which is also connected with and moves up and down the mechanism for feeding and cutting off the peg-wire, and of the driver and driver-bar E E′ is derived from a rocker arm or lever, C^3, mounted on the auxiliary rocker-shaft C′, which is rocked from the main shaft by the lever C^2, working in a cam groove on the wheel-cam C. This is best indicated by dotted lines in Fig. 14. The to-and-fro motion of the awl and driver, whereby each is brought successively over the work at the point where the peg is to be driven, is obtained by mounting them in a sliding carriage or plate, (best shown at A^4, Fig. 10,) which is slid back and forth by a cam, B^2, mounted on and driven by the main shaft, also by means of a lever, H, operated by the motion of the plate A^4, and connected at its outer or moving end with a second sliding plate, H^4. This second plate, which is perforated at H^5 to receive the cut peg and acts as a carrier for it, is brought up to and carried back from the proper point over the work to deliver the peg in place under the driver to be driven into the hole previously formed by the awl, and is then carried back to receive another peg. The heading or clinching action, which should occur simultaneously with the driving of the peg, is also obtained from the main shaft B by means of the cam-wheel P^{12}, lever P^9, (see Fig. 11^A,) mounted on the auxiliary shaft C′, connecting-rod P^6, and system of bell-crank levers, (best shown in Fig. 1,) causing a moving anvil or clincher, M, to come up through the horn and meet the inner end of the peg, thereby clinching it.

The timing of the machine is as follows:

The first operation is the feeding of the wire and cutting off of the peg, and simultaneously the punching of a hole through the work; second, the withdrawal of the awl and the return of the peg-feeding mechanism to its highest point; third, the lateral movement of the awl, driver, and cut peg, whereby the awl is moved away from its position over the hole in the work, which is taken in turn by a carrier containing the cut peg, the driver at the same time being brought into a position immediately over the peg to drive it into the work; fourth, the driver descends, and at the same time the clincher ascends to drive and clinch the peg, after which the driver is raised or withdrawn; fifth, the peg-carrier, awl, and driver are returned to their original positions, and the work is simultaneously fed forward a distance corresponding to the interval between two pegs.

I will first describe the mechanism for feeding the peg-wire and cutting off the peg, and also in connection with it the device whereby I insure the automatic regulation of the length of each peg to correspond with the thickness of the work at that point where the peg is to be driven. The bar C^4, Figs. 14 and 16, as it ascends, acting through the toggle C^5 C^5, Fig. 16, causes the levers C^6 C^6, which swing upon a pivot, C^7, to open the jaws C^8 C^8, and thus be freed from the wire. Now, the continued motion (the wire being held by a friction-pawl, c', Figs. 16 and 17) of the bar C^4 will draw the jaws C^8 C^8 up to the required distance for a feeding-down action. This feeding-down action is effected by the movement of the arm D, which is secured to the awl-bar D′, Fig. 14, the end of which passes into a slot, c^2, in the bar C^4, and thus causes the said bar C^4 to move up and down with the awl-bar D′, except that in the beginning of the downward stroke the bar C^4 does not begin to move, as the slot c^2 is longer than the arm D is wide. In other words, I have provided what is called "lost motion." As the bar C^4 moves down, it, acting through the toggle C^5 C^5, moves the levers C^6 C^6 downward without closing the jaws C^8 C^8, as the guides C^9 C^9 on the adjustable plate M^7 prevent this action; but as soon as the lower ends of the toggles C^5 C^5 have descended below the guide-pieces C^9 C^9, then they are free to open the levers C^6 C^6, and thus cause the jaws C^8 C^8 to grasp the wire sufficiently to feed it downward. This grasping pressure remaining the same until the upper ends of the levers C^6 C^6 have passed below the studs C^{10} C^{10}, then the levers C^6 C^6 are free to be expanded by the toggle action of the toggles C^5 C^5, and thus close the jaws C^8 C^8 with different motion to cut off the wire. The function of the guide-pieces C^9 is to regulate the feeding of the peg-wire just the proper distance to give a peg which shall correspond in length with the thickness of the work at the point where it is to be driven, and I will now describe the mechanism by which this is accomplished. As has been said, the gripping action of the levers C^6 will not come into play until they have passed beyond the guides C^9. These guides are connected through the plate M^7 with a sliding rod, M^6, operated by a link, M^4, worked from a rocker-shaft, M′, which in turn is rocked by an arm, K^{11}, attached to and driven by a connecting-rod, K^9. This is illustrated in Figs. 1, 11, and 16. The lower end of this connecting-rod K^9 is carried upon one arm of a lever, K^6, the other end of which carries the standard K′, by which the horn K, which carries the work, is raised and lowered. (See Fig. 1.) It is therefore obvious that through the connections described the amount of depression of the horn K from its highest position to correspond to the thickness of the work produces a corresponding amount of elevation of the guides C^9, and therefore a corresponding regulation of the height at which the feeding of the peg-wire begins, and consequently the length or extent of such feed.

From the above it may be seen that the length of the wire fed down at each motion is governed by the distance of the guides C^9 C^9 above the studs C^{10} C^{10}, since the grasping action takes place when the toggles are released from the guides C^9 C^9, and the cutting-off action takes place when the upper ends of the jaws C^6 C^6 have passed below the studs C^{10} C^{10}. This feeding and cutting-off mechanism slides in a groove made in the piece A^5, Figs. 16 and 17, which is secured to the main frame of the machine by screws A^7 A^7 A^7, Fig. 16. This fixed piece serves also to hold the stud A^6 in a fixed position. This stud A^6, in combination with the spring S, holds the friction-block A^8 against the sliding plate A^9 and presses it (the sliding plate A^9) against the fixed way A^5, so that the whole wire feeding and cutting mechanism is held in place, unless forcibly acted upon by the positive motion of the machine.

The same downward movement of the lever C^3 which feeds and cuts a peg drives the awl through the stock to form a hole. This is accomplished by the following mechanism: The outer end of the lever C^3 carries a pin, d^2, and when by the movement of the plate A^4, as above described, the awl-bar D′ has been brought in position to drive the awl through the work to punch the hole, this pin d^2 lies within a slot, d, in the awl-bar, which is arranged to slide vertically up and down through the plate A, which carries it. The machine being so timed that the awl-bar is up when the feeding of the wire begins, the same downward motion of the lever C^3 which causes the feeding and cutting off drives the awl-bar down through the work, and the upward motion of the lever C^3 withdraws it from the work. The hole now having been punched and peg cut off, the next operation is to convey the latter, and also the driver E′, to a position where they shall be in a line over the punched hole, so that the descent of the driving-bar shall drive the peg. The peg, when cut, enters a slot or hole, H^5, in the slide H^4.

The same motion which carries the awl out of place and the driver into place over the punched hole in the stock also (by reason of the action above mentioned, through the lever H, attached to the plate A^4) carries the slide H^4 over and upon a fixed base-piece or guide, H^6, until the hole H^5 stands over a similar hole, H^7, in the piece H^6, (see Fig. 17,) through which the awl has descended to punch the hole in the work. Then the descent of the driver-bar E drives the cut peg into the work, and the simultaneous ascent of the clinching-block N clinches or heads the peg on the inside.

I will now describe the mechanism by which this motion of the driver-bar and clincher-block is obtained. The driver-bar E, like the awl-bar D', is arranged to slide vertically in the plate A^4. The driver-bar is provided with a slot matching the slot d^3 in the awl-bar, before described. The lateral motion of the plate A^4 which brings the driver-bar in position over the hole in the work also brings the slot in the bar into engagement with the pin d^2 on the lever C^3. Consequently the second stroke of this lever C^3 depresses and raises the driver-bar in the same way that the first operated the awl. During the operation of the driver-bar, however, the wire-feeding mechanism is at rest, being disconnected from the lever C^3.

Simultaneous action of the clincher N is accomplished in the following manner: In operation the boot or shoe is placed upon the upper end of the horn K, with the edge under the feed-wheel I and against the gage G, and there held by the pressure of the spring K^{10}, acting through the rod K^9, foot-lever K^6, and links K^3 K^3, attached to the collar *k*, Figs. 1, 2, and 3, and standard K'. The upper end of this horn K adjusts itself to the thickness of the sole, but is not held rigidly in its vertical position, except when the shoe is being acted upon by the awl, peg inserting or heading operation. When these are all accomplished, then the horn is freed, so that the shoe-feeding motion may take place. The mechanism for thus fastening and freeing the horn consists in a device which locks and unlocks the rod K^9, this rod K^9 controlling the horn through the foot-lever K^6. This mechanism consists of a collar, L, Fig. 12, which surrounds the rod K^9, and is held with a slight elasticity by means of springs L^2 and L^3, so that its motion is very limited. The object of allowing this limited motion of the collar L is to prevent an absolutely abrupt check of the motion of the horn. When the grip-lever L^1 is raised up, the rod K^9 can move freely up and down, subject only to the action of the spring K^{10}, Figs. 1 and 10; but when the grip-lever L^1 is thrown down it causes the collar L to seize upon the rod K^9, and thus hold it, and through it the horn K. Motion is given to the grip-lever L^1 by means of the link L^5, which is pivoted to it by the pin *p*. The upper end of the link L^5 is attached to a lever, L^6, by a pin, *l*, Figs. 11 and 12, which in turn is operated by the cam L^8, which acts through the pin L' and gives the desired movement to the lever L^6.

I will now describe the heading device. This consists of a quadrant-shaped block of metal, N, which swings on trunnions n^2 n^2, Figs. 4 and 6, and is provided with a projection, N', the upper end of which projects through the opening N^2, Fig. 4, so that it may come flush or slightly above the upper surface of the horn. *n* is a ridge formed on the piece N, and is intended to fit in the groove *n'*, Fig. 4, so as to form a steady-piece. N^3, Figs. 4 and 5, is a lever, the upper end of which rests against the back or under side of the hammer-piece N, and is so proportioned that when the small part N^4 of the hammer-rod N^5 is in the position shown in Fig. 4 it will allow the hammer-piece N to fall back, as shown in Fig. 4; but when the hammer-rod N^5 moves upward it will throw the lower end of the lever N^3 backward and the upper end forward, so as to throw the hammer-piece N nearly into the position shown in Fig. 5—that is, into such a position that the hammer-rod N^5 N^4 can come immediately under it and give it a sufficient blow to head the peg. Motion is communicated to the hammer-rod N^4 N^5 by the lever N^6, which swings on the pin N^7. The end N^8 of the lever N^6 is connected to the rod N^9 by nuts, which allow the horn to swing without turning the rod N^9. This rod N^9 is attached to a lever, N^{10}, swinging upon the pivot P in the foot-lever K^6. (See Figs. 1 and 9.) The lower end of the bell-crank lever N^{10} is connected by a link, P^2, and a pivot, P^3, to the lever P^4, which swings upon a pivot, K^8, which serves for both the foot-lever K^6 and the bell-crank lever P^4. To the end of the lever P^4, I attach, by means of the pin P^5, a vertical rod, P^6, which passes up through the center of the main standard A' of the machine. The mechanism for operating this rod P^6 is shown in Fig. 11^A. The upper end of the rod P^6 is attached by a forked piece, P^7, and the pin P^8 to the lever P^9. This lever P^9 has attached to its lower part a projection, P^{10}, which works in a cam-groove, P^{11}.

Instead of permitting the hammer or clincher N to swing so far back as to require a special part—such as N^3—to bring it into place, I form it, as shown in Fig. 8, with a shoulder to arrest its motion when it is swung sufficiently far back to be out of the way of the awl, and yet while it is still within the line of motion of the hammer-rod. This is one of several modifications that may be made in the mechanical embodiment of this part of my invention, which I believe to consist, broadly, in combining with the hollow horn swinging in a circle around its standard an interiorly-located hammer or clincher, which is so constructed that it may be brought up every time squarely upon the end of the peg and in direct opposition to the downward blow of the peg-driver. In all previous devices of this character the construction has been such that at certain portions of the work, owing to the angle at

which the hammer or clincher was presented to the head of the nail, it has been impossible to give any other than a glancing blow, and in consequence the work has been very imperfectly performed. By my present invention I entirely obviate this difficulty, and thereby furnish an important improvement in machines of this class.

The final operation is to feed the work along into place for the next hole to be punched, and I will now describe the mechanism for doing this: I represents the feed-wheel, which is operated by a ratchet, I′, and pawl I^2, Figs. 16 and 17, the pawl I^2 being attached to the slide H^4 by a pivot, I^3, and operated by a spring, I^5, Figs. 14 and 17, and limited in its motion by a check-block, I^4, Fig. 17. G, Fig. 14, is a guide and an auxiliary feeding device, it being attached to the sliding plate A^4, so as to slide forward at the same time, although not in accord with the feed-wheel I—that is, the friction on the guide G will not be so much as though it were a stationary guide, the slip being reduced about one-half.

To retain the awl-bar D′ and driver-bar E in their highest position when not in engagement with the pin d^2 on the lever C^3, a pair of ribs or projections, E^2 D^3, are provided, one of which, D^3, enters the slot in the awl-bar D′, and holds it up when the driver-bar E is engaged by the pin d^2, and the other of which, E^2, enters the slot in the driver-bar E, and holds it up while the awl-bar is being held up by the same pin. The location and arrangement of this detail are best shown at Fig. 17.

I claim—

1. The combination, with the revoluble horn K, having its upper or working face perforated, of an interiorly-located hammer or clincher pivoted thereto, and arranged to swing into and away from the perforation in the horn, as set forth.

2. The combination of the horn K, having a perforated working-face, a swinging hammer or clincher, N, and a hammer-rod for operating the swinging hammer or clincher, as set forth.

3. The combination of the horn K, swinging hammer-piece N, lever N^3, and hammer-rod for operating the swinging hammer, as set forth.

4. The combination of the levers C^2 and C^3, mounted upon the common shaft C′, with the sliding plate carrying the awl and driver bars, as set forth.

5. The combination, with the lever C^2, of the plate A^4, carrying the awl and driver bars, the lever H, and peg-carrying plate H^4, whereby a simultaneous to-and-fro movement of the awl, driver, and peg-carrier is obtained, substantially as set forth.

6. The combination, with the horn K and its support or standard K′, of the lever K^6, carrying the standard and connecting rod K^9, rock-shaft M′, vertically-movable guides C^9, and rocker-arms connecting the rock-shaft with the connecting-rod K^9, and also with the vertically-movable guides C^9, whereby motion of the horn up or down will produce similar motion of the guides C^9, all substantially as set forth.

7. The combination of a toggle-bar, C^4, the toggle C^5, the pivoted grippers and cutters C^6, and the stud A^6, whereby the continued motion of the toggle-bar operates to press the grippers against the peg-wire to feed and cut the peg.

8. The combination of the sliding plate A^4, lever H, sliding-plate carrier H^4 H^4, and perforated supporting-plate H^6, as set forth.

9. The combination of the hammer-rod N^4 N^5, lever N^6, connecting-rod N^9, lever N^{10}, adjustable link P^2, lever P^4, connecting-rod P^6, lever P^9, and cam P^{12}, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 31st day of October, A. D. 1884.

EDWIN E. BEAN.

Witnesses:

CHAS. SPAULDING,

ALBERT D. GROVER.