2 Sheets—Sheet 1

J. E. CRISP.

Pegging-Machine.

No. 221,785. Patented Nov. 18, 1879.

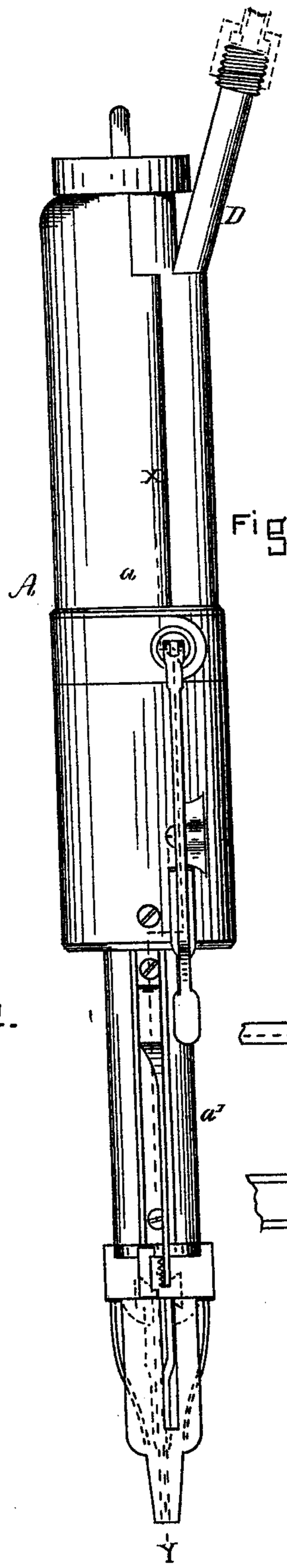

Fig. 1.

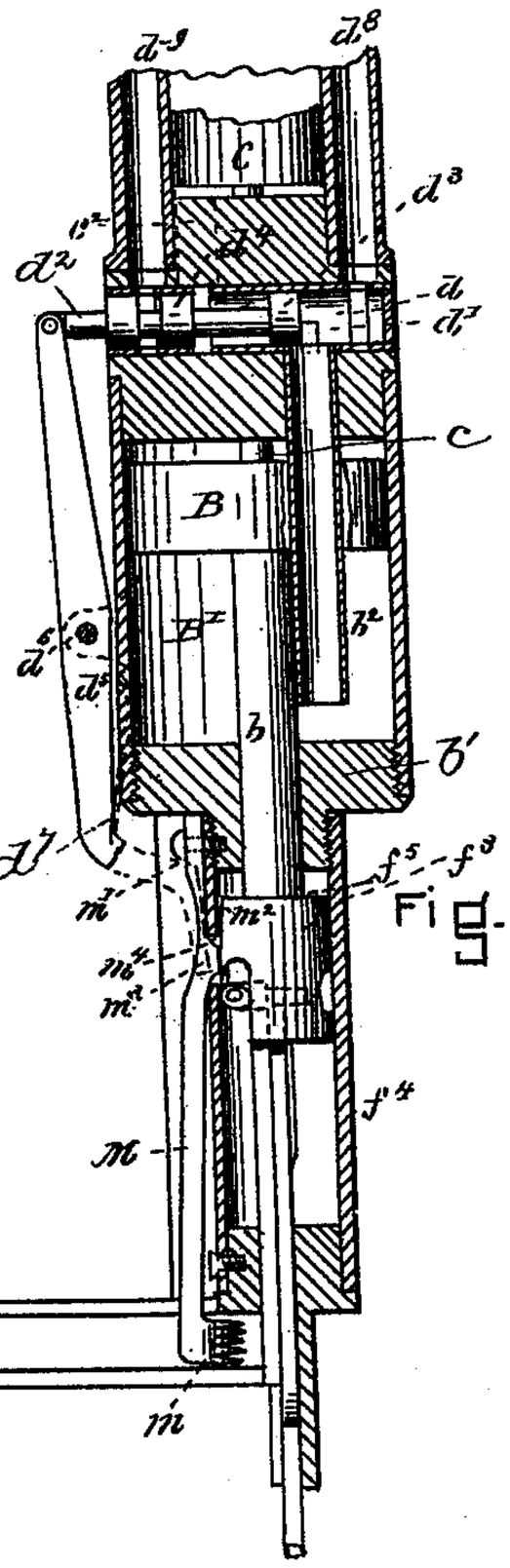

Fig. 2.

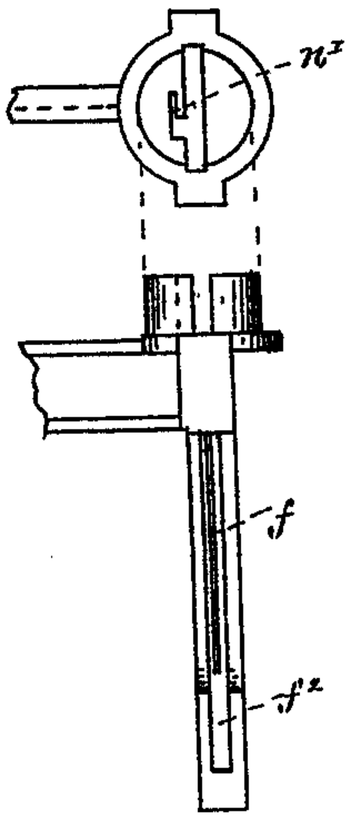

Fig. 3.

WITNESSES

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Geo. F. Walker

INVENTOR

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2 Sheets—Sheet 2.

J. E. CRISP.

Pegging-Machine.

No. 221,785. Patented Nov. 18, 1879.

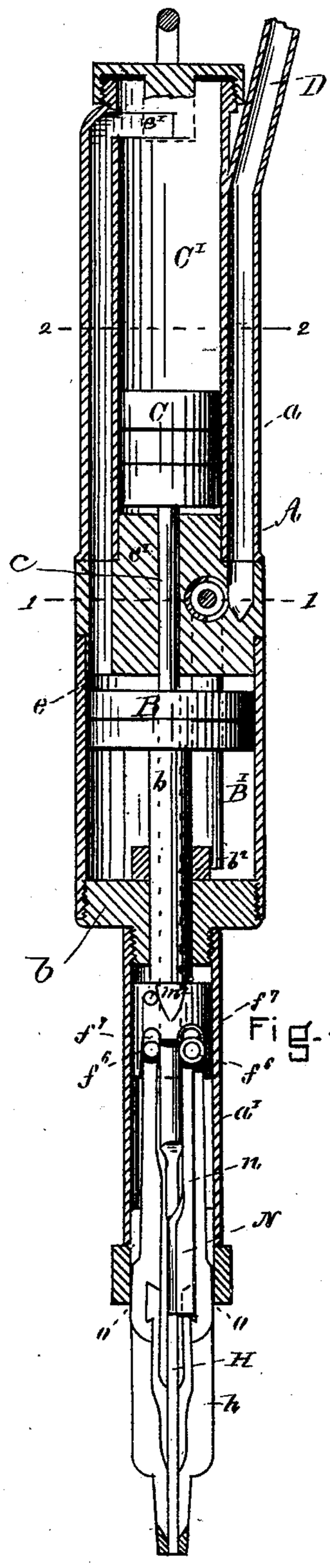

Fig. 4.

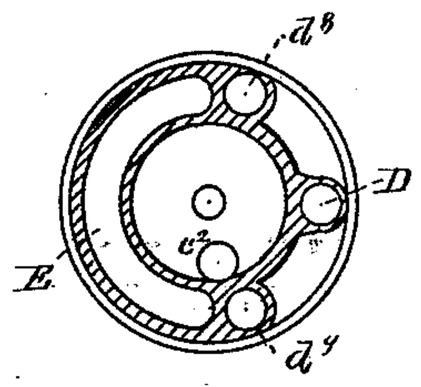

Fig. 6.

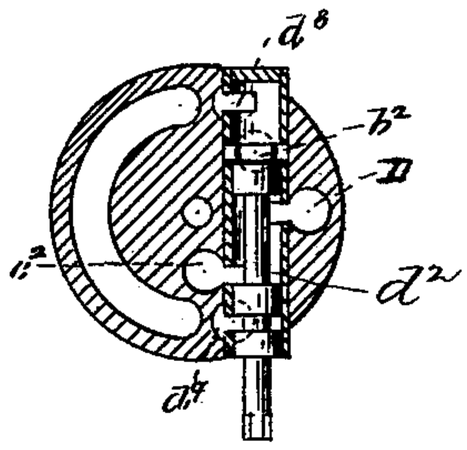

Fig. 5.

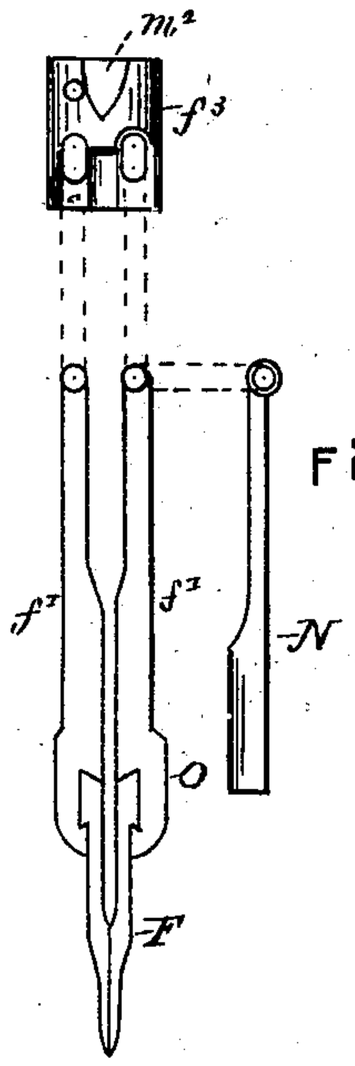

Fig. 7.

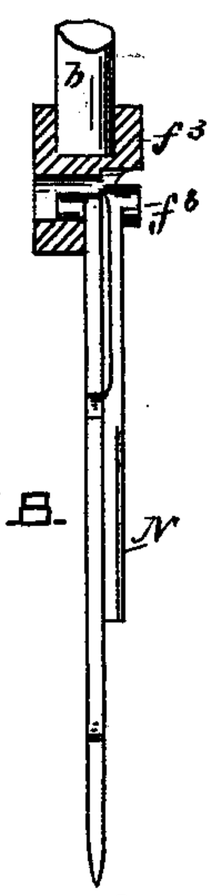

Fig. 8.

WITNESSES.

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UNITED STATES PATENT OFFICE.

JOSEPH E. CRISP, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN PEGGING-MACHINES.

Specification forming part of Letters Patent No. **221,785,** dated November 18, 1879; application filed August 28, 1879.

To all whom it may concern:

Be it known that I, JOSEPH E. CRISP, of Boston, in the county of Suffolk, in the Commonwealth of Massachusetts, have invented an Improvement in Pegging-Machines, of which the following is a specification.

This invention relates to the within-described means of operating the awl and peg driving, feeding, and severing mechanism by means of pistons actuated by compressed air, water, or any suitable liquid taken from a reservoir by hose or pipe, wherein the pressure is kept constant.

It also relates to various details in construction, all of which will be hereinafter more fully set forth.

The awl-driving and peg feeding, severing, and driving mechanism in power-machines have generally been operated by suitable cams or springs, or both.

In this invention, instead of actuating the said mechanism by cams or springs, compressed air or water, or other liquid under pressure, is employed for effecting the necessary reciprocating movements to the parts mentioned by means of suitable cylinders and pistons within the body of the machine, one piston being employed for driving and withdrawing the awl or hole-forming mechanism, and for operating the peg feeding and severing devices, and another piston for operating the driving-bar.

Reference is made to the accompanying drawings, forming a part of this specification, in explaining the nature of my invention, in which—

Figure 1 is a front elevation of my machine. Fig. 2 is a vertical central section on the line *x y* of Fig. 1. Fig. 3 is a detail view, showing in cross-section and elevation a portion of the feedway and throat of the machine. Fig. 4 is a longitudinal section at right angles to the section shown in Fig. 2. Fig. 5 is a horizontal section on the line 1 1 of Fig. 5. Fig. 6 is a horizontal section on the line 2 2 of Fig. 5. Figs. 7 and 8 represent, in elevation, the method of supporting the awl-holding and knife bars.

The case A is constructed in two parts. The upper one, *a*, contains the cylinders and pistons. The lower one, *a'*, contains the other operative parts forming the connections between the ends of the piston-rods and the bars supporting the awls and the feeding and severing devices.

The piston B in the lower cylinder, B', operates, by means of the hollow piston-rod or long sleeve *b*, which reciprocates in the cylinder-head *b'*, the awl or other hole-forming mechanism and the feeding and severing devices. The piston C in the cylinder C' operates, by means of the piston-rod *c*, which reciprocates in the cylinder-head *c'*, forming the partition between the two cylinders and the hollow piston *b*, the peg-driving rod, which is a continuation of the piston-rod reduced to the proper dimensions. The compressed air, water, or other liquid under pressure, or the power employed in operating the pistons, is introduced to the induction-port b^2, which is the one communicating with the cylinder B', and c^2, which is the one opening into the cylinder C', through the induction-way D and the valve-passage *d'*, the ports opening into the cylinders beneath the pistons.

The controlling-valves are arranged in the horizontal valve-passage *d'* between the two cylinders, and consist in the spindle d^2 and sliding seats or disks d^3 d^4, which are so arranged in the spindle as to close one port upon opening the other—that is, when the disk or sliding seat d^3 is moved beyond the port b^2 the port is open, and the sliding seat or disk d^4 closes the entrance to the port c^2. Upon being moved outwardly, the said sliding seats or disks act oppositely, the seat d^3 operating to close the port b^2, and the seat d^4 to open the port c^2.

The valves are operated by means of the lever d^5, pivoted at d^6 to the casing *a*, and the spring d^7, which is fastened to the casing, and bears against the lever below the pivot d^6, and serves to automatically close the valves.

The lower end of the operating-lever may be extended down beyond the upper case and bent inwardly, as shown in Fig. 2.

The cylinders B' and C' are connected by a passage or chamber, E, which opens into the upper portion of each cylinder at the points *e e'*. This chamber or passage and the portions of the cylinders above the piston are filled with air, compressed or not, or water, or both, as may be necessary.

In operation, the power having been introduced beneath either of the pistons, the air or water contained in the chamber becomes a power-transmitting agent, and operates to lower the other piston by the upward movement of the power-driven one—that is, the upward movement of either piston upon the introduction of the compressed air or other power forces the air or water contained in the cylinder above the piston, and in the connecting chamber or passage from the cylinder into the said passage to the upper portion of the other cylinder, thereby forcing the other piston to move in a direction opposite from that of the first-named piston.

The exhaust-passage for the lower cylinder is by way of the port b^2, valve-passage d', and exhaust or eduction way d^3, and the exhaust-passage of the upper cylinder is obtained by means of the port c^2, valve-passage d', and exhaust or eduction way d^3. The sliding valves d^3 d^4 operate additionally to alternately close and open the exhaust-passages at proper intervals.

The induction and eduction ways may be arranged outside the casing, if desired, and any suitable valves for controlling the ports may be used.

I do not confine myself to the arrangement of an induction-way, valve-passages, valves, ports, and exhausts herein shown and described, as I consider that the principal feature of this portion of my invention consists in the means for utilizing compressed air, water under pressure, or other similar power for operating the pistons connected with the awl or hole-forming devices, and the feeding, severing, and peg-driving mechanism inclosed with the cylinder within a movable machine with said devices and mechanism.

The hole-forming devices or awl F and the awl-supporting bars f, the springs f', and the throat f^2 are similar in construction and operation to like devices shown and described in Letters Patent No. 211,651, granted me on the 28th day of January, 1879, and I will not further describe their construction and operation.

The method by which the awl-supporting bars are secured to the block f^3 upon the end of the piston-sleeve b is somewhat different from that by which the bars are fastened to their operating supports in the patent, the block being cylindrical in shape and arranged to slide in the cylinder or barrel f^4. It is further provided with a central hole, f^5, in which the piston-rod c reciprocates, and with the recess f^6 and slots f^7.

The awl-supporting bars f are provided with pivots f^8, which enter the slots f^7, the slots being enough longer than the diameter of the pivots to allow a slight vertical play of the pivots therein.

The peg-driving bar H forms a continuation of the piston-rod c, and plays in the driveway between the inner opposing surfaces of the two parts of the awl and awl-bars and the sides of the casing h forming the lower portion of the machine, as explained in my said patent.

The feeding mechanism consists in the teeth m, which are bent inwardly from the end of the spring-arm M, fastened at m' to the barrel f^4, and are moved outwardly preparatory to feeding by the incline m^2 upon the reciprocating block and the projection m^3 on the arm M, which enters through the hole m^4 in the barrel sufficiently to project into the path of the reciprocating block.

The severing-knife N is fastened to an arm, n, which has a bearing on one of the pivots f^8, and projects laterally therefrom, and has a long cutting-edge inclined downwardly and outwardly from the supporting-bar, and the peg is severed upon the upward movement of the piston B upon the withdrawal of the awl; and it operates, in connection with the feeding device, to prevent the backward movement of the peg-strip upon the outward movement of the feeding-teeth m, the knife being so arranged and shaped that it does not immediately sever the peg, but has a drawing movement across the peg-strip, and the outward movement of the feeding-teeth is so timed that it takes place after the knife has commenced to draw upon the peg-strip, but before the peg is entirely severed, so that the peg-strip is held in place against the outward movement of the teeth by the knife. The blade of the knife reciprocates across the feedway near the driveway in the guide n'.

The awl-supporting bars are provided with projections o, upon which the springs f bear.

The machine may be supported by means of the cord P, pulleys p, and counter-weight P'. This method of suspension allows the machine to be moved freely in all directions.

In operation, the operator opens the valve controlling the entrance-port to cylinder C', allowing the compressed air or other power to enter it below the piston, and to move it upwardly, thereby causing the air or water above the piston to force the piston B, operating the awl or other hole-forming mechanism, downwardly. This downward movement of the piston B drives the awl. The operator then closes the port to cylinder C' and opens the port to cylinder B', thereby causing the compressed air or other power to act upon the under surface of the piston B, thereby causing it to lift the awl and severing device, and to move outwardly the feeding-teeth, and also, by the intermediary power, transmitting column of air or water, causing the piston C to move downwardly, thus actuating the driving-rod and driving the peg. The peg-strip is fed upon the downward movement of the piston B, and the peg is advanced to a position in the driveway beneath the driver.

It will be observed that by this construction the operator has the awl and peg driving mechanism under perfect control; that for every peg driven the valve must be operated; that the pegs can be driven in very rapid succession; and that, in withdrawing the awl

from the work, owing to the liability of its sticking; it may be desirable that the head F^3 shall have commenced to move and have acquired some speed and momentum before lifting the awl-bars, in order that the movement may have the character of a blow from underneath, and for this purpose I provide a loose connection between the head and the awl-bars by making the slots holding the pivots entering the awl-bars somewhat longer than the diameter of the pivots.

It will be observed that, by causing the direct pressure of the compressed air or other power to act upon one surface or side of one of the pistons only, and by connecting the two cylinders upon the sides opposite from that upon which the power is applied, and by filling such connecting-chamber with air or water, or both, that the movement of one piston controls the movement of the other, the power being applied to one piston only, the other piston being compelled to move upon the movement of the first piston, so that the time of the reciprocation of said pistons must always be in unison, and it makes no difference to which piston the power is applied so long as there is a connecting-chamber connecting the two lower or two upper ends of the cylinders, which, together with the portions of the cylinder upon the chamber side of the pistons, is filled with air, water or other liquid, or both.

When the connecting-chamber is filled with water or other practically incompressible liquid, the piston moved by the column of water will start immediately with the piston to which the power is applied. If the chamber is filled with air, the piston operated by it will move as soon as the air in the said chamber is compressed sufficiently; and by using part water and part air the time of the movement of the piston can be varied as desired within the limits of the prompt movement when water alone is used and the movement which follows the compressing of the air; and by varying the proportions of liquid, water, or air, the time at which the piston starts can be varied as desired.

I do not confine myself to the use of the two pistons, one of which is operated by the other by means of a movable power-transmitting column of water or air, or both, for the purpose of operating a pegging-machine, but may use them for any desired purpose or object.

I do not intend to limit myself to the use of an awl made in two parts, or to the use of the specific construction of feeding and severing devices herein described, but may use in connection with the means for operating said devices herein set forth any of the well-known constructions for forming the hole, and for feeding and severing the peg, when such devices are operated by pistons driven by compressed air, water under pressure, or other similar power, located within the same case with the remainder of the mechanism.

The compressed air, water under pressure, or other power employed in driving the pistons should be contained in a reservoir, and at a constant or uniform pressure, and a flexible tube or pipe should connect this reservoir with the induction-way D.

It is unnecessary to represent in the drawings a reservoir or connecting tube or pipe, as I do not confine myself to any special form or location of the same in relation to the pegging-machine.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a pegging-machine, the combination of the cylinder C′, having suitable induction and eduction ports and valves, and the piston C and piston-rod *c*, operating the driving-rod H, with the cylinder B′, having suitable induction and eduction ports and controlling-valves, the piston B and piston rod or sleeve *b*, operating the awl and peg feeding and severing devices, all arranged in an organized machine, and adapted to be used with compressed air, water under pressure, or other similar power, in such manner that the pistons alternately approach toward and recede from each other, substantially as and for the purposes described.

2. In a pegging-machine, the combination of the two cylinders B′ C′ and the passage E, connecting the upper portion of one cylinder with the upper portion of the other, the pistons B C, the piston-rods *c b*, induction and eduction ports below the pistons, and their controlling-valves, all adapted for the use of compressed air, water under pressure, or other similar power, and whereby the upward movement of one piston causes the descending movement of the other, substantially as and for the purposes set forth.

3. In a pegging-machine, the combination of the cylinders B′ C′, the passage or chamber E, connecting the upper portion of one cylinder with the upper portion of the other, said passage being filled, or partly filled, with liquid, and the pistons B C, the piston-rods *c b*, induction and eduction ports below the pistons, and their controlling-valves, all adapted for the use of compressed air, water under pressure, or other similar power, whereby the upward movement of one piston causes the descending movement of the other, substantially as and for the purposes set forth.

4. In a pegging-machine, the combination of the horizontal valve-passage *d*, the ports b' c^2 d^8 d^9, and the sliding valves d^3 d^4, substantially as and for the purposes described.

5. In a pegging-machine, the combination of the sliding valves d^3 d^4, valve-stem d^2, lever d^5, and spring d^7, all arranged to operate substantially as described.

6. In a pegging-machine, the combination of the reciprocating head f^3, provided with the slots f^7, with the awl-carrying bars f' and their pivots f^8, arranged to enter said slots, and provided with a slight vertical movement therein, substantially as described.

7. In a pegging-machine, the combination

of the spring-arm M, provided with the teeth *m* and shoulder m^3, which projects through the hole m^4 in the case *a'* into the path of the reciprocating heads f^3, with said reciprocating head, whereby, upon the upward movement of said head, the supporting-arm is moved outwardly, and upon its downward movement the teeth are allowed to feed the peg-strip, substantially as described.

8. In a pegging-machine, the combination of the reciprocating head f^3, arm *n*, and knife N, projecting from the bar, and provided with an inclined and vertical cutting-edge, arranged to reciprocate across the feedway and to sever the peg by an upward movement, substantially as described.

9. In a pegging-machine, as a means for operating the awl and peg feeding and severing and driving devices, two pistons adapted to be operated by compressed air or other like power, one of which pistons is arranged below the other and is provided with a hollow piston-rod, and in which the piston-rod of the other reciprocates, substantially as described.

10. In a pegging-machine, the combination of the head f^3, the hollow piston rod or stem *b*, and case *a'*, substantially as described.

J. E. CRISP.

Witnesses:
F. F. RAYMOND, 2d,
GEO. F. WALKER.