(No Model.) 2 Sheets—Sheet 1.

S. M. CUTTER.

MECHANISM FOR OPERATING STOCK SUPPORTS FOR NAILING MACHINES.

No. 582,580. Patented May 11, 1897.

Fig. 1.

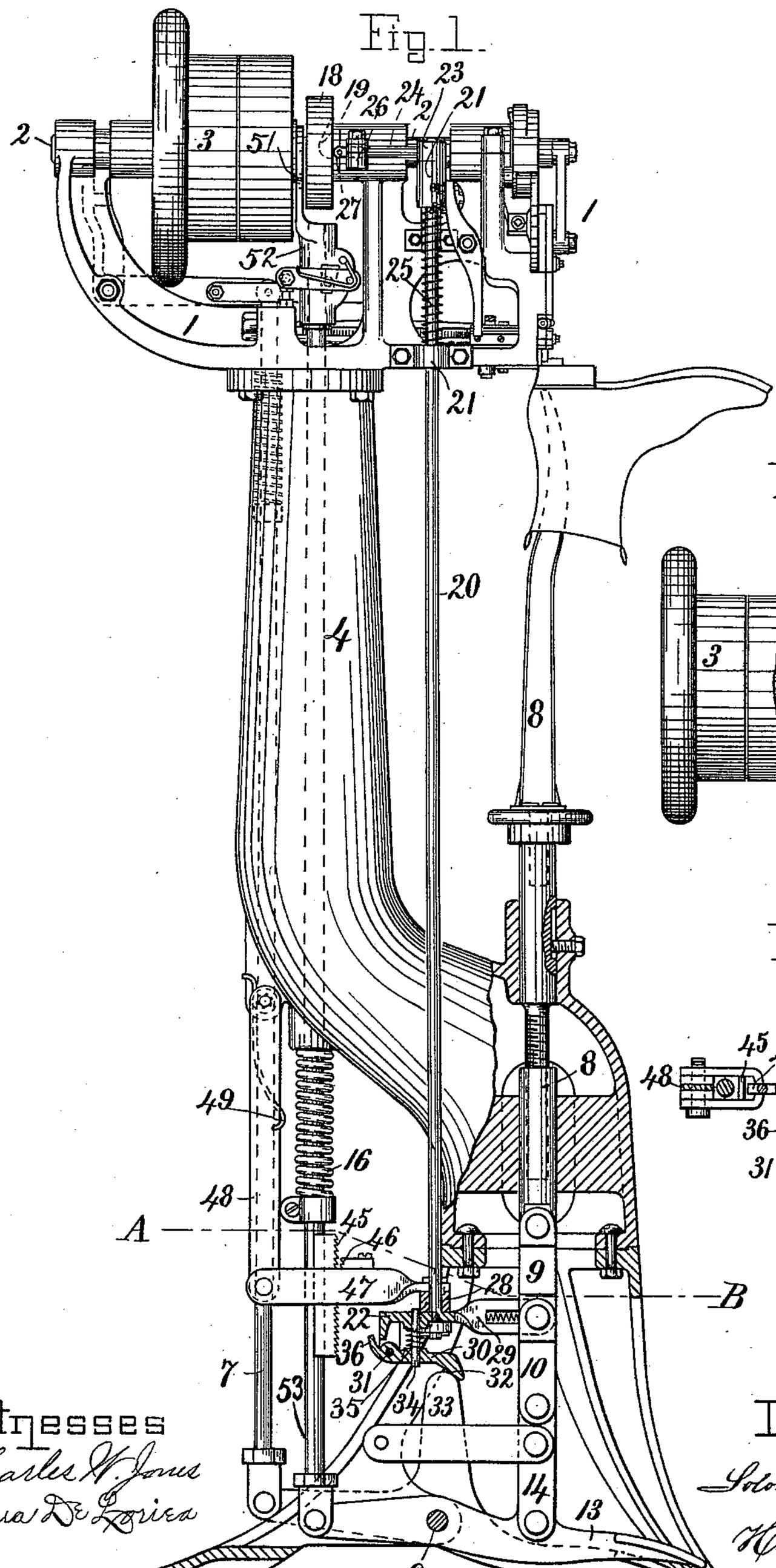


Fig. 2.

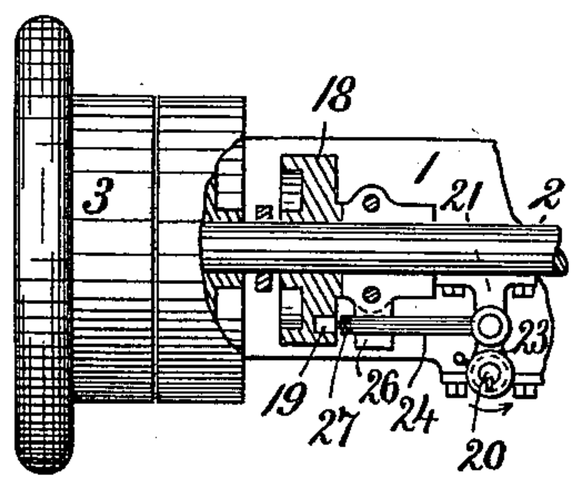
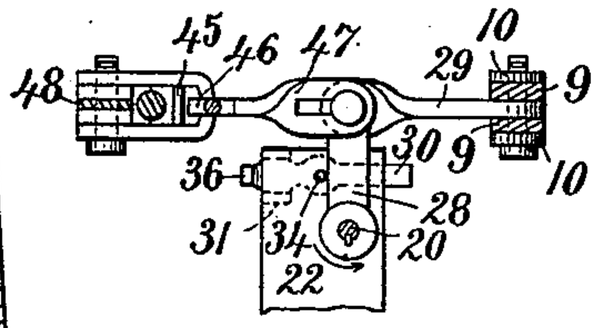


Fig. 3.



Witnesses
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Laura De Loriea

Inventor
Solomon M. Cutter
by Henry Chadbourn
his Atty.

(No Model.) 2 Sheets—Sheet 2.

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MECHANISM FOR OPERATING STOCK SUPPORTS FOR NAILING MACHINES.

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Fig. 4.

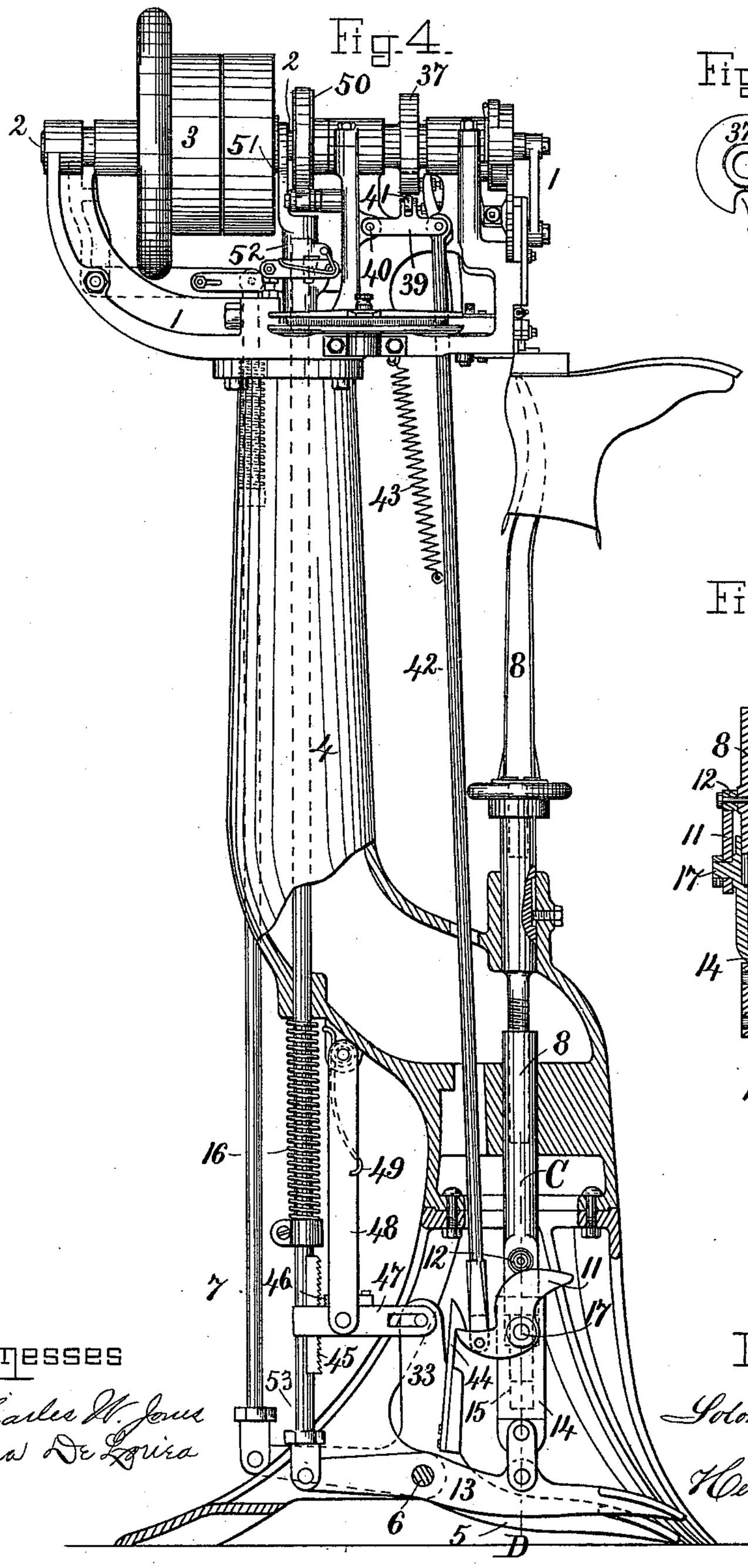
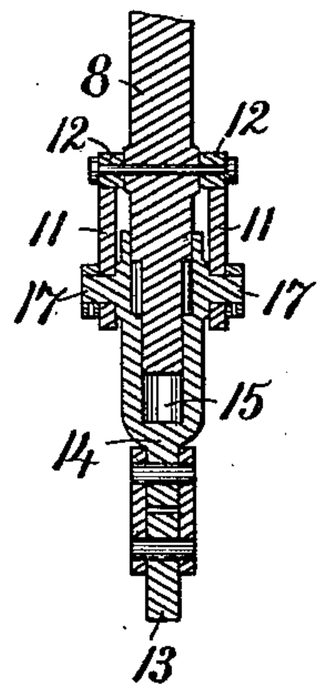


Fig. 5.

Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

SOLOMON M. CUTTER, OF NASHUA, NEW HAMPSHIRE, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE WIRE GRIP FASTENING COMPANY, OF BOSTON, MASSACHUSETTS.

MECHANISM FOR OPERATING STOCK-SUPPORTS FOR NAILING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 582,580, dated May 11, 1897.

Application filed December 2, 1895. Serial No. 570,767. (No model.)

To all whom it may concern:

Be it known that I, SOLOMON M. CUTTER, of Nashua, in the county of Hillsborough and State of New Hampshire, have invented certain new and useful Improvements in Mechanisms to Operate Stock-Supports for Nailing-Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in mechanism for operating horn or other stock supports on nailing, pegging, or similar machines; and its objects are to cause the horn to be forced upward to its working position by the first movements of the machine after being started by the starting mechanism, to cause said horn to remain in its working position so long as the nailing, pegging, or other similar machine is kept in motion and driving nails, pegs, &c., and to allow said horn to automatically lower itself when the machine is stopped by the operation of the stopping mechanism and after the nailing, pegging, or other mechanism has completed the operation of driving the nail, peg, &c.

With these objects in view the invention is carried out substantially as illustrated in the accompanying drawings, wherein—

Figure 1 represents a sectional side elevation of one of the forms of my invention applied to a boot and shoe nailing machine. Fig. 2 represents a sectional plan view of a portion of the driving-shaft of the nailing-machine shown in Fig. 1, showing a part of the mechanism used to cause the automatic operation of the stock-support. Fig. 3 represents a detailed horizontal section on the line A B in Fig. 1, showing another portion of the automatic mechanism to operate the stock-support. Fig. 4 represents a sectional side elevation, similar to that shown in Fig. 1, of a modified form of the invention. Fig. 5 represents a detail view of a cam used in the device shown in Fig. 4. Fig. 6 represents a detailed vertical section on the line C D shown in Fig. 4.

Like characters of reference indicate like parts on the different parts of the drawings.

Heretofore stock-supports used on the machine above mentioned have either been connected to a suitable treadle which has been operated by the operator to lower said support against the influence of a suitable spring or weight which normally held said support in working position or said supports have been connected with the starting and stopping treadle and raised or lowered, respectively, by the starting or stopping of the machine by said treadle. In the former case it necessitated the operation of two treadles when an operator removed the stock from the support when finished and replaced it with other stock, as he was obliged to release the pressure on the starting and stopping treadle to stop the machine and then to depress the treadle attached to the support to lower said support in order to remove the stock therefrom. The use of such a device not only consumed time in its operation, but was inconvenient for the operator to manipulate. In the latter case, where the stock-support is attached to and operated with the starting and stopping treadle, the necessity of using two independent treadles is done away with, but by the attaching of both the starting and stopping mechanism and the stock-support-operating mechanism to one and the same treadle it requires so much additional force to operate said treadle that it constitutes an objection to such a construction or arrangement.

My present invention is to overcome the objections found in both of the constructions now in use; and to accomplish this object I cause the stock-support-operating mechanism to be operated by suitable mechanism connected with the driving-shaft of the machine on which the stock-support is to be used, and preferably have the mechanism which is employed to place the stock-support into working position operated by the first movement of the driving-shaft after it has been started by the starting mechanism, and to have the mechanism which is employed to withdraw said support from its working position operated by the last movement of the driving-shaft after the stopping mechanism has been operated. With the support-actuating mechanism above described I use a locking device which insures the stock-support remaining in

working position during the rotations of the driving-shaft.

On the drawings I have illustrated my invention as applied to a nailing-machine for nailing boots and shoes, having the head 1, provided with the driving-shaft 2 and driving-pulley 3, said head being mounted upon a suitable standard or base 4, provided with a starting and stopping treadle 5, fulcrumed at 6 to said standard and having the rod 7 extended upward from said treadle to a suitable starting and stopping mechanism on the head of the machine. As such starting and stopping mechanism forms no essential part of this present invention and may be replaced by many of the common and well-known mechanisms now in use, I shall not enter into any detailed description of such mechanism, but will simply say that the treadle 5 is depressed to cause the starting of the machine and allowed to rise to cause the stopping of the machine.

The machine on which my improved device is to be used may be provided with an automatically-operating mechanism to periodically depress the stock-support to allow the feeding of the stock the desired distance between the nails or pegs, which mechanism is independent of the mechanism to automatically raise said support at the starting and lower it at the stopping of the machine, and I have illustrated on the drawings a suitable mechanism for this purpose, which will be described hereinafter, but which forms a part of an invention for which I filed an application for Letters Patent of the United States on the 17th day of October, 1895, which application bears Serial No. 565,932, and to which application reference may be made for a full and complete description.

The standard or base is also provided with an upward and downward adjustable stock-support 8 and mechanism to adjust said support, which support may be made in several parts, as shown, or it may be made in one single piece, if so desired. The adjusting mechanism may consist of suitable toggles 9 and 10, pivotally attached to the lower end of the stock-support, as shown in Fig. 1, or it may consist of a suitable cam lever or levers 11, acting upon projections 12 on the stock-support, as shown in Fig. 4, or it may consist of any other suitable device whereby said support may be raised or lowered, as desired. To provide means whereby the stock-support may be lowered by the operator independent of the devices above described, I provide the standard with a second treadle 13, also fulcrumed at 6 to said standard and connected to the stock-support by the link 14, which is connected at one end to the forward part of the treadle and at the opposite end pivotally connected to the lower end of the toggle 10, as shown in Fig. 1, or said link may be provided with a socket 15, within which the lower end of the stock-support is guided in its upward and downward movements, as shown in Fig. 6. A spring 16 acts upon the treadle 13 and tends to force the stock-support upward with a yielding pressure, as will be fully understood by reference to the drawings, and similar to many of the devices now in common use for this purpose. In the machine illustrated in Figs. 4, 5, and 6 the cam-levers 11 are fulcrumed at 17 to the link 14, substantially as shown.

My improved device to automatically operate the stock-support, as illustrated in Figs. 1, 2, and 3, is constructed substantially as follows: Upon the driving-shaft of the machine is firmly mounted the cam or disk 18, having the cam-recess 19, as shown by dotted lines in Fig. 1 and full lines in Fig. 2. The vertical rod or shaft 20 is mounted and rotatable within suitable bearings 21 on the head of the machine and within a suitable plate 22, attached to or made in one piece with the standard. The arm 23 is firmly mounted on the upper end of this vertical shaft, and to said arm is pivotally attached the pin or bolt 24, the free end of which is held in contact with the side of the cam 18 with a yielding pressure by means of the spring 25, which surrounds the shaft 20. The pin 24 is guided within the bearing 26 on the frame of the head of the machine, and its free end is preferably provided with the antifriction-roll 27, which runs upon the surface of the side of the cam 18. To the lower end of the shaft 20 is firmly mounted the arm 28, which extends horizontally from said shaft on the top of the bearing-plate 22, and to the outer free end of the arm 28 is pivotally attached the link 29, which link is also pivotally attached to the toggles 9 10, as shown.

It will be seen that when the pin 24 on the arm 23 is in the position shown on the drawings the link 29 will be held in such a position as to force the toggles forward and hold the stock-support raised against the under side of the stock and pressing said stock against the under side of the work-plate on the head of the machine, but when said pin is forced into the cam-recess 19 by the action of the spring 25 it will cause the shaft 20 to turn in its bearings in the direction of the arrow shown in Figs. 2 and 3, and thereby cause the link to be drawn toward the rear of the standard, which movement will operate the toggles and withdraw or lower the stock-support. The cam-recess 19 is arranged in such a position on the cam 18 as to be exactly in line with the pin 24 when the machine has come to a full stop after the stopping mechanism has been operated by the treadle 5, and when the cam-recess reaches such a position the pin 24 will be forced into said recess by the influence of the spring 25. When the machine is again started by the depression of the starting-treadle, the cam 18 will begin to rotate with the driving-shaft and will at once cause the cam-recess 19 to force the pin 24 out from said recess against the influence of the spring 25 and

through the connections between said pin and the toggles will force the toggles forward into the positions shown on the drawings, which movement will cause the stock-support to be raised.

As there is but one cam-recess on the cam 18 into which the pin 24 can be forced and as said recess is never in proper position to receive said pin excepting when the machine has finished a complete operation of driving a nail-peg or other work to be performed by said machine and is always in proper position to receive said pin, just as the machine comes to a full stop the stock-support will always remain in its raised position until a complete operation of the machine has been made, or when the machine has come to a full stop by the operation of the stopping-treadle.

It will be seen that the stock-support would be raised and lowered by the action of the pin 24 and cam-recess 19 once in each and every rotation of the driving-shaft. To prevent this and to have the pin enter the recess in the cam only when the treadle is released to stop the machine, I provide the machine with a suitable locking device operated by the treadle when starting the machine and acting to lock the automatic stock-support-adjusting mechanism in such a position as to hold the stock-support raised during the time that the treadle is depressed and the machine is kept in motion, and such a locking device has been illustrated on the drawings as being constructed substantially as follows:

To the under side of plate 22 is attached the lever 30, which is pivoted at 31 thereto. This lever is provided in its forward end with the inclined or cam-shaped surface 32, and the projection 33 on the starting-treadle comes in contact with said inclined surface when said treadle is depressed to start the machine, thereby causing said lever to turn on its fulcrum. The pin 34 plays loosely through perforations in the plate 22 and lever 30 and is forced upward with a yielding pressure by the action of a suitable spring 35. This spring is not of sufficient strength to force the pin in the perforation in the plate 22 and to cause it to project above the same when the projection on the treadle is removed from contact with the inclined surface on the lever 30 and said lever has swung downward, but is of sufficient strength to force said pin through said perforation when the lever 30 is turned upward by the action of the projection 33.

The locking-pin 34 is in such a position on the plate 22 that when the stock-support is raised by its automatic mechanism above described said pin will be forced upward through the perforation in the plate and be just behind and in contact with the side of the arm 28. This will prevent the pin 24 from entering the recess in the cam 18 and will lock the stock-support in its raised position so long as the treadle 5 is depressed and the lever 30 is forced upward.

As the arm 28 occupies a position just above the perforation in the plate for the pin 34 when the stock-support is lowered and as said pin is forced upward immediately by the depression of the starting-treadle and before said arm can be moved by the action of the cam-recess 19, as above described, said pin will come in contact with the under side of said arm, but will yield against the influence of the spring 35, and will be forced upward by said spring behind said arm as soon as the stock-support has been raised.

The lever 30 is provided with the stock projection 36 to limit the downward movement of said lever, substantially as shown.

In Figs. 4, 5, and 6 of the drawings my invention has been shown as applied to a nailing-machine similar to that shown in Figs. 1, 2, and 3, with the exception that the machine shown in Figs. 4 and 5 has a stock-support 8, which is raised or lowered by causing the lower end of said support to slide up or down within the socket 15 in the link 14 by the action of the cam-levers 11 upon the projections 12, as fully shown in Fig. 6, and in connection with such a machine my device is constructed substantially as follows:

The cam 37 is firmly mounted upon the driving-shaft of the machine and is rotated therewith, said cam being provided with the cam-recess 38, as shown in Fig. 5.

The lever 39 is fulcrumed at 40 to the frame of the machine and is provided with the anti-friction-roll 41, which is acted upon by the cam 37 to turn said lever upon its fulcrum, as will be fully understood by reference to the drawings. The free end of the lever 39 is pivoted to the vertical rod 42, which extends downward through perforations in the frame and standard of the machine, said rod being pivotally attached at its lower end to the cam-levers 11, as shown in Fig. 4. The spring 43, attached at one end to the frame of the machine and at the other end to the rod 42, tends to draw said rod upward and to keep the roll 41 in contact with the cam 37. The starting and stopping treadle 5 is provided with the spring-catch 44, which springs over the end of the cam-levers 11 and holds said levers in such a position that the stock-support is raised when the starting-treadle is depressed to start the machine, as shown in Fig. 4.

With the several parts of the machine in the position shown on the drawings and the stock nailed the operation of removing said stock and replacing it by other stock to be nailed is as follows: Pressure is released by the starting and stopping treadle to stop the machine. This causes the spring-catch to be withdrawn from the end of the cam-levers 11 and allows the spring 43 to raise the rod 42 and force the roll 41 into the cam-recess in the cam 37, which recess comes in line with said roll when the machine is stopped. The raising of the rod 42 will turn the cam-levers 11 upon their fulcra 17 on the link 14, there-

by withdrawing said cam-levers from the projections 12 on the stock-support and allowing said support to be lowered by its own weight. After removing the stock from the stock-support and replacing it by other stock to be operated upon the treadle 5 is depressed and the machine thereby started. This causes the cam 37 to act upon the roll on the lever 39, and by forcing the rod 32 downward against the influence of the spring 43 will turn the cam-levers 11 upon their fulcra and cause said levers to raise the stock-support into working position. The spring-catch 44, which has been brought into the path of the downward movement of the rear end of the cam-levers by the depression of the treadle 5, will yield and allow said levers to pass said spring-catch until said catch springs over the top of said levers and hold said stock-support in its raised position during the operation on the stock.

To prevent the spring 16 from holding the stock-support upward when it is desired to have said support lowered by the automatic mechanism as above described, I provide the machine with a suitable locking device to lock or prevent said spring from exerting its influence on the stock-support, and such locking device has been illustrated on Figs. 1 and 3 of the drawings as consisting of the following mechanism, but other suitable locking devices may be substituted therefor without departing from the spirit of my invention.

The toothed rack 45 is attached to some part of the mechanism moved by the influence of the spring 16 when forcing the stock-support upward and to such part as is between said spring and the means employed to automatically raise and lower said support.

The locking-block 46, having teeth thereon corresponding with the teeth of the rack 45, is attached to the link 47, which link is suspended at one end from the standard of the machine by means of the pivoted hanger 48 and is attached to the free end of the arm 28 by means of a sliding joint, substantially as shown in Figs. 1 and 3. The spring 49 acts upon the hanger 48 and tends to keep the teeth of the block 46 in engagement with the teeth of the rack 45. The operation of this locking device is as follows: When the machine is stopped and the arm 28 begins to move backward to lower the support, the first movement of said arm allows the spring 49 to force the locking-block 46 into engagement with the rack 45, and thereby locks the spring 16 from exerting an upward pressure on the stock-support. This is accomplished before the stock-support has commenced to be lowered by the action of said arm. The sliding connection between the link 47 and the arm 28 allows said arm to continue its backward movement and operate the toggles to lower the support after the spring 16 has been locked. When the machine is again started and the arm is thereby moved forward to operate the toggles to raise the stock-support, as above described, the first part of the movement of the said arm operates said toggles, and at or near the last part of the forward movement of said arm the locking-block is withdrawn from contact with the rack and the spring 16 is thereby released, so that it is free to force said support upward with a yielding pressure, as described.

In Fig. 4 a similar locking device for the spring 16 has been shown, but in said device the link 47 has been shown as connected to the projection 33 on the treadle 5 by means of a sliding connection. The operation of this locking device is the same as that shown in Figs. 1 and 3, but instead of being operated by connection with the automatic stock-support-adjusting mechanism it is operated by the movements of the starting and stopping treadle. The spring 16 is locked by the first movement of the treadle 5 when the pressure is released from said treadle to stop the machine, and said spring is unlocked at or near the completion of the downward movement of said treadle when starting the machine.

In the machine illustrated in Figs. 1, 2, and 3, as well as in the machine illustrated in Figs. 4, 5, and 6, the stock-support has been shown as being provided with mechanism to periodically depress the same to remove the pressure from the stock and allow it to be fed the desired distance between the nails or pegs by the stock-feeding device on the machine, and said stock-support-operating mechanism is constructed as follows: The cam 18 (shown in Fig. 1) or an independent cam 50, as shown in Fig. 4, is provided on one of its faces with a suitable cam-groove, (not shown on the drawings,) which acts upon a pin or roll 51, attached to the block 52, to periodically raise and lower said block. The block 52 is attached to the rod 53, the lower end of which is pivotally attached to the rear end of the treadle 13, upon the forward part of which the stock-support is mounted. Thus it will be seen that as the block 52 is periodically raised and lowered during the time that the driving-shaft is kept in motion the stock-support will also be periodically raised and depressed so long as the driving-shaft is kept in motion. This periodical depression of the stock-support takes place just at the time that the stock is ready to be fed, and therefore removes the pressure from the stock during the feeding of the same.

It will be understood that the stock-support is free to be raised or lowered by the operation of the treadle 13 at any time independent of the automatic mechanism for adjusting said support.

Having thus fully described the nature, construction, and operation of my invention, I wish to secure by Letters Patent and claim—

1. A stock-support movable up and down, a driving-shaft, a cam on said shaft driven thereby, and connections between said cam and stock-support operated by said cam,

whereby the support is automatically raised by the first movement of the driving-shaft when the machine is started and held in its raised position until the machine is stopped, for the purpose set forth.

2. A stock-support, and toggles to raise and lower said support, a driving-shaft, a cam on the driving-shaft driven thereby, and connections between the cam and said toggles operated by said cam, whereby the support is raised automatically by the first movement of the driving-shaft when the machine is started and held in its raised position, until the machine is stopped, for the purpose set forth.

3. In a nailing-machine, a stock-support, means to periodically depress it to allow the feeding of the stock, a driving-shaft, and independent mechanism automatically operated by said shaft to depress the support as the machine stops, for the purpose set forth.

4. In a nailing-machine, a stock-support, means to periodically depress it to allow feeding of the stock, a driving-shaft, an independent mechanism automatically operated by said shaft to depress the support as the machine stops, and a device controlling and preventing the operation of said independent mechanism except at the completion of the operation and stopping of the machine, for the purpose set forth.

5. A stock-support, a spring to force said support upward with a yielding pressure, and mechanism to raise and lower said support independent of said spring, combined with mechanism operated by the driving-shaft of the machine on which the stock-support is used to cause said stock-support to rise at the first movement of the driving-shaft when the machine is started, and to lower at the time the driving-shaft is stopped, and a lock to lock said spring from exerting its upward pressure on said support when said support is lowered by said mechanism, for the purpose set forth.

6. A stock-support, a starting and stopping treadle for the machine on which said stock-support is used, mechanism operated by the driving-shaft of the machine to automatically raise said support at the commencement of the rotation of said driving-shaft when the machine is started by the operation of the starting-treadle and to automatically lower said support when the machine is stopped by the operation of the said treadle, and a locking device brought into operating position to lock said automatic support raising and lowering mechanism by the operation of the starting-treadle when starting the machine, and to unlock said mechanism when said treadle is operated to stop the machine, for the purpose set forth.

7. A stock-support, mechanism operated by the driving-shaft of the machine on which said support is used, whereby the stock-support is automatically raised and lowered respectively by the starting of the driving-shaft and the stopping of the same, and a lock to hold said support in its raised position until the driving-shaft has been stopped, for the purpose set forth.

8. A stock-support, mechanism operated by the driving-shaft of the machine on which said support is used, whereby the stock-support is automatically raised and lowered respectively by the starting of the driving-shaft and the stopping of the same, a lock to prevent the automatic stock-support-lowering mechanism from lowering said support until the driving-shaft is stopped, and a treadle connected with the stock-support, whereby the stock-support can be lowered or allowed to rise independent of its automatic operating mechanism or said lock, for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 29th day of November, A. D. 1895.

SOLOMON M. CUTTER.

Witnesses:

HENRY CHADBOURN,

CHARLES W. JONES.