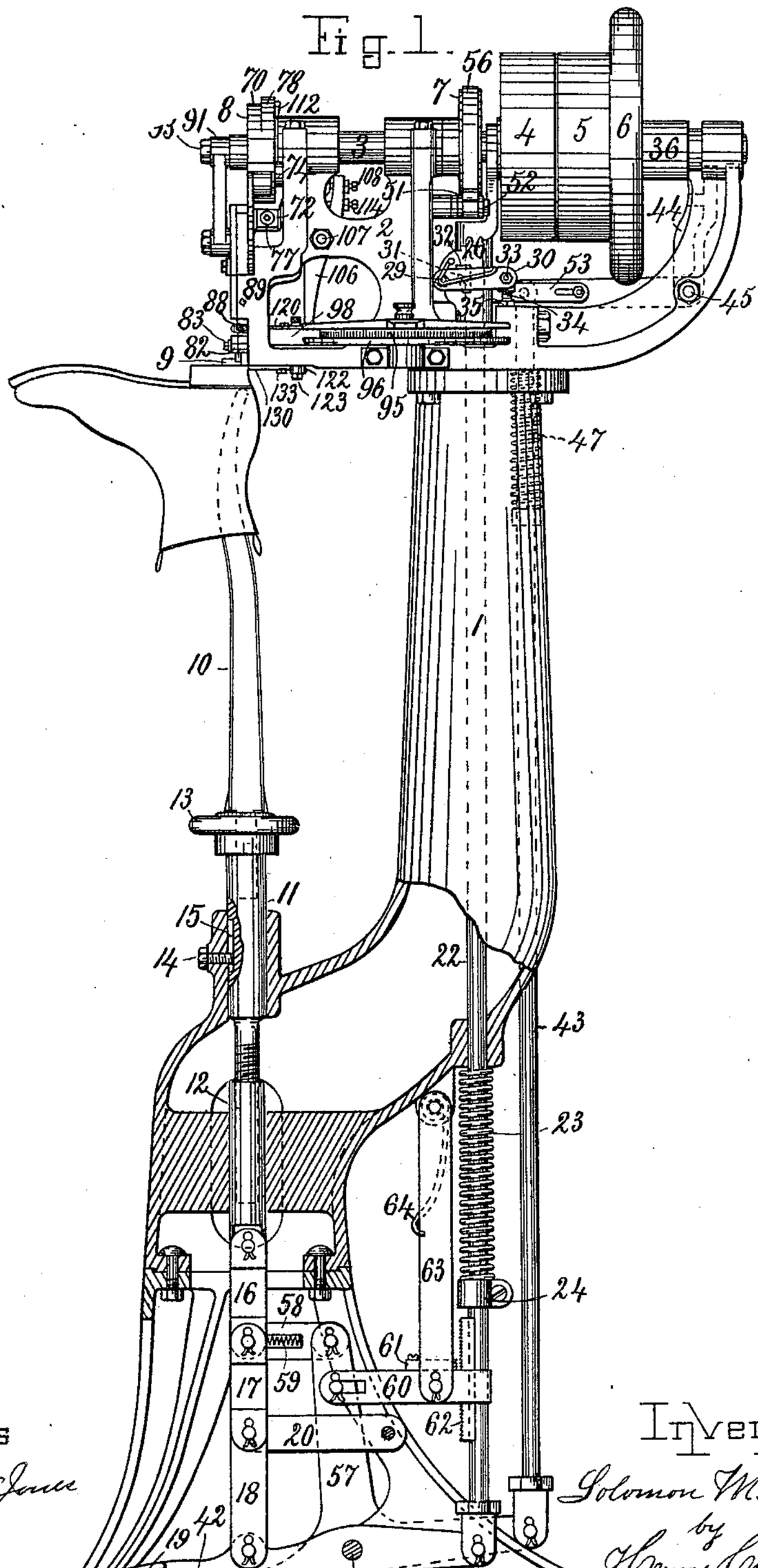
(No Model.) 6 Sheets—Sheet 1.

S. M. CUTTER.

NAILING MACHINE FOR BOOTS OR SHOES.

No. 582,579. Patented May 11. 1897.

Fig. 1.



Witnesses
Charles W. Jones
L. B. Cobb

Inventor
Solomon M. Cutter
by
Henry Chadbourn
his Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 6 Sheets—Sheet 2.

S. M. CUTTER.

NAILING MACHINE FOR BOOTS OR SHOES.

No. 582,579. Patented May 11, 1897.

Fig. 2.

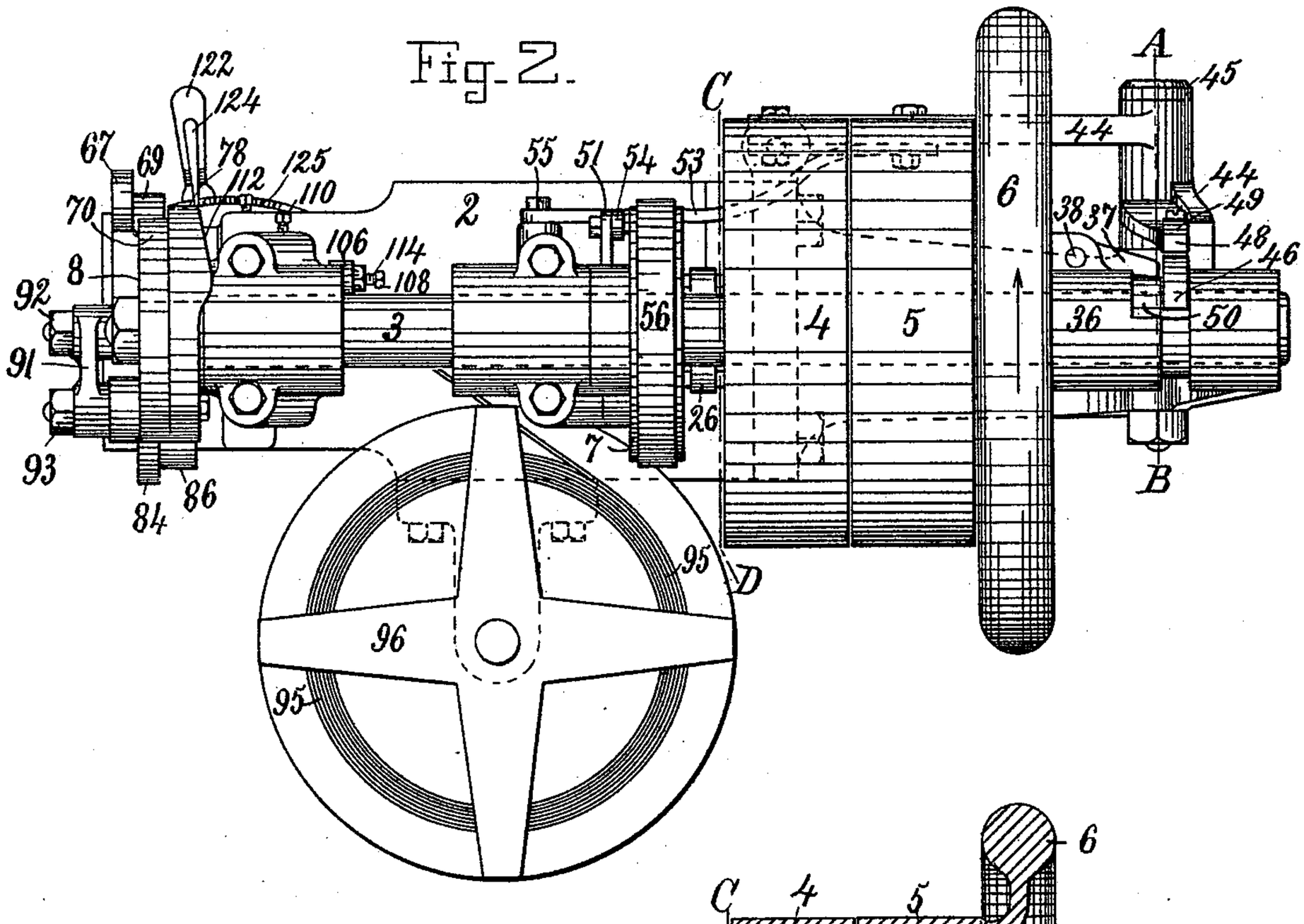
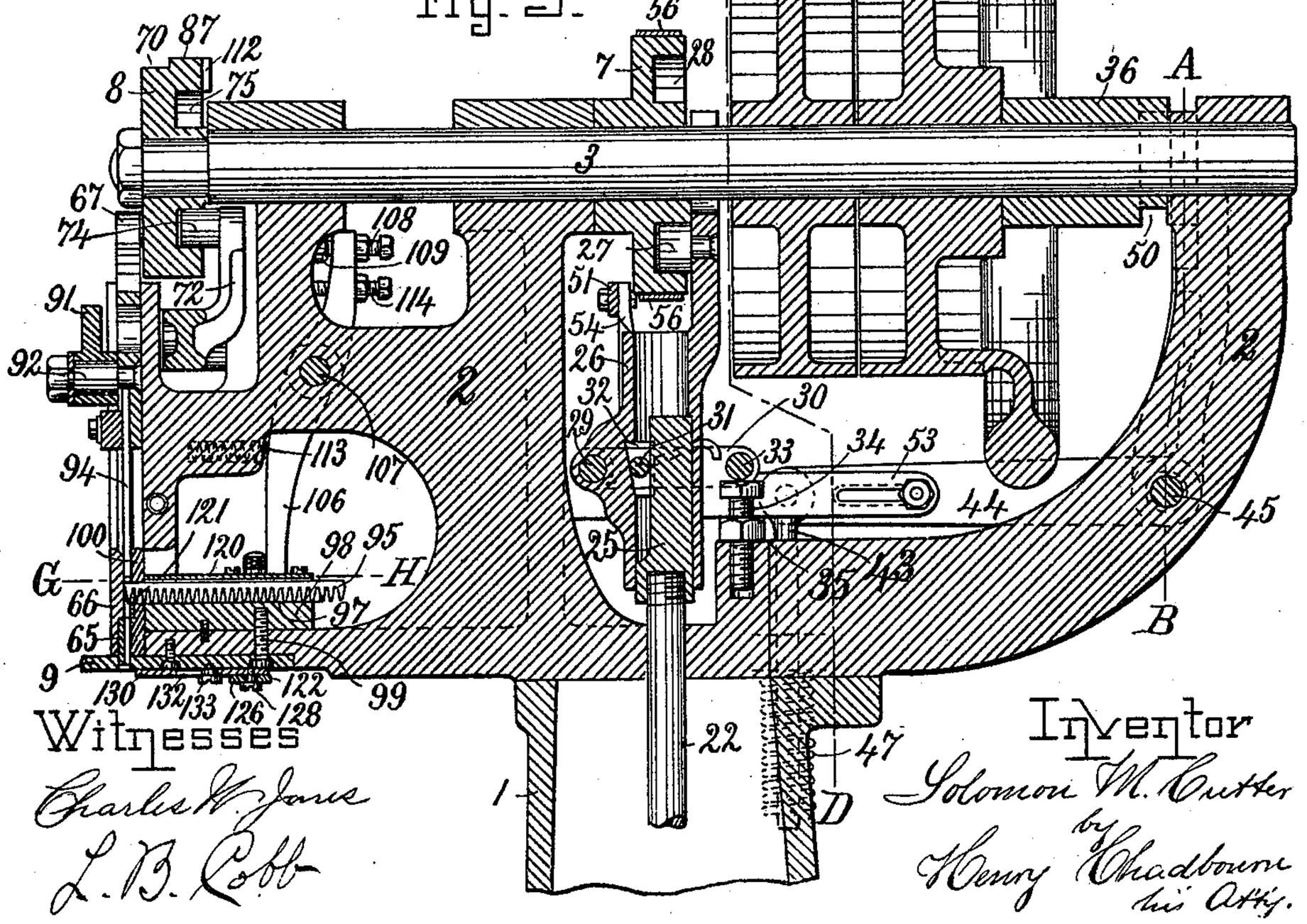


Fig. 3.



Witnesses

Charles H. Jones

L. B. Cobb

Inventor

Solomon M. Cutter

by Henry Chadbourne

his Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 6 Sheets—Sheet 3.

S. M. CUTTER.

NAILING MACHINE FOR BOOTS OR SHOES.

No. 582,579. Patented May 11, 1897.

Fig. 5.

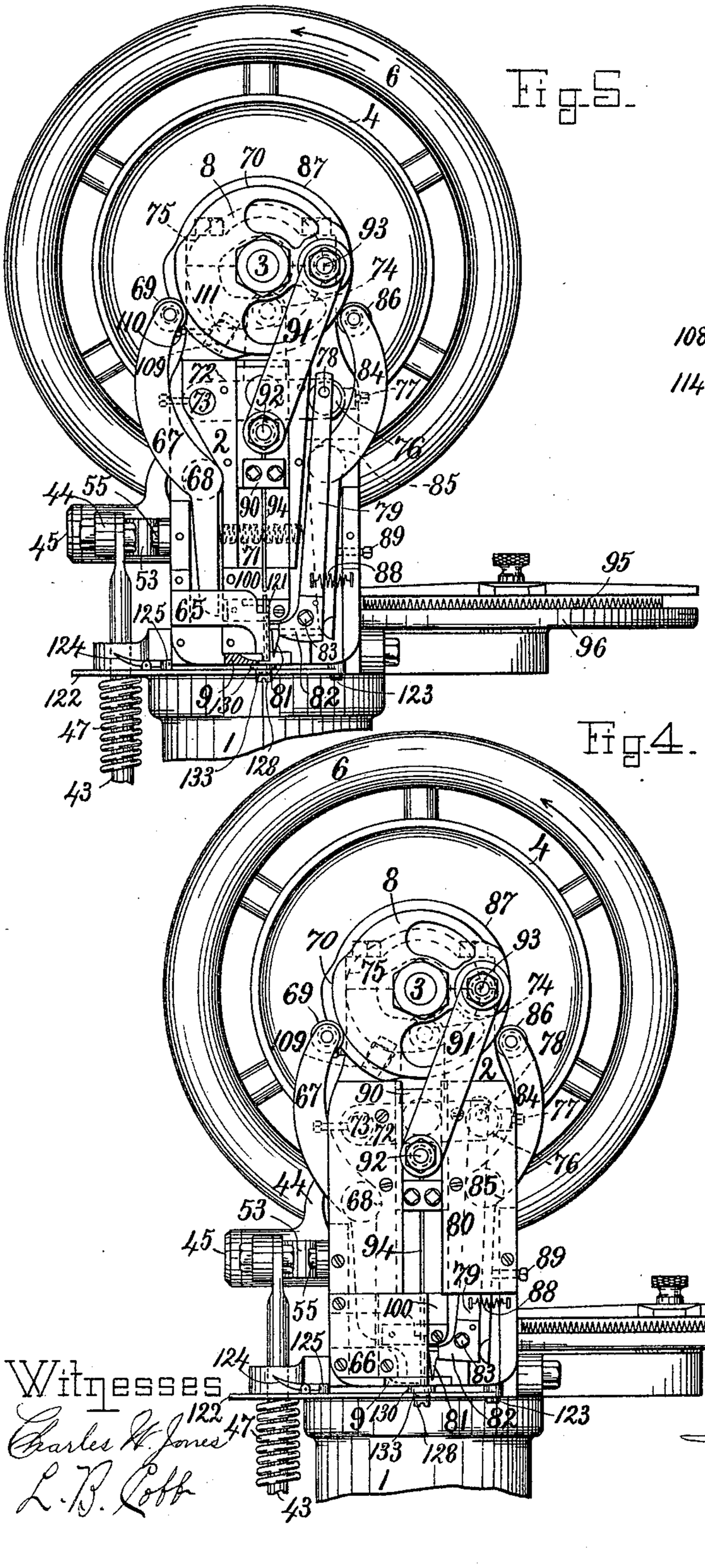


Fig. 7.

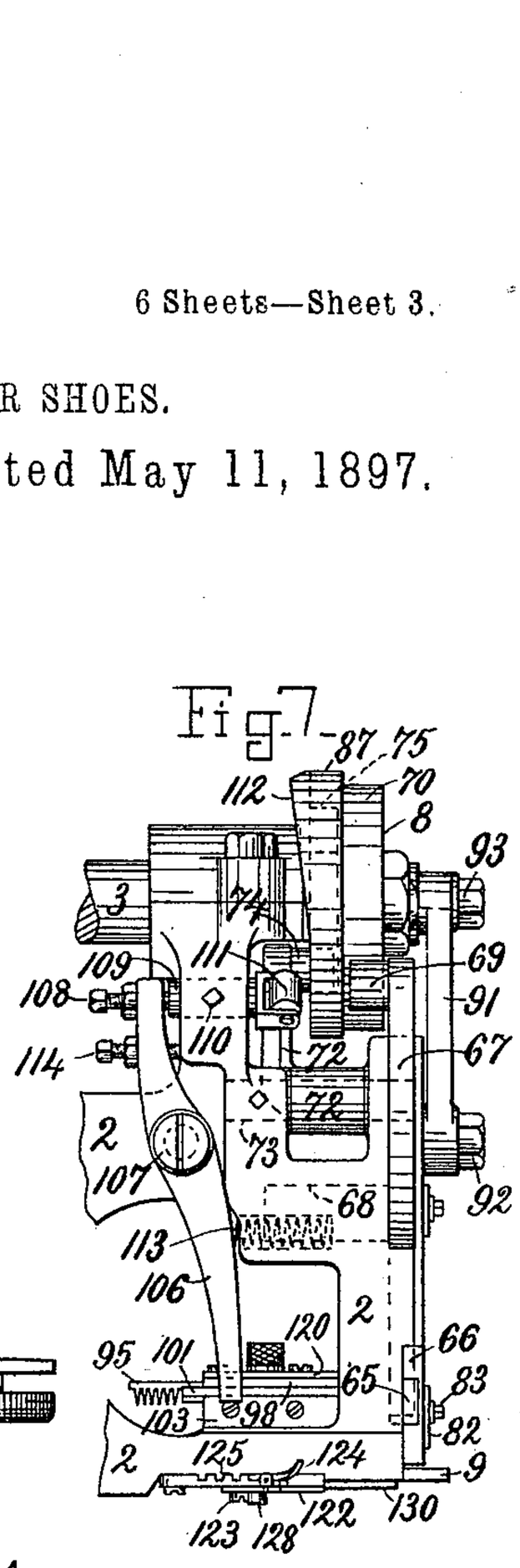
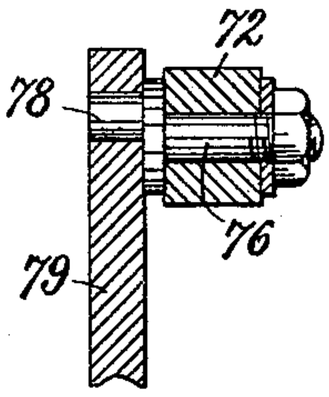


Fig. 4.

Fig. 6.



Witnesses

Charles H. Jones

L. B. Cobb

Inventor

Solomon M. Cutter

by Henry Chadbourn

his Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 6 Sheets—Sheet 4.

S. M. CUTTER.

NAILING MACHINE FOR BOOTS OR SHOES.

No. 582,579. Patented May 11, 1897.

Fig. 10.

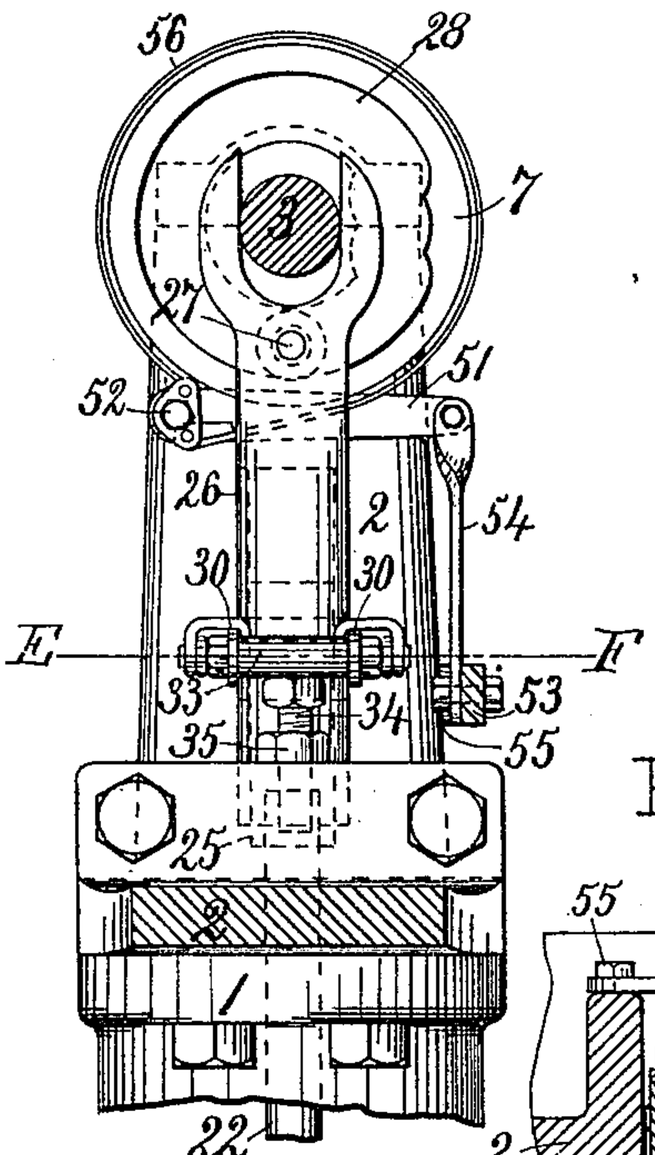


Fig. 8.

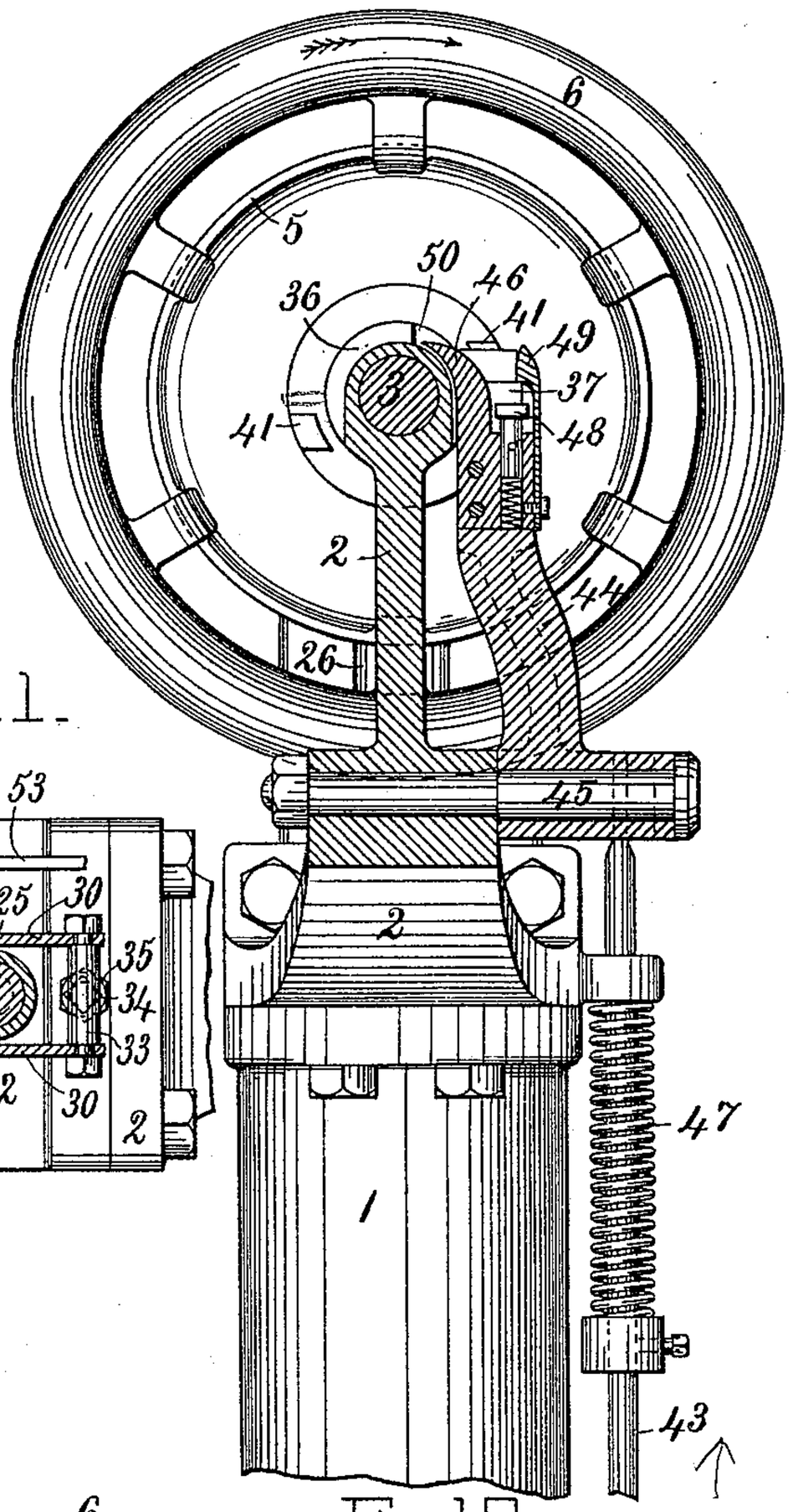


Fig. 11.

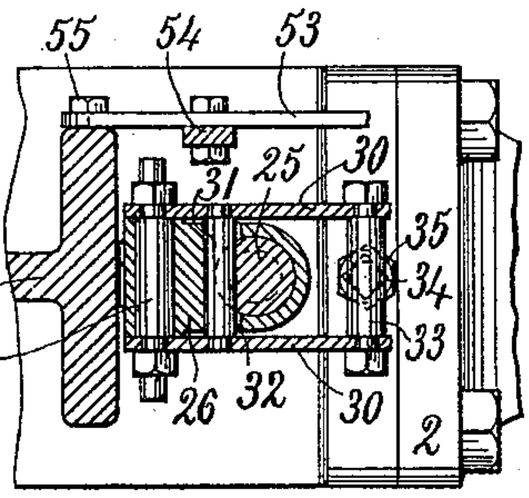


Fig. 9.

Fig. 12.

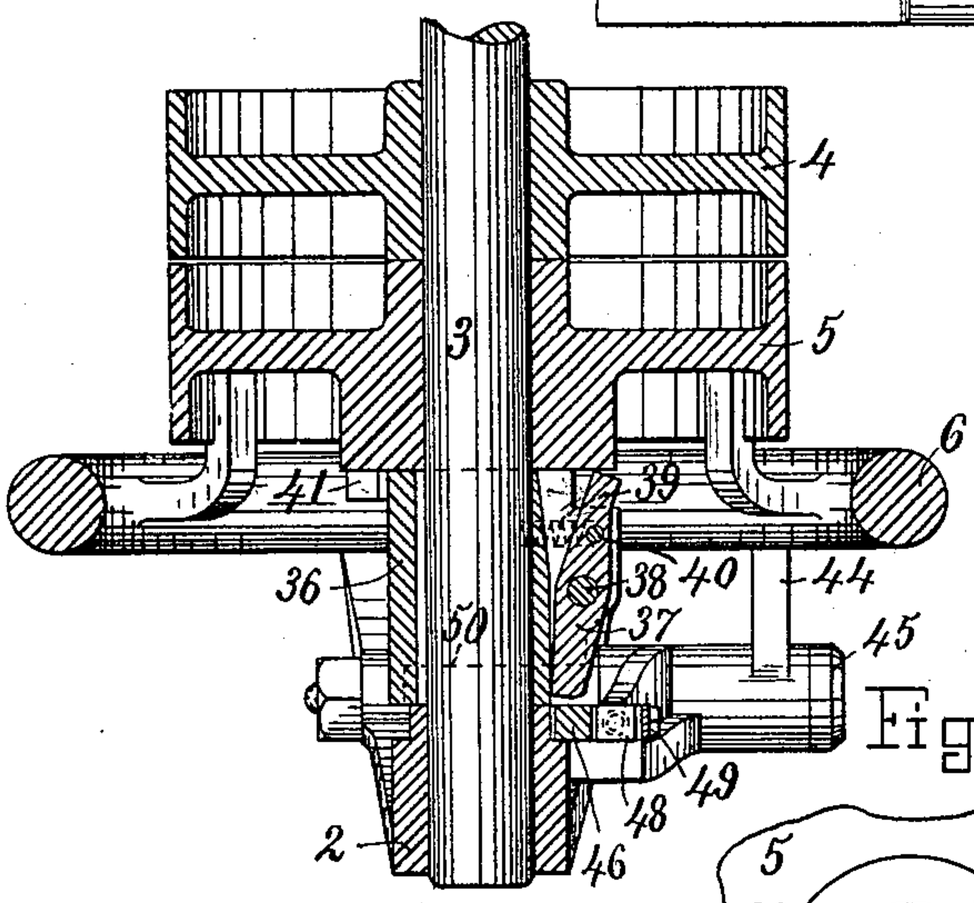
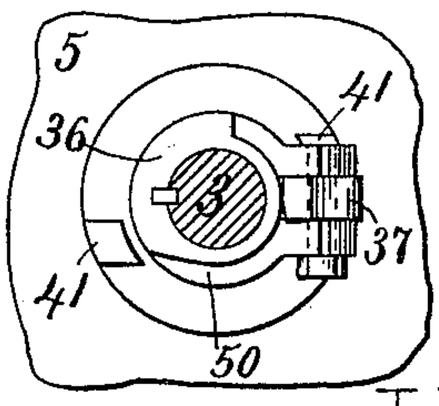
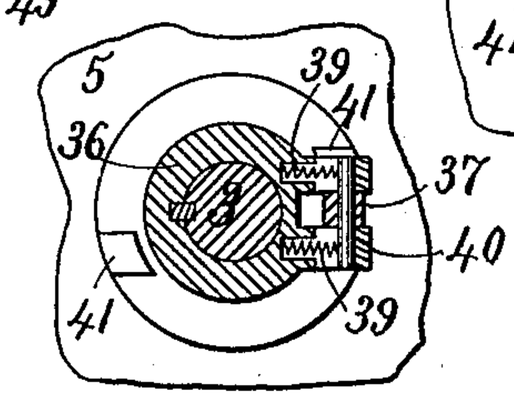


Fig. 13.





Witnesses
Charles A. Jones
L. B. Cobb

Inventor
Solomon M. Cutter
by Henry Chadbourn
his Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 6 Sheets—Sheet 5.

S. M. CUTTER.

NAILING MACHINE FOR BOOTS OR SHOES.

No. 582,579. Patented May 11, 1897.

Fig. 14.

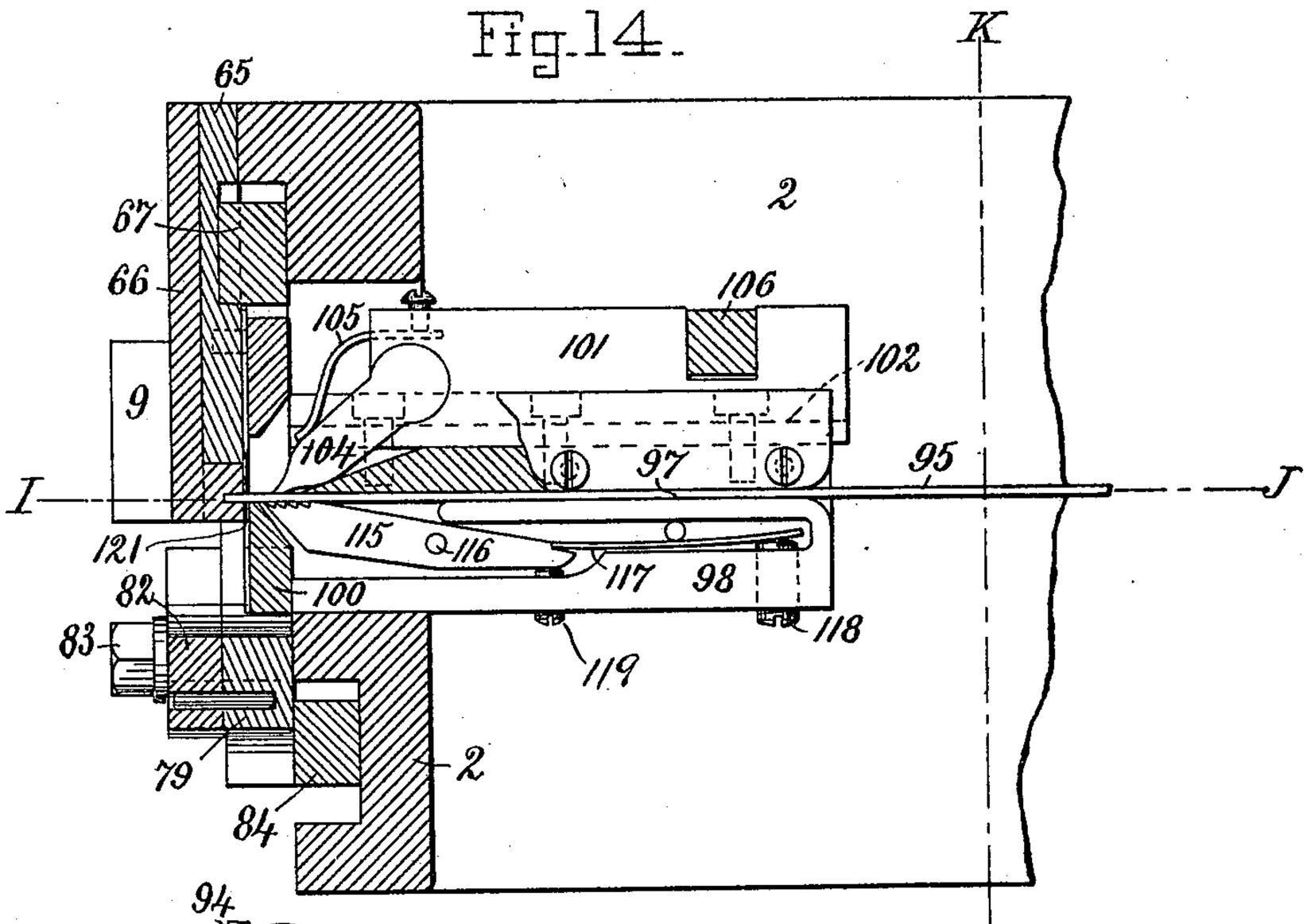


Fig. 15.

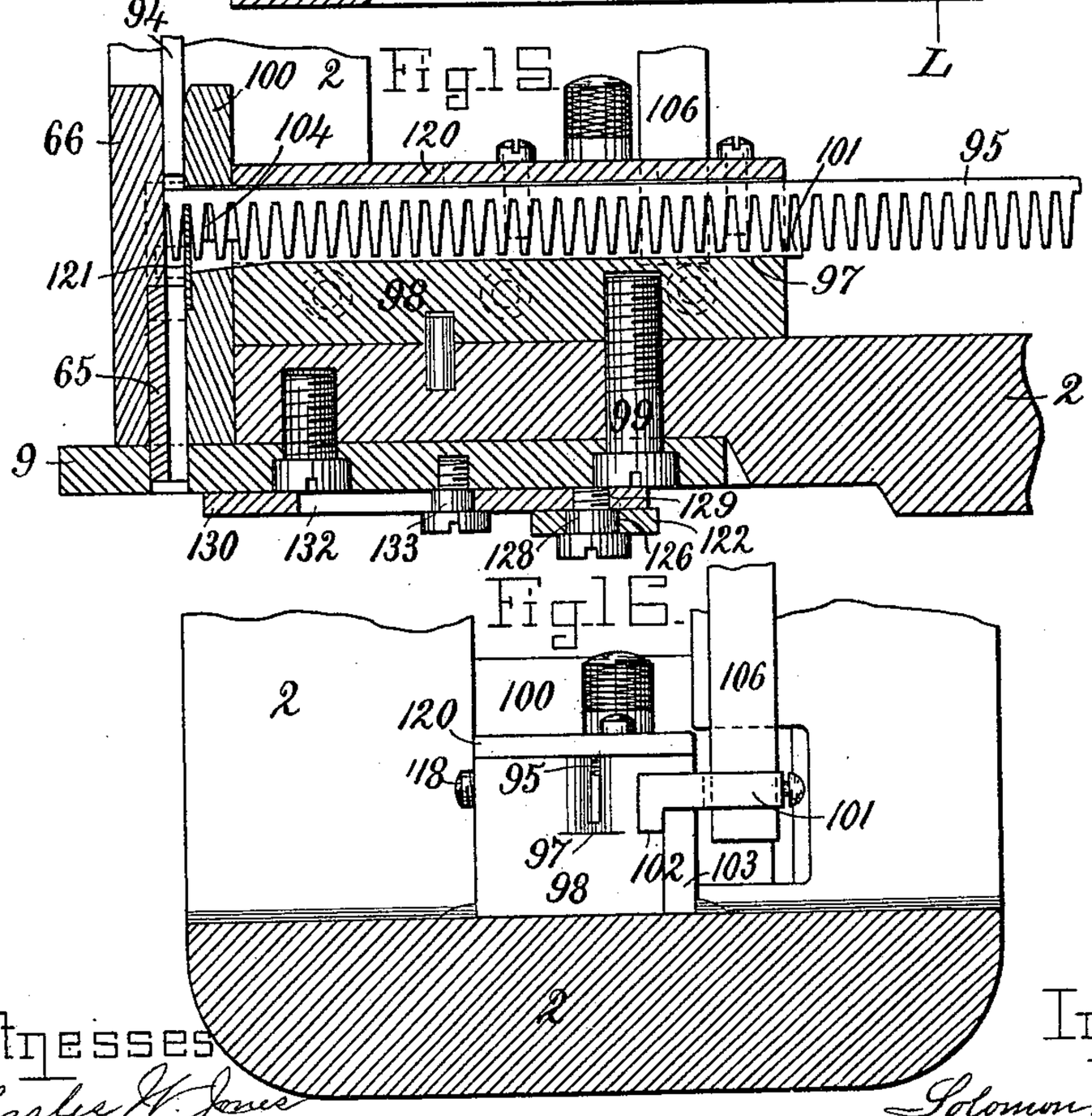
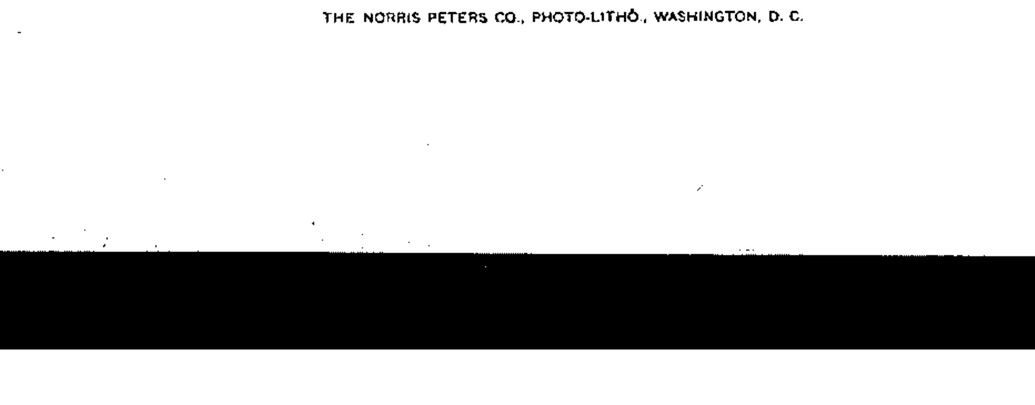


Fig. 16.



Witnesses
Charles H. Jones
L. B. Coffe

Inventor
Solomon M. Cutter
by Henry Chadbourne
his Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 6 Sheets—Sheet 6.

S. M. CUTTER.

NAILING MACHINE FOR BOOTS OR SHOES.

No. 582,579. Patented May 11, 1897.

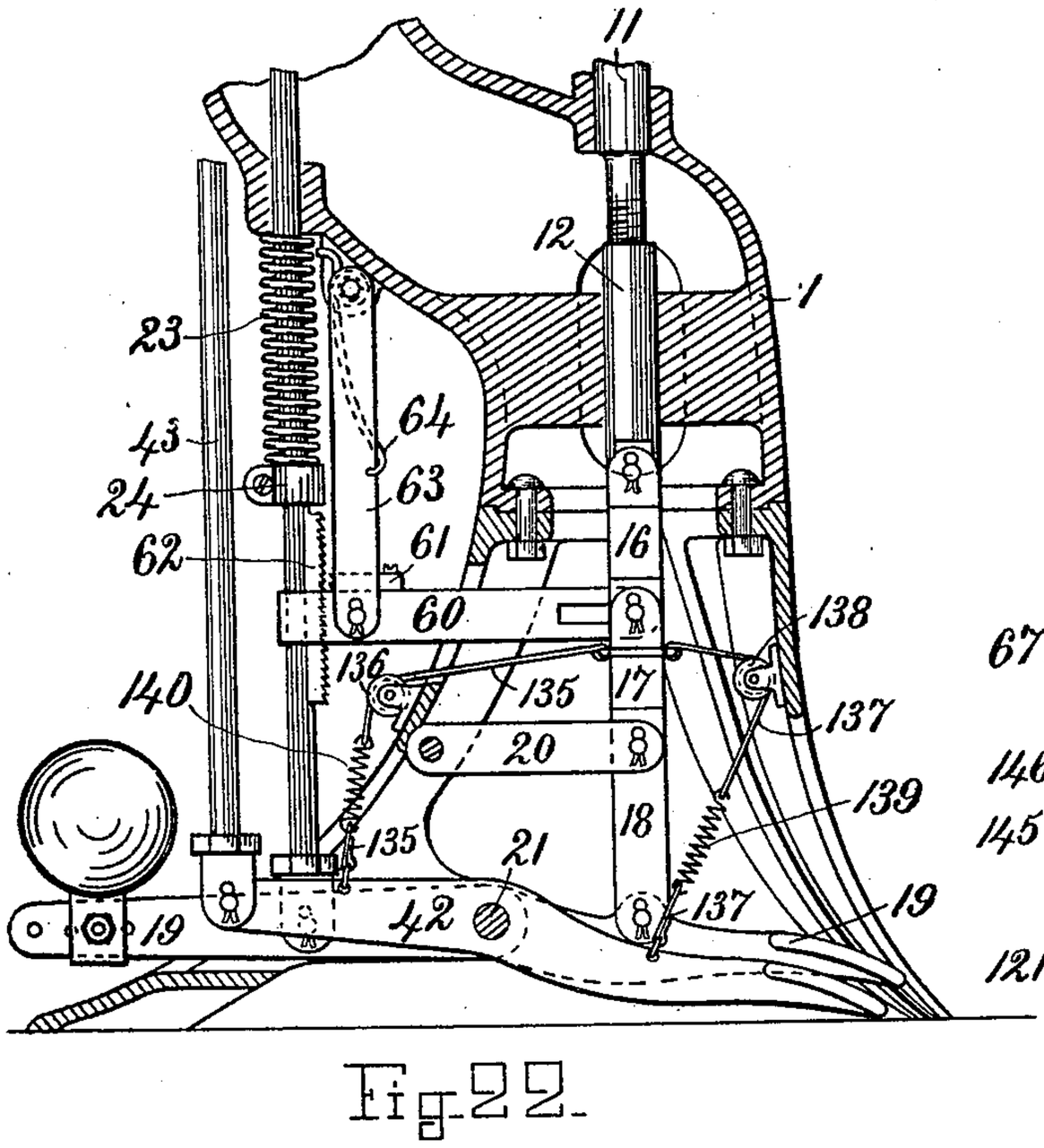


Fig. 22.

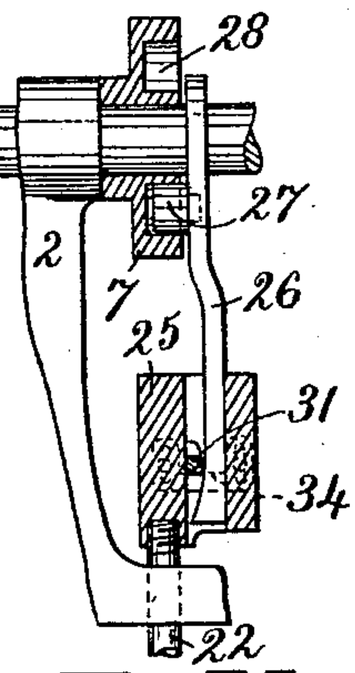


Fig. 20.

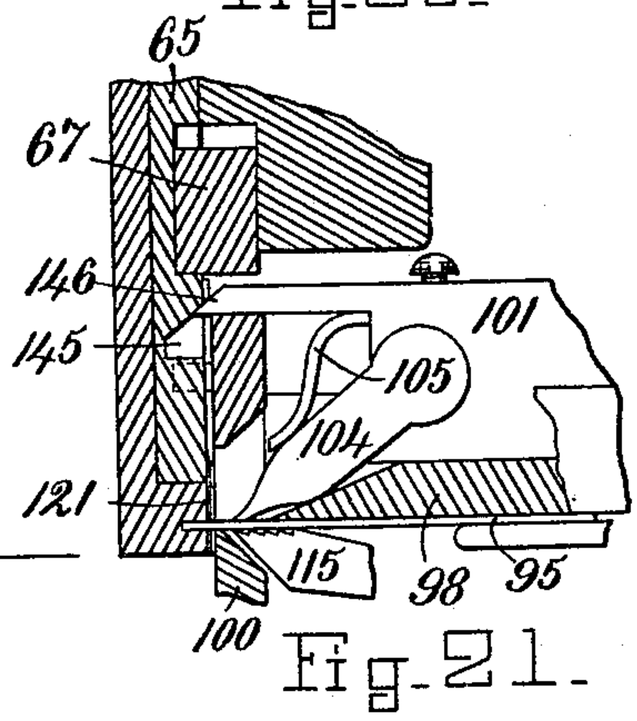


Fig. 21.

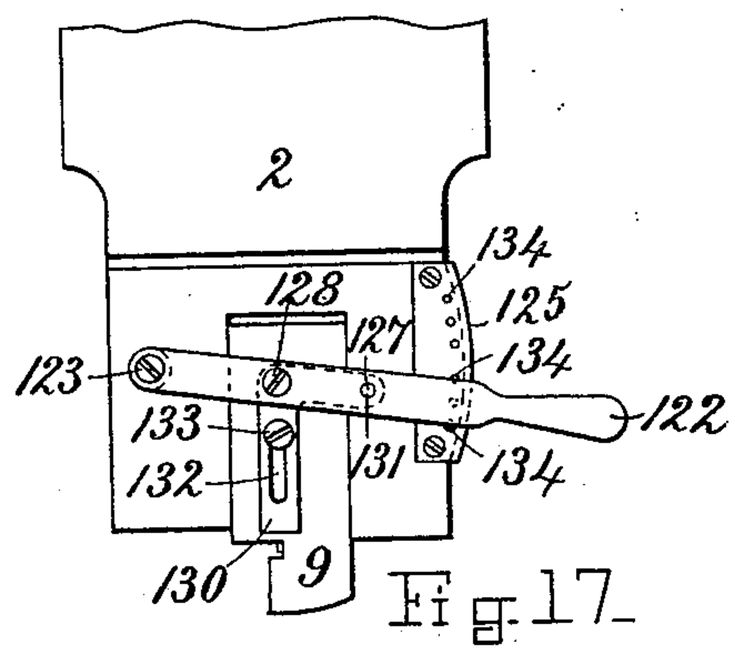


Fig. 17.

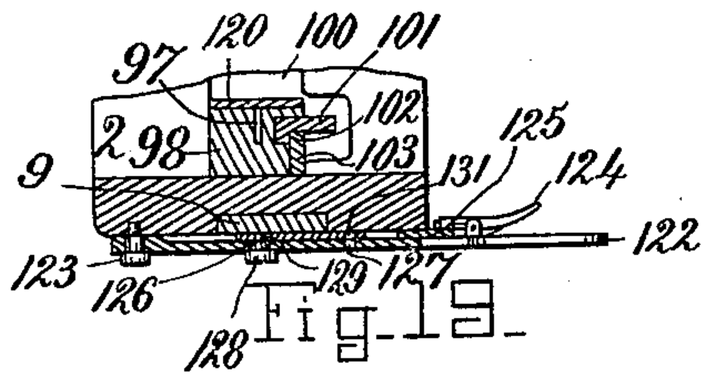


Fig. 19.

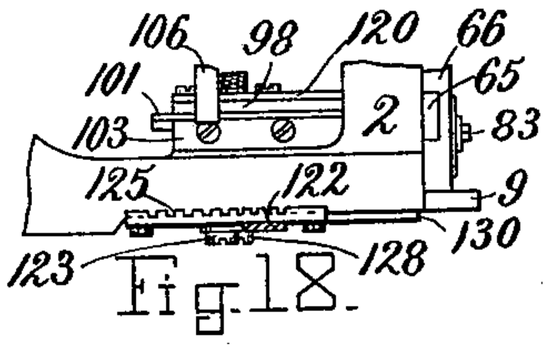


Fig. 18.

Witnesses
Charles W. Jones
L. B. Cobb

Inventor
Solomon M. Cutter
by
Henry Chadbourn
his Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

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

NAILING-MACHINE FOR BOOTS OR SHOES.

SPECIFICATION forming part of Letters Patent No. 582,579, dated May 11, 1897.

Application filed October 17, 1895. Serial No. 565,932. (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 Nailing-Machines for Boots or Shoes, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in nailing-machines, and more especially in machines to drive slugs into the heels of boots and shoes or analogous work.

The object of the invention is to produce a more practical, smoother operating, and more reliable machine than others now in common use—one which can be run at greater speed and will produce more and better work with less complication of working parts.

The invention consists in novel mechanisms and combinations and arrangements of elements, which will be fully described hereinafter and claimed, the same being illustrated on the accompanying sheets of drawings, which form an essential part of this specification, and whereon—

Figure 1 represents a side elevation of the complete machine, showing lower part of the standard in section. Fig. 2 represents a plan view of the head of the machine. Fig. 3 represents a central longitudinal section of the head of the machine and the top of the standard. Fig. 4 represents a front elevation of the head of the machine and the top of the standard. Fig. 5 represents a similar front elevation with the plates on the front of the head removed, showing internal mechanism. Fig. 6 represents a detail sectional view showing the means employed to adjust the awl. Fig. 7 represents a side elevation of the front portion of the head of the machine opposite to that shown in Fig. 1. Fig. 8 represents a vertical section on the line A B shown in Figs. 2 and 3, showing a portion of the starting and stopping mechanism. Fig. 9 represents a horizontal section through the rear portion of the driving-shaft. Fig. 10 represents a vertical section on the line C D shown in Figs. 2 and 3, showing the mechanism to automatically adjust the height of the stock-support and to automatically withdraw the support to allow the feeding of the stock, also the brake to stop the machine. Fig. 11 represents a horizontal section on the line E F shown in Fig. 10. Figs. 12 and 13 represent detailed views of the clutch used in the starting and stopping mechanism. Fig. 14 represents an enlarged horizontal section through the lower part of the front part of the head of the machine on the line G H in Fig. 3. Fig. 15 represents a longitudinal section on the line I J shown in Fig. 14. Fig. 16 represents a cross-section on the line K L shown in Fig. 14. Fig. 17 represents a detailed bottom view of the adjustable stock-gage. Fig. 18 represents a detailed side elevation of the adjustable stock-gage. Fig. 19 represents a detailed cross-section through the lever which operates the adjustable stock-gage. Fig. 20 represents another construction of the mechanism employed to automatically adjust the height of the stock-support and to automatically withdraw the same. Fig. 21 represents another arrangement to automatically move the movable part of the nail tube or throat to allow the feeding of the stock. Fig. 22 represents a section of the lower part of the standard of the machine, showing a modified form from that shown in Fig. 1 of the mechanism connected with and operated by the treadle which starts and stops the machine and by which the stock-support is automatically raised by the starting and lowered by the stopping of the machine.

Similar numerals refer to similar parts wherever they occur on the different parts of the drawings.

The machine is provided with a suitable frame for the support of the various devices which constitute it, which frame preferably consists of the standard 1 and the frame 2 for the support of the mechanisms included in the head of the machine, attached in a suitable manner to the top of said standard.

The standard 1 and frame 2 may be made in one or more parts, as desired. Within bearings in the frame of the head is mounted the driving-shaft 3, which carries the loose pulleys 4 and 5, the pulley 5 being provided with a hand or balance wheel 6. Upon the driving-shaft are also firmly mounted the

cams 7 and 8 for a purpose as will be fully described hereinafter. The frame 2 is provided in its forward part with the plate 9, which is termed the "work-plate" and against which the work is held while the nails or slugs are being driven.

The stock is supported on a suitable support consisting of the horn 10 and a vertically-movable shaft or support within a recess in which the lower end of the horn proper fits. This vertically-movable shaft is preferably made in two parts 11 and 12, adjustable one to the other so as to raise or lower the horn proper and thereby adjust the pressure of the horn upon the work. The adjustment of the supporting-shaft is preferably accomplished by screw-threading one of its constituent parts and screwing it more or less into a screw-threaded recess in the other part by means of a suitable hand-wheel 13 on the part 11 in a manner substantially as shown on the drawings. This adjustment may, if so desired, be accomplished in any other manner. The supporting-shaft is mounted in bearings in the standard 1 and is prevented from turning in said bearings by means of the screw 14, screwed through one of the bearings for the supporting-shaft and having its inner end resting loosely within a longitudinal groove 15 on the portion 11 of the supporting-shaft. Toggles 16 17 are pivotally attached together. The upper end of the toggle 16 is pivotally attached to the lower end of the portion 12 of the supporting-shaft, and the lower end of the toggle 17 is pivotally attached to the link 18, which is itself pivotally attached to the treadle 19. The upper end of the link 18, to which the toggle 17 is attached, is pivotally connected to a stationary part of the standard 1 by means of the link 20, so as to hold the link 18 in substantially a vertical position. The treadle 19 is fulcrumed at 21 to an ear on the standard 1, and to the rear end of said treadle is pivotally attached the vertical rod 22, which rod is guided in bearings in the standard, as shown. A coil-spring 23 surrounds the rod 22 between one of its bearings in the standard and a collar 24, adjustably but firmly secured on the rod, the tendency of said spring being to force the rod downward, and consequently to press the horn proper, 10, against the under side of the work-plate or against the stock held between the horn and work-plate with sufficient pressure to hold the stock against the work while the nail or slug is being driven. The treadle 19 is held in its elevated or normal position, as shown on the drawings, by means of the spring 23 and is depressed against the influence of said spring for the purpose of withdrawing the horn when the amount of the automatic withdrawal of the horn, as hereinafter described, is insufficient to allow stock of increased thickness to be placed upon the horn.

The mechanism to automatically adjust the height of the horn is preferably constructed as follows: On the upper end of the rod 22 or on a stud 25, secured to the upper end of the rod 22, is the block 26, which block is loosely movable up and down on said rod, the upper end of said block being forked and projecting upward on either side of the driving-shaft, so as to guide the block in its movements. The upper end of the block 26 is provided with a pin or roll 27, which is acted upon by a cam-groove 28 on the cam 7 to cause the block to move up and down on the rod 22 or on its attached stud 25. On either side of the block 26 and pivotally attached at 29 thereto are the levers 30 30, within bearings in which is mounted the clamp-roll 31. This roll projects through a perforation 32 in the block 26 in such a position that when in its normal position one side of the roll will rest against the rod 22 or the stud 25, which rod or stud is preferably flattened at this place, the opposite side of the roll 31 resting against the wall of the perforation 32, which wall is inclined to the flattened surface of the stud, being nearer to the stud at the lower end of said perforation. Thus it will be seen that the roll 31 projects through a tapering perforation in the block 26 and that the cam-groove acting upon the pin 27 on the block 26 will cause said block to move upward and downward on said rod or stud or with said rod or stud, as will be understood by a further description of the device. As the block starts to move upward it will cause the roll 31 by the action of its gravity to engage and clamp the block 26 and stud 25 firmly together. As the stud is attached to or made in one piece with the rod 22 the upward movement of said stud will draw said rod upward against the influence of the spring 23, which movement will cause the withdrawal of the horn from the stock. The groove in the cam 7 is preferably so formed that it will cause the horn to be automatically withdrawn once in each complete rotation of the driving-shaft. This action upon the horn is entirely automatic and is accomplished for the purpose of allowing the feeding of the stock by the awl, as will be fully described hereinafter.

The free ends of the levers 30 30 are joined together by means of the bar 33, which bar comes in contact with a screw stop or projection 34 on the frame as the block is moved downward by the action of the cam-groove 28. The action of this stop upon the levers is such that it will cause the roll 31 to be retarded in its downward movement while the block continues to move downward the full movement imparted to it from the cam-groove 28. This retarding of the downward movement of the clamp-roll causes it to release the stud 25 and the rod 22 and allows the spring 23 to force the horn upward against the under side of the stock with a pressure sufficient to resist the action of the driver when driving nails or slugs. When

the cam 7 again causes the block 26 to be drawn upward, it will allow the clamp-roll 31 to move downward in the tapering perforation in the block by its own gravity or a suitable spring acting thereon and by clamping the block and the rod 22 firmly together will withdraw the horn from the under side of the stock.

The stop 34 is made adjustable in the frame, it being held in its adjusted position by means of the check-nut 35, and it will be seen that by this adjustment of the stop I am able to both adjust the amount the horn is withdrawn from the stock and the time the rod 22 is released from the block.

The cam-groove 28 is so formed that the roll 31 will be raised out of engagement with the block 26 and rod 22 during the greater part of the revolution of the driving-shaft, it being in such a position as to clamp said block and roll firmly together and to withdraw the horn only during the time that the stock is being fed the desired distance between the slugs by the stock-feeding mechanism.

It will be obvious that a suitable jack-last or other well-known equivalent means used to support stock may be used as a support for the stock in the place of the horn shown on the drawings and that such supports may be operated by the mechanism described herein without departing from the spirit of my invention; also, that such stock-support and its operating mechanism may be used on other than nail-driving machines, and I do not wish to confine myself to its use in connection with nailing-machines alone.

In Fig. 20 has been shown a detailed view of another arrangement of the mechanism which is used to cause the automatic adjustment of the height and the withdrawal of the stock-support. In this arrangement the stud 25 has been shown in the form of a perforated block and the block 26 as projecting downward into the perforation therein, being provided near its lower end with an inclined surface. The clamp-roll 31 is inserted through the perforation in the stud 25 and projects through side slots in said stud. This roll is so arranged that it will engage the inclined surface on the block 26 and the side of the perforation in the stud 25, clamping the block and stud firmly together. In this arrangement the adjustable stop 34 is made in the form of bars adjustable on the side of the stud 25, which bars limit the downward movement of the roll within the slotted side perforations in the stud. The operation of this device is the same as that described in relation to the mechanism shown on the other views of the drawings.

The starting and stopping mechanism which is preferably used on the machine is constructed substantially as follows: The sleeve 36 is keyed or otherwise firmly mounted upon the driving-shaft 3, and the dog 37 is fulcrumed at 38 within a longitudinal groove on the outside of said sleeve in such a manner that it will be capable of a rocking movement on said fulcrum, so that its ends will move toward and from the center of the driving-shaft. Springs 39 39, of any suitable construction, act upon the dog, so that when in its normal position the inner end of the dog will be forced outward from the center of the driving-shaft. On the drawings these springs have been shown as spiral springs placed within recesses in the sleeve, which springs act upon a rod 40, which rod passes through the dog and projects on either side thereof, as shown in Fig. 13. The hub of the pulley 5 is provided with one or more projections 41 41, adapted to engage the inner end of the dog when the dog is in its normal position, and thereby to turn the driving-shaft by the rotary motion of said pulley in the direction of the arrows, as shown on the hand-wheel 6, attached to the pulley 5.

A second treadle 42 is fulcrumed at 21 to the lower part of the standard, and to the rear end of said treadle is pivotally attached the vertical rod 43. The upper end of said rod is also pivotally attached to the bell-crank lever 44, which lever is fulcrumed at 45 to the frame 2 of the head of the machine. The free arm of the bell-crank lever 44 extends upward at one side of the rear bearing for the driving-shaft and is there provided with a hooked wedge-shaped portion 46, as shown in Fig. 8. The rear bearing for the driving-shaft is cut away, as shown in Figs. 8 and 9, to receive the upper wedge-shaped portion of the bell-crank lever when said portion is forced backward by the depression of the forward end of the treadle 42 to the position shown in Fig. 1 when starting the machine. A coil-spring 47 surrounds the rod 43 between an ear on the frame 2, through which the rod passes, and a collar adjustably mounted on the rod, the influence of said spring tending to raise the forward end of the treadle 42, and by turning the bell-crank lever 44 on its fulcrum to move the wedge-shaped portion of said lever forward so that the tail of the dog 37 in rotating with the driving-shaft will engage said wedge-shaped portion and by so doing will turn said dog upon its fulcrum and swing the inner end of the dog toward the center of the driving-shaft out of engagement with the projection 41 on the pulley 5, with which it has been in engagement. This action of the bell-crank lever will prevent any further rotary motion being imparted to the driving-shaft from the pulley 5. A spring-pressed stop 48 is attached to the top of the bell-crank lever 44 and is engaged by the tail of the dog 37 after said dog has been acted upon by the wedge on the bell-crank lever and disengaged from the projections on the pulley 5. This spring-pressed stop 48 forms a yielding cushion for the dog, and thus the stopping of the driv-

ing-shaft, and consequently the stopping of the machine, is accomplished with as little shock as possible to the machine.

If so desired, the bell-crank lever may be provided with a spring-catch 49, adapted to spring over the dog 37 after the machine has been brought to a stop, so as to prevent any rebounding of the driving-shaft, but such catch may be dispensed with without departing from my invention.

To insure the completion of the operation of driving a nail after the pressure is removed from the starting and stopping treadle and prior to the withdrawal of the horn, even though said pressure be removed at the very commencement of the revolution of the driving-shaft, I provide the sleeve 36 with a recess or cut-away portion 50 for the reception of the wedge 46, which portion is of sufficient size and in such a location on said sleeve as to hold the bell-crank lever 44 in position to retain the horn against the stock until after the driver has descended and driven the nail, said cut-away portion being brought into line with the wedge portion of the bell-crank lever just at the completion of driving the nail or after the nail is driven for a purpose to be fully understood by a further description of the machine.

In order to still further lessen the shock to the machine when stopped, I may provide the driving-shaft with a suitable brake, and such has been shown as applied to the exterior of the cam 7, it being constructed as follows: A lever 51 is fulcrumed at 52 to the frame, the free end of this lever being connected to a second lever 53 by means of a connecting-link 54. The lever 53 is fulcrumed at 55 to the frame and at its opposite end attached to the bell-crank lever 44 by means of a bolt or stud which passes through and is adjustable in slots in the levers 53 and 54. Thus it will be seen that when the bell-crank lever is turned on its fulcrum to cause the starting or stopping of the machine it will, through its connection with the lever 51, cause the latter lever to turn in either direction on its fulcrum 52. A friction band or brake 56 surrounds the cam 7, being connected at its ends to the lever 51 in such a manner that when the said lever is turned on its fulcrum in stopping the machine it will cause said band to draw tightly around said cam, and thereby produce a friction between the band and cam which will tend to stop the rotation of the driving-shaft. Thus it will be seen that the friction-band and its connection with the starting and stopping mechanism form a brake which will help stop the machine with as little shock as is possible. By the adjustment of the stud within the slotted perforations in the lever 53 and in the bell-crank lever 44 I am enabled to adjust the amount of the friction of the band 56 on the cam 7.

The starting-lever 42 is provided with a projection 57, which extends upward in the rear of the toggles 16 and 17, being connected to said toggles by the connecting-link 58, so that when the starting-lever is depressed to the position shown on the drawings it will have acted upon the toggles and raised the stock-support so as to cause said support to press against the under side of the stock, and as the machine only starts when the starting-treadle reaches the extreme end of its downward movement it will be obvious that it can never start before the stock-support has been raised to its proper position. To allow the starting-treadle to be fully depressed in case the stock-support is raised as far as possible prior to the withdrawal of the wedge 46 from under the dog 37 and the consequent starting of the machine, I provide the link 58 with a slot, through which one of the pins pass which connect said link to the toggles or to the projection on the starting-lever, and insert a spring 59 within said slot, as shown in Fig. 1, so that said spring will yield and allow the treadle to be further depressed, if necessary. This yielding in the connection between the starting-treadle and the toggles may be accomplished by any other and equivalent means than by the use of the spring 59 without departing from my invention.

The yielding connection between the starting and stopping treadle and the device to raise and lower the stock-support is necessary or especially desirable when stock of greater thickness than that just nailed is to be nailed, as the support will be raised as far as possible before the wedge is withdrawn from the dog and the machine started. If this yielding connection were dispensed with, it would be necessary in such a case to depress the treadle with sufficient force to overcome the influence of the spring 23 and to force the rod 22 upward until the wedge 46 was freed from the dog 37, which operation would require a great pressure on the treadle.

By the use of the connection between the starting-lever and the device to raise and lower the support for the stock it will be seen that said support is automatically raised into operative position by the starting of the machine and automatically lowered so as to remove the stock therefrom or to replace it when desired by the stopping of the machine.

It will be seen that when the toggles are drawn backward by the link 58 in stopping the machine the tendency of the spring 23 on the rod 22 is such that it will tend to turn the horn-depressing treadle 19 on its fulcrum and cause the horn to remain at its upper position and against the stock. To obviate this and to allow the horn to be withdrawn by the stopping of the machine, I provide a suitable locking device to lock the rod 22 against the influence of the spring 23, which locking device is preferably constructed as follows and as shown on the drawings: A bar 60, extending backward from the projection on the starting-treadle, is pivotally attached to said projection by means of a pin which passes through said projection and through a slotted

projection in said bar. The rear end of this bar is forked and embraces the rod 22, being provided with a block 61, adjustably attached to said bar, having teeth which engage the teeth of a rack 62 on the rod 22 when said bar is forced backward by the action of the projection on the starting and stopping treadle in stopping the machine. A link or links 63, pivotally attached at their upper ends to an ear on the standard 1, are also pivotally attached at their lower ends to the bar 60 and act to support the rear end of said bar, preventing it from being swung downward by the action of the spring 23 when the toothed block 61 engages the rack 62. A spring 64 acts upon the links 63, tending to hold the block 61 in contact with the rack 62.

It will be seen that when the starting and stopping treadle commences to withdraw the horn from the stock the block 61 will be moved into engagement with the rack 62 by the action of the spring 64 and lock the rod 22 against the influence of the spring 23, the remaining movement of said treadle causing the connecting-pin between the projection on the treadle and the bar 60 to move backward in the slot in the bar. When the starting-treadle is again depressed, the slot in the bar 60 will allow the projection on the treadle to move forward sufficient to raise the horn before the block 61 is disengaged from the rack 62. This effectually prevents the horn from being forced upward by the spring 23 when the horn is being automatically operated by the starting and stopping treadle, as set forth. This automatic withdrawal and return of the stock-support by the operation of the starting and stopping treadle is entirely independent of the mechanism whereby the support is withdrawn by the depression of the treadle 19 and also entirely independent of the mechanism whereby the stock-support is automatically and intermittently withdrawn during the operation of the machine to allow the stock to be fed the desired distance between each nail or slug.

It will be obvious that the mechanism to lock the stock-support against the influence of the spring 23 might, if so desired, be used independent of the mechanism to withdraw or raise said support or of the starting and stopping mechanism.

The head of the machine is provided with a nail or slug tube or throat through which the nail passes when being driven, having the whole or a portion of said throat movable to allow the feeding of the stock by the awl, also with an awl and its operating mechanism, a feeding mechanism for the stock, a driver and its operating mechanism, a feeding mechanism for the nail or slug strip used in the machine, a cut-off mechanism to sever each nail or slug in its turn from the nail or slug strip, and adjusting mechanisms to adjust the several devices to insure the proper working of the machine, as will be herein fully described.

The throat through which the nails or slugs pass when being driven is formed with the whole or a portion thereof situated with a movable block 65, which block is guided in its movements in a groove in the frame of the head or in a plate 66, secured to the front of the frame. This block is normally held in such a position as to be in line with the driver, being held in such a position by means of a lever 67, fulcrumed at 68 to the frame of the head of the machine. The upper end of the lever 67 is provided with a roll 69, which is acted upon by means of the cam-surface 70 on the cam 8, as shown. The roll on the lever 67 is kept in contact with the cam 8 by means of a spring 71, substantially as shown in dotted line in Fig. 5. The movement of the block 65 is for a purpose to be fully described hereinafter.

A lever 72 is fulcrumed at 73 to the frame of the head, which lever is provided with an arm extending upward from said lever, having a roll 74, which is acted upon by a cam-groove 75 on the cam 8 to cause said lever to oscillate on its fulcrum. Within a perforation in the free end of the lever 72 is secured a headed bolt 76, which is prevented from turning in said perforation by means of a set-screw 77 in the lever, and on the head of said bolt, eccentric to the bolt, is made a pin 78 for a purpose to be described. On the pin 78 is loosely hung a lever 79, which rests within a vertical groove in the frame of the head and is held in the groove by means of a plate 80, secured to the front of the frame of the head. To the lower end of the lever 79 is secured an awl 81 by means of a block 82 and bolt 83. Thus it will be seen that the action of the cam 8 upon the lever 72 will cause an up-and-down movement of the lever 79, which will cause the awl to enter and withdraw from the stock; also that the adjustment of the bolt 76 in the lever 72 will adjust the distance that the awl will enter the stock.

A lever 84 is fulcrumed at 85 to the frame of the head, which lever is provided at its upper end with a roll 86, which rests against and is acted upon by a cam-surface 87 in the cam 8, in order to cause the lower end of said lever to oscillate on its fulcrum toward and from the nail-throat of the machine. The lower end of the lever 84 is so formed that it engages the lower end of the awl-carrying lever 79, causing the latter lever to swing in one direction on the pin 78, on which said lever is hung, the awl-carrying lever being swung in the opposite direction by means of a spring 88. The cam-surface 87 is so timed that it will cause the lateral swinging of the awl-carrying lever when the awl is in the stock, which action will cause the feeding of the stock. The spring 71, which keeps the roll 69 on the lever 67 in contact with the cam-surface 70, also tends to keep the roll 86 on the lever 84 in contact with the cam-surface 87. As the amount of the movement of the lower end of the lever 84 is sufficient for the greatest feed of the stock necessary and gov-

erns the amount of the feeding of the stock, it is desirable that such movement should be adjustable to vary the feed. To accomplish this adjustment, I provide the frame with an adjusting-screw 89, which is screwed through the frame of the head and engages the lever to limit its lateral movement from the nail tube or throat.

Within vertical guideways on the front of the head of the machine is mounted the sliding block 90, which is capable of a vertical reciprocating movement in said guideway and is so reciprocated by means of the pitman 91, one end of which is pivotally attached at 92 to said block, the other end being pivotally attached to the crank-pin 93 on the front of the cam 8. The driver 94 is secured to the lower end of the block 90 and moves vertically with the same, entering the nail tube or throat and, when in its lowest position, extending through the same, so that the lower end of the driver is even with the under side of the work-plate 9.

I do not claim any particular novelty in the driver or its operating mechanism, as such is a common and well-known mechanism and may be substituted by any now in common use.

In this machine I use a suitable comb-shaped nail or slug strip 95, substantially like that shown in Fig. 15. This strip is preferably coiled and placed upon a suitable reel 96, pivotally attached to a bracket projecting from the frame of the head of the machine; but the construction or the use of said reel forms no essential part of my invention and may be varied or entirely dispensed with, if so desired.

The nail or slug strip is guided through a groove 97 in a block 98, as shown in Figs. 14, 15, and 16, which block is secured to the frame 2 by means of the screw 99, said screw also helping to attach the work-plate to the frame. The end of the nail or slug strip after passing through the groove in the feeding-block enters the nail tube or throat from the rear of said throat through a perforation in the frame or in a plate 100, secured to the front of the frame. This plate forms one side of the nail tube or throat.

The nail or slug strip is fed into the nail tube or throat the distance between each nail or slug on the strip by means of the following mechanism: A slide 101 is longitudinally movable toward and from the nail-tube in an L-shaped groove 102 in the feed-block 98, (shown in Fig. 16,) being held in such groove by the plate 103, secured to the side of the feed-block. To the forward end of said slide is pivoted the feed-pawl 104, which is acted upon by the spring 105 to hold said pawl in contact with the side of the nail or slug strip. This pawl is arranged to enter between the shanks of the two nails on the nail-strip and preferably just below the head portions of said nails, which head portions are joined together to form the nail-strip. A lever 106 is fulcrumed at 107 to the frame of the head and has its lower end resting in a side recess in the slide 101, the upper end of the lever being provided with a set-screw and check-nut 108. A pin 109 is mounted in a perforation in the front of the frame of the head, being free to move longitudinally within said perforation, as shown in Fig. 7, and kept from turning therein by means of the set-screw 110, screwed through a perforation in the frame and entering a longitudinal groove on said pin; but such groove has not been illustrated, it being of the common and well-known construction. The front end of this pin is provided with the roll 111, which is acted upon by the cam-surface 112 on the cam 8 to move the pin backward in its perforation. The pin 109 when forced backward comes in contact with the set-screw in the upper end of the lever 106, so as to turn said lever on its fulcrum and to move the slide 101 forward in its guide in the block 98 in order to feed the nail-strip into or toward the nail-throat. A spring 113 (shown in dotted lines in Fig. 7) acts upon the lever 106, tending to turn it on its fulcrum and by moving the pin forward to keep the roll 111 in contact with the cam-surface 112. Thus it will be seen that the lever 106 by its rocking movement on its fulcrum will cause an intermittent feeding of the nail-strip into the nail-throat. The lever 106 is provided at its upper end with a second set-screw and check-nut 114, so arranged that the end of the screw will come in contact with the frame of the head of the machine when the lower end of the lever is moved backward by the action of the spring 113.

It will be seen that the amount of the forward movement of the lower end of lever 106 is adjustable by means of a set-screw 108, and its backward movement is adjustable by means of the screw 114. As the movements of the lever 106 govern the amount of the feeding of the strip, said feeding of the strip is made adjustable by means of the set-screws 108 and 114.

To prevent any liability of withdrawing the nail-strip after it has been fed forward when the feed-pawl is moved backward, I provide the block 98 with the lever 115, which is fulcrumed at 116 to said block and preferably provided with serrations in its forward end, which rest against the side of the nail-strip opposite to the pawl 104. This lever is pressed against the nail-strip with a yielding pressure by the influence of a spring 117, which pressure is adjustable by means of a set-screw 118, substantially as shown in Fig. 14. To prevent the lever 115 from being forced against the end of the pawl by the influence of the spring 117 when the nail-strip is removed from the feed-block, I provide said block with a set-screw 119, which acts as a stop for said lever and may be adjusted as described, and shown in said Fig. 14.

The feed-block 98 is provided with the movable cover 120, which is preferably fur-

nished with a suitable handle and held in position on the block by means of screws, substantially as shown in Figs. 15 and 18.

Attached to or made in one piece with the movable block 65 is a knife or cutter 121, which moves in a groove in the front of the frame of the head or in the plate 100, attached to the frame. This knife is so arranged that when the movable block is in its normal position or so that the portion of the throat which is contained therein is in a line with the driver the end of said knife will be inserted between the shank of the nail which has been fed into the throat and the next nail on the nail-strip, as shown in Figs. 14 and 15, but when the movable block is moved out of line with the driver said knife will be withdrawn to one side and from the nail-strip, so as to allow the next nail to be fed into the throat by the feeding mechanism.

Prior to the withdrawal of the knife the nail which has been fed into the throat is severed from the nail-strip by the driver forcing the nail-strip downward against the upper cutting edge of the knife. The nail thus severed passes downward through the nail-tube, enters the hole made in the stock by the awl, and is driven by the driver. The hole made in the stock by the awl for the reception of the nail has been moved into line with the driver by the feeding of the stock by the awl.

The machine is provided with a suitable adjustable gage to properly guide the stock while the nails are being driven, which gage is preferably constructed as follows, as illustrated in Figs. 17, 18, and 19.

To the under side of the frame of the head is arranged a hand-lever 122, which lever is fulcrumed at 123 to said frame in such a manner that its free end is capable of a swinging movement toward and from the front of the machine. This lever is provided at or near its free end with a spring-actuated pawl 124, which in its normal position engages the teeth on the comb 125, attached to or made in one piece with the frame of the head. This pawl acts to hold the lever 122 in any desired position to which it may have been turned, for a purpose as will be fully understood by a further description of the invention.

The lever 122 is provided with two perforations 126 and 127, and through the desired one of said perforations is inserted a shouldered screw 128, which screw is screwed into a screw-threaded perforation 129 in the gage 130. The gage is preferably made in the form of an L, one arm of which is provided with a screw-threaded perforation 131, corresponding to the perforation 127 in the lever 122, for a purpose to be understood by a further description of the gage. The arm of the L-shaped gage, which projects toward the front of the machine, is provided with a slot 132, through which a shouldered screw 133 passes, said screw being screwed into the under side of the frame of the head or the work-plate 9, secured to said frame. The forward free end of the gage forms the gage proper, against which the stock is held while being nailed, and said forward end is preferably slightly curved, as shown in Fig. 17.

In order to adjust the gage so as to drive the nails into the stock the desired distance from the edge of the same, it is only necessary to depress the free end of the pawl 124 to withdraw it from the comb 125 and then to swing the hand-lever 122 on its fulcrum either forward or backward, thereby causing the gage 130 to move in a corresponding direction on the screw 133, the slot 132 in the gage allowing such a movement. After the gage has been adjusted it is locked in such a position by releasing the pawl 124 and allowing the pawl to engage the comb on the frame.

The perforations 126 and 127 in the lever 122 and the corresponding screw-threaded perforations 129 and 131 in the gage are for the purpose of varying the amount of adjustment of the gage by the swinging of the lever 122—that is to say, if the gage and lever are pivotally connected together by inserting the screw 128 through the perforation 126 in the lever and screwing it into the perforation 129 in the gage, as shown on the drawings, the movement of the lever will adjust the gage less than when said lever and gage are connected by the insertion of the screw 128 through the recess 127 in the lever and screwing it into the perforation 131 in the gage.

It will be obvious that a series of any number of perforations corresponding to the perforations 126 and 127 in the lever may be made in said lever and a similar series of perforations made in the arm of said L-shaped gage, if so desired, without departing from the spirit of my invention.

In nailing boots and shoes it is somewhat desirable to drive the nails at two different distances from the edge of the sole or heel, and especially is this necessary when slugging the heels with two rows of slugs, one inside of the other. To provide means whereby the gage may be quickly and accurately adjusted to the desired positions to accomplish this result, I supply the comb 125 or the frame of the head with a series of perforations 134 and insert stop-pins into the desired perforations, one to stop the forward movement of the hand-lever and another to stop its backward movement. Thus it will be seen that when it is desired to drive nails nearest to the edge of the stock after the stop-pins have been properly adjusted in the perforations 134 it is only necessary to swing the lever forward until it is stopped by the forward stop-pin and to swing it backward until stopped by the rear stop-pin when it is desired to drive the nails which are to be the farthest from the edge of the stock without being obliged to measure the position of the gage at each adjustment.

In Fig. 22 I have shown another form of the mechanism whereby the stock-support is caused to automatically withdraw when the

machine is stopped by the rise of the treadle 42 and automatically return again into operative position when the machine is again started by the depression of the starting-treadle. This form of said mechanism is constructed substantially as follows: The projection 57 on the treadle 42 and the link 58, attached to said projection above described, are dispensed with, and in lieu of such devices I attach a chain or belt 135 at one end to the toggles 16 17 and at the other end to the treadle 42, back of its fulcrum 21. This chain or belt is carried over a suitable sheave or roller 136, attached to the standard 1 at the rear of the toggles, substantially as shown. A second chain or belt 137 is attached at one end to the toggles 16 17 and at the other end to the treadle 42 in front of its fulcrum 21. This second chain or belt is carried over a suitable sheave or roller 138, attached to the standard 1 in front of the toggles, substantially as shown. By this construction it will be seen that when the treadle 42 is depressed, as shown on the drawings, to start the machine it will cause a pulling strain to be exerted on the chain 137, which strain will operate said toggles and raise the stock-support. A spring 139 is introduced within the chain or belt 137 for the same purpose as above set forth in relation to the spring 59. It will also be seen that when the treadle 42 is released from its downward pressure to stop the machine the chain 135 will operate upon said toggles and automatically lower the stock-support. A spring 140 is introduced within the chain or belt 135 to allow of a slight yielding of the chain, if required. In this construction the link 60, which operates the lock 61 62 to prevent the upward movement of the stock-support, caused by the influence of the spring 23, is preferably attached to the toggles, as shown.

In using my improved nailing-machine the only time that it is necessary to depress the treadle 19 is when you desire to nail stock the thickness of which is increased over that just nailed more than the distance the stock-support is automatically withdrawn by the stopping of the machine, which is the case when you desire to nail heels after having nailed soles or when you desire to nail very high heels after having nailed low ones. After the support has been depressed for the treadle 19, the stock placed upon the support, and the machine started the height of the support will be automatically adjusted and properly operated by the mechanisms hereinbefore described.

In Fig. 21 I have shown another means which might be employed to cause the movement of the nail tube or throat out of line with the driver, so as to allow the feeding of the stock by the awl, and the placing of the hole made thereby in line with the driver, so as to receive the nail when driven. In this construction the movable block 65, which contains the movable nail-tube, is moved to one side by the operation of the mechanism which causes the feeding of the nails to or over the nail-tube. To accomplish this, I provide the movable block 65 with a recess or perforation 145 and also provide the feed-slide 101 with a wedge-shaped projection 146, which enters said recess as the slide is moved forward in feeding the nails to the driver. As this wedge-shaped projection enters the recess in the block it comes in contact with the side of said recess and forces the block out of line with the driver. The block is returned into line again when the slide is drawn backward by the action of the lever 67, as hereinbefore described.

I do not wish herein to limit myself to the use of the exact combination of parts as herein shown and described to produce the automatic adjustment or intermittent withdrawal of the stock-support, the automatic withdrawal and replacing of the support by the operation of the starting and stopping treadle, the locking of the support against its upward pressure, or the moving of the nail tube or throat out of line with the driver and the return of the same, as such parts may be varied by the use or substitution of well-known equivalent parts or changed within the scope of mechanical skill without departing from the spirit of my invention, if so desired.

With the various parts of the machine in the positions shown on the drawings and the starting-lever just depressed, as shown, the operation of the machine is as follows: The driving-shaft is caused to rotate in the direction of the arrows shown on the hand-wheel in Figs. 4 and 5, causing the awl to be driven into the stock by the action of the cam-groove 75 on the lever 72. The stock-support is then slightly withdrawn from the stock by the action of the cam-groove 28 on the block 26. The stock is then fed forward the desired distance between the slugs by the action of the cam-surface 87 on the lever 84, which movement causes the movable block 65, containing a portion of the nail tube or throat, to move so that the portion of the nail tube or throat contained therein is out of line with the driver, and also causes the end of the knife 121, attached to said movable block, to be withdrawn from the nail or slug strip 95. This feeding of the stock also causes the placing of the hole or recess in the stock made by the awl directly in line with the driver to receive the nail. The spring 23 is then allowed to return the stock-support to its normal position and to press the support against the under side of the stock by the cam-groove 28 acting on the block 26 and the unclamping of the rod 22 from the block 26 by the stop 34 acting on the levers 30 30. The awl is then withdrawn from the stock by the cam-groove 75 acting on the lever 72, and at the same time the nail or slug strip is fed to the nail tube or throat by the cam-surface 112 acting to turn the lever 106 on its fulcrum. The

awl is then returned to its normal position by the cam-surface 87 allowing the spring 71 to act upon the lever 84, releasing the spring-actuated awl-carrying lever 79, and at the same time the movable block 65 is moved so as to bring the portion of the throat contained therein in line with the driver, and its attached knife 121 is introduced between the first and second nail on the nail-strip by the cam-surface 70 acting on the lever 67. The driver, having moved continually during the above operations of the machine, has reached a position in its downward stroke where the lower end of the driver is a little above the nail which has been fed into or above the nail-throat, and now continues its downward movement, cutting off and driving the nail into the stock.

If the starting and stopping treadle has been released during the preceding operations of the machine, it will allow the wedge-shaped projections 46 to release the dog 37 from the projection 41 on the pulley 5 and stop the machine; but if the said treadle is still held in its depressed position the operations of the machine will be repeated over and over again. At the same time that the wedge-shaped projection moves into position to stop the machine the stock-support will be automatically withdrawn from the under side of the stock by the connection of the starting and stopping treadle with the toggles which operate the stock-support, for the purpose of removing the stock which has just been nailed from the stock-support and replacing it with other stock to be nailed.

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

1. In a nailing-machine a driver and operating mechanism to reciprocate the driver, an awl, an awl-carrying lever 79, a cam and connected mechanism to move said lever both vertically and toward and from the driver as set forth, a block 65 having a nail-tube therein, guided within guides in the frame of the machine held against said awl-carrying lever, and moved laterally in one direction by engagement with said awl-carrying lever during the lateral movement of said lever, to allow the feeding of the stock by the awl, as set forth.

2. In a nailing-machine a driver and operating mechanism to reciprocate the driver, an awl, an awl-carrying lever 79, a cam and connected mechanism to move said lever both vertically and toward and from the driver, to cause the awl to both puncture and feed the stock, an adjustable stop to limit the amount of the movement of said lever from the driver to vary the feeding of the stock combined with a block 65 having a nail-tube therein, guided within guides in the frame of the machine, held against said awl-carrying lever and moved laterally in one direction by the lateral movement of the awl-carrying lever, to allow the awl to be moved into line under driver, when feeding the stock for the purpose set forth.

3. In a nailing mechanism a driver and operating mechanism to reciprocate the driver, an awl, an awl-carrying lever 79, a cam and connected mechanism to move said lever both vertically and toward and from the driver as set forth, a block 65 having a nail-tube therein guided within guides in the frame of the machine, held against said awl-carrying lever and moved laterally in one direction by engagement with said awl-carrying lever during the lateral movement of said lever, to allow the feeding of the stock by the awl, a cam and a lever operated thereby to return said block to normal position with its contained nail-tube in line with the driver for the purpose set forth.

4. In a nailing-machine a driver and operating mechanism to reciprocate the driver, an awl, an awl-carrying lever, a cam and connected mechanism to move said lever both vertically and toward and from the driver, to puncture and feed the stock, a laterally-movable block having a nail-tube therein, said block held against said awl-carrying lever and moved out of line with the driver by the movement of the awl-carrying lever toward the driver, to allow the feeding of the stock by the awl, a nail-supply operated independent of the driver or awl-operating mechanisms, whereby nails are delivered from the nail-supply to the nail-tube while said tube is directly in line with the driver, substantially as set forth.

5. In a nailing-machine, a driving-shaft, a cam on said shaft, a lever pivoted to the frame of the machine having a pin or roll acted upon by said cam, a bolt adjustably but securely mounted in the free end of said lever, a pin on said bolt arranged eccentric thereto, an awl-carrying lever pivotally hung on said pin, an awl attached to the awl-carrying lever moved up and down by the action of the cam on said lever to pierce and withdraw from the stock, the distance said awl pierces the stock being determined by the adjustment of the eccentric-bolt within the end of the lever, for the purpose set forth.

6. In a nailing-machine, a driving-shaft, a cam on the shaft, two levers operated by said cam, the free end of one lever being moved vertically by said cam and the free end of the second lever being moved laterally by said cam, an awl-carrying lever being hung to the vertically-moving lever having its free end moved laterally by the laterally-moving lever and an awl attached to the awl-carrying lever said awl being given a vertical and lateral movement by said levers, for the purpose set forth.

7. In a nailing-machine, a driving-shaft, a cam on the shaft, an awl and operating mechanism whereby the awl is intermittently reciprocated vertically to pierce and withdraw from the stock, combined with a lever fulcrumed to the frame and acted upon by said

cam to move the awl laterally in one direction when the awl is in the stock to feed the stock, and a spring to move said awl laterally in the opposite direction for the purpose set forth.

8. In a nailing-machine a reciprocating driver and mechanism to reciprocate the same, the plates 66 and 100 having the nail-tube formed therein through which the nails are driven by the driver, the perforation in the plate 100, the feed-pawl 104 and mechanism to operate said pawl to intermittently feed a comb-shaped nail-strip through the perforation in the plate 100 and into the nail-tube, the knife 121 having upper cutting edge and guided within guides on the plate 100, mechanism to move said knife laterally within the guides across the perforation in the plate and through the comb-teeth shank-forming portions of the nail-strip, the end nail of the strip being severed from the strip against the cutting edge of the knife by the downward movement of the driver as set forth.

9. A vertically-adjustable stock-support, the cam 7 having cam-groove 28, the perforated block 26 having an inclined surface as described and the pin and roll 27 engaging the cam, the block 25 movable loosely within the perforation in the block 26, the clamp-roll 31 engaging the block 25 and the inclined surface on the block 26, and connections between the vertically-movable stock-support and the block 25, whereby the stock-support is automatically adjusted downward for increased thickness of stock to be nailed on the machine as set forth.

10. A spring-pressed vertically-adjustable stock-support, the cam 7 having cam-groove 28, the perforated block 26 having an inclined surface as described and the pin and roll 27 engaging said cam, the block 25 movable loosely within the perforation in the block 26, the clamp-roll 31 engaging the block 25 and the inclined surface on the block 26, automatic mechanism to disengage said roll from the blocks 25 and 26, and connections between the vertically-movable spring-pressed stock-support and the block 25 whereby the stock-support is automatically adjusted downward or allowed to be pressed upward by its spring-pressure, to compensate for various thicknesses of stock to be nailed on the machine as set forth.

11. A vertically-adjustable stock-support, a block moved vertically and positively, a tapering perforation in the block, a rod having bearing in the block in which it is longitudinally movable, a clamp-roll in said tapering perforation clamping the block and rod firmly together when the block is moved in one direction but allowing the block to move freely on the rod when the block is moved in the opposite direction, levers having bearings for the clamp-roll, a stop to engage said levers to move the clamp-roll and to disengage the block and rod during a desired part of the movement of the block, and connections between the rod and stock-support whereby the height of the stock-support is automatically adjusted for various thicknesses of stock and slightly withdrawn to allow the stock to be moved on the support, for the purpose set forth.

12. A vertically-adjustable stock-support, a block moved vertically and positively, a tapering perforation in the block, a rod having bearing in the block in which it is longitudinally movable, a clamp-roll in said tapering perforation clamping the block and rod firmly together whenever the rod is moved in one direction, but allowing the block to move freely on the rod when the block is moved in the opposite direction, a releasing mechanism to automatically release the block and rod during a desired part of the movement of the block, and an adjustable stop to operate said releasing mechanism, whereby the distance and the time that the stock-support is withdrawn are adjusted, for the purpose set forth.

13. A vertically-movable stock-support, two independent treadles and independent connections between each of said treadles and the stock-support, whereby the stock-support is raised or lowered by either treadle independent of the other treadle, for the purpose set forth.

14. A vertically-movable stock-support, a starting and stopping treadle, connections with said treadle to start or stop the machine, and connections between said treadle and the stock-support to automatically raise and lower said support respectively by the starting or stopping of the machine, combined with a second treadle, and connections between said second treadle and the stock-support, whereby the stock-support may be lowered independent of the starting or stopping treadle for the purpose set forth.

15. A vertically-movable stock-support, toggles to raise and lower said support, a starting and stopping treadle, mechanism operated thereby to start or stop the machine, a connection between the treadle and the toggles whereby said stock-support is automatically raised when the treadle is operated to start the machine and automatically lowered when the treadle is operated to stop the machine, for the purpose set forth.

16. A vertically-movable stock-support, toggles to raise and lower said support, a starting and stopping treadle mechanism operated thereby to start or stop the machine, a yielding connection between the treadle and the toggles, whereby the stock-support is automatically raised when the treadle is operated to start the machine and automatically lowered when the treadle is operated to stop the machine, said yielding connection allowing the treadle to be further operated provided the stock-support is raised as far as possible before the treadle has caused the starting of the machine, for the purpose set forth.

17. A vertically-movable stock-support, mechanism connected with said support to press it upward with a yielding pressure, a treadle independent of said mechanism and a lock operated by said treadle and acting on said mechanism whereby said support is released of its upward pressure at any of the various positions of the support for the purpose set forth.

18. A vertically-movable stock-support, mechanism connected with said support to press it upward with a yielding pressure, a starting and stopping treadle independent of said mechanism to start and stop the machine, mechanism connected with said treadle and governed thereby to raise and lower the stock-support, and a lock operated by said treadle acting on the mechanism which presses the stock upward to release said support of its upward pressure, for the purpose set forth.

19. A vertically-movable and upwardly-pressed stock-support, toggles to raise and lower said support, a treadle to operate said toggles, and a lock attached to said treadle and operated thereby to lock said support against its upward pressure, for the purpose set forth.

20. A vertically-movable stock-support, a spring to press said support upward with a yielding pressure, toggles to raise and lower said support, a treadle connected to said toggles to operate the same, a rack on the mechanism moved by said spring in pressing said stock-support upward, a link pivotally attached to said treadle having teeth to engage said rack when said treadle is operated to lower said stock-support prior to the lowering of the same to lock said stock-support against the pressure of said spring, for the purpose set forth.

21. A vertically-movable stock-support pressed upward with a yielding pressure, mechanism substantially as described to raise and lower said support, a treadle connected to said mechanism to operate it, a rack on the parts moved in causing said upward pressure on said support, a link attached to said treadle having teeth thereon, a spring to force said link toward said rack so as to cause the teeth thereon to engage the teeth of said rack to lock said support against said upward pressure, the connection between said treadle and link allowing said treadle to be operated after said teeth engage said rack, whereby the support is first locked against the upward pressure and then lowered or whereby said support is first raised into position and then unlocked by and according to the movements of said treadle, for the purpose set forth.

22. In a nailing-machine, a driving-shaft, a stock-support, connecting mechanism between said shaft and support to periodically depress said support to allow the feeding of the stock, and independent mechanism operating on said support and governed by the starting and stopping of the machine respectively to raise and lower said support, for the purpose set forth.

23. In a nailing-machine, a stock-support, a starting and stopping mechanism, a driving-shaft, mechanism operated by said shaft to periodically depress said support to permit the feeding of the stock, and independent means controlled by said starting and stopping mechanism to finally depress the horn when the machine is stopped, for the purpose set forth.

24. In a nailing-machine, a stock-support, a starting and stopping mechanism, a driving-shaft, connecting mechanism between said support and shaft to periodically depress said support to allow the feeding of the stock, a mechanism connected to the starting and stopping mechanism independent of the nail-driving mechanism, operating on said support and governed by the starting and stopping mechanism of the machine respectively to raise and lower said support when the machine is started or stopped, and a device controlling said independent mechanism and preventing its operation on said support until such time as will insure the complete operation of the machine, for the purpose set forth.

25. In a nailing-machine, a driver and its accompanying mechanism to cause the driving of the nails, a starting and stopping mechanism to start and stop the machine, a stock-support and connecting mechanism between the stock-support and the starting and stopping mechanism automatically raising and lowering said support respectively by the starting and stopping of the machine, and mechanism engaging the starting and stopping mechanism preventing the stopping of the machine and consequent lowering of the stock-support prior to the completion of the operation of driving a nail, for the purpose set forth.

26. In a nailing-machine, a driver and its accompanying mechanism to cause the driving of the nails, starting and stopping mechanism to cause the starting and stopping of the machine, a lever contained within said starting and stopping mechanism, a stock-support, and connecting mechanism between said support and the starting and stopping mechanism whereby said support is automatically raised and lowered respectively by the starting and stopping of the machine, combined with a rotating sleeve and a recess in said sleeve, whereby said lever is prevented from moving to stop the machine and lower the stock-support, after the machine has been started, prior to the completion of the operation of driving a nail, for the purpose set forth.

27. In a nailing-machine having a vertically-reciprocating driver, a gage movable on the machine toward and from the line of the movements of said driver, a hand-lever fulcrumed to the machine and attached to said gage to adjust said gage in relation to the driver, a comb on the machine, a pawl on said hand-lever engaging said comb to hold said gage in its adjusted position, perforations in said comb, and stop-pins to be placed within the

desired perforations in said comb to admit of a quick and positive changing of the gage when driving two rows of nails of different gage, substantially as set forth.

28. In a nailing-machine, a driving-shaft, a driver operated thereby, a cam on said driving-shaft, a push-pin moved longitudinally in bearings in the frame of the machine by said cam, a lever turned on its fulcrum in one direction by said push-pin to cause the feeding of the nails to the driver, a spring to return said lever to its normal position, and a set-screw in said lever to engage said push-pin, the amount of the feeding of the nails being adjusted by the adjustment of the said set-screw in said lever, for the purpose set forth.

29. In a nailing-machine, a driving-shaft, a driver operated thereby, a cam on said driving-shaft, a push-pin moved longitudinally in bearings in the frame of the machine by said cam, a lever turned on its fulcrum in one direction by said push-pin to cause the feeding of nails to the driver, a spring to return said lever to its normal position, and a set-screw through said lever engaging the frame of the machine to limit and adjust the movement imparted to said lever by said spring so as to adjust the feeding of the nails, for the purpose set forth.

30. In a nailing-machine, a driving-shaft, a driver operated thereby, and an intermittent nail-feeding device to feed nails to the driver which device consists of the following instrumentalities: a grooved feed-block through which the nail-forming material is fed, a reciprocating slide, a pawl carried by said slide, a lever fulcrumed to the frame of the machine and acting on said slide, a cam on said driving-shaft, a push-pin mounted in bearing in the frame of the machine and moved longitudinally therein by said cam against said lever to move it upon its fulcrum in one direction causing the feeding of the nail-forming material toward the driver by said pawl, and a spring to return said lever to its normal position, for the purpose set forth.

31. In a nailing-machine, a driving-shaft, a driver operated thereby, and an intermittent nail-feeding device to feed nails to the driver which device consists of the following instrumentalities; a grooved feed-block through which the nail-forming material is fed, a reciprocating slide, a pawl carried by said slide, a lever fulcrumed to the frame of the machine and acting on said slide, a cam on the driving-shaft, a push-pin mounted in bearing in the frame of the machine and moved longitudinally therein by said cam against said lever to move it upon its fulcrum in one direction causing the feeding of the nail-forming material toward said lever by said pawl, a spring to move said lever in the opposite direction to its normal position, and a spring-actuated adjustable detent acting upon the nail-forming material to prevent its return when said lever is returned by said spring, 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 11th day of October, A. D. 1895.

SOLOMON M. CUTTER.

Witnesses:
HENRY CHADBOURN,
L. B. COBB.