No. 615,481. Patented Dec. 6, 1898.

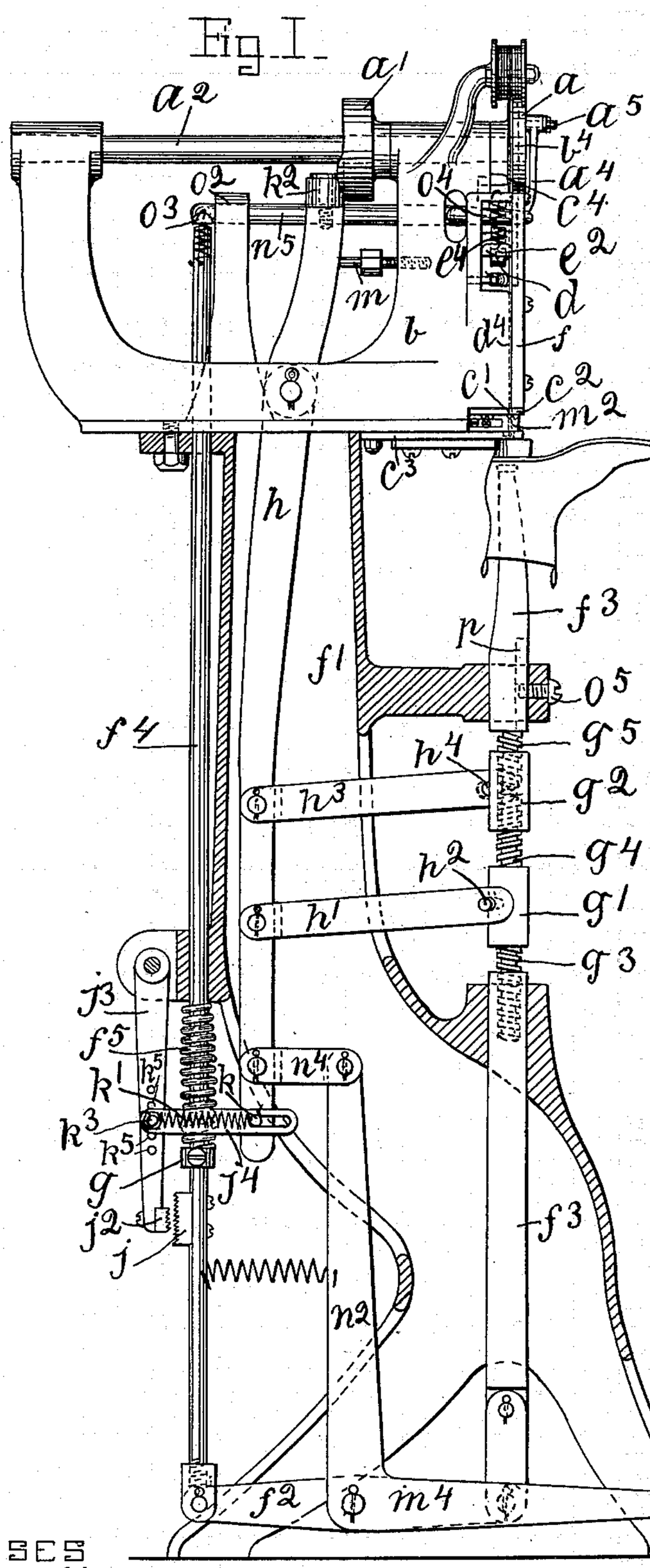
E. T. FREEMAN.

NAILING MACHINE.

(Application filed Nov. 2, 1897.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.



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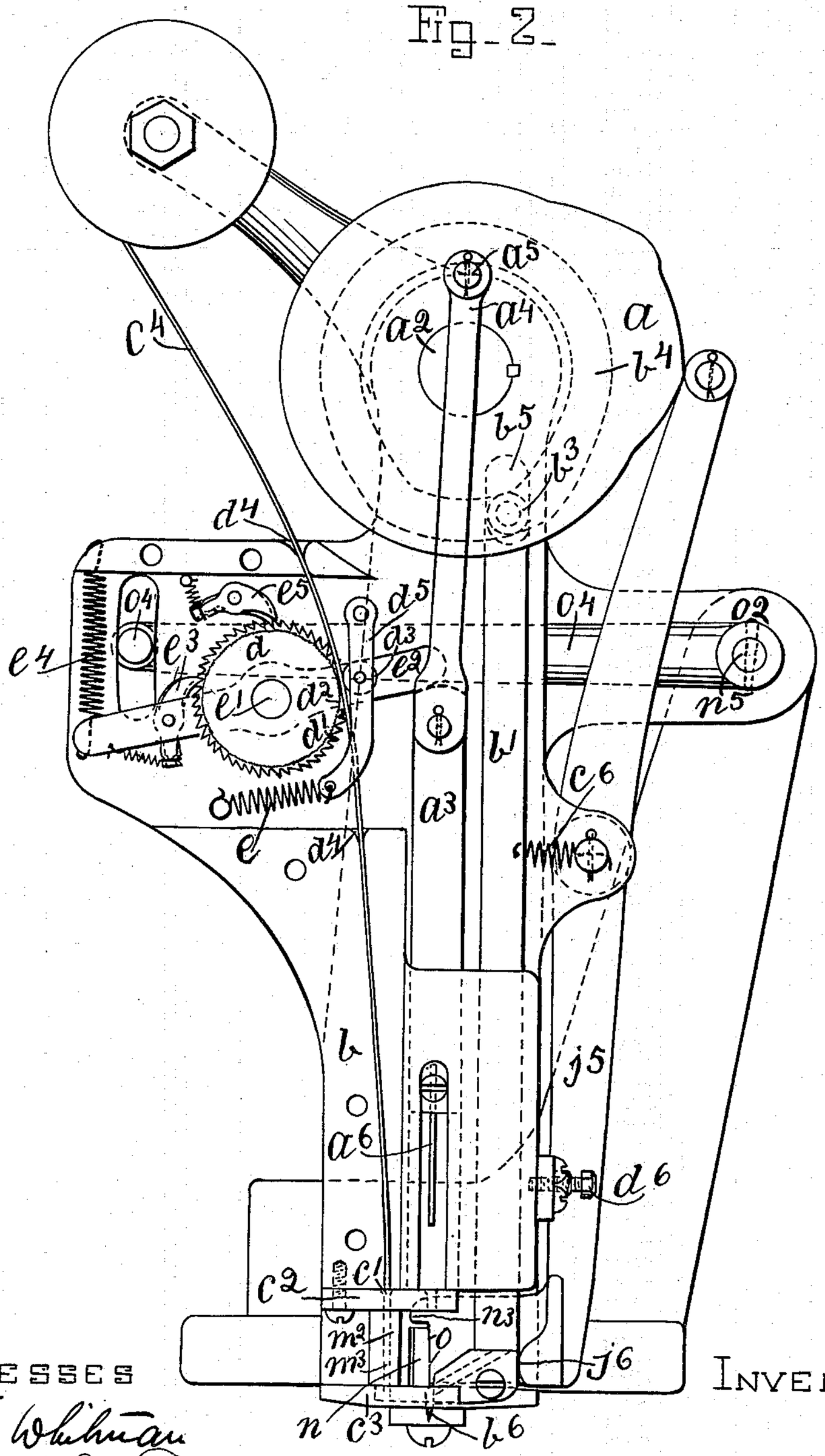
4 Sheets—Sheet 2.

Fig. 2.



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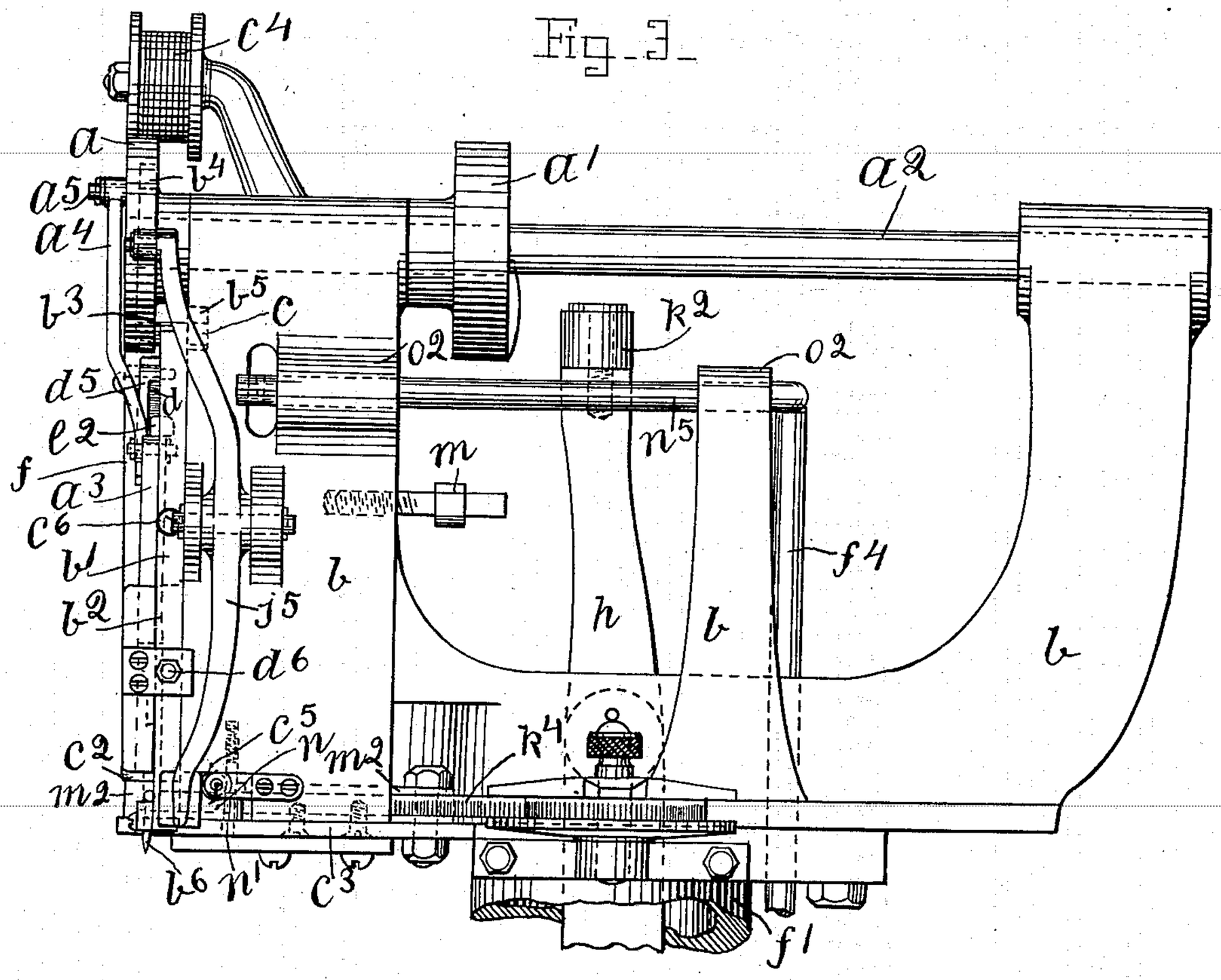
(No Model.) 4 Sheets—Sheet 3.

Fig. 3.



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No. 615,481. Patented Dec. 6, 1898.

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NAILING MACHINE.

(Application filed Nov. 2, 1897.)

(No Model.) 4 Sheets—Sheet 4.

Fig. 4.

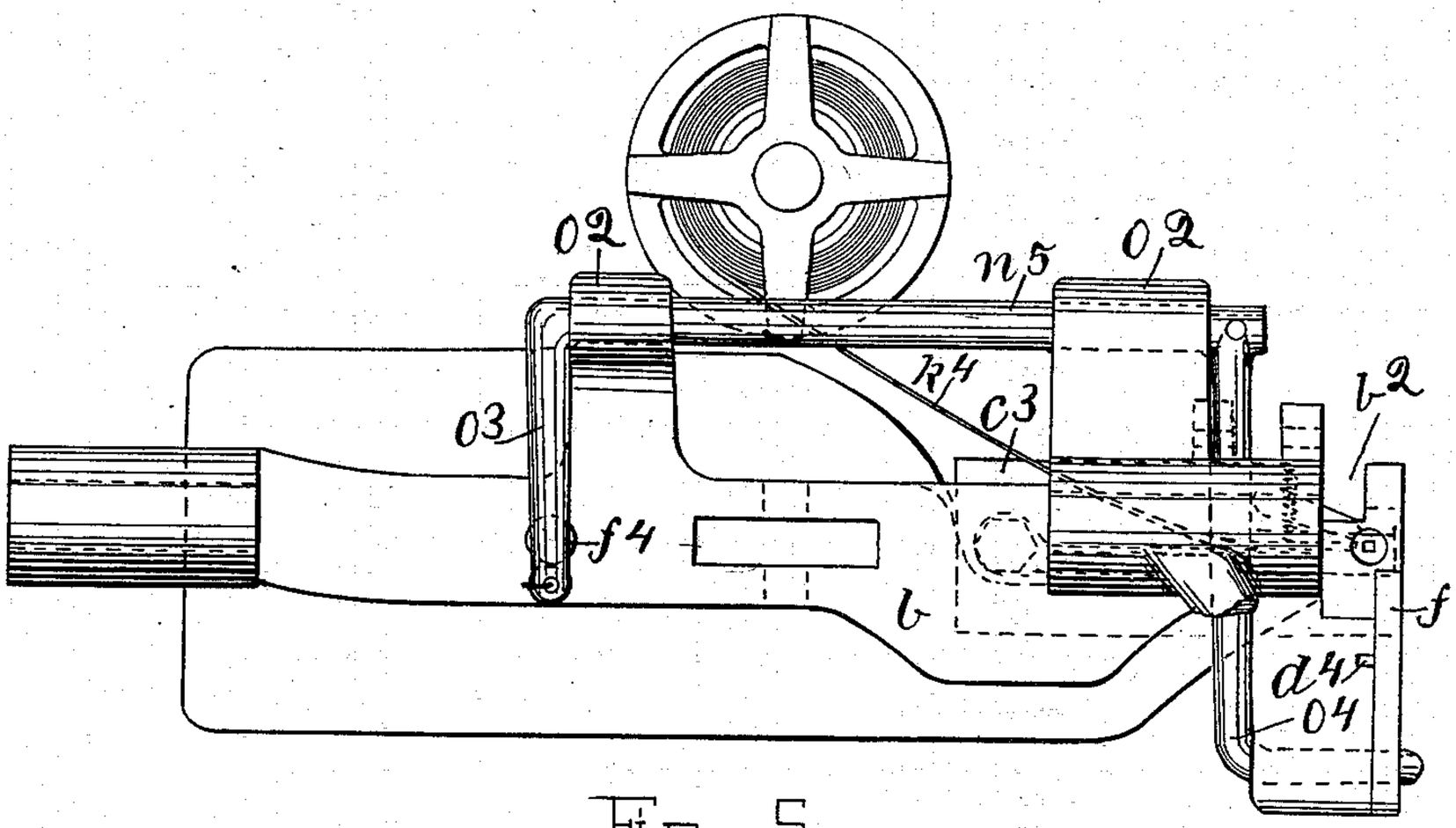


Fig. 5.

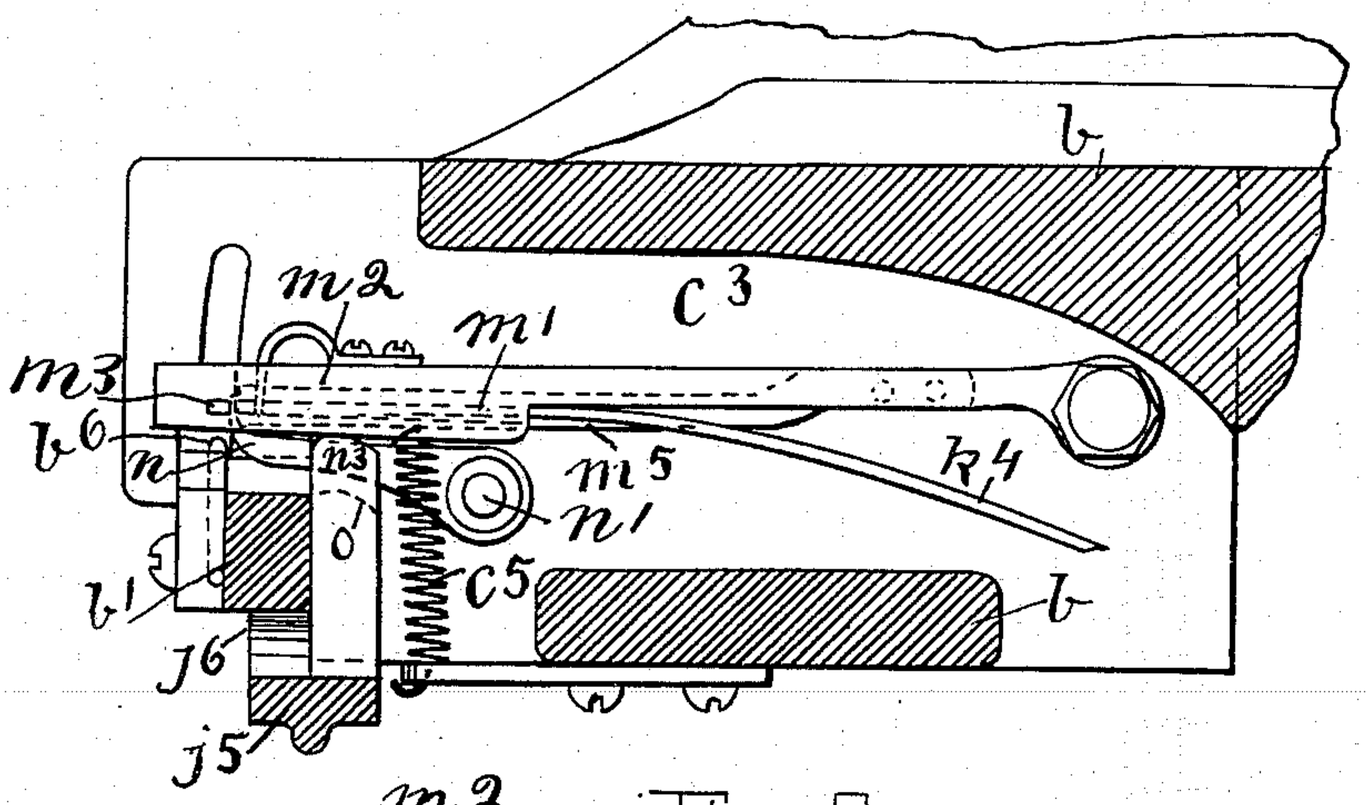
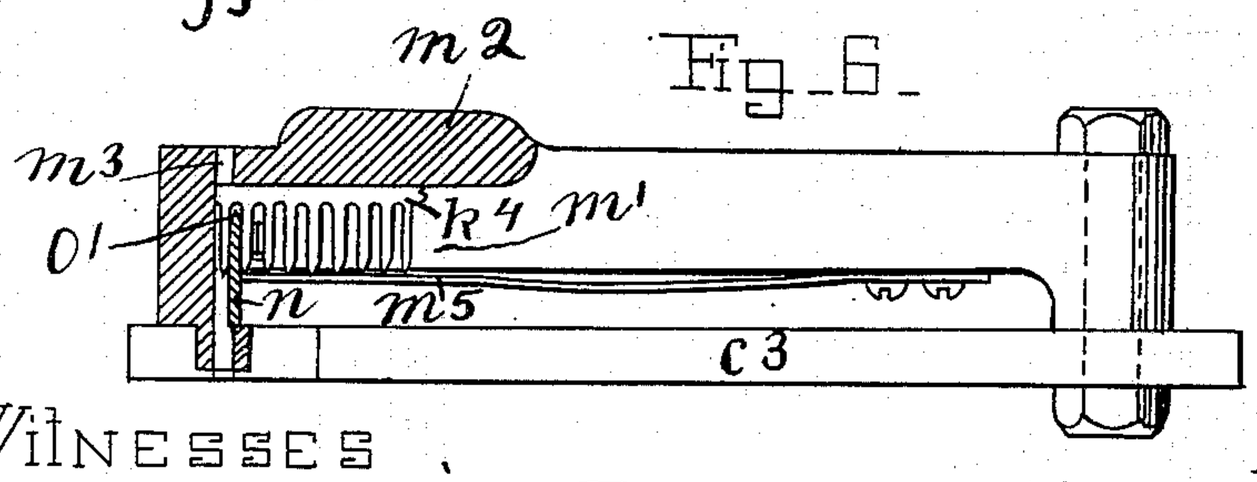


Fig. 6.



Witnesses:
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UNITED STATES PATENT OFFICE.

EDWIN T. FREEMAN, OF HALIFAX, CANADA.

NAILING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 615,481, dated December 6, 1898.

Application filed November 2, 1897. Serial No. 657,191. (No model.)

To all whom it may concern:

Be it known that I, EDWIN T. FREEMAN, of Halifax, in the county of Halifax and Province of Nova Scotia, Canada, have invented certain new and useful Improvements in Nailing-Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention has for its object the production of a nailing-machine simple in construction and adapted to sever nails from a continuous wire or, if desired, from a comb-shaped nail-strip without any changing of parts. Features of my invention more especially consist of mechanism to accomplish said results.

Other improvements relate to an automatically-adjustable feed for the continuous wire.

In the accompanying drawings, Figure 1 is a side elevation of a machine embodying my invention, the standard being shown in section. Fig. 2 is a front view of the upper part of the machine, showing the front plate covering part of mechanism removed. Fig. 3 is a side elevation of the opposite side of the head portion of Fig. 1, showing the position of the upper end of a lever, which by connection operates the stock-support when its lower end is operated by a treadle. Fig. 4 is a top view of part of connection between the stock-support and wire-feeding mechanism, whereby the wire-feeding mechanism is automatically adjusted. Fig. 5 is a top view of the work-plate of the machine and of mechanism attached thereto and a sectional view of the awl-carrying bar and feeding mechanism. Fig. 6 is a sectional view of the raceway.

Similar letters of reference indicate the same or similar parts in all the figures in the drawings.

Power to this machine can be communicated in any suitable or well-known manner.

Cams a and a' are mounted on the driving-shaft a^2. The cam a is connected with the driving-bar a^3 by means of the connection-bar a^4 and crank-pin a^5. The driving-bar a^3 carries the driver a^6 in a well-known manner, and is supported against sidewise movement in a bearing which is formed in the frame b. The awl-carrying bar b', which carries the awl b^6 in a well-known manner, is guided in a groove b^2 and is capable to be moved toward and from the driver a^6. The upper end of the awl-carrying bar is provided with a cam-roller b^3, which extends into a cam-groove b^4, which is made in the cam a and is shown in dotted lines in Figs. 1, 2, and 3, whereby the awl-carrying bar is operated to force the awl to puncture the stock and to withdraw from the stock. In line with the cam-roller extends a rounded part c from the side of the bar opposite to the cam-roller, which part reaches into a vertical groove b^5 in the frame, (shown in dotted lines in Figs. 2 and 3,) thereby guiding the upper end of the bar while moved vertically by the cam and permitting the bar to be given an oscillating motion.

The raceway and nail-carrier m^2 is at its rear end pivotally attached to the work-plate c^3 and has a longitudinal groove m' partly extending through the height of the front part of the raceway, as shown and described in my pending application filed October 5, 1897, Serial No. 654,180, for nailing-machines, and has also the extreme front end m^3 of the groove m' extending through the entire height of the raceway and directly in line with the driver a^6 when the free end of the raceway remains under the driver. The raceway is also provided with the spring m^5 to hold the nail-strip k^4 in its vertical position when conveyed in the raceway. The cutter n is provided with the cutting edge o', and is at n' pivoted to the work-plate c^3 on one side of the raceway, and its free end, when operated, enters through a perforation into the groove m', as also shown and described in said application.

The free end of the raceway is moved from the driver a^6 by a lever j^5, which is operated by the periphery of the cam a, and has the projection n^3 in contact with the free end of the raceway and has the part o of the projection n^3 coming into contact with the cutter n and the projection j^6 into contact with the awl-carrying bar b' when moving the free end of the raceway from the driver, thereby forcing the free end of the cutter to enter the groove m' and the awl to feed the stock toward the driver, as shown and described in my said pending application. When the awl has been moved directly into line with the driver, the part m^3 of the groove m' has come directly in line with a perforation c', (shown in dotted lines in Fig. 2,) which extends

through a stationary part c^2 and is adapted to fit the continuous wire c^4, from which nails are to be severed. The raceway fits exactly between the plate c^2 and the work-plate c^3. After the awl has come directly in line with the driver the movement of the lever j^5 is stopped until the awl is withdrawn from the stock, and the continuous wire, if used, is fed by means, as will be described, through the perforation c' and into the part m^3 of the groove m^2, when the raceway and cutter are moved farther from the driver sufficiently for the wire to be sheared off between the raceway and the stationary plate c^2. It will be seen that the awl is moved past the driver in the second movement of the lever j^5, but without moving the stock, as the awl is at that time above the stock. At a proper time after the wire in the raceway is severed from the other part of the wire a spring c^5, which is attached to the raceway and is tending to move the free end of the raceway toward the driver, is permitted to move the free end of the raceway until the part m^3 of the groove m' will be moved into line with the driver, when the raceway will be stopped by the lever j^5, and the driver will enter the part m^3 of the groove m' and drive the nail, which is severed from the wire, therethrough and into the stock. After a nail is severed from the wire it is, by the cutter n', prevented from entering the groove m' proper, as will hereinafter be described.

When the free end of the raceway is moved toward the driver by the spring c^5, a spring c^6 moves the free end of the awl-carrying bar from the driver until stopped by a set-screw d^6. The extent of the feeding of the stock can be regulated by screwing the set-screw toward or from the awl-carrying bar.

The continuous wire c^4 is fed into the raceway by means of a wheel d, which is provided with notches d' and smaller notches d^2. The wire passes between the notches d^2 and a smaller wheel d^3 and downward through a groove d^4 and into the perforation c'. The wheel d^3 is pivoted to a lever d^5, and by means of a spring e the lever d^5 forces the wheel d^3 to press the wire against the notches d^2 of the wheel d, thereby providing for varying sizes of wire. On a stud e', on which the wheel d is hung, is also hung a lever e^2, to which spring-pressed pawls e^3 are pivotally attached, which are arranged to engage the larger notches d' of the wheel d. One end of the lever e^2 extends into the pathway of the driving-bar a^3, and in the last part of the upward movement of the driving-bar is raised by the bar against the influence of a spring e^4, which is attached to the lever and to the frame b. In this part of the movement of the lever the notches permit the pawls to move over them. After the movement of the driving-bar is reversed the lever e^2 is moved by the spring e^4 into its former position against a stop, which will hereinafter be described. In the latter part of the movement of the lever e^2 the pawls e^3 are not permitted by the notches to move over them, but forced against them, thereby turning the wheel d and also causing the wheel d' to move the wire downward, and the lower end of the wire will enter into the groove in the raceway for the purpose set forth. Other pawls e^5, which are pivoted to the frame b, also engage the notches d', whereby the wheel d is insured not to be moved, while the pawls e^3 move over the notches, as described. Any desired number of pawls of different length or shape can be attached to the lever e^2 or to the frame to prevent lost motion without departing from my invention. The plate f, which is firmly secured to the front side of the frame b, covers the wire-feeding mechanism and is thereby partly holding the parts in their respective places.

When the free end of the raceway is moved from the driver and the nails used are severed from the nail-strip k^4, the free end of the cutter n is moved before the raceway stops at its outer position between the shanks of the nails nearest to the front end of the groove m', as the free end of the cutter after being started moves a greater distance during the same time than the free end of the raceway. When the free end of the cutter is moved toward the driver, the free end of the cutter is moved in the same direction by the raceway, thereby moving the nail-strip forward as the free end of the cutter is moved forward when the cutter turns on its pivot in said direction.

When the raceway stops under the driver a^6, the first nail in the groove m' has been moved against the front end of the groove, and when the driver a^6 enters the part m^3 of the groove m' and comes into contact with the nail therein, which forms a part of the nail-strip, the nail-strip is forced downward against the cutting edge o' of the cutter, and the nail having its position in the part m^3 of the groove m' is severed from the nail-strip, and as the driver continues its downward movement the nail is driven into the stock which is held against the work-plate c^3.

When the raceway stops under the perforation c', the free end of the cutter n has been moved into the groove m', and in the further movement of the raceway prevents the nail which is severed from the wire from falling over. When the raceway stops under the driver, the nail carried by the raceway is held by the cutter against the front end of the groove, thereby also in line with the driver and in position to be driven into the stock by the driver.

When the nails used are severed from the nail-strips and it is desired to sever nails from wire, the nail-strip is removed from the raceway and the continuous wire is placed in a position to be fed by the wire-feeding mechanism. Consequently if the nails used are severed from the wire and a change is desired the wire is removed from the wire-feeding

mechanism and the nail-strip is placed in a position to be conveyed in the raceway.

A lever f^2 is pivoted to the standard f'. To one end of the lever is pivoted the lower end of the stock-support f^3 and to the other end is pivoted a rod f^4, which is surrounded by a spring f^5, by the tendency of which the stock-support is forced to press the stock against the work-plate c^3.

A rod n^5 is supported in horizontal bearings o^2 and is provided with two arms o^3 and o^4. The end of the arm o^3 is engaged by the upper end of the rod f^4. The end of the other arm is arranged to stop or limit the upward movement of the outer end of the lever e^2, as shown in Figs. 1 and 2. When the stock which is nailed varies in thickness, the rod f^4 is raised and lowered accordingly by its connection to the stock-support. When the stock which is nailed is thinner than the stock which was nailed previous thereto, the rod f^4 is lowered by the spring f^5 and the stock-support is raised and the end of the arm o^4 is lowered by its connection to the stock-support, whereby the movement of the lever e^2 is shortened and the wire fed a shorter distance than the time previous thereto. It will be seen that if the stock was thicker than the stock nailed previous thereto, the end of the arm o^4 would have been raised and the wire fed a greater distance. As the fulcrum of the lever f^2 and the length of the arm o^4 are in a proper relation to the size of the wheel d and to the distance from the center of the wheel d to where the arm o^4 engages the lever e^2 the wire will be fed into the raceway or nail-carrier a distance corresponding with the thickness of the stock.

Having thus described my invention, what I claim is—

1. In a nailing-machine, a wheel, a lever, and means to move said lever, pawls attached to said lever, and the pawls arranged to move the wheel in a part of the movement of the lever, a stock-support adapted to provide for varying thicknesses of stock, a rod, connection between the stock-support and the rod, another rod, an arm on the second rod arranged to be moved by the first rod, another arm on the second rod, and the movement of said lever regulated by the second arm, for the purpose set forth.

2. In a nailing-machine, a driver, means for supplying nails, and means to convey nails into line with the driver, means for supplying wire, and means to sever nails from the wire and to convey them into line with the driver, and means to operate the driver to drive the nails conveyed into line with the driver.

3. In a nailing-machine, a driver, means for supplying nails, a raceway, a groove in the raceway, and means to convey nails through the groove and into line with the driver, and means to operate the driver to drive the nails, means for supplying wire, and means to feed wire into said groove, and means to shear off wire fed into said groove, and means to convey the sheared-off wire into line with the driver, and means to operate the driver to drive the sheared-off wire.

4. In a nailing-machine, a driver, a raceway, a groove in the raceway, means to convey nails in the groove and into line with the driver, a perforation in a part of the machine, means to feed wire through the perforation and into said groove, means to operate the raceway to shear off the wire against said part of the machine and to convey the sheared-off wire into line with the driver.

5. In a nailing-machine, a driver, means for supplying nails formed in a strip, and means to convey the nails into line with the driver, means for supplying wire, and means to sever nails from the wire and to convey them into line with the driver, and means to operate the driver to drive the nails conveyed into line with the driver.

6. In a nailing-machine, a driver, nails formed in a strip, a raceway, a groove in the raceway, means to convey said nails in the groove and into line with the driver, a supply of wire, and means to feed wire from the supply and into said groove, and means to shear off wire fed into the groove and to convey the sheared-off wire into line with the driver, for the purpose set forth.

7. In a nailing-machine, a driver, a raceway, a groove in the raceway, means to convey nails, which are formed in a strip, in said groove, a stationary part, a perforation in said part, means to feed wire through the perforation and into the groove in the raceway, means to operate the raceway, whereby the wire will be sheared off between the raceway and said stationary part and carried into line with the driver, for the purpose set forth.

8. In a nailing-machine, a driver, a raceway, means to move the raceway, a groove in the raceway adapted to permit nails formed in a strip, to be conveyed in it, means adapted to be moved between the shanks of two nails and to move them, and the driver arranged to be operated to come into contact with one of said nails, whereby the nail is severed from the nail-strip by said means, a stationary part, a perforation in said part, means to feed wire through the perforation and into said groove, and means to cut off the wire fed into the groove, and the raceway adapted to carry the cut-off wire into line with the driver, for the purpose set forth.

9. In a nailing-machine, a rotating cam, a driver, connection between the driver and the cam, whereby the driver is operated, a wire-feeding mechanism, and mechanism adapted to operate the wire-feeding mechanism, mechanism adapted to feed nails formed in a strip, connection between the cam and latter feeding mechanism, whereby the feeding mechanism is operated, for the purpose set forth.

10. In a nailing-machine, a rotating cam, a driver, connection between the driver and the cam, whereby the driver is operated, a wire-

feeding mechanism, and mechanism adapted to be operated by said cam and thereby to operate the wire-feeding mechanism, connection between said cam and another feeding mechanism, whereby the feeding mechanism is operated to feed nails, and connection between the cam and a nail-carrier, whereby the nail-carrier is moved, for the purpose set forth.

11. In a nailing-machine, a wire-feeding mechanism, a cam, connection between the cam and the wire-feeding mechanism, whereby the wire-feeding mechanism is operated, a raceway, a nail-feeding mechanism, connection between the cam and the nail-feeding mechanism, and the connection operated by the cam to force the nail-feeding mechanism to move nails in the raceway, for the purpose set forth.

12. In a nailing-machine, a wire-feeding mechanism, a cam, connection between the cam and the wire-feeding mechanism, whereby the wire-feeding mechanism is operated, a raceway, a nail-feeding mechanism, connection between the cam and the nail-feeding mechanism, and the connection operated by the cam to force the nail-feeding mechanism to move nails in the raceway, an awl, connection between the awl and the cam, and the cam to operate the connection to actuate the awl.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 27th day of October, A. D. 1897.

EDWIN T. FREEMAN.

Witnesses:
ALFRED WHITMAN,
JOSIE O'TOOLE.