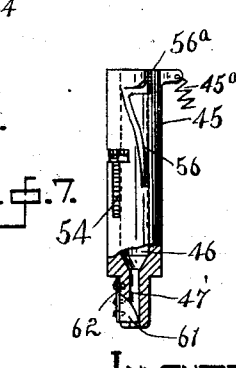
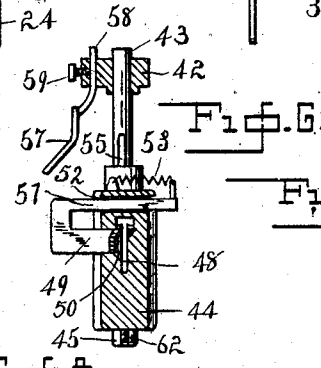
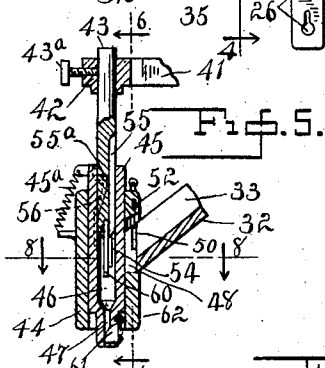
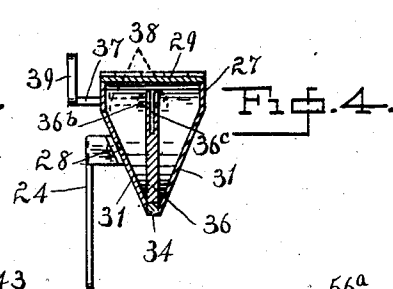
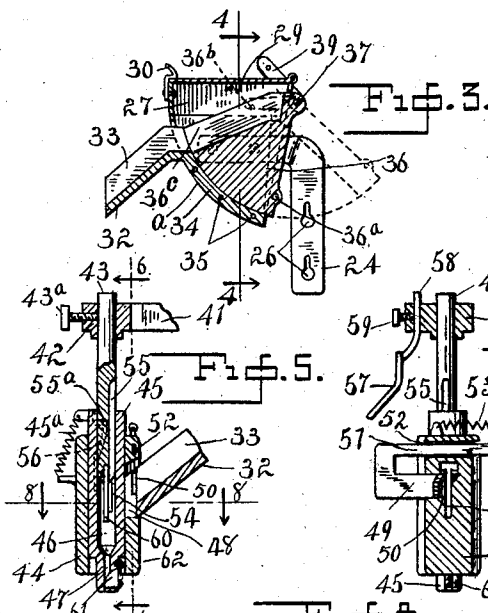
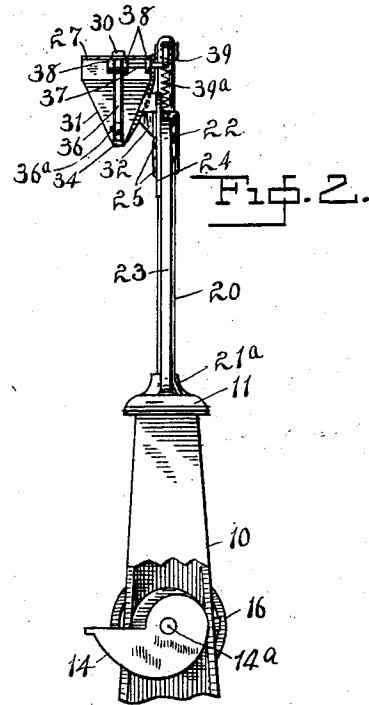
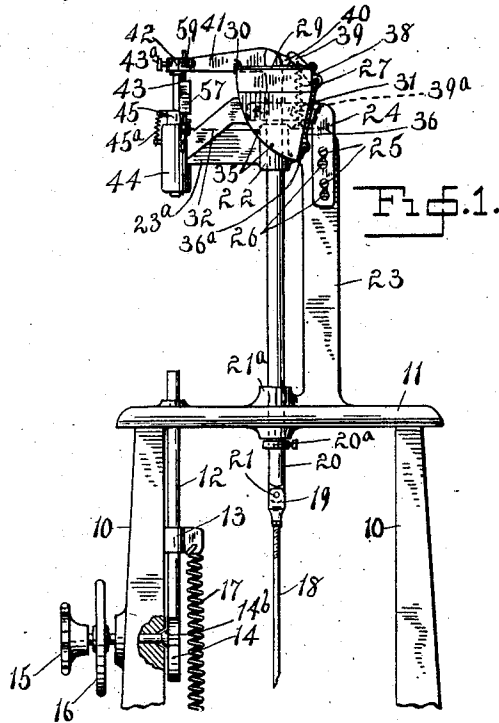


L. E. JOHNSON.
AUTOMATIC SHOE NAILING MACHINE.
APPLICATION FILED AUG. 17, 1908.

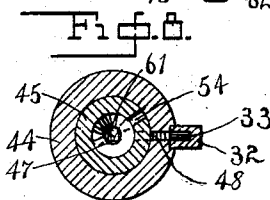
994,408.

Patented June 6, 1911.



WITNESSES:

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UNITED STATES PATENT OFFICE.

LAWRENCE E. JOHNSON, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO HENRY E. BRAGG & COMPANY, OF ST. JOSEPH, MISSOURI.

AUTOMATIC SHOE-NAILING MACHINE.

994,408.

Specification of Letters Patent.

Patented June 6, 1911.

Application filed August 17, 1908. Serial No. 448,779.

To all whom it may concern:

Be it known that I, LAWRENCE E. JOHNSON, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Shoe-Nailing Machines, of which the following is a specification.

My invention relates to nailing machines, and refers especially to appliances designed for use in the manufacture of shoes, the particular work for which they are adapted being the attachment of soles and heels.

The chief objects of the improvements which form the subject matter of this application are:—to provide in a machine of the character stated novel and efficient mechanism for adjusting the anvil work holder; to supply improved means for feeding the nails to the driving head with speed and precision, and to furnish a feed mechanism that will handle nails of various sizes.

Other objects of my invention are to furnish an efficient nail pick-up device for separating the individual nails from the bulk contained in the receptacle and arranging them in alinement in the nail conduit, and to provide means for guiding the selected nails to the feeding devices.

Further objects of the improvements disclosed herein are:—to provide a shoe nailing machine that will be unusually rapid and efficient and so designed that the working mechanism will have comparatively few parts and thus be unlikely to get out of order, and to furnish a construction that will be simple and durable, thus conducing to economy in the first cost of the machine as well as in subsequent repairs.

I accomplish the above and other results of minor importance by the employment of the mechanism illustrated in the accompanying drawing which forms a part of this application, and in which the various details of the construction are disclosed in the following views:—

Figure 1 is a side elevation of a shoe nailing machine embodying my improvements, a portion of the supporting frame being broken away; Fig. 2 is a rear elevation; Fig. 3 is a fragmentary view, enlarged, showing the nail receptacle and nail conduit in median section; Fig. 4 is a sectional view on the line 4—4 of Fig. 3; Fig. 5 is an enlarged view of the nailing head, showing the parts in vertical section; Fig. 6 is a sectional view

on the line 6—6 of Fig. 5; Fig. 7 is a side elevation of the nail feeding sleeve, partly in section, and Fig. 8 is a sectional view on the line 8—8 of Fig. 5.

Referring more particularly to the details of the drawing, the numeral 10 indicates the standards or legs forming a supporting frame carrying a bed plate or table 11. Passing through this table is a vertical bar or rod 12, placed in alinement with the hammer, hereinafter described. This rod forms a support for the work and performs the office of an anvil. It is slidable in the table and also in a projection or lug 13 secured to a standard 10. It is desirable that this anvil be adjustable vertically, and since small movements are often required the adjusting means should be capable of slight variations, and as the anvil receives the full impact of the hammer strokes, the retaining mechanism must be shock-resisting. These important results are secured by mounting a lifting cam 14 on the inner end of a short shaft 14^a journaled in a boss cast integral with the leg 10 (Figs. 1 and 2). The said cam is placed directly beneath the anvil, so that the lower end of the latter rests thereon as shown. A hand wheel 15 is fixed to the outer end of the shaft for turning the cam and a clamp wheel 16 having threaded engagement with said shaft, is mounted thereon between the said hand wheel and the frame member 10. The cam end of the shaft 14^a has a greater diameter than the body of the shaft and presents a conical shoulder 14^b which is received in a depression of similar shape formed by chamfering the margin of the journal bore as shown in Fig. 1. When the cam is adjusted by turning the hand wheel 15 the inclined shoulder 14^b will be drawn into the said depression thus producing a wedging action between the inclined surfaces, and clamping the parts securely against displacement from the continual jarring caused by the hammer blows, and as the line of force from the hammer intersects the axis of the cam shaft, there will be no appreciable tendency to turn the shaft whatever may be the force of the strokes.

The appliance under consideration is designed to be operated by foot power by means of a suitable treadle, not shown or described since it forms no part of my invention. Portions of certain attachments to the treadle, however, are illustrated in

Fig. 1, as they bear a direct relation to the operative movements; these attachments are a main retracting spring 17 and an operating link or rod 18. The function of said spring is to restore the operative parts to their initial positions, shown in Figs. 1 and 2, while the rod 18 actuates the operative mechanism, both of these members being of universal use in foot power machines. The rod 18 is threaded at its upper end and engaging these threads is a coupling 19 pivotally attached to a vertical rod, or frame-post 20 by a pivot 21. This post is slidably mounted in bosses or bearings 21^a and 22, attached to a frame member 23 cast integral with the bed-plate 11. The upper end of the member 23 carries a bracket arm 24, secured to the said member by screws 25, which pass through key-hole slots 26, so that, when the screws are loosened, the bracket may be readily removed, or reassembled. The said bracket arm supports a nail-receptacle or reservoir 27, secured thereto by fastenings 28. The receptacle is furnished with a hinged cover or lid 29, firmly locked by a spring catch 30 to prevent the cover from being raised through the action of the nail-selecting mechanism to be hereinafter described. The lateral walls 31 of the receptacle are inclined toward each other to form a hopper, as shown in Figs. 2 and 4. The front wall of the receptacle is curved as shown at *a*, Fig. 3, and projecting from the curved wall in the median line, is a nail conduit 32 having a suitable slot or nail channel 33 communicating with the interior of the nail receptacle or hopper 27. The conduit 32 is continuous with a curved member 34 forming a portion of the front wall of the hopper and secured by suitable rivets 35 passing through the side plates 31. Occupying the median longitudinal plane of the hopper is a nail selecting slide in the form of a segment shaped plate 36 protruding through a suitable slot in the rear wall of the hopper and fixed to a pintle or rod 37, journaled in ears 38 on the hopper. This pintle extends at one end beyond the hopper side and carries on its extremity a crank-arm 39, adapted to be engaged by a lug 40 fixed on the upper end of the frame-rod 20. The action of the said lug is to swing the said nail-slide 36 on its pivot, carrying it to the position shown in Fig. 3 when the rod 20 is in its highest position, and allowing the slide or plate 36 urged by a spring 39^a, to recede to the position shown in dotted outlines, when the frame-rod 20 descends. The movement of the slide is limited by stops 36^a, 36^b, which respectively engage the rear and front faces of the back wall of the hopper as the slide is swung upon its pivot. The upper margin of the slide is furnished with a slot 36^c adapted to elevate any nails whose bodies may chance to fall therein,

during the ascending movement, the heads of the nails riding upon the slot margin and when in its highest position, the said slot will aline with the slot 33 in the conduit 32 and the inclination of said margin will cause the nails so caught to gravitate into the slot of the conduit 32.

The upper end of the rod 20 is provided with a forwardly extending arm 41 having an eye 42 at the extremity in which is adjustably mounted a cylindrical hammer 43, secured by a clamping screw 43^a. The upper end of the frame member 23 has a horizontal arm 23^a which carries upon the end an integral hollow cylinder or nailing head 44. Within this cylinder is a nail-feed sleeve 45, suitably fitted to turn or slide easily in the bore of the cylinder and urged downwardly by a tension spring 45^a. The said sleeve is furnished with a bore 46 in which the hammer 43 is adapted to reciprocate. This bore is reduced at the lower end forming a duct 47 extending to the end of the sleeve. The nailing head 44 is pierced by a T-shaped receiving slot 48 with which the slot 33 in the conduit alines, and transversely to the conduit is arranged a cut-off plate 49 which slides in a recess 50 in the head. The said plate has an arm 51 slidably supported in a slot 52, a spring 53 holding the slide in a retracted position so as to leave the channel in the nail conduit open. The sleeve 45 is furnished with a T-shaped discharging slot 54 which is a duplicate of the slot 48. The hammer 43 has a longitudinal groove 55, arranged opposite the receiving slot 48. The purpose of this slot is to insure the dropping of the nail from the discharge slot. Located about a quarter turn from this slot is a pin 55^a which engages a spiral slot 56 cut entirely through the wall of the nail-feed sleeve 45. Near its upper end the slot turns abruptly forming a shoulder 56^a, and is then extended vertically to the end margin of the sleeve to facilitate assembling. The pin 55^a travels in the spiral portion, and being fixed in the hammer will partially rotate the said sleeve alternately in opposite directions as the hammer reciprocates, causing the slot 54 to register with the slot 48 when the hammer descends, and moving it away therefrom when the hammer rises. This may be considered the initial position and is shown in Fig. 5. During the down movement of the hammer the slide 49 is operated by an inclined plate 57 attached by a bracket arm 58 to the reciprocating arm 41 in which it is adjustable by a screw 59. The lower end of the hammer 43 is supplied with the usual pin or rod 60 which passes through the duct 47 when driving.

When the slide 49 is in the initial position, shown in Fig. 6, the first nail in the conduit will occupy the slot 48 and lie against the

sleeve 45 until the slot 54 is brought into alinement therewith when the nail will drop into said slot 54, the cut-off arm 49 having in the meantime been extended to hold back the remaining nails in the conduit. As the hammer rises the sleeve will return to its initial position, carrying the nail with it and as soon as the hammer rises high enough to uncover the slot 54, the nail therein will fall into the cavity 46 below the hammer. The nail is held in the duct 47 by means of a shoe or block 61 attached by a spring 62 to the lower end of the sleeve and extending across the bore 47, the shoe having an inclined face which will permit the nail to pass when urged by a blow from the hammer. The lower end of the sleeve is reduced in diameter to accommodate the shoe and attachments.

Having thus detailed the construction of my improved devices and in connection therewith indicated the functions and manner of action of the cooperating mechanisms, it will only be necessary to give a general outline of the working of the apparatus as a whole. A sufficient quantity of nails in bulk having been placed in the receptacle or hopper, the operator places the work upon the anvil 12, and having adjusted the latter by means of the hand wheel 15 he clamps it by turning the wheel 16 and then operates the treadle (not shown) with his foot, to depress the frame arm 20. This will reciprocate the nail-slide 36 and the nails caught properly therein will glide down the incline of this slide and of the conduit 32 until the nailing head is reached. The nails will then be fed singly to the cavity below the hammer in the manner hereinbefore described, and as soon as the first nail has been driven the feed will be automatic and continuous so long as there is a supply in the hopper. Every time the hammer rises the pin 55^a will engage the shoulder 56^a and lift the sleeve 45 to permit the work to be shifted, the said sleeve urged by the spring 45^a, descending upon the work to hold it securely in advance of the hammer stroke.

Having thus described my invention what I claim, is:—

1. In a nailing machine, the combination with a hollow fixed head having a nail-receiving slot, and a hammer arranged in the head, of a sleeve rotatably and slidably mounted in said head and having a nail discharging slot, a spring for the sleeve, and means attached to the hammer for rotating said sleeve.

2. In a nailing machine, the combination with a fixed head provided with a nail-receiving slot and a reciprocating hammer in the head, of a sleeve rotatable and slidable in

said head and having a nail-discharging slot, a spirally arranged slot in said sleeve, and a pin in said hammer engaging said spiral slot.

3. In a nailing machine, the combination with a hollow head having a nail-receiving slot extending through its wall, a nail-conduit in alinement with said slot, nail cut-off mechanism, and a reciprocating hammer in the head, of a sleeve rotatable and slidable in the head, and furnished with a nail-discharging slot extending through the wall of the sleeve, a spring for the sleeve, a spirally arranged slot in the sleeve, and a pin in said hammer engaging the spiral slot.

4. In a nailing machine, the combination with a hollow fixed head having a nail receiving slot, and a hammer arranged in said head, of a sleeve rotatably and slidably mounted in said head and having a nail discharging slot, a spiral slot in said sleeve and a pin in said hammer engaging said spiral slot.

5. In a nailing machine, the combination with a hollow fixed head having a nail-receiving slot, of a sleeve rotatably and slidably mounted in said head and having a nail-discharging slot, a spring urging the sleeve downward, a spirally arranged slot in said sleeve, said spiral slot having a shoulder, a hammer reciprocating in the sleeve, a pin in said hammer engaging said spiral slot, and a yielding block having an inclined face projecting into the path of the hammer.

6. In a nailing machine, the combination with a reciprocating frame, a fixed frame, a nailing head secured to the fixed frame, a nail receptacle, and nail selecting means, of a sleeve rotatably and slidably mounted in the nailing head, a hammer reciprocating in the sleeve and provided with a longitudinal groove, means carried by the hammer for operating the said sleeve, and a yielding member extending into the path of said hammer.

7. In a nailing machine, the combination with a reciprocating frame, a fixed frame, a nailing head secured to the fixed frame, a nail receptacle and nail selecting means, of a sleeve rotatably and slidably mounted in the nailing head, a spiral groove in said sleeve, a hammer reciprocating in the sleeve and provided with a longitudinal groove, a pin in said hammer operatively engaging said spiral groove, and a yielding block extending into the path of said hammer.

In testimony whereof I affix my signature in the presence of two witnesses.

LAWRENCE E. JOHNSON.

Witnesses:

F. BENJAMIN,
M. A. MILORD.