

J. M. WATSON.

Machines for Arranging Nails for being Driven
into Heels or Soles of Boots and Shoes.

No. 146,152.

Patented Jan. 6, 1874.

Fig. 1.

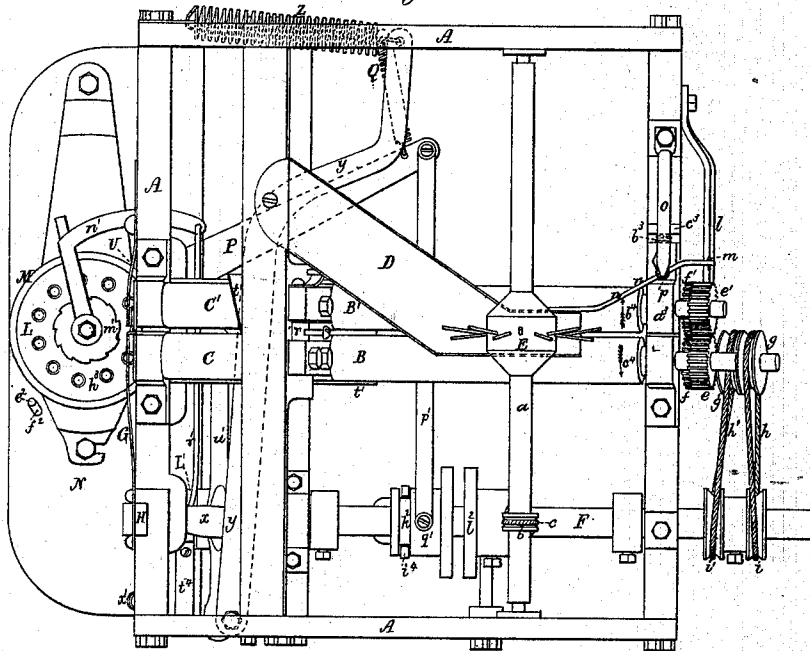
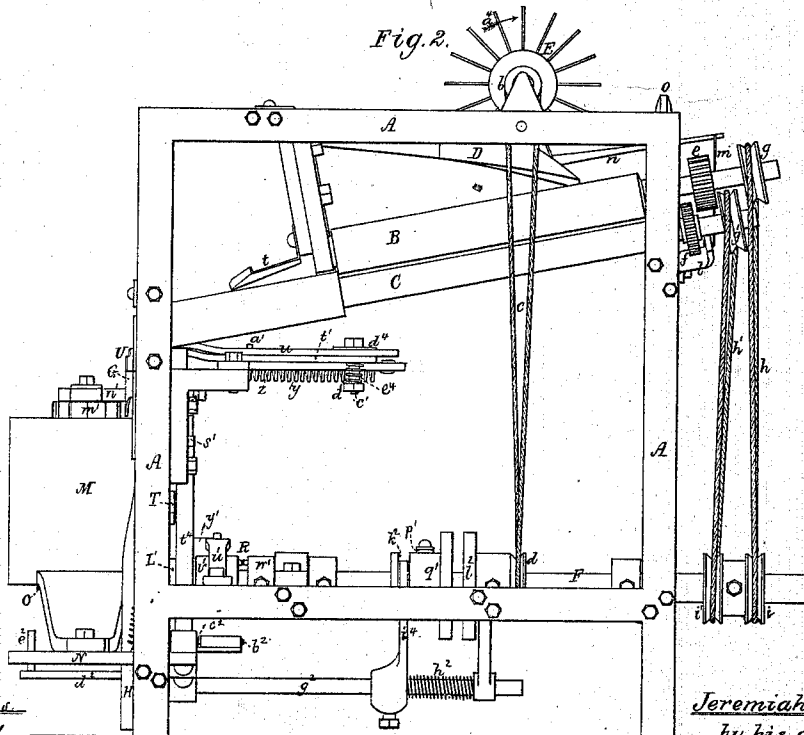


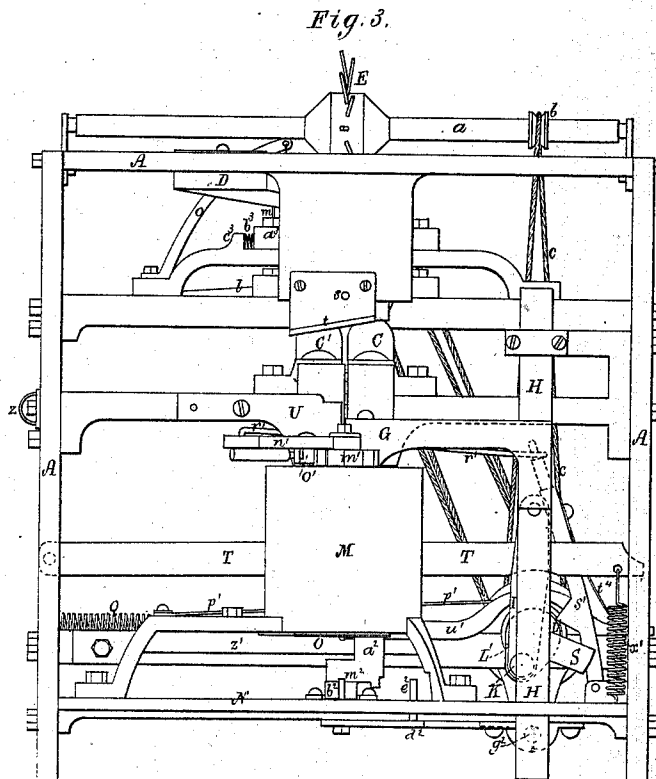
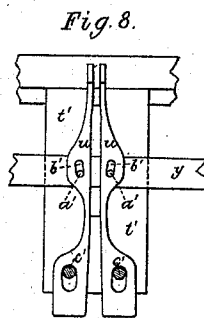
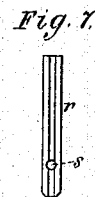
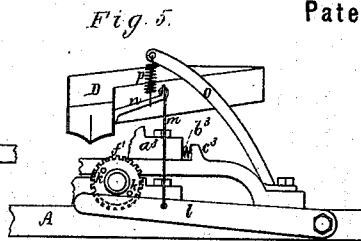
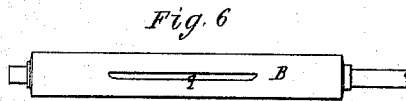
Fig. 2.



Witnesses
S. W. Rippe
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Jeremiah M. Watson
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R. H. Eddy

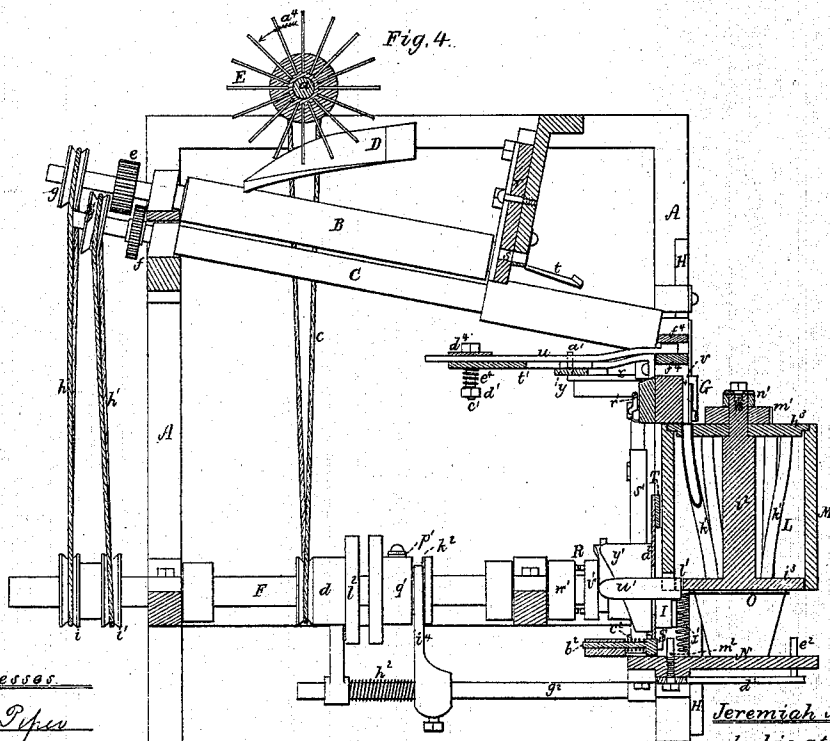
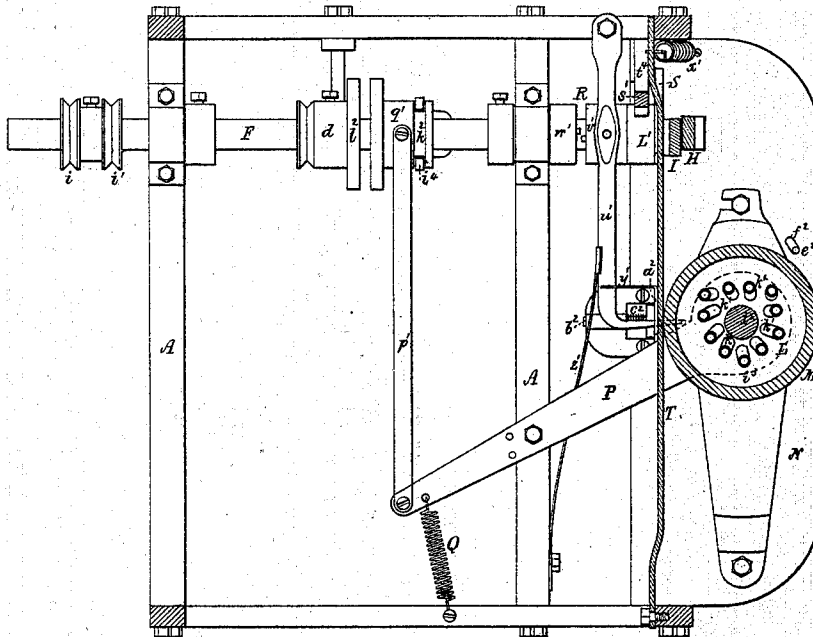
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Witnesses
S. W. Phipps
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Machines for Arranging Nails for being Driven
into Heels or Soles of Boots and Shoes.
 No. 146,152. *Fig. 15.* Patented Jan. 6, 1874.



Witnesses
S. W. Piper
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Fig. 11.

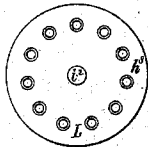


Fig. 12.

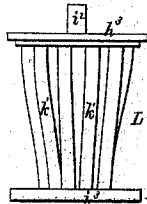


Fig. 13.

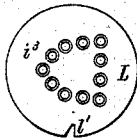


Fig. 14.

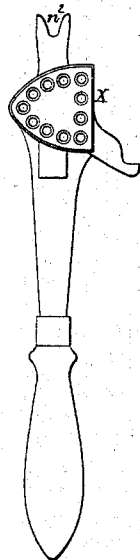


Fig. 16.

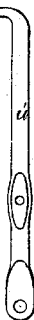


Fig. 9.



Fig. 20.



Fig. 10.

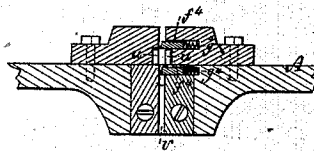


Fig. 18.

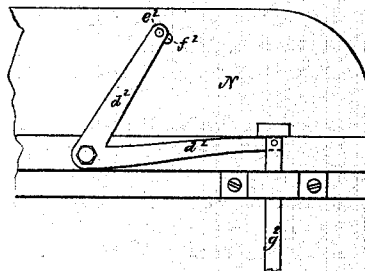


Fig. 21.

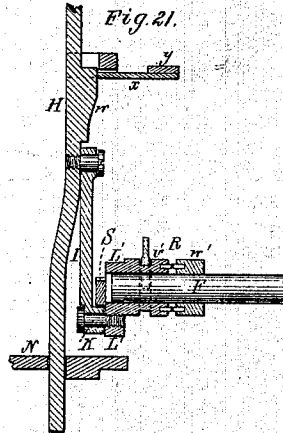


Fig. 17.

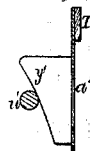


Fig. 19.



Witnesses
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UNITED STATES PATENT OFFICE.

JEREMIAH M. WATSON, OF SHARON, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR ARRANGING NAILS FOR BEING DRIVEN INTO HEELS OR SOLES OF BOOTS AND SHOES.

Specification forming part of Letters Patent No. **146,152**, dated January 6, 1874; application filed December 3, 1873.

To all whom it may concern:

Be it known that I, JEREMIAH M. WATSON, of Sharon, of the county of Norfolk and State of Massachusetts, have invented a new and useful Machine for Arranging Nails for Being Driven into the Heel or Sole of a Shoe or Boot; and I do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a top view, Fig. 2 a side elevation, Fig. 3 a front view, and Fig. 4 a longitudinal and vertical section, of it.

The remaining figures are hereinafter referred to and described.

In such drawings, A denotes the frame for supporting the main operative parts of the machine. Within this frame there are disposed, as shown, two pairs of inclined rollers, B B' C C', the lower pair being below and in advance of the upper pair. Over the upper portions of the upper pair of said rollers is an inclined spout or hopper, D, which is open at its end next the rollers, and at its opposite end is fastened to the frame. Extending within such spout near its lower end is a rotary brush, E, provided with wire teeth, arranged as represented, such brush being fixed upon a horizontal shaft, *a*. The said shaft is provided with a pulley, *b*, to receive an endless band, *c*, proceeding from and around a pulley, *d*, on a driving-shaft, F, which is arranged in the frame in manner as represented. The brush, by being revolved in the direction of the arrow *a*¹, serves to prevent the too free discharge of the nails from the hopper. Each pair of rollers, B B' C C', are geared together, as shown at *e e*¹ *f f*¹, there being on one of the shafts of each pair a grooved pulley, *g* or *g*¹. Endless bands *h h*¹, going around the pulleys *g g*¹ and pulleys *i i*¹ on the driving-shaft, serve to impart motion to the pairs of rollers. The hopper D at its lower end is provided with a mechanism for agitating it. This mechanism is shown in side view in Fig. 5, and may be thus explained: Studs *k k* project from the gear *f*¹ over a lever, *l*, pivoted to the frame A. This lever by a rod, *m*, is connected with an arm, *n*, extended from the spout, such arm being connected with a post, *o*, by a helical spring, *p*. During each revolution of the gear *f*¹ the spout will, by means of it—the

lever *l*, and spring *p*—be vibrated up and down. In the outer surface of one or each of the upper rollers B B' there is a groove, *q*, made lengthwise, as shown in Fig. 6, which is a side view of such roller. This groove, while the rollers are revolving and have nails between them, is to tip a nail into a vertical position in case it should tend to maintain a position parallel, or about so, to and upon the rollers. The bite of the upper rollers or the space between them terminates against a grooved guide or abutment, *r*, into which the nails in succession pass, and by which they are one after another introduced into the bite of, or between, the lower rollers C C'. There is, through the abutment *r* and in line with the bite of the upper rollers, a hole or passage, *s*, leading to an inclined spout, *t*, arranged as shown. Waste or imperfect nails, as well as the crooked ones, will be discharged through the passage and upon and by the spout without dropping between the lower set of rollers.

On the hopper being supplied with shoe-nails, (such as taper from heel to toe,) and the machine being set in operation, the nails will be delivered from the hopper upon the upper pair of rollers, which rollers, revolving in the directions denoted in Fig. 1 by arrows *b*¹ *c*¹, will cause the nails to assume upright positions with their points downward, and to gradually work their way down toward the abutment, from which they will drop successively into the bite of the lower rollers C C'. Should the bite of the lower rollers become fully charged with the nails, the surplus passing down the upper rollers will drop out of the machine, the uneven or defective or crooked ones being discharged through the passage *s* in the grooved abutment, a side view of which abutment is shown in Fig. 7. The box *a*² of the upper journal of the upper roller B' should rest against a spring, *b*², interposed between one end of it and a shoulder, *c*², the same being so as to enable the box to move laterally, or the roller to give way a little, should any two of the nails get across one another. Were it not for such movement of the roller away from the fellow roller, the nails would be liable to become jammed between them, so as either not to separate or to be productive of injurious consequences.

Underneath the lower set of rollers C C'

there is arranged upon a shelf, t^1 , a set of jaws or nippers, $u\ u$, a top view of them being shown in Fig. 8. These nippers are to seize the nails and advance them into a vertical channel, v , down which they are successively to be driven by a driving mechanism, to be hereinafter explained. It consists, in part, of a driver, G , (shown in Fig. 3 and in end view in Fig. 9 and in top view in Fig. 20,) projected from an upright slide-bar, H , arranged as represented. A connecting-rod, I , pivoted to said bar H , and to a crank-pin, K , projecting from a cam, L' , arranged on the driving-shaft, serves to effect the vertical motions of the bar H . From the rear side of the bar H a cam, w , is extended, as shown in Fig. 21. This cam rests against a projection, x , from a lever, y , arranged as represented and connected at its free end to a spring, z , fixed to the frame A . The cam is to move the lever backward, and the spring is to give to it a forward motion, in order to enable it to impart like movements to the nippers by means of studs or pins $a^1\ a^1$ extended up from the said lever into oblique slots $b^1\ b^1$ made in the nippers. These slots serve with the pins to open and close the nippers, as well as to aid in moving them longitudinally. Each nipper is provided with a friction apparatus to keep it from sliding too freely. It consists partly of a screw, c^1 , going down through a washer, d^1 , on the nipper, and through a slot in the nipper, and also through the shelf. A helical spring, e^1 , encompassing the screw, bears against the shelf and a nut, d^1 , screwed on the screw, as shown. The nippers should be elastic, in order to conform to the nails, as they may vary in thickness.

Fig. 10 is a vertical section of the channel v , and the nail pressers or devices for holding the nail from dropping out of time into and through the channel v . These pressers consist of slides $f^1\ f^1$, arranged as shown, and provided with helical springs $g^1\ g^1$, for forcing them up to the nail. Below the channel v is what I term the rotary distributor L , which is shown in top view in Fig. 11, in side elevation in Fig. 12, and in bottom view in Fig. 13. It consists of two disks, $h^3\ i^3$, connected by a shaft, i^2 . The upper disk is perforated with a range of holes disposed in a circle, and the lower disk has a corresponding number of holes arranged as the nails are to be when inserted in a heel or in the nail-carrier X , a top view of such carrier being shown in Fig. 14. Each of the holes of the upper disk h^3 is connected with one of those of the lower disk i^3 by one of a series of tubes, k^1 . Furthermore, there is a notch, l^1 , made in the lower disk i^3 from its periphery, and there is fixed on the shaft i^2 , above the upper disk, a ratchet-wheel, m^1 . A bent lever, n^1 , carrying an impelling-pawl, o^1 , is arranged so as to turn freely on the shaft and above the ratchet-wheel. The distributor is supported within and by a tubular standard, M , in a manner to enable such distributor to be freely revolved horizontally. The tubu-

lar standard is open at top and bottom, and is arranged over and above a shelf, N , and supported by legs extending up therefrom, as represented. A disk O , sustained by a lever, P , extends underneath the distributor L . The said lever P , arranged as shown, has its rear arm connected to a helical spring, Q , attached to the frame A . There is also fixed to the said arm a belt, p^1 , which proceeds from a friction-pulley, q^1 , arranged to turn upon the driving-shaft F . Pivoted to the bent lever n^1 is a rod, r^1 , which is also pivoted to the upper end of a lever, s^1 , arranged as shown, and provided with a spring, t^1 , for pressing it against the cam L' , hereinbefore mentioned. During each revolution of the cam, the lever s^1 , the spring t^1 , the rod r^1 , the lever n^1 , pawl o^1 , and ratchet-wheel m^1 will effect one movement of the distributor, which distributor will remain at rest for a time, in order to receive a nail. As the nails pass into the distributor, they drop through its tubes and rest upon the disk O . After the distributor may have received its full complement of nails, it will stop revolving, such being caused by mechanism to be next described.

Fig. 15 is a horizontal section of the machine, taken through the distributor, so as to show the driving-shaft and mechanism in the lower part of the frame.

A catch-lever, u' , (shown in top view in Fig. 16,) is to operate with the notch l^1 to stop the distributor from revolving. This catch-lever is pivoted to the frame A , and to the sliding part v' of a clutch, R , carried by the driving-shaft F . The cam L' , although on the driving-shaft, is fixed to such sliding part v' , so as to be revolved by it when in engagement with the fixed part w' of the clutch. There is a cam, S , fixed to the cam L' , as shown, and underneath a lever, T , disposed as represented. The free end of this lever is fastened to a spring, x' , which operates to draw the lever downward. The said lever carries a foot, a^2 , from which a cam, y' , (shown more particularly in Fig. 17, which is a transverse and vertical section of the lever with the cam attached,) projects. This cam is to actuate the lever-catch u' in one direction, or force it back, a spring, z' , arranged as shown, serving to move it in the opposite way. The foot a^2 that projects down from the lever T rests upon a yielding slide, b^2 , arranged as shown, and provided with a spring, c^2 , to force it forward.

Furthermore, there is disposed underneath the shelf N a bent lever, d^2 . (Shown in underside view in Fig. 18.) From one arm of said lever a stud, e^2 , projects up through a short slot, f^2 , made in the shelf. The other arm of the lever d^2 is pivoted to a slide-rod, g^2 , provided with a spring, h^2 , for forcing it forward. (See Fig. 2.) The said rod has projecting up from it a fork, i^1 , that enters a groove, k^2 , made in and around the friction-pulley q^1 , hereinbefore mentioned. To co-operate with and revolve the pulley q^1 , there is fixed on the driving-shaft a disk or friction-wheel, p^2 . In

advance of the nail-driver G, and fixed to the frame A, is a spring, U, formed as shown in Fig. 3, and in end view, as represented in Fig. 19. The spring U serves to force the nail-driver G (shown in top view in Fig. 20) out of the nail-passage preparatory to each ascent of the driver, and to keep it out thereof until it may have arisen above the nail next to be driven downward by it. In front of the yielding slide b^2 is a stationary stud or short post, m^2 , erected on the shelf N. After the distributor L may have been supplied with tacks, the nail-carrier X (shown in Fig. 14) is to be placed on the shelf N, and underneath the disk O, and so that the stud or post m^2 may be straddled by the fork n^2 of such carrier. This having been done, the carrier is to be moved aside upon the post as a fulcrum, and against the stud e^2 of the lever d^2 , so as to move said lever, and thereby cause the friction-pulley q' to be borne up against and revolved by the disk ℓ^2 . This will cause the belt p' to be wound on the pulley q' , whereby the disk O will be moved laterally from underneath the distributor L, so as to allow the nails in the distributor to fall out of it into the ranges of holes of the carrier. On withdrawing the carrier charged with the nails, the disk O will at once be returned to place underneath the distributor, which will be unlocked, and next will be again intermittently revolved and charged with nails. On applying the nail-carrier X to the stud m^2 , such nail-carrier is to be pressed against the yielding slide b^2 , so as to force it backward from underneath the foot a^2 of the lever T, and allow such foot to rest on the carrier. On withdrawing the carrier the lever of course will be drawn downward by its actuating-spring, and the cam projecting from the foot will operate or move the catch-lever, so as to unlatch the distributor, and throw into engagement the parts of the clutch by which the mechanism for turning the distributor is put in action.

From the above it will be seen how shoe-nails, after being put into the hopper of the machine, will be dropped therefrom upon the upper pair of inclined rollers B B', and by them arranged points downward, and delivered to and between the lower pair of rollers, and from them be delivered successively into the vertical nail-receiving passage, and driven therefrom into the distributor, and, finally, discharged therefrom into a carrier for being inserted in or applied to a heel.

What I claim as my invention in said machine is as follows:

1. The combination of the grooved guide or abutment r and the two pairs of inclined rollers B B' C C', arranged and applied together, as and for arranging and feeding shoe-nails, as set forth.

2. The grooved abutment r , provided with the hole s arranged in it, and with the rollers B B' C C', as specified.

3. The spout t , arranged and combined with the two sets of inclined rollers B B' C C', and the grooved abutment r provided with the hole s , all being substantially as represented and explained.

4. The combination of the rotary brush E with the hopper D, and the inclined rollers B B', all being arranged and to operate substantially as explained.

5. The yielding box a^3 , and its spring b^3 combined with the two inclined rollers B B', arranged as and for the arrangements and feeding of shoe-nails, in manner as set forth.

6. The rotary distributor L, composed of the perforated disks h^3 i^3 , connecting-tubes k^1 , and central shaft ℓ^2 , arranged and combined substantially as described.

7. The combination of the driver G and the rotary distributor L (provided with mechanism for operating them, substantially as described) with the vertical channel v and the nail feed inclined rollers C C', arranged as set forth.

8. The combination of the driver G and the rotary distributor L (provided with mechanism for operating them, substantially as described) with the rollers C C', the grooved abutment r , and the rollers B B', arranged and to operate as explained.

9. The combination of the nippers $u u$ (provided with mechanism for operating them, as described) with the feed and arranging rollers C C', the guide-channel v , and the driver G, furnished with mechanism for actuating it, as set forth.

10. The combination of the nippers $u u$ (provided with mechanism for operating them, as described) with the feed and arranging rollers C C', the guide-channel v , and the driver G, and distributor L furnished with mechanism for actuating them, substantially as explained.

11. The stud or post m^2 and the yielding slide b^2 arranged and combined with the shelf N, and for use with the furcated carrier and the post a^2 of the lever T, all substantially as described.

12. The combination of one or more yielding pressers, f^4 f^4 , with the channel v and with the nippers $u u$, and the nail-driver G provided with mechanism for operating them, substantially as described.

13. The combination of the movable disk O (provided with mechanism for operating it, as described) with the rotary distributor L and the driver G, arranged with the channel v , and provided with mechanism for operating them, essentially as explained.

14. Either or both the inclined feed-rollers B B', provided with a groove, g , arranged substantially as and for the purpose set forth.

JEREMIAH M. WATSON.

Witnesses:

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