S. SHEPHERD & E. D. WHITCOMB.

Machine for Driving Nails in Boots and Shoes.

No. 212,274. Patented Feb. 11, 1879.

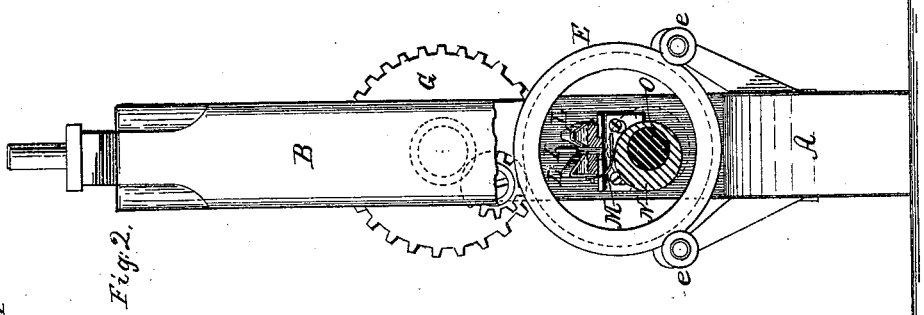

Fig. 2.

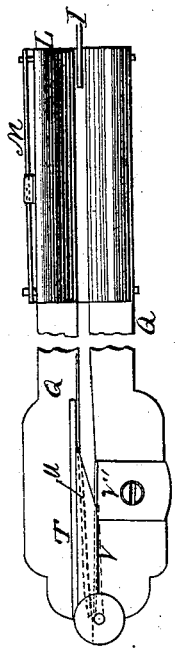

Fig. 3

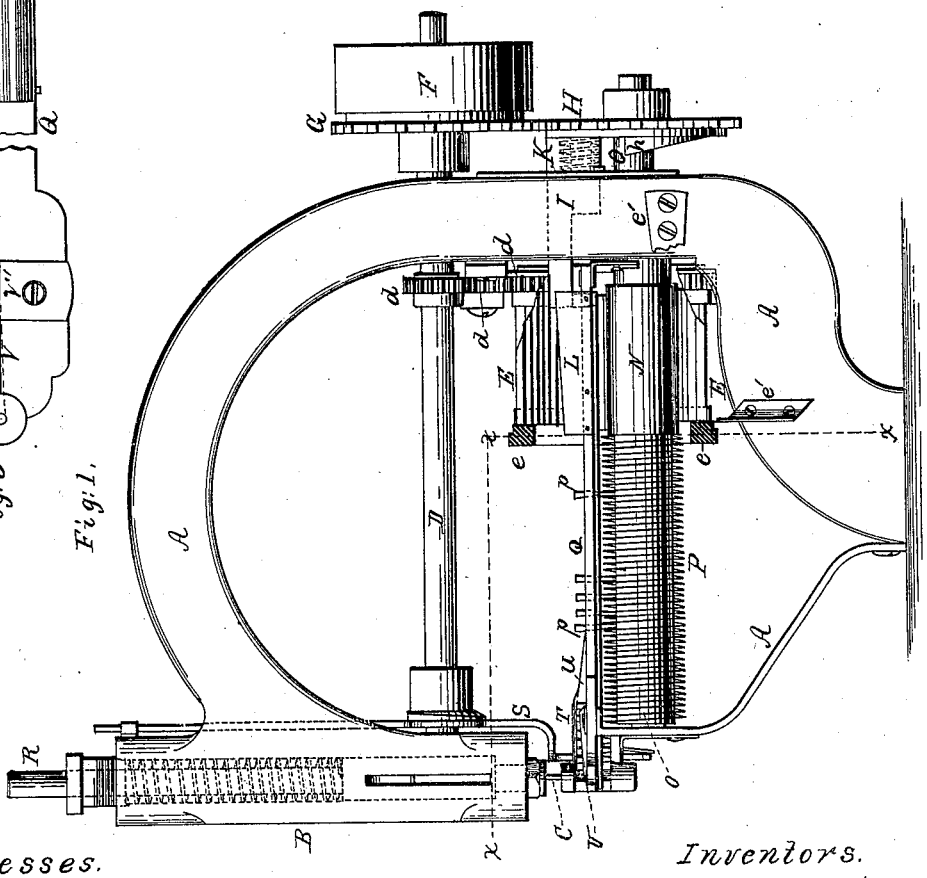

Fig. 1.

Witnesses.

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by J. H. Adams Atty.

UNITED STATES PATENT OFFICE.

SAMUEL SHEPHERD AND ERASTUS D. WHITCOMB, OF NASHUA, NEW HAMPSHIRE, ASSIGNORS TO THEMSELVES, TIMOTHY A. COOLEDGE, OF MARLBOROUGH, AND HOMER ROGERS, OF ALLSTON, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR DRIVING NAILS IN BOOTS AND SHOES.

Specification forming part of Letters Patent No. **212,274**, dated February 11, 1879; application filed August 27, 1878.

To all whom it may concern:

Be it known that we, SAMUEL SHEPHERD and ERASTUS D. WHITCOMB, of Nashua, in the county of Hillsborough and State of New Hampshire, have invented a new and useful Improvement in Machines for Driving Nails in Boots and Shoes, of which the following is a specification:

Our invention relates to an improvement in boot and shoe nailing machines of that class in which the nails are fed from a hopper to the driver-tube, and is designed more especially for driving headless nails.

The object of our invention is to provide a means for supplying a certain and uniform feed of the nails, after leaving the hopper, to the driver-tube; and the invention consists in the combination, with the driveway and nail-hopper of a machine for driving nails in boots and shoes, of a spiral carrier, arranged to extend from the hopper to a point at or near the driveway, and a raceway, located above the spiral carrier, and constructed and arranged to retain the nails in proper position, while the lower ends of the nails are supported upon the shaft of the carrier, and transported from the nail-hopper to the driveway by the spirals of said carrier.

The invention further consists in making the surface of the shaft within the hopper or rotating drum eccentric with the surface or outer edges of the spiral carrier, so that as the shaft rotates the eccentric portion of the latter will impart to a curved or bent plate hinged to one side of the trough into which the nails are dropped, and extending under the same, an up-and-down motion for the purpose of facilitating the passage of the nails in the said trough to the raceway.

The invention further consists of a thin plate of metal placed at the rear of the trough, into which the nails are dropped, its lower edge moving in the slot of the trough, and to which plate an intermittent forward motion is imparted by means of a cam on the gear-wheel attached to the main shaft, a coiled spring serving to retract the plate after being operated by the said cam.

Referring to the drawings, Figure 1 represents a side elevation of a machine embodying our improvements, with portions broken away to show the interior construction. Fig. 2 is a rear elevation, with a part shown in section on the line *x x x* of Fig. 1. Fig. 3 is a view of the raceway and trough.

A A represent the main frame, in which is mounted the main driving-shaft D, and supporting the standard B, in which is arranged the driver-stock R, carrying the driver C, and operated in a well-known manner by a cam on the shaft D and a spring surrounding the driver stock or bar. E is a circular cage or hopper, composed of a series of cylindrical rods or bars, the heads or rims of which are supported by rollers *e e*, mounted in supports *e' e'*, secured to the main frame. The rotating hopper E serves to take up the nails and drop them upon the trough connected with the raceway.

Within the hopper E is arranged a trough, L, extending to the front of the hopper, and composed of two bent plates, L L, as shown in section in Fig. 2, each being secured to the sides of the raceway Q, and separated from each other at the center, so as to form a slot or opening corresponding to the opening in the raceway for the passage of the nails.

The device for feeding the nails to the driver consists of a carrier or conveyer, P, composed of a spiral flange or fin upon a shaft or core, and forming a continuous channel or groove extending from the hopper to a point near the driveway for the nails, the channel or groove being of sufficient depth to support the nails in an upright position, and convey them, in connection with a guide or raceway, uniformly and with a positive motion to the end of the carrier.

The surface or periphery of the shaft within the hopper E is made eccentric with that of the flanged portion, as seen in Fig. 2, for a purpose hereinafter described.

Underneath the trough L and the portion of the raceway within the hopper E is a curved plate, M, hinged or pivoted at one side of the raceway, so as to admit of an up-and-down motion, which is effected by means of the rotation of the eccentric portion of the shaft N.

The eccentric portion of the shaft may be formed of a sleeve having a bore made eccentric with the shaft or core of the flanged portion P. The object of the plate M, as it is made to rise and fall by the eccentricity of the shaft, is to agitate the nails as they pass through the slot in the trough L, and prevent them from clogging, and also to facilitate their passage to the raceway.

The nails *p p* used in this machine are headless, and of wedge-shaped form on two sides.

Over the flanged conveyer P is arranged the raceway Q, composed of two flat bars, extending from the inner end of the hopper E to the driveway.

At the rear of the trough L is a metal plate, I, arranged vertically, and so as to slide in the slot of the trough. The plate I extends through the frame A, and is caused to move inwardly in the slot of the trough by means of a cam, *h*, on the gear-wheel H, attached to the shaft O of the feed-flange. After being forced forward by the cam *h*, the plate I is retracted by means of a spring, K, properly arranged for the purpose. The object of the sliding plate I is to push forward the nails as they drop into the trough.

At the front end of the raceway Q is arranged a plate, T, which is bent over the center of the raceway, and forms a shield to prevent the nails from leaving the raceway above. The nails are held in position by means of springs U and V, arranged one on either side of the raceway, so as to guide the nails properly to the driveway. The spring U is attached to the plate T, and is composed of a thin plate of metal, extending from the driveway to a short distance from the end of plate T within the raceway. The spring V is attached to or forms part of a plate, V′, secured to one side of the raceway, and extends also to the driveway.

When the machine is in operation, the nails, being placed in the rotating hopper E, are carried up and dropped into the trough L, from whence they pass to the raceway Q, being aided in their passage by means of the vibrating plate M, and in case of clogging by the spring-plate I the points of the nails drop into the spiral carrier P, the groove in the same being deep enough to maintain the nails in an upright position in the raceway and to insure their passage regularly to the end of the raceway, where they are held in proper position by means of the springs U and V, so as to drop regularly and uniformly into the driveway, to be operated upon by the driver C.

We are aware that boot and shoe nailing machines have been provided with pairs of spiral carriers, arranged and adapted to engage with the heads of nails and transport the nails from a raceway to the driveway of the machine, and we make no claim to such construction.

By means of our improvement headless nails are transported in proper order from the hopper to the driveway by a single spiral carrier.

We are not aware that spiral carriers (one or more) have ever been employed to feed headless nails to the driveway of a boot and shoe machine. Further, we are aware that a spiral carrier has been used in machines for papering pins; but in such case the arrangement and construction of the several parts are such that the machine or the feeding mechanism thereof would be totally useless and impracticable for transporting headless nails from the hopper to the driveway of a machine for driving nails in boots and shoes, and hence we make no claim to feeding mechanism heretofore employed in pin machinery.

What we claim as our invention is—

1. The combination, with the nail-hopper and the driveway of a machine for nailing boots and shoes, of a spiral carrier, extending from the hopper to a point at or near the driveway, and a raceway, located over the carrier, and in close proximity thereto, whereby the upper ends of the nails are held in proper position by the raceway and the lower end supported upon the shaft of the carrier, and the nails transported from the hopper to the driveway by the spirals of the carrier, substantially as set forth.

2. The eccentric shaft N, in combination with the movable plate M and raceway Q, substantially as and for the purpose set forth.

3. The combination of the raceway Q, the trough L L, and the movable plate M, as and for the purpose specified.

4. The combination, with the raceway Q, of the spring-plate I, arranged and operating as and for the purpose described.

5. The plate or shield T, in combination with the springs U and V, attached respectively to opposite sides of the raceway, and arranged at the end of the latter near the driveway for the nails, as and for the purpose specified.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

SAMUEL SHEPHERD.
ERASTUS D. WHITCOMB.

Witnesses:
W. W. BAILEY,
S. EVANS.