2 Sheets—Sheet 1

S. HARRIS, Jr.
Nailing Machine.

No. 197,269. **Patented Nov. 20, 1877.**

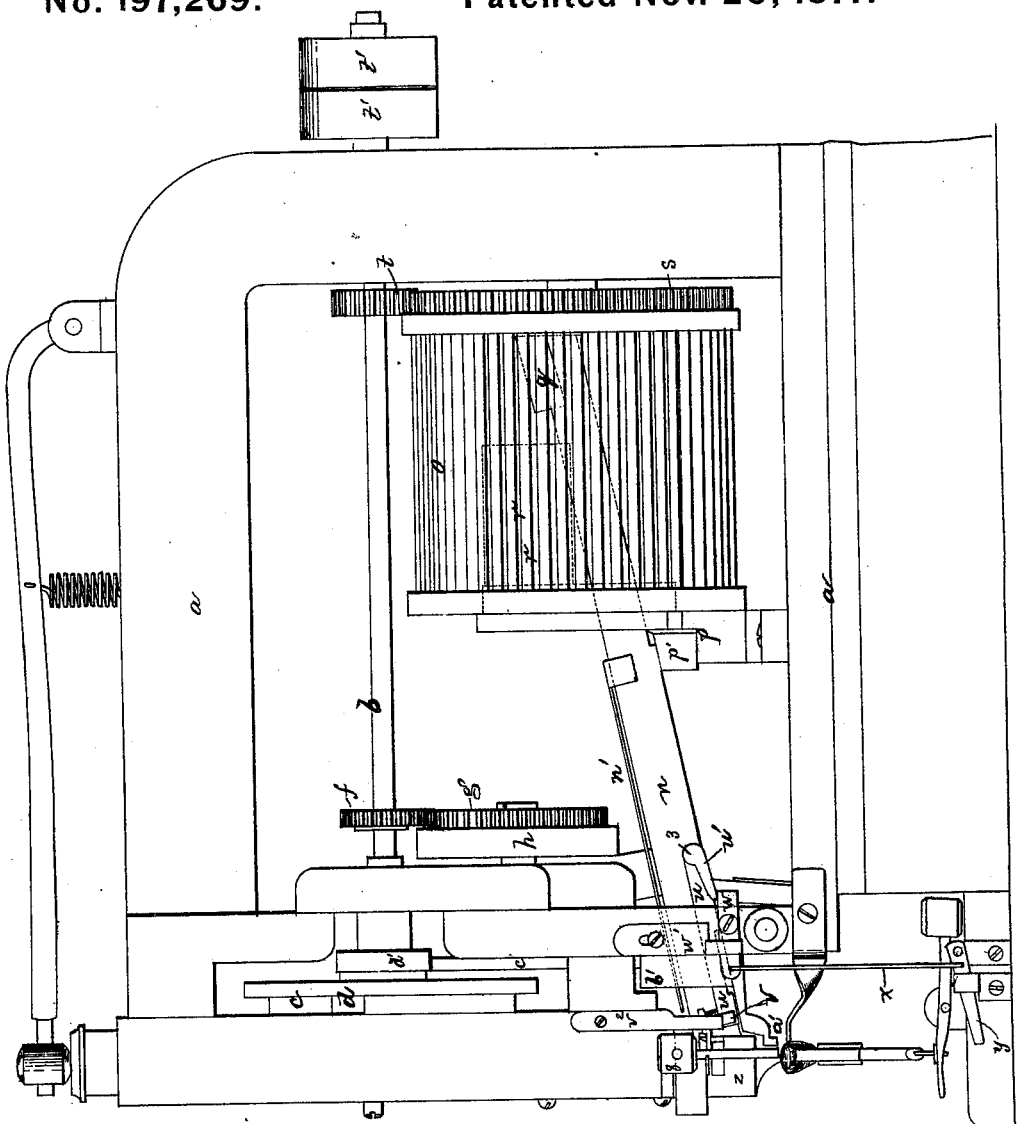

Fig 2.

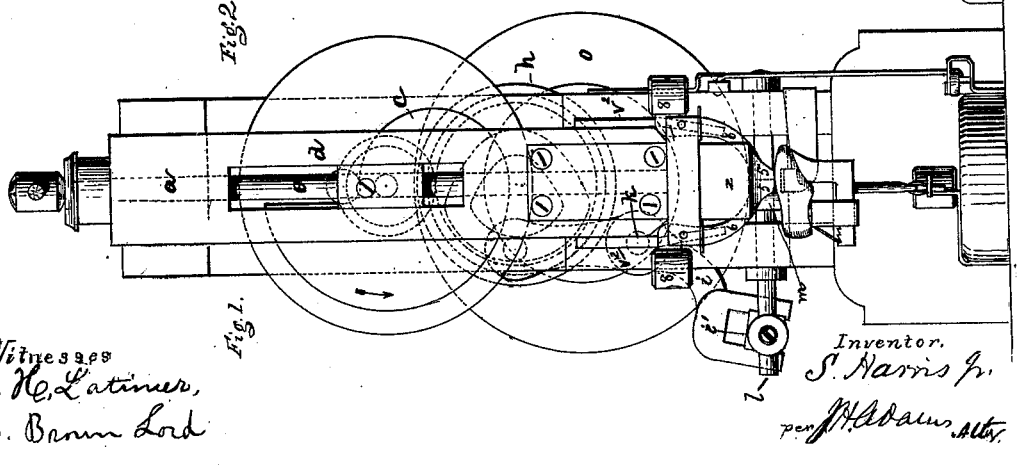

Fig 1.

Witnesses
L. H. Latimer,
J. Brown Lord

Inventor.
S. Harris Jr.
per J. H. Adams Atty.

2 Sheets—Sheet 2.

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Fig. 3.

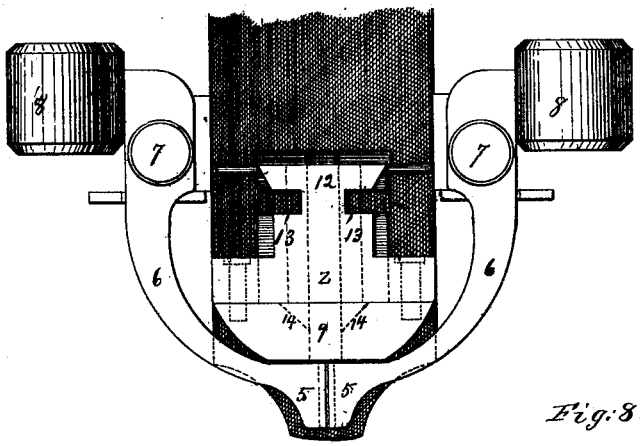


Fig. 8.

Fig. 4.

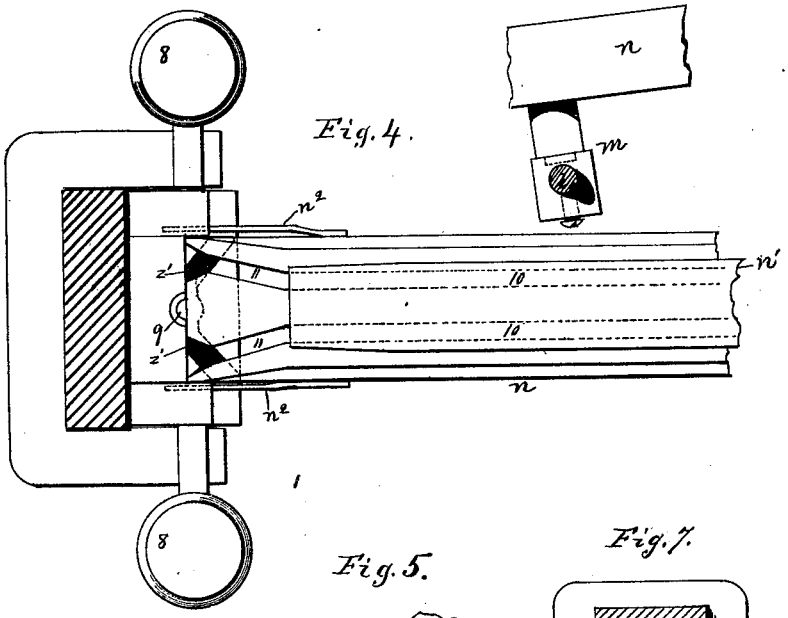


Fig. 6

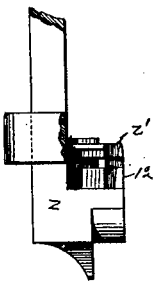


Fig. 5.

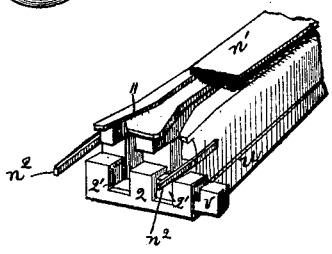
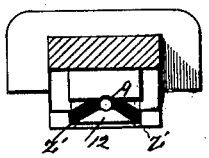


Fig. 7.



Witnesses.
L. H. Latimer.
J. Bonn Lord

Inventor.
S. Harris Jr.
per J. H. Adams Atty.

UNITED STATES PATENT OFFICE.

SAMUEL HARRIS, JR., OF EAST CAMBRIDGE, MASSACHUSETTS, ASSIGNOR TO JOSEPH GREELEY AND SAMUEL SHEPHERD, OF NASHUA, NEW HAMPSHIRE, AND HORACE L. HAZELTON, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN NAILING-MACHINES.

Specification forming part of Letters Patent No. **197,269**, dated November 20, 1877; application filed August 22, 1877.

To all whom it may concern:

Be it known that I, SAMUEL HARRIS, Jr., of East Cambridge, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Nailing-Machines, of which the following is a specification:

My invention relates to an improvement in machines for driving nails into the soles of boots and shoes.

The invention consists of a cylindrical hopper, having upon its periphery a series of longitudinal slots or openings, of a size sufficiently large to admit of the passage of the shanks of nails of a required size, the same being held by the enlargement at their heads until, by the rotation of the hopper, they are brought to a position over a raceway projecting into the hopper, into which raceway they then drop. The openings in the hopper at the same time allow all imperfect nails, dirt, or other extraneous matter to drop through, thus providing against the clogging of the raceway and mechanism.

The invention further consists of a double-channeled raceway, which is pivoted at one or more points, and operated in such a manner as to cause its delivery end to move from side to side, so as to alternately deliver a nail from each of the raceway-channels to a stationary slotted nail-guide, which acts, in connection with the oscillating raceway, to place the nail in position to be driven.

By means of the double-channeled raceway I am enabled to drive twice the number of nails in a given time as could be driven by the use of a single raceway, such as is commonly employed.

The invention further consists in an adjustable device for cutting off the pointed ends of headed nails to any required length, at the will of the operator, for the purpose of adapting them to the varying thickness of material into which they are to be driven.

Referring to the drawings, Figure 1 is a front elevation of a machine embodying my invention. Fig. 2 is a side view of the same. Fig. 3 is an enlarged view in detail of the slotted nail-guide. Fig. 4 is an enlarged view in detail of the double-channeled raceway and nail-guide. Fig. 5 is a perspective view, showing the location and arrangement of the cutting contrivance with respect to the mouths of the double nail or tack raceways, a portion of the cover of said raceways being removed to facilitate the illustration. Fig. 6 is a side view of the nail-guide, with the weighted arms removed. Fig. 7 is a plan of the nail-guide, with the weighted arms removed; and Fig. 8 is a view of the front end of the double-channeled raceway, showing its pivot *m*.

a represents the head-frame, in which is mounted longitudinally the shaft *b*. On the front end of the shaft *b* is a cam, *c*, which serves to elevate the driver-bar against the stress of a spring, which forces the driver-bar downward when released by the cam. On the forward portion of the shaft *b* is a gear-wheel, *f*, which engages with a gear, *g*, attached to the back of a disk, *h*, which has a cam-groove on its face. A roll working in this cam-groove is attached to the upper end of a lever-arm, *i*, which vibrates on a center, *k*, in the frame *a*. The lower end of the lever-arm *i* is attached, by means of an adjustable block, *i'*, moving in a yoke thereon, to the end of a reciprocating bar, *l*, upon which is placed an adjustable block, *m*, to which is pivoted the forward end of the double-channeled raceway *n*.

O is a hopper, into which the nails are thrown, and it consists of a cylindrical cage, provided with longitudinal openings sufficiently large to allow the shanks of the nails and headless nails to drop through, but not large enough to admit of the heads passing through, so that as the hopper rotates the nails are carried up by their heads, the shanks projecting through the openings, and when brought to a position over the raceway they drop upon the same and adapt themselves to the channels of the raceway, the headless nails and the dirt, &c., passing out through the openings.

The raceway *n* is composed of two channels, 10 10, running parallel with each other, and both channels receive the nails from a supplementary hopper, *q*, as they drop from the rotating hopper, and, as the raceway is caused

to reciprocate while the machine is operated, double the quantity of nails will be supplied to the nail-tube in a given time than if only a single channel were used.

The rear end of the raceway *n* extends into the nail-hopper *o*, and is provided with a supplementary hopper, *q*, (shown in dotted lines, Fig. 2,) which serves to guide the nails into the channels in the raceway. The raceway *n* is also pivoted at *p'* to the front bearing *p* of the hopper *o*.

Over the raceway, inside of the hopper *o*, and attached to its front bearing *p*, is arranged a stationary shield, *r*, consisting of a curved piece of sheet metal, which prevents the nails from falling upon that portion of the raceway, and also obviates the liability of the nails escaping through the front opening of the hopper.

The hopper *o* is rotated by means of a gear, *s*, at its rear end engaging with a spur-wheel, *t*, on the shaft *b*, which latter may be driven by power applied to the pulley *t'*.

In order to adapt the length of the nail to the varying thickness of a sole while it is being nailed, I have adopted a device for cutting off the ends of the nails at the will of the operator during the operation of the machine.

This device consists of a bearing, 2, provided with the two notches or openings 2' 2', as shown in Fig. 5, to correspond with the ends of the channels in the raceway. The bearing 2 is supported upon the ends of arms *u*, one on each side of the lower part of the raceway, the said arms being pivoted, as shown at 3, Fig. 2. Fitted in the bearing 2 is a sliding bar, *v*, provided with two notches or recesses. The solid portion between the recesses, as it passes to and fro in the recessed bearing 2, serves to cut off a nail-point passing into the recesses of the bearing 2. The arms which support the notched bearing 2 are elevated, so as to bring the slide or cutter *v* into action, by means of a pedal, *y*, in connection with the rod *x*, bar or arm *w*, pivoted to the frame *a*, and operating the lever-arm *w'*, fixed to the pivotal point 3 of arm *u*, as shown.

The sliding movement of the bar or cutter *v* is effected by means of the ends of the same coming in contact with pendent bars v^2, attached, one at each side of the frame, as the bearing 2 is moved to and fro with the raceway.

The length to be cut from the end of the nail is regulated by the degree of motion of the pivoted bar *w*, the limit of which is adjusted by the stop *w'*.

The nails are prevented from riding out of the channels of the raceway by means of a strip of metal, n^1, placed over the top of the raceway, as seen in Figs. 2 and 4.

In Fig. 3, 5 5 are two jaws, having each a groove on its inner face, so as when closed together to form a tubular passage, constituting a continuation of the nail-tube 9, and serving to hold and guide the nail to be driven into the sole.

The jaws 5 5 form part of arms 6 6, which are pivoted at 7 7, and are caused to close together by weights 8 8, acting as counter-weights. *a'* is the feed, attached to the lower central part of a stirrup-frame, *b'*, on the end of a bar or rod, *c'*, connected to a cam, *d'*, on the shaft *b*.

The bar *c'* has a slot through its face, through which a pin or projection on the frame passes, and on which it oscillates, so as to impart the proper motion to the feed *a'*.

The double-raceway channels 10 10 terminate in two diverging channels, 11 11, as shown in Figs. 4 and 5. The ends of the diverging channels 11 11 project over the ends of the slots *z' z'* in the stationary nail-guide *z*, as shown in Fig. 4. At the point where the two angular slots of the guideway meet is the nail-tube 9.

At the rear of the nail-tube and nail-guide is the angular piece or block 12, the extreme points or angles of which serve to catch the shank of the nail from each channel 11 11 as the raceway reciprocates, the motion of the raceway causing the nail to be moved and guided directly to the nail-tube 9, thus insuring the positive delivery of the nail from the raceway to the nail-tube or driveway, to be acted upon by the driver.

Two fingers, n^2 n^2, projecting one on each side of the end of the movable raceway, and playing into slots 13 13, (shown enlarged in Fig. 3,) serve to prevent the pointed ends of the nails from being thrown out of proper position.

Should the point of the nail, while passing through the nail-tube, be diverted from a straight course, the front angular walls of the slots in the nail-guide will prevent the point from being carried outward, and, as the nail descends, the countersink in the lower portion of the stationary nail-guide (shown in dotted lines 14 14, Fig. 3) will direct the point of the nail into the nail-tube.

I do not claim a slotted nail-hopper; but

What I claim as my invention is—

1. In a nailing-machine, the combination, with a rotating hopper having a series of longitudinal openings, of an automatically-vibrating raceway, pivoted outside of said hopper and composed of two parallel channels, one end of said raceway projecting within said hopper, and the other being provided with diverging channels, the several parts being arranged to operate substantially as and for the purposes set forth.

2. The vibrating double-channeled raceway, pivoted at a point exterior to the main hopper, and provided with the diverging channels 11 11, in combination with the slotted stationary nail-guide *z*, substantially as shown and described.

3. The combination of the slotted nail-guide *z*, the nail-tube 9, the angular block 12, and the diverging channels 11 11, as and for the purpose specified.

4. The fingers n^2 n^2 projecting from the end

of the reciprocating raceway at each side thereof, and adapted to play in the slots 13 13, as and for the purpose set forth.

5. In a nail-driving-machine, a cutting device, constructed and operating substantially as described, so as to cut off the points of headed nails, as desired, before driving and during the operation of the machine.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAML. HARRIS, JR.

Witnesses:
J. H. ADAMS,
L. H. LATIMER.