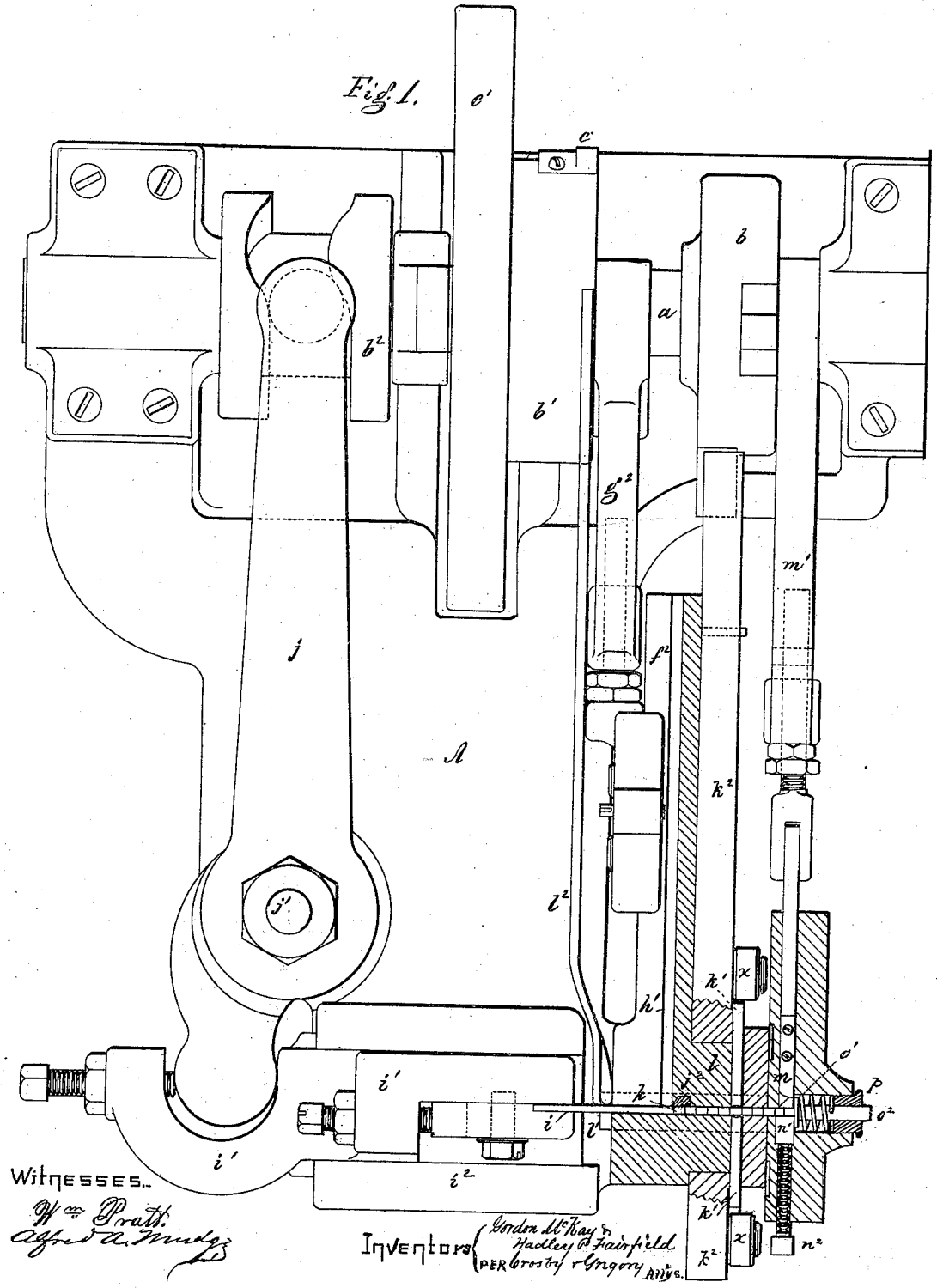
3 Sheets—Sheet 1.

G. McKAY & H. P. FAIRFIELD.

MACHINE FOR UNITING THE UPPERS AND SOLES OF BOOTS AND SHOES.

No. 169,463. Patented Nov. 2, 1875.

Fig. 1.



Witnesses.
Wm. Pratt.
Alfred A. Mudge

Inventors { Gordon McKay & Hadley P. Fairfield
PER Crosby & Gregory Att'ys.

3 Sheets—Sheet 2.

G. McKAY & H. P. FAIRFIELD.

MACHINE FOR UNITING THE UPPERS AND SOLES OF BOOTS AND SHOES.

No. 169,463. Patented Nov. 2, 1875.

Fig 2.

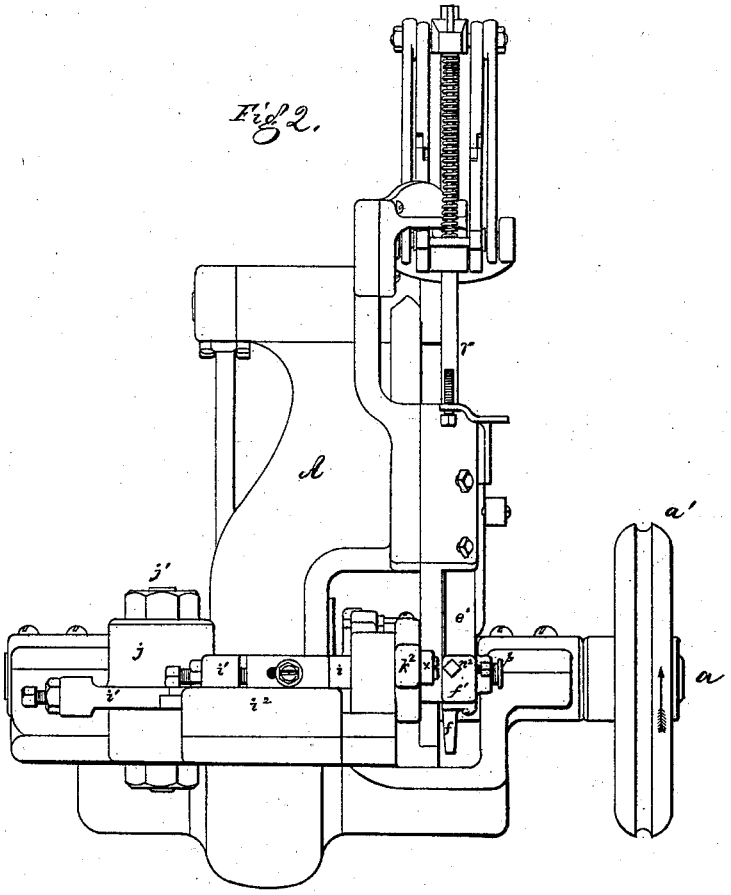
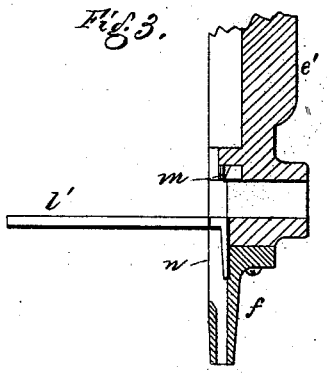


Fig 3.



Witnesses.

Wm Pratt.

Alfred W. Mundy

Inventors

Gordon McKay
Hadley P. Fairfield

PER Crosby & Gregory Atty's

3 Sheets—Sheet 3.

G. McKAY & H. P. FAIRFIELD.

MACHINE FOR UNITING THE UPPERS AND SOLES OF BOOTS AND SHOES.

No. 169,463. Patented Nov. 2, 1875.

Fig 5

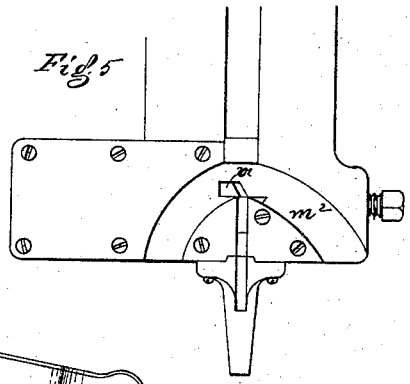
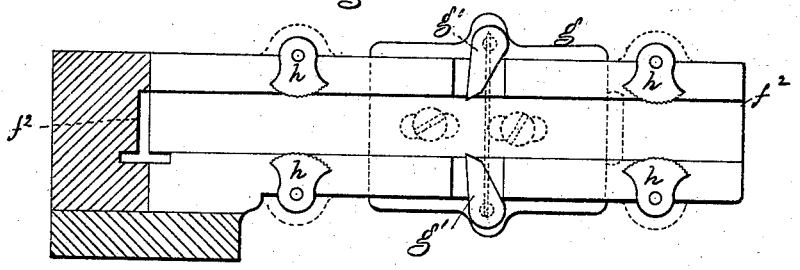


Fig 4.

Fig 6.



Witnesses.

Wm Pratt.

Alfred W. Mudge

Inventors.

Gordon McKay & Hadley P. Fairfield

PER Crosby & Gregory Att'ys

UNITED STATES PATENT OFFICE.

GORDON McKAY, OF CAMBRIDGE, AND HADLEY P. FAIRFIELD, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR UNITING THE UPPERS AND SOLES OF BOOTS AND SHOES.

Specification forming part of Letters Patent No. **169,463**, dated November 2, 1875; application filed May 15, 1875.

To all whom it may concern:

Be it known that we, GORDON McKAY, of Cambridge, Middlesex county, and HADLEY P. FAIRFIELD, of Boston, Suffolk county, all in the State of Massachusetts, have invented jointly an Improved Machine for Uniting the Uppers and Soles of Boots and Shoes, of which the following is a specification:

This invention relates to mechanism for uniting the uppers and soles of boots and shoes, is an improvement on other machines heretofore patented by us, and the mechanism herein described is to be used in connection with a shoe-support and proper feeding mechanism for moving the shoe, and for these mechanisms we prefer as the support a curved salient horn or arm, and feeding mechanism shown in United States Patents Nos. 122,985 and 140,400, but we might employ any other well-known feeding mechanism.

The horn and feeding mechanisms, not being a part of this invention, are not represented in the drawings, as they are fully described in the patents above cited, and are shown in the well-known McKay sewing-machine.

In machines using nails cut from wire-like material it is common to cause the length of the nail to vary automatically by the variation in the thickness of the sole or soles.

In this machine, instead of a wire we employ a flat strip of metal from which the nails are formed. The strip being of a width equal to the length of the longest nail desired, and fed through the strip-guiding tube, it is cut into nails, and each nail is forced into a nail-guiding channel, where it is corrugated by dies or compressors operated from the cam-shaft by a pivoted lever, and then the nail is moved forward supported at its point on a movable rest, and placed within the line of movement of the head-cutter, which is carried in ways in the reciprocating or sliding head which carries the nail-driver and nail-guiding tube, and which adapts itself in its lowest position to the thickness of the material into which the nail is to be driven. This sliding head is adapted to rise and fall in guides in the framing, and carries the nail-guiding tube and head-cutter, and in line with the nail-guiding tube is the nail-driver, it being steadied by suitable guides. The sliding head is raised from the work prior to each feed movement of the shoe, to release the shoe from pressure, and to allow it to be moved easily by a cam on the main shaft through a lever which engages a friction-roller or other projection on the sliding head, and the sliding head after the feeding movement has taken place is thrown down by a suitable spring until the nail-guiding tube rests on the sole. In this position the nail-rest is moved forward within the open side of the nail-guiding tube, thereby supporting a nail in the tube in the path of the nail-head cutter, which is then thrown forward, and cuts off the head of the nail more or less, according to the position of the sliding head and cutter, and in this way the corrugated nail is cut to correspond with the thickness of the material, they projecting through the inner sole only just far enough to meet or clinch a little against the iron support. This strip from which the nails are cut will preferably have a groove near its point-forming edge to weaken the point of the nail so that it will readily turn and form a clinch. The nail-driving mechanism, or that which operates the driver, is operated through a walking-beam or a lever, and by a toggle-jointed connection or link, as in United States Patent No. 155,962, and need not, therefore, be herein described, as such devices operate in this as in the machine described in such patent.

Figure 1 is a top view, partially in section, of this our improved mechanism. Fig. 2 is a front view; Fig. 3, a detail of the nail-guiding tube and movable rest for the nail, the latter being in position to sustain a nail while its head is being cut off by the head-cutter. Fig. 4 is a side view. Fig. 5 is a back view of the sliding head and nail-guiding tube and head-cutter, and Fig. 6 is a section taken through the strip-guiding tube.

A is the frame of the machine, of any suitable shape to sustain the working parts, and provided with a shaft, a, having a fly or band wheel, a^1, and with cams b b^1 b^2 c c^1 c^2 d. An arm, d^1, pivoted at d^2 to the frame, and with one end resting under the roller or projection e of the sliding head e^1, guided in ways e^2, is struck by cam d at each revolution of the shaft a, so as to raise the sliding head e^1 and

the nail-guiding tube f and head-cutter-guiding box f^1 prior to each feed-movement, and the sliding head is allowed to drop so that the tube f rests on the sole after each feed-movement. The strip from which the nails are to be cut is placed in the strip-guiding tube f^2, and is fed forward in such tube by a pawl-carrying slide, g, provided with pawls g^1, connected with a rod, g^2, reciprocated by means of a cam, b, having a groove in its side which receives a friction-roller on the rod g^2. The strip is kept from being drawn backward by the pawls h on the guiding-tube. The strip is shown at h^1, and where its end meets the end of the tube f^2 a cutter, i, adjustably attached to a reciprocating carriage, i^1, working in ways i^2, and is actuated by lever j, pivoted at j^1, and moved by the cam b^2 on the main shaft. The cutter i has opposite it a stationary cutter, j^2, and as a nail, k, is cut from the strip f^2 it is moved toward the nail-guiding tube, the drawing, Fig. 1, showing a number of such nails so cut off and moved at right angles to the movement of the strip, each nail acting against the other. When the nails come between the corrugating-dies k^1 such dies, having corrugated and concaved faces suitably shaped, are caused to move against the sides of the nail and press it into somewhat c val form, and corrugate or nick it. These dies are held in a fixed portion of the frame, and are caused to approach each other through the action of projections x on a lever, k^2, made to turn about the hub l, (shown in section, Fig. 1,) and moved by a cam, c^2, on shaft a. After the nail is corrugated it is passed along in the nail-guiding channel and through the hub l. The bottom of the nail-guiding channel is formed by a movable plate or rest, l^1, (see Figs. 1 and 3,) which is reciprocated by a pivoted lever, l^2, operated by cam e on cam b^1, the forward end of the lever having an inclined actuating face, and entering a slot in the rest i^1, so as to move it forward and back at the desired times, the lever l^2 being moved in one direction preferably by a spring. The forward end of this rest forms a shelf for a nail, and when the rest is thrown forward it passes within the nail-guiding tube f, as shown in Fig. 3, and there supports a nail, the tube being open at its side for such purpose. The rest has no vertical motion, and is stationary with relation to the inner surface of the shoe-sole, and as the sliding head, by the action of the nail-guiding tube on the sole, is raised or lowered, with relation to the shelf, the head-cutter m, carried by the head e^1, will be raised more or less above the shelf l^1, and the point of the nail and the head-cutter m in its forward movement, actuated by the face-grooved cam b, through rod m^1, will cut off more or less of the head of the nail, preparing it for the thickness of the stock, and the head of the nail will be forced out through the channel m^2, Fig. 5. The head of the nail being cut off, the shelf l^1 is withdrawn, the nail drops into the tube f, it being prevented from moving back by the nails standing back of it, and when drawn back the projection n on the shelf or rest l^1 closes the side of the tube f, and prevents the nail from falling out. The nail-driver r then operates in the usual way to drive the nail from the tube f into the sole. The stationary cutter n^1, against which cutter m works, is made adjustable by means of the screws n^2 o, Fig. 4. The nails fed into the tube f are not always of the same thickness, and therefore it is not safe to crowd the cut-off nails from the tube f^2 against a rigid portion of the sliding head e^1, and to prevent any damage from the accumulating nails, and to keep them held properly together, we place in the sliding head e^1, and opposite the passage through which the separate nails move, a spring-supporting plate, o^1, having a shank, o^2, surrounded by a spiral spring, one end of which bears against o^1, and the other against a nut, p, screw-threaded, and turned into the sliding head, the nut governing the force of the spring. The cutters and feeding devices are adjustable as to their movements.

With this our invention strips of wood such as are commonly used in pegging-machines may be used instead of metal; but we prefer metal.

To properly sever a nail, k, from the strip, the cutter i should move sufficiently far forward to pass its cutting-edge beyond the opposite side of the strip, and in so doing all the severed nails are moved forward for a distance greater than the thickness of the nail last severed. During this movement the outer nail k is pressed against the spring-supporting plate o^1, and when the cutter i is drawn back the spring about the shank o^2 presses back the plate o^1, and with it the nails, leaving the nail at the outer end of the shelf l^1 in position to be driven by the driver r.

Having described our invention, we claim—

1. The combination of the strip-guiding tube and cutter for severing the nails, with the movable dies for corrugating the nails after they are cut from the strip, and in their passage to the tube and driver, substantially as described.

2. The combination of the movable nail-guiding-tube and the rest or shelf, adapted to support a nail within the tube, with the head-cutter to cut the nail to the required length, substantially as described.

3. The combination, in a nailing-machine, of mechanism for cutting nails from a strip, mechanism for corrugating the nails cut from the strip, and mechanism for supporting and cutting each nail just prior to its being driven to a length corresponding to the thickness of the sole, substantially as described.

4. The combination of the strip-guiding tube and nail-cutter with the movable rest for the severed nails, substantially as described.

5. The combination of the movable slide and nail-tube, variable in position, according to the thickness of the sole of the boot or shoe, and its head-cutter, with the rest for supporting

the nail while being cut, and with the nail-driver, substantially as described.

6. The combination, with the strip-guiding tube, of a cutter adapted to cut a nail from the strip and move it into a nail-guiding passage, substantially in line with the path of the cutter's movement, as and for the purpose set forth.

7. The combination of the cutter *i*, adapted to sever the nails from the nail-strip and move them forward in the nail-guiding passage, with the spring-supporting plate o^1, substantially as described.

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

GORDON McKAY.
HADLEY P. FAIRFIELD.

Witnesses:
E. K. BEECHER,
FRANK F. STANLEY.