3 Sheets—Sheet 1.

J. E. KIMBALL & E. MERRITT.

NAIL-DRIVING MACHINES FOR ATTACHING SOLES TO BOOTS AND SHOES.

No. 193,965. Patented Aug 7, 1877.

Fig. 2.

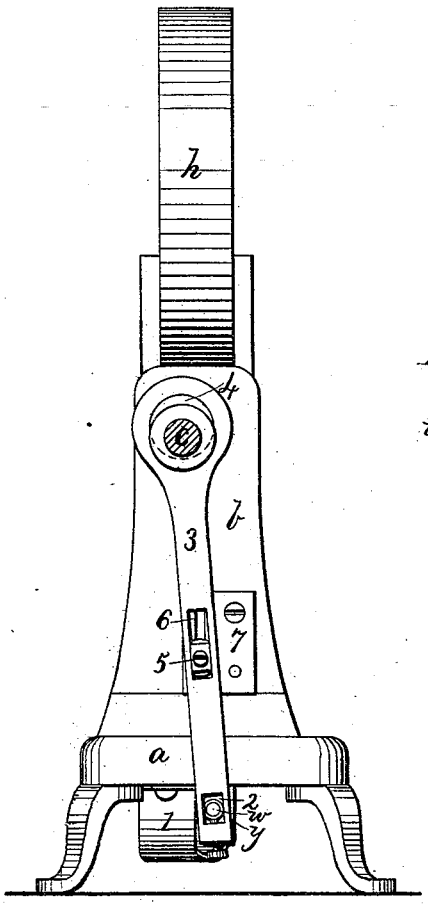


Fig. 5.

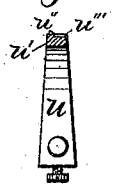
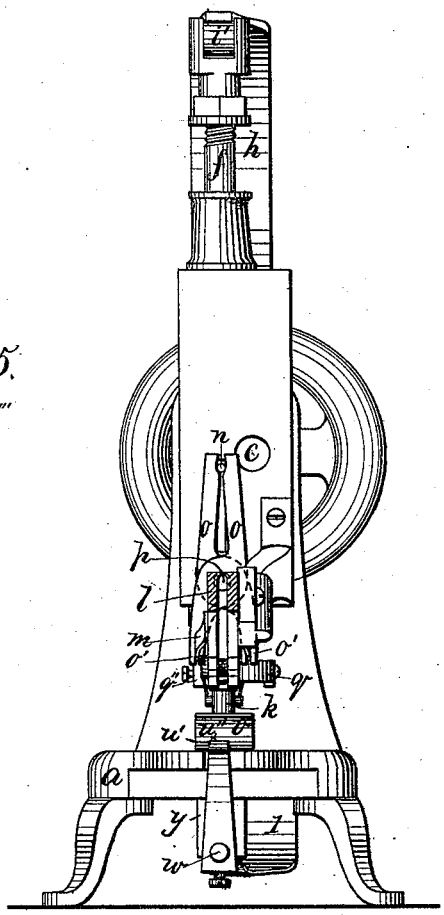


Fig. 1.



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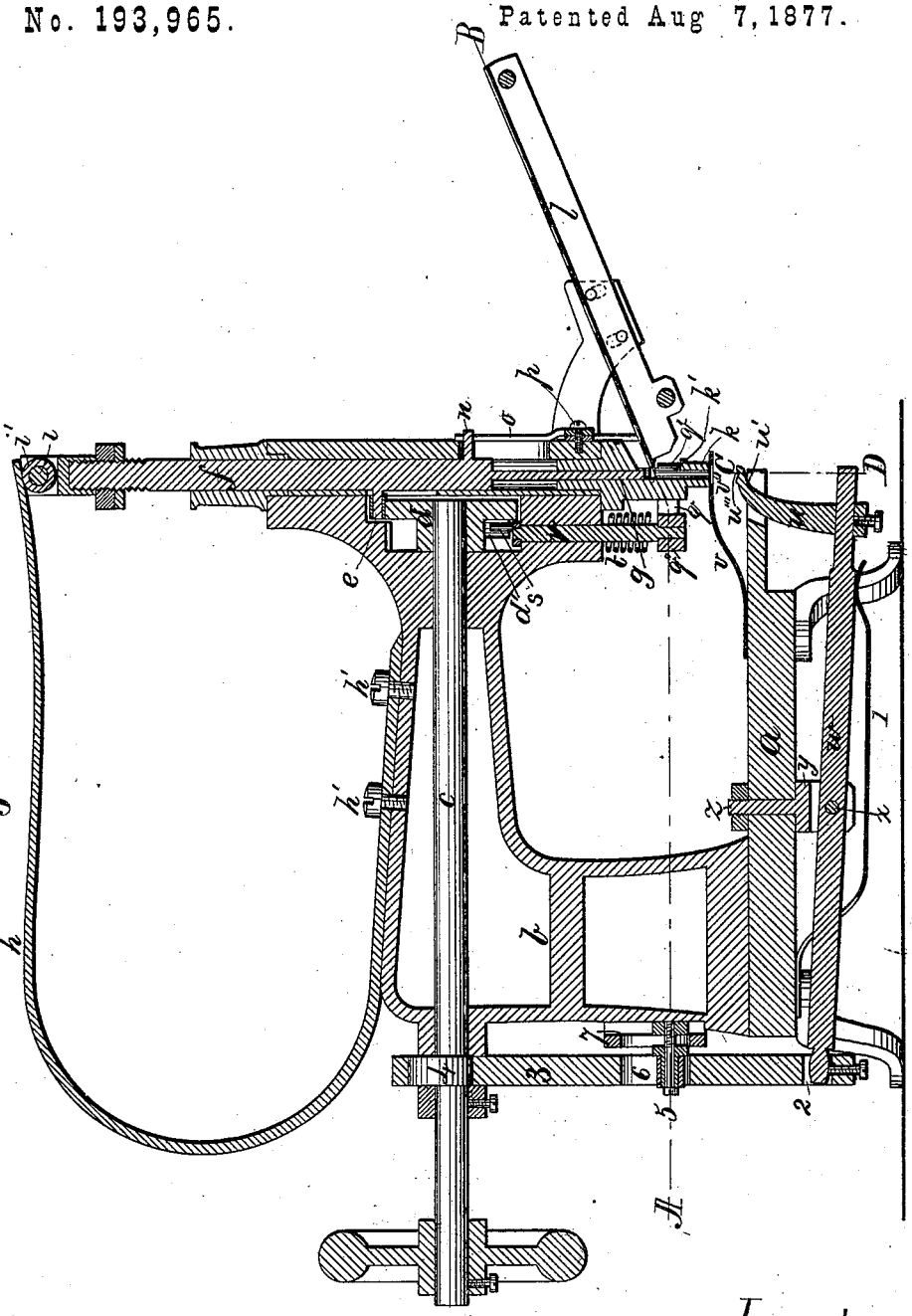

Fig. 3.

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3 Sheets—Sheet 3.

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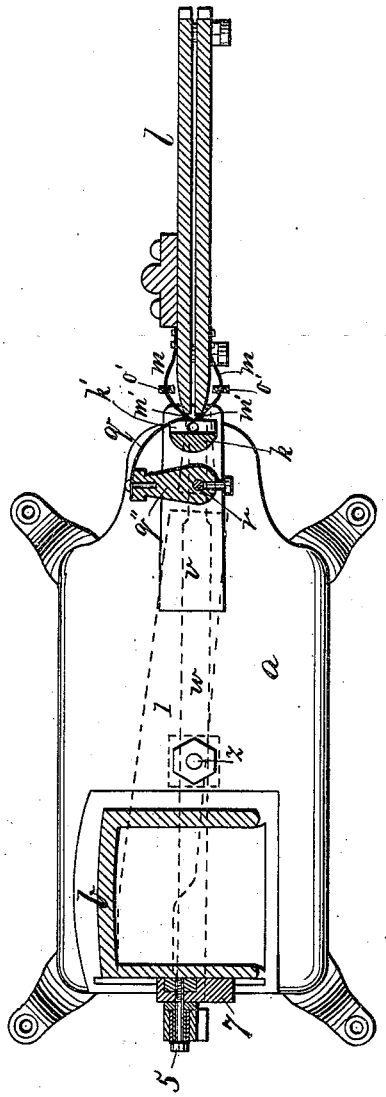
Fig. 4.



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UNITED STATES PATENT OFFICE.

JOSEPH E. KIMBALL AND EDWARD MERRITT, OF ABINGTON, MASS.

IMPROVEMENT IN NAIL-DRIVING MACHINES FOR ATTACHING SOLES TO BOOTS AND SHOES.

Specification forming part of Letters Patent No. 193,965, dated August 7, 1877; application filed May 26, 1877.

To all whom it may concern:

Be it known that we, JOSEPH E. KIMBALL and EDWARD MERRITT, of Abington, in the county of Plymouth and State of Massachusetts, have jointly invented certain new and useful Improvements in Nail-Driving Machines; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Our invention relates to improvements in nail-driving machines for the purpose of nailing and quilting soles of boots and shoes, and for the purpose of nailing and riveting the outer edges of the soles of boots and shoes; and our invention consists of a stationary nail-way, having adjustable spring-dies in its lower end, for the purpose of holding the nail in its proper position till it is ready to be driven by the driver, in combination with operating-levers, acted upon by a pin or stud on the driver-bar, for the purpose of releasing the hold of said spring-dies on the nail when driven, and also for the purpose of holding the dies open to allow the driver to pass down and return; also, in the employment of an oscillating barb, in combination with automatically-movable spring-dies upon the termination of the inclined nailway, for the purpose of separating the last nail that is held between the said spring-dies from the next one in succession, so as to allow the first-named nail to be driven without the danger of driving more than one nail at the same time.

The driver-bar is operated upward by means of a cam, and forced downward by means of an elliptic or flat spring, acting upon a pin or roll in the upper end of the driver-bar.

The support upon which the work rests is provided with a forward projection, by which arrangement the projecting edge of the sole of the boot or shoe may rest thereon during the progress of the work without letting the upper of the boot or shoe come in contact with the support. On the upper side of the support is made a groove for the purpose of laying the points of the nails horizontally when driven through the work. A four-motion feed is given to the aforesaid support, which is of great importance and advantage in nailing and feeding the work in irregular forms and curves, as it retains the same distance between the nails throughout, which is difficult to accomplish with a feed-wheel.

The support is operated by a rocker bar or lever, beneath which is located a spring, for the purpose of sustaining the support when the nail is clinched, as well as for the purpose of moving the support upward. The said rocker bar or lever is hung in a swivel-bearing, so that a horizontal as well as a vertical swinging motion is imparted to the support. The said rocker-bar is operated from the driving-shaft by means of a cam or eccentric, and a connecting-link to the rear end of the rocker bar or lever. The amount of feed is made adjustable by means of a slot on the connecting-link aforesaid, and an adjustable fulcrum-pin moving in a slot or groove on the rear of the frame of the machine.

On the accompanying drawings, Figure 1 represents a front elevation of our improved nailing-machine. Fig. 2 represents a rear elevation of the same. Fig. 3 represents a longitudinal section; and Fig. 4 represents a horizontal section on the line A B, indicated in Fig. 3. Fig. 5 is a cross-section of the support on the line C D, shown in Fig. 3.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

a represents the plate or frame of the machine, and *b* represents the standard or goose-neck, secured to the frame *a*, or made in one piece with it in the ordinary way. *c* represents the driving-shaft, with its cam *d*, acting upon a pin or projection, *e*, on the driver-bar *f*, that is movable up and down in bearings in the forward part of the standard *b*. *g* is the driver in the lower end of the driver-bar *f*, as shown in Fig. 3. The cam *d* acts upon the projection *e* for the purpose of lifting the driver-bar. The driver-bar is forced downward, when relieved by said cam, by means of the spring *h*, secured to the standard *b* by means of screws *h' h'*, and having its forward free end acting upon a pin and roll, *i i'*, in the upper end of the driver-bar *f*. *k* represents

the nail-tube, in which the nail is delivered previous to its being driven by the driver *g*. This nail-tube is provided with an opening, *k'*, in front of the machine, in which the nails enter the nail-tube from the stationary inclined nailway *l*. On each side of the nailway *l* are secured the spring-dies *m m*, terminating in lips *m' m'* in the opening *k'* in the driver-tube, for the purpose of holding the nail in position till ready to be driven. These spring-dies are automatically operated by means of a projection, *n*, on the front of the driver-bar *f*, that acts upon the upper ends of the levers *o o*, hinged to the frame at *p*, as shown, and having their lower ends *o' o'* forked, as shown, so as to embrace each of the spring-dies *m m*, and in this manner to hold a nail in position till ready to be driven, and also for the purpose of holding the dies open to allow the driver to pass down and return.

The nail to be driven is separated from the next one in succession by means of the oscillating barb or picker *q*, that enters between said nails, the last one of which is held between the spring-dies *m m*, directly in the nail-tube, and the said oscillating barb or picker *q* remains in such position till the first nail has been released and driven, when the said barb or picker *q* is automatically swung backward, so as to allow the next nail to enter the nail-tube, when the same operation is repeated.

The picker *q* is secured to the arm *q''*, attached to the vertical shaft *r*, movable in a bearing in the frame *b*, and provided in its upper end with a crank-pin, *s*, that is acted upon by the projection *d'* on the side of the cam *d*, for the purpose of automatically swinging the picker *q*, so as to allow the nail to enter the front opening in the nail-tube. The forward swinging motion of the said picker, for the purpose of taking a nail from the spring-dies and to force it into the nail-tube, is obtained by means of the coiled or other suitable spring *t*, as shown. This oscillating picker remains in front of the opening in the nail-tube till the spring-dies have released the nail to be driven, and till the dies are closed again for receiving the next nail.

u represents the support for the work, provided with a forward projection, *u'*, as shown, for the purpose set forth. The upper surface of said projection is provided with a feed-peg, *u''*, and, furthermore, with a lateral groove, *u'''*, Fig. 5, for the purpose of laying the points of the nails horizontally when driven against the said support. *v* is a spring with a slotted perforation, *v'*, on which the work is resting during the downward motion of the support *u*. The said support *u* is secured to the forward end of the rocking lever *w*, that is jointed at *x* to the bearing *y*. This bearing is provided with a vertical pin or rod, *z*, inserted in a perforation in the frame or plate *a*, as shown in Fig. 3, by which arrangement the said rocking lever is allowed to rock both vertically and horizontally, and thus a four-motion feed is imparted by the mechanism from the driving-shaft to the support *u*.

1 represents a spring secured to the frame *a*, and acting upon the under side of the forward end of the rocker-lever *w*, by which said forward end of the lever is moved upward, and by which the said support is sustained on said spring when the nail is clinched.

The rear of the lever *w* is inserted and moves in a perforation, 2, in the lower end of the link 3, the upper end of which is operated by means of the cam or eccentric 4, secured to the driving-shaft *c*. 5 represents the adjustable fulcrum-pin, on which the link 3 is turned, which pin projects through a slotted opening, 6, in the link 3, so as to allow for the up and downward motion of said link. The fulcrum-pin 5 is adjustable up and down in a slotted frame, 7, on the rear of the standard *b*, for the purpose of increasing or decreasing the amount of feed, as may be desired.

Having thus fully described the nature, construction, and operation of our invention, we wish to secure by Letters Patent, and claim—

1. In combination, the inclined nailway *l*, with its automatically-movable spring-dies *m m*, the nail-tube *k*, vertical shaft *r*, and the oscillating barb or picker *q*, as and for the purpose herein shown and described.

2. In combination, the inclined nailway *l*, the spring-dies *m m*, the driver-bar *f*, projection *n*, and levers *o o*, as and for the purpose set forth.

3. In combination with the driver *f* and nail-tube *k*, the curved support *u u'*, as and for the purpose set forth.

4. In a nailing-machine, the curved support *u u'*, with its feed point or surface *u''*, and groove *u'''*, as and for the purpose set forth.

5. In combination with the driver *f* and its nail-tube *k*, a four-motion feed-support and clinching surface, *u u' u'' u'''*, as and for the purpose set forth.

6. In combination with the driver *f* and its nail-tube *k*, the support *u u'*, swivel rocking lever *u*, spring 1, link 3, adjustable fulcrum-pin 5, and the driving-shaft *c*, with its cam or eccentric 4, as and for the purpose set forth.

In testimony that we claim the foregoing as our own and joint invention we have affixed our signatures in presence of two witnesses.

JOSEPH E. KIMBALL.
EDWARD MERRITT.

Witnesses:
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HENRY CHADBOURN.