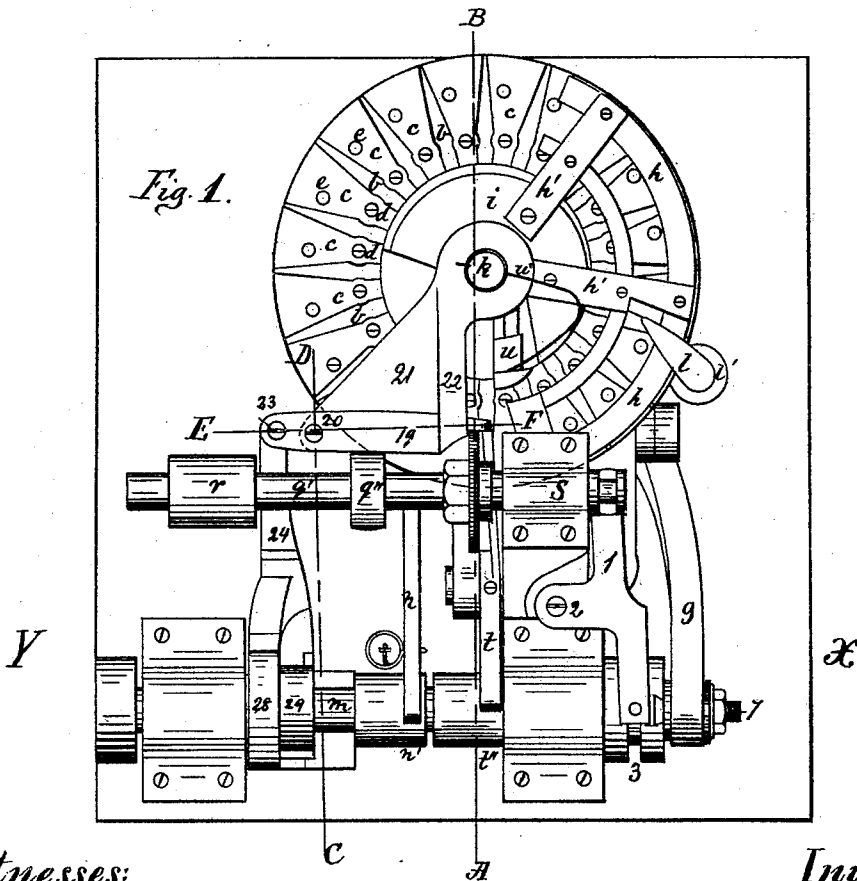
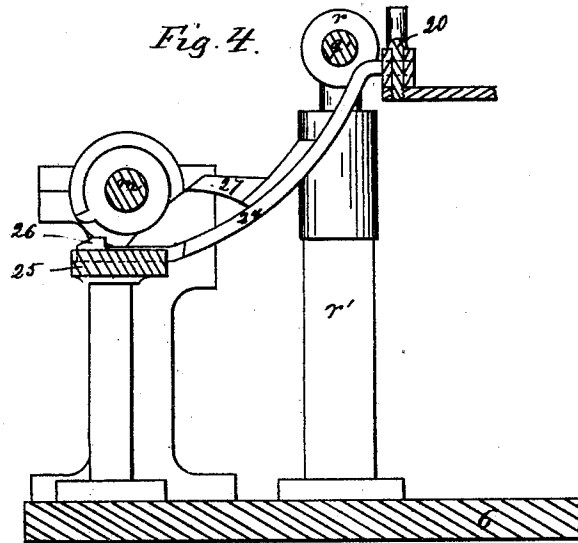


E. W. KELLEY.

MACHINE FOR FINISHING HORSESHOE-NAILS.

No. 172,127.

Patented Jan. 11. 1876.



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Fig. 2.

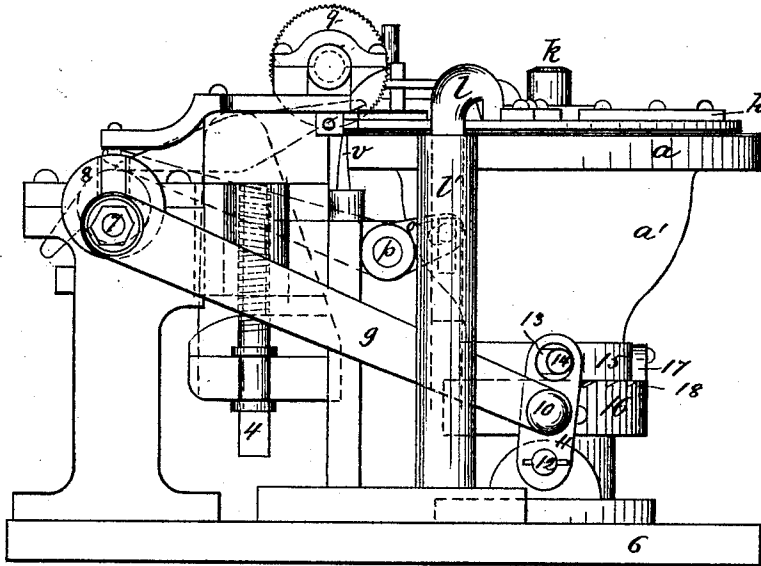
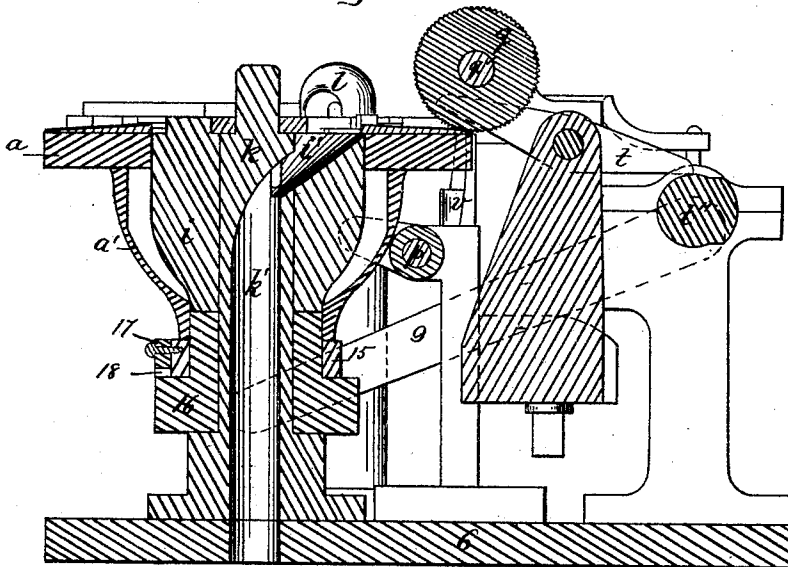


Fig. 3.



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Fig. 5.

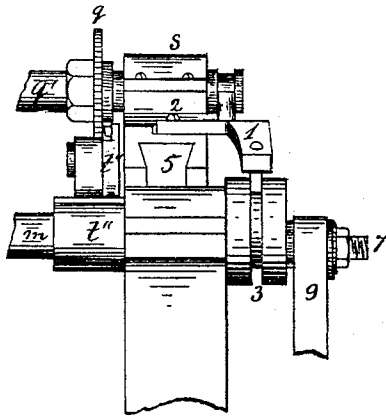


Fig. 6.

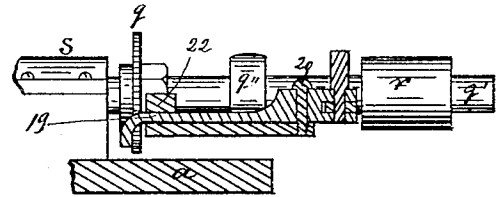


Fig. 7.

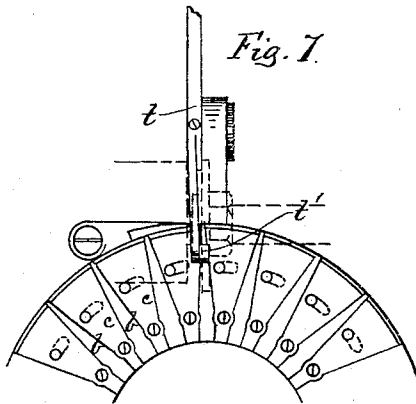


Fig. 9.

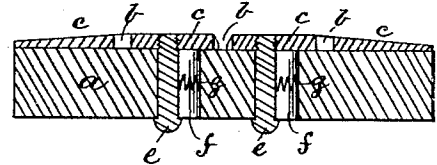
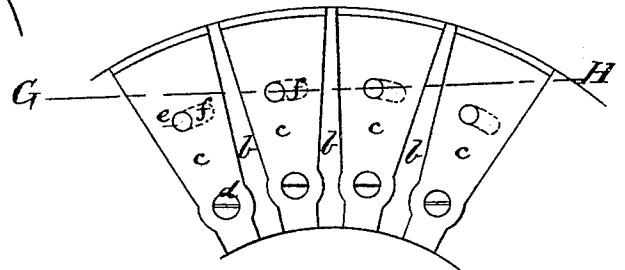


Fig. 8.



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UNITED STATES PATENT OFFICE.

EDWARD WATSON KELLEY, OF LOWELL, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR FINISHING HORSESHOE-NAILS.

Specification forming part of Letters Patent No. **172,127**, dated January 11, 1876; application filed October 16, 1875.

To all whom it may concern:

Be it known that I, EDWARD WATSON KELLEY, of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Machines for Pointing Horseshoe-Nails; and I 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 pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in machines for pointing horseshoe-nails, consisting of a revolving table with receptacles on its upper surface for holding the nails in position during the operation of feeding the nails to the revolving cutter. Said nail-receptacles are automatically adjustable by means of springs placed in slotted openings in the revolving table. Above the table is arranged a stationary guide to prevent the nails from turning around during their travel toward the revolving-cutter or mill. The table revolves around a stationary hollow standard, that is surrounded by a stationary conveyer, through which the nails are conveyed downward through the hollow standard after they are pointed.

In combination with the rotary table I employ a vertically-adjustable straightening device, that exerts a pressure from above on each nail, and it is operated by means of a cam on the driving-shaft, a rocking lever secured to a rock-shaft, and a smaller rocking lever jointed to the vertically adjustable straightening-bar. The nail is held in its proper position on the table beneath the rotary mill by means of a rocking lever having a projecting lip on its side, which lever is operated by means of a cam on the driving-wheel. I also employ an automatic presser located above the table, by means of which the nails are pressed outward against a stationary guide, for the purpose of pushing the nails outward, so that the points thereof shall be laid all alike before being pointed by the rotary mill.

The mill or toothed cutter is secured to a rotary and reciprocating shaft located in adjustable bearings above the table, which said bearings are capable of being adjustable to

and from the center of the table, as well as in a vertical direction, by which I am able to point the nails to any required bevel.

The table is rotated around the stationary conveyer and its stationary hollow standard by means of an adjustable crank-pin on the driving-shaft, a connecting-link to a rocking lever, the upper end of which is provided with a perforation, in which is loosely inserted a pin that is attached to a ring fitting loosely around the lower part of the annular support for the rotary table. To the said ring is hinged a pawl that engages with an annular ratchet made on the aforesaid annular support.

It will thus be seen that the table is moved around its axis a distance equal to the pitch between two successive nails, when it remains stationary a short time, during which the rotary and reciprocating cutter or mill trims the point of the nail, after which the table is again rotated by the pawl and ratchet the same distance, and so on.

After the nail has been pointed by the rotary and reciprocating cutter, it is cleared from its receptacle on the table and delivered into the conveyer, from which it drops into the hollow stationary standard, below which the nails may be collected in any suitable box or receptacle. This is accomplished by means of a rocking lever, movable in a forked guide above the table. The rear of said rocking lever is hinged to the upper end of a link, the lower end of which is movable in guides, and provided with two projections that are acted upon by a pair of projections on cams on the driving-shaft, so as to impart a rocking motion to the delivery-lever without the use of springs. The nails are fed by hand into the adjustable receptacles on the rotary table.

On the accompanying drawings, Figure 1 represents a plan of my invention. Fig. 2 represents a side elevation, seen from X on Fig. 1. Fig. 3 represents a longitudinal section on the line A B, seen from Y on Fig. 1. Fig. 4 represents a cross-section on the line C D, seen from X on Fig. 1. Fig. 5 represents an end view of the adjustable bearing for the reciprocating cutter-shaft. Fig. 6 represents a cross-section on the line E F, seen

from B on Fig. 1. Fig. 7 represents a detailed plan of the holding-down lever. Fig. 8 represents a detailed plan of a part of the rotary table; and Fig. 9 represents a cross-section on the line G H, shown in Fig. 8.

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

a is the rotary table, having nail-receptacles *b b b* arranged on its upper surface, which receptacles are formed from the spaces between the adjustable pieces *c c c*, movable on the fulcrums *d d d*, and provided in their outer ends with the screws *e e e*, movable in the slot-holes *f f f*, made through the table *a*, (shown in Figs. 7, 8, and 9,) and with the yielding springs *g g g* laid in the said slot-holes. By this arrangement the receptacles *b b b* will automatically adjust themselves to the shape of the nails placed therein. Above the table *a* is arranged the stationary arched guide *h*, for the purpose of preventing the nails from turning sidewise during their travel toward the rotary mill or cutter. This guide is secured to the stationary conveyer *i* by means of the braces *h' h'*, or to a similar stationary part of the machine. The table *a* is made to rotate around the stationary conveyer *i*, that is secured to the stationary hollow standard *k*, as shown in Fig. 3. The conveyer *i* is provided with a recess, *i'*, and the standard *k* is provided, centrally, with a tube, *k'*, through which the nails are conveyed from the rotary table *a* after they have been pointed. In combination with the rotary table *a* is employed the vertically-movable straightening-bar *l*, that is movable up and down in the stationary hollow bearing *l'*. An up-and-down motion is given to the straightening-bar *l* by means of the rotary driving-shaft *m*, its cam *n'*, and rocking levers *n o*, secured to the rock-shaft *p*. The rocking lever *o* is hinged to the lower part of the straightening-bar *l* by means of a pin playing through a slotted opening in the side of the hollow vertical bearing *l'*. When each successive nail approaches the mill or cutter *q* the table *a* remains stationary long enough for its being pointed by the rotary cutter *q*, that has, in addition to its rotary motion, a reciprocating motion in the bearings *r* and *s*, by which the mill *q* gradually approaches the nail, that is firmly held to the table by means of the rocking lever *t* and its side lip *t'*, that are automatically operated by the cam *t''*, secured to the driving-shaft *m*. The lip *t'* on the lever *t* allows of holding the nail firmly to the table *a* without letting the reciprocating rotary cutter *q* come in contact with said lever *t*. *u* represents the automatically-adjustable presser, operated by means of a suitable spring, *u'*, secured to the standard *k*, by means of which each successive nail is pressed outward against the stationary guide *v*, by which I am able to lay all the nails alike before being pointed by the rotary cutter. The rotary mill or cutter *q* is secured to the shaft *q'*, that is set in rotary motion by

belt-power applied to the pulley *q''*. A reciprocating motion in the direction of its axis is given to the shaft *q'* by means of the rocking lever 1, movable around the fulcrum 2, and operated by the grooved cam 3 on the driving-shaft *m*.

The bearing *s* for the shaft *q'* is adjustable up and down by means of the set-screw 4, Fig. 2, and it is also adjustable toward the center of the table *a* by sliding said bearing over the stationary guide 5, Fig. 5, that forms a part of the frame-work. The bearing *r* is also adjustable up and down in the standard *r'*, in which it may be secured in place by means of a set-screw or similar well-known device. The whole of the standard *r'* can be adjusted on the bed-plate 6 toward the center of the table *a* by means of set-screws, in a similar manner. By this arrangement of the vertically and horizontally adjustable bearings *r* and *s*, I am able to locate the rotary mill *q* so as to point the nails to any desired bevel. The table *a* is rotated around the stationary conveyer *i* and its standard *k* by means of the adjustable crank-pin 7 on the cam-disk 8, secured to the driving-shaft *m* and the link 9, the lower end of which is hinged at 10 to the rocking lever 11, that is made to rock on the stationary fulcrum 12. The upper end of the rocking lever 11 is provided with a perforation, 13, in which is loosely fitted a pin, 14, that is secured to the annular ring 15, surrounding the hub 16, forming an extension of the rotary table *a* and its support *a'*. A pawl, 17, is hinged to the annular ring 15, that engages into an annular ratchet, 18, made on the upper side of the hub 16, as shown in Fig. 3. By this arrangement the table *a* is moved around its axis a distance equal to the pitch between two successive nails, after which it remains stationary a short time during which time the rotary and reciprocating mill *q* cuts the point of the nail, after which the table is again rotated by the pawl and ratchet the same distance, and so on. The nail, after being pointed by the rotary cutter *q*, is delivered to the receptacle *i'* by means of the rocking lever 19, movable on the fulcrum 20, secured to the stationary plate 21, the part nearest to the cutter of which is forked, as shown at 22 on Figs. 1 and 6, in which the lever 19 is guided so as to prevent the end of said lever from slipping by the head of the nail during its delivery to the receptacle *i'*. The rear end of the lever 19 is hinged at 23 to the link 24, the lower end of which is made to slide in the guide 25, Fig. 4, and provided with two projections, 26 and 27, by means of which, and corresponding projections on the cam-disks 28 29, secured to the driving-shaft *m*, a reciprocating motion is imparted to the link 24 without the employment of springs.

The operation of my invention is as follows: The nails are laid by hand into the receptacles *b b* on the rotary table *a*, and, after passing under the guide *h*, they are straightened by the up-and-down-movable bar *l*, and automatically pressed outward against the guide *v* by

means of the presser *u*, after which each nail is firmly held to the table *a* by means of the holding-lever *t* and its lip *t'*, when the rotary reciprocating cutter *q* performs the operation of pointing the nail to the desired bevel. The lever *t* releases its hold on the nail after it is pointed, and the rocking lever 19 forces the now ready nail into the receptacle *v'*, from which it drops into the hollow cylinder *k'*, at the bottom of which it is collected into any desirable box or receptacle, as may be found convenient.

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

1. The rotary table *a*, with its receptacles *b b*, adjustable pieces *c c c*, bolts *d e*, slot-holes *f*, and elastic springs *g*, as and for the purpose set forth.

2. In combination with the rotary table *a*, its stationary hollow standard *k k'*, and stationary conveyer *i i'*, the rocking delivery-lever 19, link 24, and cams 28 29, as and for the purpose set forth.

3. In combination with the rotary table *a* and its receptacles *b b b*, the vertically-adjustable straightening-bar *l* and its connect-

ing mechanism to the driving-shaft *m*, substantially as described.

4. In combination with the rotary table *a* and the rotary reciprocating cutter *q*, the holding-down lever *t t'* and its connecting mechanism to the driving-shaft *m*, substantially as herein described.

5. In combination with the rotary table *a* and its receptacles *b b b*, the automatic presser *u*, spring *w*, and the stationary guide *v*, as and for the purpose set forth and described.

6. In combination with the rotary and reciprocating cutter *q*, and its shaft *q'*, the vertically and horizontally adjustable bearings *r* and *s*, substantially as described.

7. The combination of the rotary table *a a'*, ratchet-hub 16, annular ring 15, pawl 17, the lever 11, and the connecting-link 9 to the adjustable crank-pin 7 on the shaft *m*, as and for the purpose herein described.

In testimony that I claim the foregoing as my own invention I have affixed my signature in presence of two witnesses.

EDWARD WATSON KELLEY.

Witnesses:

ALBAN ANDRÉN,
H. CHADBOURN.