(No Model.)

I. TJERNELD.

FEEDING APPARATUS FOR HORSESHOE NAIL MACHINES.

No. 555,715. Patented Mar. 3, 1896.

Fig. 1.

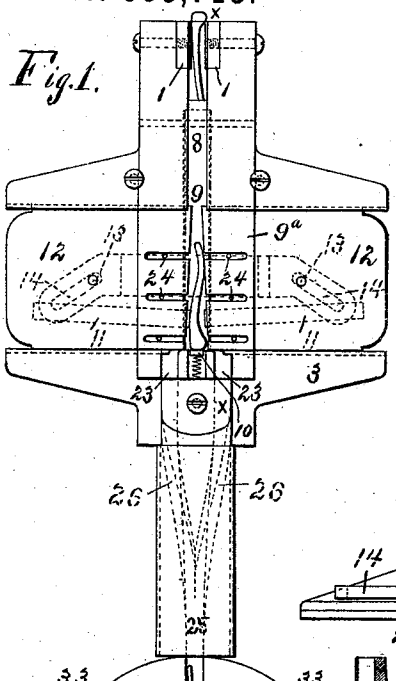


Fig. 2.

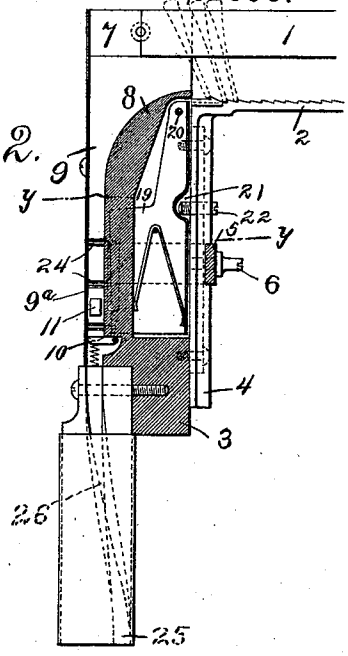
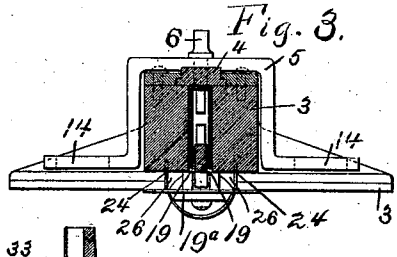


Fig. 3.



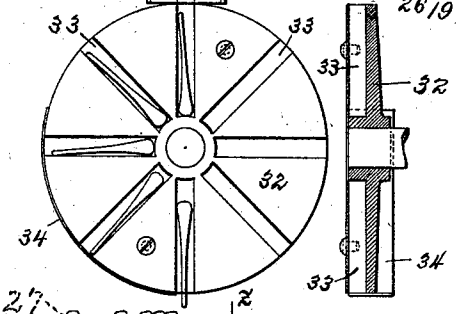


Fig. 6

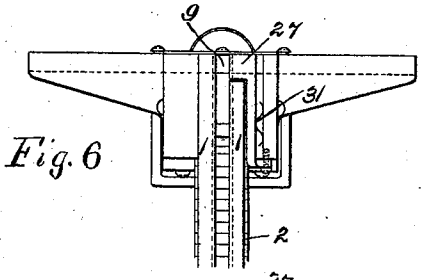


Fig. 4.

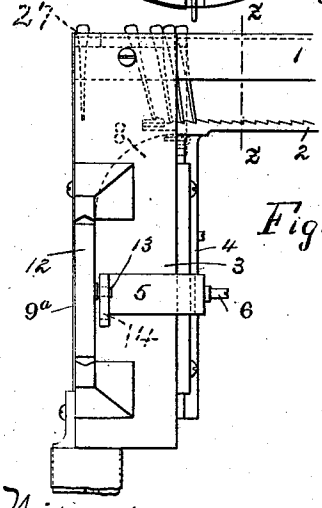
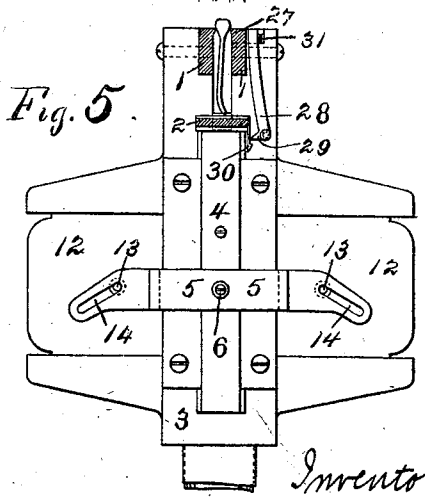


Fig. 5.



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UNITED STATES PATENT OFFICE.

IVAR TJERNELD, OF MUNKFORS, SWEDEN.

FEEDING APPARATUS FOR HORSESHOE-NAIL MACHINES.

SPECIFICATION forming part of Letters Patent No. 555,715, dated March 3, 1896.

Application filed October 5, 1895. Serial No. 564,776. (No model.)

To all whom it may concern:

Be it known that I, IVAR TJERNELD, a subject of the King of Sweden and Norway, and a resident of Munkfors Bruk, Munkfors, Sweden, have invented certain Improvements in Feeding Apparatus for Horseshoe-Nail and Like Machines, of which the following is a specification.

This invention relates to feeding apparatus for horseshoe-nail and like machines, and has for its object to provide mechanism that will separate from one another blanks that are turned in diametrically-opposite lateral directions, deliver them into different channels, so that they may afterward be forwarded to the machine all turned in the same direction. According thereto I take advantage of the usual unsymmetrical form of two of the sides of the blank, and employ a magnet (or magnets) to which or each of which is given a limited movement toward and from such an unsymmetrical side of the blank, thereby either removing the blank from the channel in which it is situated or leaving it there, according to which side of the blank is turned toward the pole, and consequently to whether the pole comes in contact with the blank or not. The removed blank is loosened from the magnet when brought by it over the mouth of a side channel into which it drops. In this way all of the blanks that are similarly turned drop into the same channel and in their further progress those in one of the channels (or in both) are turned, for instance, by passing through a somewhat twisted channel in such a way that all the blanks shall arrive at the machine similarly turned.

In the annexed drawings, Figures 1, 2, and 3 represent an arrangement suitable when the blanks are to be brought to the machine with their heads foremost, Fig. 1 being a front elevation thereof; Fig. 2, a section along the line *x x* of Fig. 1; and Fig. 3, a section along the line *y y* of Fig. 2, the magnets being omitted in Fig. 3 for the sake of clearness. Figs. 4, 5, and 6 represent an arrangement suitable when the blanks are to be brought to the machine with the points foremost, Fig. 4 being a side elevation, Fig. 5 a section along the line *z z* of Fig. 4, and Fig. 6 a plan thereof.

In using either of the arrangements the blanks are by some suitable means fed in a row between two horizontal bars 1 1, so situated that the blanks rest with their heads on the upper edges of and turn their unsymmetrical sides toward the said bars. Under and along the bars 1 1 is a bar 2, which is provided with teeth on its upper surface, and is so situated that the blanks rest somewhat forwardly inclined with their points upon the bar 2. The blanks are moved forward along the bars 1 1 by giving the bar 2 an up-and-down movement by means of some suitable mechanism. In the examples shown the bar 2 is attached to a slide 4, which is adapted to move in guides on a fixed part 3 and carries a bent piece 5 provided with a pin 6 for connecting it to the mechanism for giving the up-and-down movement to the bar 2.

In the arrangement illustrated in Figs. 1, 2, and 3 the inner sides of the bars 1 1 are cut away at their forward ends, so as to form a widening through which the head of a blank can just pass when the blank is by the last tooth of the bar 2 pushed so far that the said head reaches the said widening. When the head drops through the widening, the blank turns over the rounded piece 8 and falls down the upright channel 9 until stopped by the bottom 10 thereof.

As it is desirable that the blank should not rebound when it comes against the bottom of the channel, it is advantageous to make the said bottom elastic.

The movable magnets 11 11, which may be either permanent magnets, as shown, or electromagnets, are located on the two sides of the channel 9 and are attached to pieces 12 12, which are movable in guides and to which the requisite movement toward and from the channel 9 must be given by means of some suitable mechanism. In the examples shown the pieces 12 have projecting studs 13 that engage in oblique slots 14 made in plates attached to or forming parts of the bent piece 5. Thus when the piece 5 moves up and down the magnets are thereby moved horizontally to and fro.

The size of the channel 9 is such as to prevent the blanks from turning in it. It is advantageous to make the front wall of the channel 9 of a transparent-glass plate 9^a. The side walls between the blank and the poles of the magnets 11 11 are provided with

means for moving them away when the magnets approach the blank and for bringing them back when the magnets are moved apart. As shown in Figs. 1 to 3, these side walls consist of a U-formed sheet 19, which is adapted to turn on a pin 20 and is provided at the back with a cavity 21 in which enters a stud 22 on the slide 4, the cavity and the stud being so located and formed as to impart the necessary movement to the side walls at the required times. A spring 19^a brings the side walls back to their withdrawn position.

On each side of the bottom 10 of the channel 9 there is a side channel 23 and vertically over the wall thereof farthest from the channel 9 are fixed projections 24 extending above and below the paths of the corresponding magnet in order to arrest the blank that may be adhering to the magnet when the latter is moving backward. After being thus arrested the blank becomes free from the magnet and drops into the side channel 23. As the magnet on one side of the channel 9 comes into contact only with blanks that are similarly turned and the other magnet only with blanks turned in the opposite direction, it follows that only blanks similarly turned will find their way into each of the side channels 23. The side channels are connected to a common feeding-channel 25 leading to the machine by channels 26 26, which are twisted in such a way that all the blanks reach the feeding-channel 25 similarly turned.

To insure that only one blank at a time shall drop down in the channel 9, the last tooth (or teeth) of the bar 2 is made a little longer and thus also a little higher than the others. This tooth (or these teeth) should be made exchangeable in order to be able to adapt the same apparatus for blanks of different lengths by inserting specially-formed teeth.

In the examples shown the magnets have a rectilinear movement; but, if desired, they can of course be arranged so that they oscillate about a vertical shaft, in which case the side channels also must be so located that the blanks can drop into them.

In Fig. 1 the apparatus is shown to be provided with a wheel 32 with radial recesses 33 below the channel 25; but this wheel is not wanted if the blanks are to be fed to the nail-machine head foremost. It is shown only as a device to be used for turning the blanks if they are to be fed point foremost. The wheel 32 is given an intermittent rotation by means of some suitable mechanism, (not shown on the drawings,) so that an empty recess is always in line with the channel 25 when a blank passes said channel to receive the blank. A bent plate 34 is provided outside a part of the circumference of the wheel 32 to prevent the blanks from falling out before arriving over the mouth of the channel (not shown on the drawings) leading to the horseshoe-nail machine.

The arrangement shown in Figs. 4, 5, and 6 is similar to that shown in Figs. 1, 2 and 3, except that the upper part is modified so as to cause the blanks to drop into the channel 9 with their points foremost. For this arrangement there is no permanent widening vertically over the channel 9, but the last blank is left hanging with its head on the bars 1 1 when its point leaves the bar 2, and the top part of the piece 8 is on this account made lower than in the arrangement shown in Figs. 1 to 3 in order to allow the point to swing forward when the bar 2 descends. To enable the blank to drop when its point has swung forward over the channel 9, the distance apart of the bars 1 1 must be increased at the place where the head of the blank is supported. For this purpose in the example shown the part 27 of one of the bars 1 is cut off, and the said part is carried by an arm 28 of a bell-crank lever movable round a fixed point, the other arm, 29, of the said lever lying in the path of a projection 30, attached to the vertically-reciprocating bar 2. The projection 30, which may be elastic, and the arm 29 of the bell-crank lever are so formed and located that the cut-off part 27 is removed when the blank is to drop. A spring 31 brings the arm 29 and the part 27 back to their normal position.

I claim—

1. Feeding apparatus for horseshoe-nail and like machines, provided with means for separating from one another unsymmetrical blanks turned in opposite directions, comprising two magnets between which the blanks are to pass with their unsymmetrical sides toward the magnets, means for moving the magnets toward and from the space into which the blanks are fed, and means for loosening the blanks from the magnets and for conveying them in different directions, substantially as described.

2. In feeding apparatus for horseshoe-nail machines and like machines, a device for separating from one another blanks turned in diametrically-opposite directions and delivering them in different channels, comprising two magnets between which the blanks are adapted to pass with their unsymmetrical sides toward the magnets, means for moving the magnets toward and from the space into which the blanks are fed, stops arranged to loosen from the returning magnets blanks adhering thereto and a channel arranged under each magnet with its mouth so located that blanks loosened as aforesaid from the magnet will drop into the said channel, substantially as herein described.

3. In apparatus for feeding blanks to horseshoe-nail and like machines, in which the blanks are moved forward in a single row with their unsymmetrical sides turned in diametrically-opposite directions and are delivered one by one, mechanism for separating from one another the blanks dissimilarly turned and delivering all the blanks similarly turned, comprising an upright channel 9 provided

with a bottom 10 and adapted closely to surround with its walls the head of a blank fed therein, an upright side channel 23 on each side of the said bottom 10, magnets 11 on each side of the central channel 9 with their poles turned toward the channel and arranged over the side channels 23, 23, mechanism for moving the said magnets toward and from a blank resting on the bottom 10, movable side walls 19, 19 for the central channel 9 between the said blank and the pole of each magnet 11, 11, means for removing the side walls 19, 19 when the magnets are approaching each other and pushing them forward again when the magnets are moving apart, fixed projections 27 above the walls of the said channels 23 farthermost from the central channel 9 for loosening blanks adhering to the corresponding magnets so as to cause them to drop into the side channels 23, and twisted channels 26 for leading the blanks from the channels 23 to a common channel 25 and for turning them so that they shall be all similarly turned when in the channel 25, substantially as described.

4. In an apparatus for feeding blanks to horseshoe-nail and like machines, two opposite bars 1, 1, along which the blanks are adapted to be fed, leaning forward in single file with their heads resting on the upper edges of the bars, in combination with a vertically-reciprocating bar 2 provided with teeth on its upper surface and located under and along the said bars 1, 1, the last tooth or teeth of the bar 2 being longer and higher than the others, the points of the nails resting upon said teeth, substantially as and for the purpose herein set forth.

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

IVAR TJERNELD.

Witnesses:
CARL P. GERELL,
FREDRIK L. ENQUIST.