J. E. WHEELER & F. W. COY.

MACHINES FOR FEEDING HORSESHOE-NAIL BLANKS.

No. 192,665. Patented July 3, 1877.

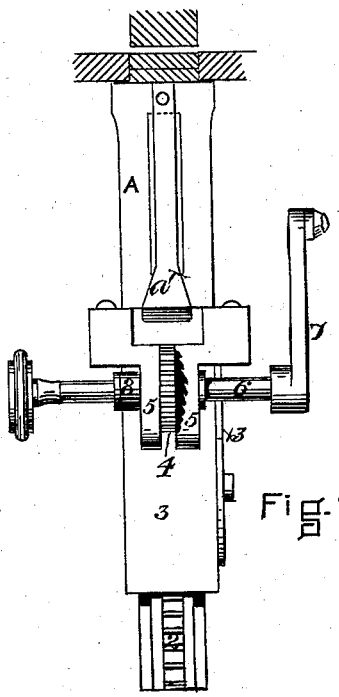


Fig. 2.

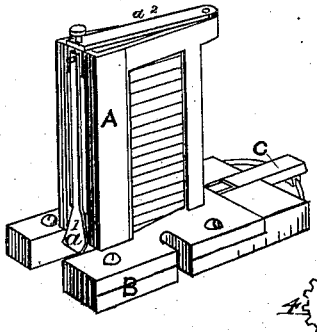


Fig. 1.

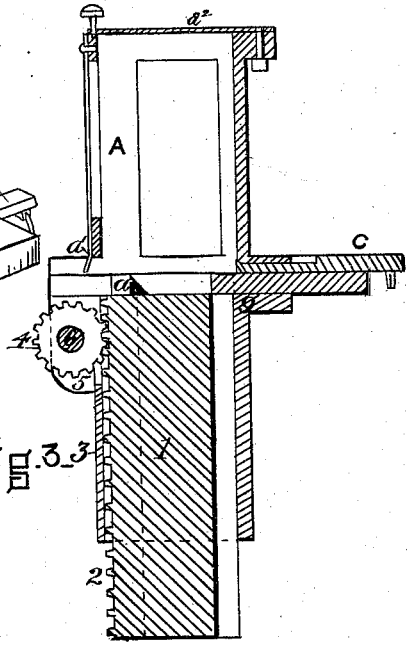


Fig. 3.

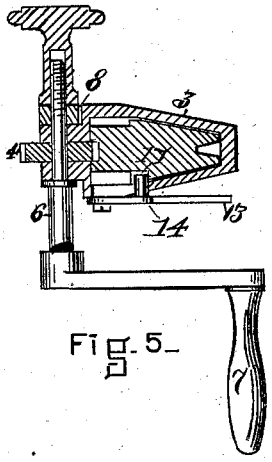


Fig. 5.

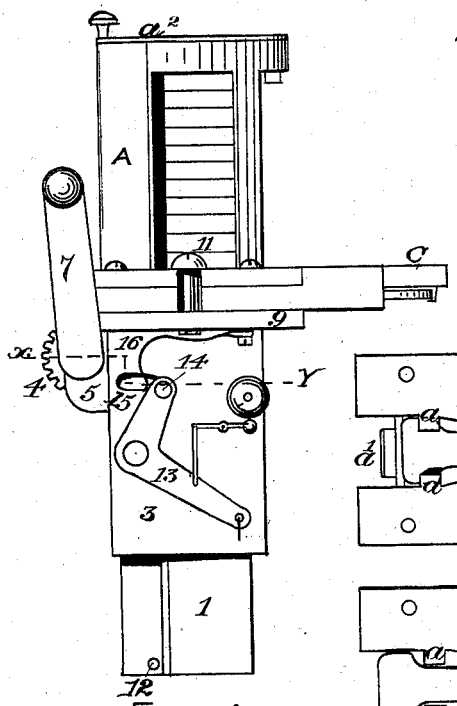
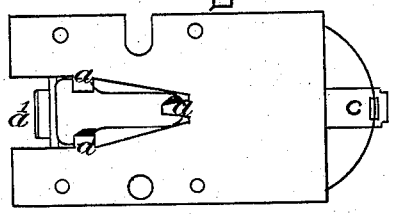


Fig. 4.

Fig. 6.



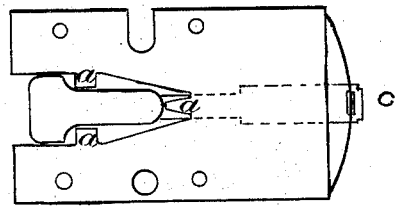


Fig. 7.

WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN E. WHEELER, OF LYNN, AND FREDERICK W. COY, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR FEEDING HORSESHOE-NAIL BLANKS.

Specification forming part of Letters Patent No. **192,665**, dated July 3, 1877; application filed March 19, 1877.

To all whom it may concern:

Be it known that we, JOHN E. WHEELER, of Lynn, in the county of Essex and State of Massachusetts, and FREDERICK W. COY, of Boston, in the county of Suffolk, in said State of Massachusetts, have invented an Improvement in the Manufacture of Horseshoe-Nails, of which the following is a specification.

This invention relates particularly to that process of manufacturing horseshoe-nails by machinery in which a blank is punched from a sheet of metal and afterward reduced to shape by rolling, and it consists of mechanism for receiving the blanks from the punch, a removable conveyer for holding and transferring the blanks from the punch to the rolls, and an automatic feeding device for feeding the blank from the conveyer to the rolls.

Reference is made to the accompanying drawing, forming a part of this specification, in explaining the nature of our invention, in which—

Figure 1 is a perspective of the removable conveyer, filled with blanks, detached from the filling mechanism. Fig. 2 is a front elevation of the conveyer and filling mechanism, showing their position in relation to the die and punch. Fig. 3 is a vertical section of the conveyer and filling mechanism. Fig. 4 is a side elevation of the same. Fig. 5 is a horizontal section on the line *x y*, Fig. 4. Fig. 6 is a plan of the bottom plate of the conveyer reversed, showing the three projections and spring which hold the bottom blank in place in the tube; and Fig. 7 shows the position of a blank when dislodged from the projection by a reciprocating plate at the instant of its fall.

The conveyer from which the blanks are fed to the rolls consists of a vertical tube, A, designed to hold a quantity of blanks, lodged upon their sides, one upon the other in one pile; a base-plate, B, from which the tube projects, and a sliding plate, C, reciprocated under the tube, and designed to shoot successively the undermost blank from the tube. The tube is preferably made open, and the blanks are held therein by the three projections *a* and spring a^1. A swinging bar, a^2, pivoted at the top of the tube at one side, to swing over its center and latch upon the other side, serves to prevent the blanks from falling from the tube while it is being conveyed from the punch to the rolls.

The above description explains the construction of the conveyer, and its operation after it has been filled with blanks and placed in position to feed; the method by which it is automatically filled with blanks from the punching-machine will next be shown.

The mechanism commonly used in punching out blanks from a plate of metal, and the method of its operation, and the means used in presenting the plate to the punch and die, are too well known to make it necessary to describe them here, it being sufficient to state that heretofore the blanks fell from the die, as they were punched, in an indiscriminate mass into a pan placed to receive them, and were then taken to the rolls, to which they were fed, one by one, by hand.

In order that the tube A may be automatically filled with the blanks as they are successively punched from the plate, we arrange immediately under the die the following-described mechanism, consisting of a follower, 1, which is arranged to move vertically in the tube A while the same is under the die, as will be hereinafter explained; this follower is somewhat longer than the tube to be filled, and is of a shape corresponding generally to the interior of the tube; it is provided with a rack, 2, is recessed, as shown, on each side of the rack, and is inclosed in a casing, 3.

The pinion 4, having a bearing in brackets 5, a shaft, 6, and a handle, 7, engages with the teeth of the rack, and serves to lift the follower into the tube to a position under the die. The shaft 6 is provided with a screw-thread at one end, upon which is fitted a thumb-screw, which produces a friction upon the cog and prevents its turning easily when screwed against the bracket 5, or against a collar, 8, which may be interposed on the shaft between the thumb-screw and bracket.

It will readily be seen that the degree of friction on the cog is regulated by the degree of tightness with which the screw bears against the bracket.

The casing 3 is provided with the plate 9,

upon which the conveyer is secured while it is being filled, by a pin, (not shown,) and set-screw 11. A stop, 12, prevents the follower from being raised above the requisite distance, by contacting with one of the projections *a*.

The bent lever 13 is pivoted to the casing 3, as shown, and is provided with a pin, 14, which projects through the slot 15 in the side of the casing, and is caused to bear against the shoulder forming one side of one of the side recesses on the follower by the spring 16. This arrangement of lever, spring, and pin, together with the recess 17 in the shoulder near the top of the follower, serves to operate an alarm or ship a belt when the tube is almost filled with blanks, by the pin being forced into the recess as the follower gradually descends, thereby causing the long arm of the bent lever to drop, creating a motion which may be utilized in operating an alarm, (when the punch can be stopped by the operator,) or in shipping a belt and automatically stopping the machine.

In the drawing we show the end of the lever connected with a bell-hammer, through a connecting rod and lever, and a gong.

The operation of our invention is as follows: The conveyer is placed upon the plate 9, in such a way that the tube A is immediately below the die and over the follower, as represented in Fig. 2; the follower is then lifted in the tube almost to its top, so that the first blank that is punched will fall through the die onto the top of the follower, the top of the follower being immediately under the die, and so close to the bottom of the punch when it is down that a blank cannot turn as it falls on the follower, and the thumb-screw is set against the bracket to secure a friction sufficient to prevent the follower from falling by gravity, but allowing the follower to be forced down by each successive blank as it is forced into the tube.

The punch is then operated, and the first blank cut falls upon the follower and partly fills the bottom of the die. The second blank that is punched out forces the first one into the tube, and takes its place at the base of the die; and each succeeding blank that is cut out forces the preceding blanks farther into the tube, the follower being forced down a distance equal to the thickness of a blank with each blank punched out; and when the tube is almost filled an alarm is given, or the punching-machine stopped, by the mechanism heretofore described.

The tube being filled, the conveyer is removed from under the punch to a position over the rolls, from which the blanks are successively fed to the rolls by the action of the reciprocating plate, which successively shoots out the undermost blank from the tube, the remaining blanks successively falling by gravity into the position occupied by the preceding blanks, and another conveyer is placed in position under the die.

It will be observed that in order to fill the tube with blanks with regularity and precision it is necessary that the first blank punched must be held in position in the tube immediately under the die; that it must be prevented from a sudden precipitation to the bottom of the tube; and that it must hold its position until a succeeding blank is punched and has taken its place by forcing it into the tube a distance equal to the thickness of a blank. It will also be seen that the space between the last blank punched and the top of the die is not over half the thickness of a blank.

It will also be observed, although we describe our method by which the blanks are gradually deposited in the tube by means of a yielding follower held in place by friction, that other ways of balancing the blanks in the tube may be employed—such as a diaphragm supported on a long spiral spring, which is gradually compressed by the increasing weight of the blanks as they are deposited, or a diaphragm supported on a column of water or air, which is allowed to gradually escape; or they may be held and lowered in the tube positively by means of a sliding diaphragm, automatically lowered the thickness of a blank by each descent of the punch operating through the medium of suitable connecting mechanism.

The advantage of our invention consists in providing a removable conveyer for holding and feeding blanks with mechanism by which the same may be automatically filled from the punching apparatus.

Having thus fully described our invention, we claim, and desire to secure by Letters Patent of the United States—.

1. The conveyer described, the same consisting of a tube for holding blanks, provided with the detaining-spring a^1, and a base plate having means for successively ejecting the undermost blank from the tube, and recessed as shown, to render the same easily detachable, and from which the tube projects.

2. In combination with a removable tube for holding blanks, a yielding follower, arranged to support the blanks in the tube while the same is being filled, and to gradually lower or be forced downward about the thickness of a blank with each blank deposited in the tube, substantially as and for the purpose described.

3. In combination with a removable conveyer for holding and feeding blanks, the mechanism described, the same consisting of a follower provided with means for lifting the same, and for regulating its descent, substantially as shown and described.

4. The combination of a follower for the support of blanks, arranged to yield under pressure, with suitable alarm mechanism for denoting that the tube is almost filled with blanks, substantially as described.

5. As an attachment to punching-machines for filling removable conveyer with blanks, the pinion 4 and shaft 6, having a bearing in brackets 5, projecting from the casing 3, and provided with a thumb-screw and handle, 7,

in combination with the follower 1, recessed as shown, and provided with the rack 2 and stop 12, all arranged under the bed-plate of the punching-machine, to operate the follower vertically on a line with the die, as shown.

6. The combination of the follower, recessed as shown, with the bent lever 13, pivoted to the casing 3, pin 14, projecting through slot 15, and spring 16, substantially as and for the purpose described.

7. The combination of the casing 3 and platform 9, a mechanism for lifting a follower and restraining the same from descent except under pressure, an alarm mechanism and suitable stops, with a removable conveyer for receiving and holding blanks from a punching-machine, and feeding the same, all operating to automatically receive and lodge said blanks in tube A, substantially as shown and described.

8. In a removable conveyer for receiving, holding, and feeding blanks, the open tube A, provided at its base with the rests a upon its sides, with the restraining-spring a^1, and upon its top with the swinging bar a^2, substantially as shown and described.

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Witnesses:
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