S. M. HOWARD.
Nail-Separator.

No. 219,863. Patented Sept. 23, 1879.

Fig. 1.

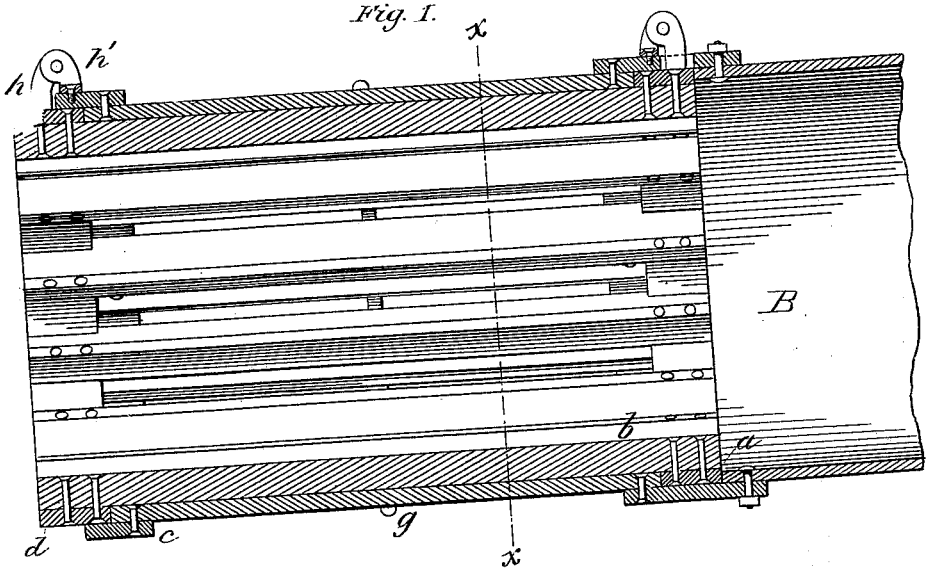


Fig. 3.

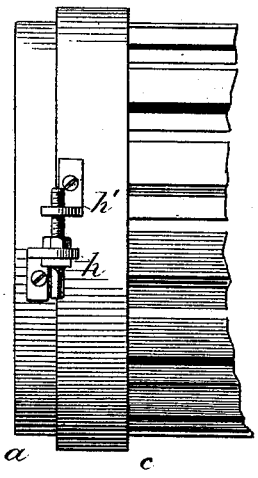


Fig. 2.

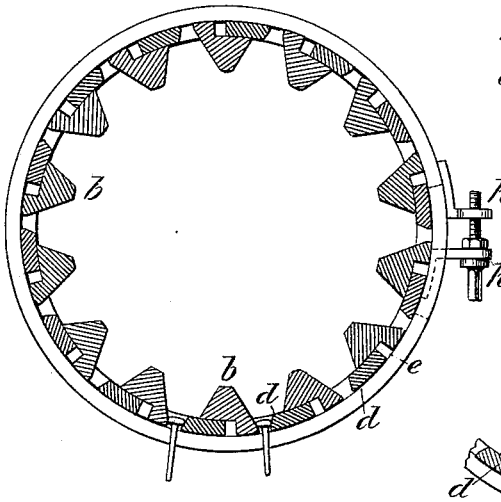


Fig. 4.

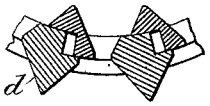


Fig. 5.

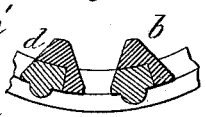
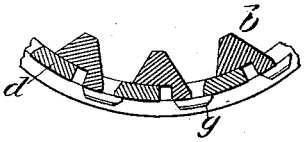


Fig. 6.



Attest
Clarence Poole
Warren Seely.

Inventor:
Stanton M. Howard
by Ellis Spear
His Atty

UNITED STATES PATENT OFFICE.

STANTON M. HOWARD, OF WHEELING, WEST VIRGINIA.

IMPROVEMENT IN NAIL-SEPARATORS.

Specification forming part of Letters Patent No. **219,863**, dated September 23, 1879; application filed December 14, 1878.

To all whom it may concern:

Be it known that I, STANTON M. HOWARD, of Wheeling, West Virginia, have invented an Improvement in Nail-Separators, of which the following is a specification.

My invention relates to screens for use in the manufacture of nails, commonly called "nail-pickers," in which screens the slits or spaces between the bars are made adjustable for different sizes of nails.

The invention is an improvement upon the form shown in the patent granted October 23, 1877, and numbered 196,456.

In that patent the screen was made in cylindrical form, and the bars arranged longitudinally of the cylinder. The screen was composed of two cylinders, one fitting closely within the other, each cylinder consisting of rings at the ends connected by the longitudinal bars, between which were the slits for the passage of scale, defective nails, and like refuse matter.

The two cylinders were capable of rotary motion upon each other, and one carrying an inner and the other an outer set of bars, the opposing faces of which were flat and fitted closely to each other. A slight motion of one cylinder upon the other caused one set of bars to overlap the other, and thus diminished the width of the interstices; but as the bars were made flat on their contiguous or opposing faces, and round or angular on their opposite sides, and one set overlapped the other, one side of each slit or interstice presented to the interior of the cylinder was formed by the inner flat surface of the outer bar, and the other by the round or inclined inner surface of the inner bar.

The result of this was found to be in practice that the nails dropping through by the points and suspended by the heads hung in a position inclined from radial lines, the heads being held higher on that side of the slot on which the rounded or angular inner bar projected over its corresponding lower bar. This caused the cylinder to operate imperfectly, for sometimes the nails having heads only slightly larger than the body, suspended in this inclined position, would fall through the unequal support, the receding outer bar under the flat projecting ledge above it permitting the head to pass through one side first, after the manner of a button. Further, the nails which lodged in proper position, and were held by the heads, and were carried around by the revolution of the cylinder, by reason of their inclined position as they hung in the slots, would be carried around without falling out, and thus their passage through the screen would be retarded.

Another objection found in the form shown in the patent referred to was the difficulty of fitting accurately the flat bars placed face to face, and of keeping them in position. The adjacent bars coming edge to edge, any sagging of one would practically widen the slit and increase the liability of the nails falling through. The double bars also added greatly to the weight of the screen.

To obviate all these objections, after much study and experiment, I have devised a form of compound bar, in which a flat bar fits closely and adjustably within a rabbet on the lower or outer side of the main bar, said flat bar projecting toward the opposite inclining edge of the next bar and having the same bevel, so as to form a symmetrical **V**-shaped groove. The main or inner bar is made with a rib projecting radially inward, either brought to a sharp edge with straight inclined sides or rounded, or having the edge of the **V**-shaped section slightly truncated. The said inner bars are fixed upon the outer rings, or those which are at the extreme ends of the cylinder.

The flat bars, fitting into the rabbet of the main bars, are connected firmly to the inner rings. The flat bars are made of the same thickness as the outer rings, so that the outer surfaces of the main bars rest against the said inner rings, and may be moved over them in contact therewith.

Slight peripheral motion of one cylinder in relation to the other will move the flat bars in relation to the main rabbeted bars and change the width of the interstices.

In the drawings I have shown the forms embodying my invention found in practice to be preferable.

Figure 1 represents a longitudinal section of the screen with part of the annealing-furnace to which it is attached. Fig. 2 shows a

transverse section on line *x x;* Fig. 3, a side view of one end of the cylinder, showing adjusting devices. Figs. 4, 5, and 6 represent modifications of the form of the bars.

In this drawing, Fig. 1, *a a* represent the inner rings, to which the main bars *b* are attached. *c c* represent the outer rings, with the flat bars *d* riveted thereto. Fig. 2 shows clearly the form of said bars.

The bars *b* are represented in different forms; but it is essential that they should be approximately wedge-shaped, so as to turn either one way or the other the nails or refuse material falling thereon in the revolution of the picker.

Beneath and on one side they are rabbeted, as shown at *e*, said rabbets being about three-eighths inch in depth and five-eighths inch in width. The flat bars *d* fit snugly, as represented, into the rabbets. They are beveled on the outer edge at the same angle as the main bars, so that with the opposite face of the adjacent bars they form symmetrical V-shaped grooves.

The main bars, for the sake of cheapness and rigidity, are made of cast-iron. The inner flat bars are formed of steel—a material necessary for bars of such thickness and length.

It will be observed that when the flat bars are moved into the rabbets to the full extent the V-shaped grooves have uniform plain sides from apex to base. When the flat bars are moved out to diminish the slits, a slight ledge is formed on one side; but as the lower part of the groove or slot remains of the same V shape, no disadvantage occurs in the operation of the machine.

The cylinder of the picker is made ordinarily from thirty inches to four feet in length and about twenty-two inches in diameter.

In machines of larger size various expedients may be resorted to for the purpose of obviating the tendency of the bars to sag in the middle. The form of the bars may be made for this purpose as shown in Figs. 4 and 5. When the form is used as shown in Fig. 2, a lug, *g*, may be cast on the main bar, fitted to project under the flat steel bar and support the same.

It will be seen on the right hand of Fig. 1 that the outer ring on that end is made wider and fitted to overlap the annealing-cylinder B, to which it may be securely bolted and revolved therewith.

The rings which support the bars are shown clearly in section in Fig. 1, and the adjusting devices in Figs. 2 and 3. These devices consist of metallic ears *h h'*, the first fixed to the outer ring, *a*, and bent sidewise to face the ear *h'*, which is bolted to the ring *c* by a threaded bolt, *l*, passing through the ears, and affording means for moving the cylinders in relation to each other, and thus accurately adjusting the width of the slits.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a screen for cleaning and separating nails, the compound bar composed of a rabbeted and a flat bar the parts being constructed and arranged for adjustment in relation to each other as set forth.

2. The combination of the rabbeted bar and the flat bars, arranged to move in the rabbet, and the inner and outer rings, as set forth.

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

STANTON M. HOWARD.

Witnesses:
A. C. RICHARDS,
WARREN SEELY.