2 Sheets—Sheet 1.

O. D. WOODRUFF.

Machine for Separating Iron from Foundry Refuse.

No. 200,638. Patented Feb. 26, 1878.

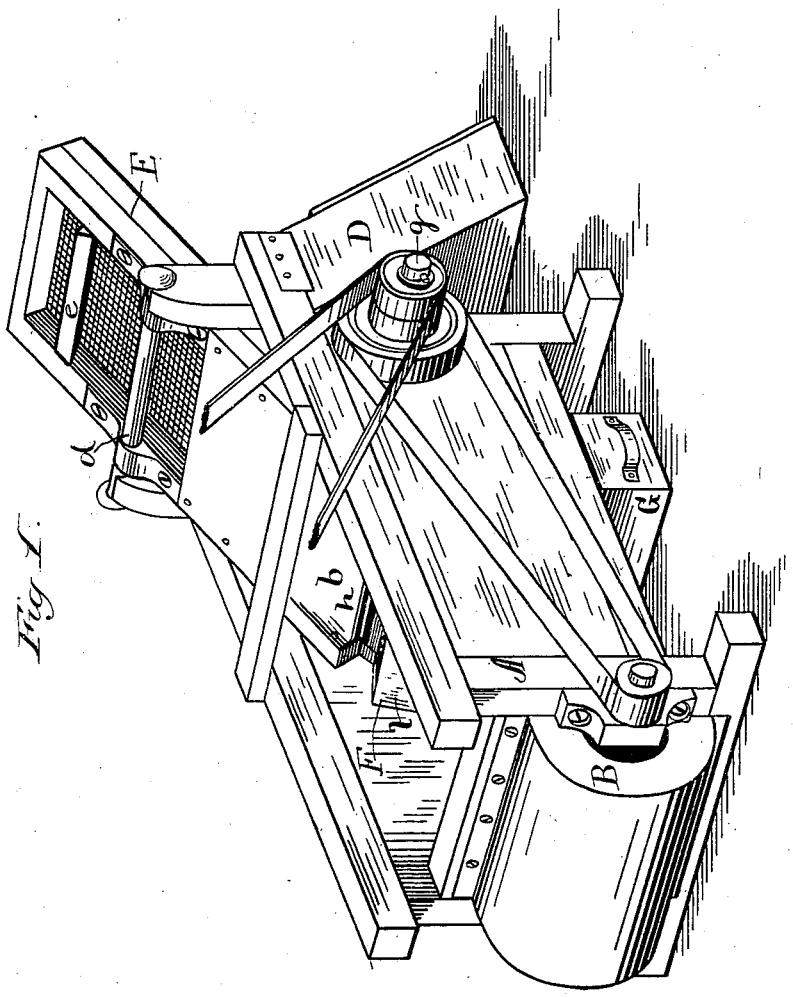

Fig. 1.

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2 Sheets—Sheet 2.

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Machine for Separating Iron from Foundry Refuse.

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Fig. 2.

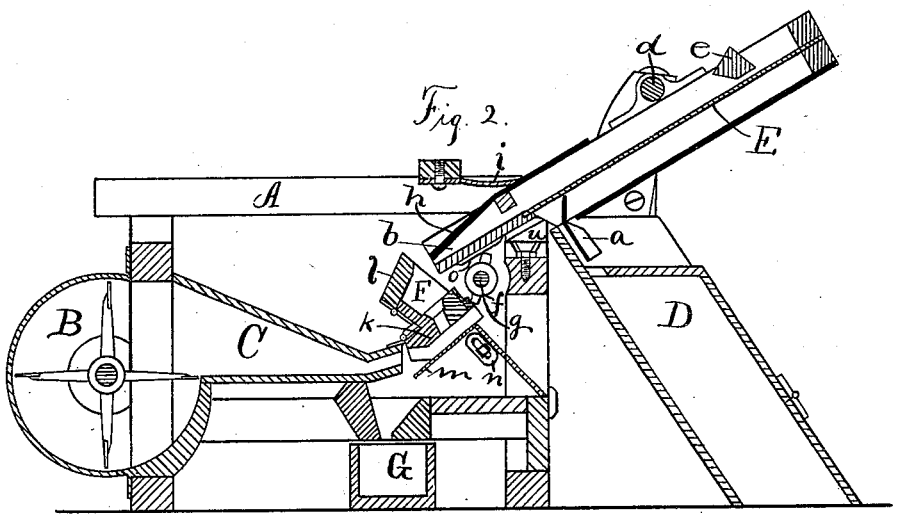


Fig. 3.

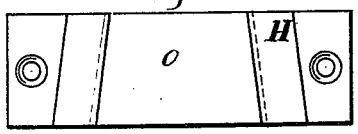


Fig. 4.

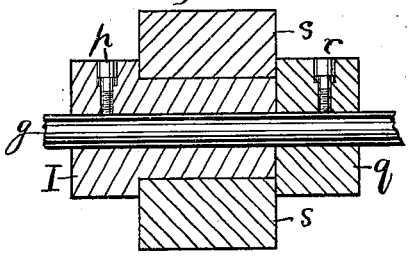


Fig. 5.

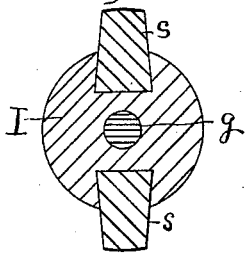
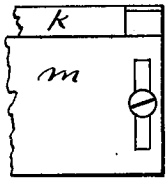


Fig. 6.



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UNITED STATES PATENT OFFICE.

OLIVER D. WOODRUFF, OF SOUTHINGTON, CONNECTICUT.

IMPROVEMENT IN MACHINES FOR SEPARATING IRON FROM FOUNDRY REFUSE.

Specification forming part of Letters Patent No. **200,638**, dated February 26, 1878; application filed October 22, 1877.

To all whom it may concern:

Be it known that I, OLIVER D. WOODRUFF, of Southington, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Machines for Separating Iron from Foundry Refuse, of which the following is a specification:

My invention consists in the peculiar construction and arrangement of certain parts, and in the combination of parts, all as hereinafter described.

In the accompanying drawing, Figure 1 is a perspective view of a machine for separating iron from foundry refuse which embodies my invention. Fig. 2 is a vertical section of the same, taken on a line running longitudinally through the middle of the machine; and Figs. 3, 4, 5, and 6 are detached views of parts thereof.

A designates the frame of the machine; B, the blower; C, the air-chute to conduct the blast from the blower, all as in various prior machines; and D designates the dust-arrester, substantially the same as patented to me March 21, 1876. E designates the vertically-vibrating screen, provided at its lower end with two chutes, *a b*, the one, *a*, leading into the dust-arrester D, and the other into the hopper F. Toward the upper end of the screen is a cross-beam, *e*, reaching the top, but leaving a small space between its lower edge and the screen, as shown in Fig. 2.

Instead of vibrating the screen laterally, as in my former patent above named, the screen E is hung on a horizontal shaft, *d*, supported by the frame A, so as to vibrate vertically, the part below the shaft being longer and heavier than the part above it, so that gravity causes said lower end to have a constant downward pressure upon the cam *f* of the main shaft *g*. The screen, as thus supported, stands upon an incline, as shown. The lower end is covered over by a cover, *h;* and, if desired, a spring, *i*, may be added, to insure a quick depression of the lower end of the screen.

At the effluent end of the air-chute F the upper side or cover *k* is made adjustable on hinges, something as in my former patent; but the air-chute is carried down lower, so as to bring this cover *k* at a greater angle of inclination, and parallel to the apron. Through this hinged portion of the cover *k* is an opening leading into the hopper F, which is under the lower end of the screen-chute *b*.

One side, *l*, of the hopper may be adjustable, in order to better catch the material flowing from the screen. Upon the under side of the cover *k* is the apron *m*, secured by screws passing through slots in the apron into the cover *k*, and with straight ledges or bars under each end, to hold the apron at a proper distance from and parallel to the chute-cover *k* under all its various adjustments, while the slots in the apron and screws are for adjusting the edge of the apron up or down to its proper place when the angle of its inclination is changed. A detached view of the under side of one end of the apron is shown in Fig. 6.

Underneath the apron, on each side of the machine, is an adjustable stop, *n*, provided with a longitudinal slot, through which a screw passes, and on which stops the apron and chute-cover *k* are supported. By adjusting the stops the apron and chute-cover can be adjusted to any desired inclination; and in case the parallel space between the chute-cover *k* and apron *m* requires to be increased or diminished, it can be done by changing the bars or blocking between said parts.

Rolling-barrel refuse is placed in the screen E above the cross-beam *e*, and motion is imparted to the main and blower shafts in any proper manner, when the rapid motion of the cam *f* on main shaft *g*, together with the weighted end of the screen, causes said screen to be violently agitated on its shaft to shake the finer material, dust, ashes, &c., through the sieve or screen, and into the dust-arrester by way of the chute *a*, while the coarser material, iron, coal, &c., will pass under the cross-beam *e*, and down through the chute *b* into the hopper F, from which it flows into the parallel space between the apron *m* and chute-cover *k*, where the air-blast throws the coal and lighter material up over the upper edge of the apron, and out at the rear of the machine, while the iron, which is the heavier material, will pass downward and into the receptacle G.

Under different air-blasts different adjust-

ments are required. The stronger the blast the steeper should the inclination of the apron be. If coal, cinders, &c., should work down into the receptacle with the iron, then the blast is too feeble for the inclination of the apron, which should be let down to an angle of less inclination until the coal, cinders, &c., are carried over its upper edge.

By loosening the screws on the under side of the apron it can be raised or lowered, so as to leave the opening at its foot of the proper width, and bring its top edge up higher than the opening in the chute-cover *k* under the hopper.

By making the adjacent sides of the chute-cover *k* and apron *m* parallel under all adjustments, the air-blast is substantially of the same compactness and strength for the whole length of the space between them, so that in case coal, &c., should work down to the lower part of the apron it will be blown back, whereas in case the space at the lower part of the apron were wider, the blast would be weaker, and coal, &c., working down into this weak blast would not be blown backward and upward with that certainty which is attendant upon a blast confined in the parallel space.

By making the screen vibrate vertically instead of laterally, the agitating-cam can be located on the main shaft, thereby rendering the machine more simple, and requiring less power to run it.

The screen is also agitated more violently at its upper end than when hung as in my former patent, while the cross-beam retains the material put into the screen at the upper end until it is substantially screened from dust, &c., before it can pass under said beam and down into the chute *b*.

In order to compensate for wear, I place a metal guard, *o*, under the end of the screen-chute for the cam *f* to work against, the same being shown by an enlarged view in Fig. 3.

The guard proper, *o*, is made of hardened steel, and it is dovetailed into a metal socket, H, Fig. 3, which can be secured or bolted to the under side of the screen-chute; and by making the guard dovetailed it can readily be removed, and a new one inserted at a very small cost.

Instead of this dovetailed socket, a hardened disk of steel might be bolted to the screen-chute, in such a position that the cam *f* will engage it near the edge, and when it becomes worn the bolt can be loosened and the disk rotated sufficiently to bring an unworn surface into engagement with the cam.

Upon one of the cross-beams of the frame of the machine, and under the lower end of the screen-chute, there is an adjustable stop, *u*, to regulate the vibration of the screen and chute *b*, upon which stop the screen falls when not elevated by the cam *f*. This stop *u* is slotted, and held in place by a screw or screws passing through said slots, whereby the stop can be moved forward or backward, as may be desired, and thereby stop the descent of the chute *b* and the screen at a greater or less elevation, and consequently allowing the cam *f* to vibrate the chute and screen with a greater or less motion, as may be desired.

I also make the cam *f* in parts, to compensate for wear. Fig. 4 is a longitudinal section of said cam, and Fig. 5 a transverse section.

The hub I is provided with longitudinal dovetailed recesses, as shown in Fig. 5, and it is held in place on the main shaft by the set-screw *p*. Detachable steel teeth *s* are inserted endwise in the dovetailed recesses, and held in place by the collar *q*, also secured to the main shaft by a set-screw, *r*. When these teeth *s* become too much worn for use, or broken, the collar can be set back, the old teeth removed, and new ones inserted at a very small cost.

I claim as my invention—

1. In a separator, the screen E, having cross-beam *e* a little below its upper end, a single pair of horizontal bearings between its ends, on which the screen can oscillate to vibrate its ends vertically, and the two chutes *a* and *b* at its lower end, substantially as described, and for the purpose specified.

2. In a separator, the screen E, having cross-beam *e* a little below its upper end, the chute *b* at its lower end, and a single pair of horizontal bearings between its ends, on which the screen can oscillate to vibrate its ends vertically, in combination with mechanism for oscillating said screen and its above-named parts, substantially as described, and for the purpose specified.

3. In a separator, the screen E, having cross-beam *e* a little below its upper end, a single pair of horizontal bearings between its ends, on which the screen can oscillate to vibrate its ends vertically, and the chute *b*, provided with cover *h* at its lower end, substantially as described, and for the purpose specified.

4. In a separator, the adjustable chute-cover *k*, in combination with the apron *m*, having their adjacent sides adjusted parallel to each other, substantially as described, and for the purpose specified.

5. In a separator, the combination of hinged chute-cover *k*, apron *m*, slotted at its ends and adjustably secured to said cover, and the adjustable stops on the sides of the frame, substantially as described, and for the purpose specified.

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