

O. D. WOODRUFF.

APPARATUS FOR SEPARATING IRON FROM FOUNDRY REFUSE.
No. 175,231.

Patented March 21, 1876.

Fig. 1.

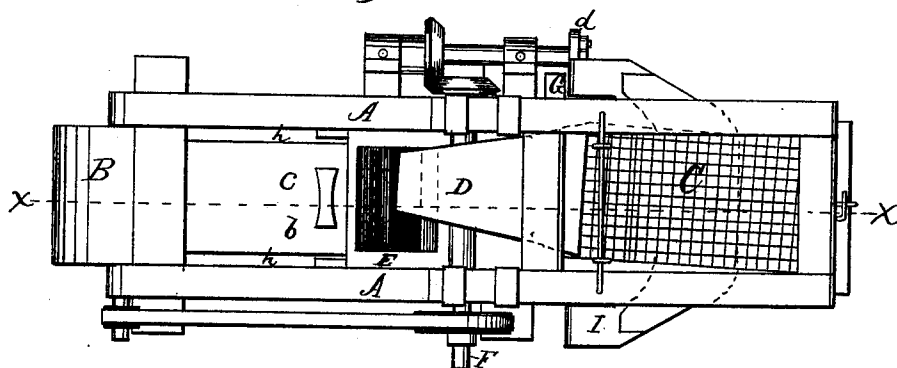


Fig. 2.

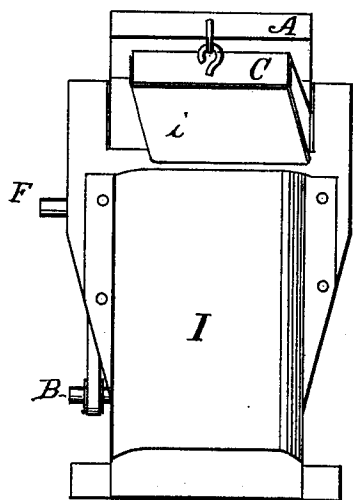
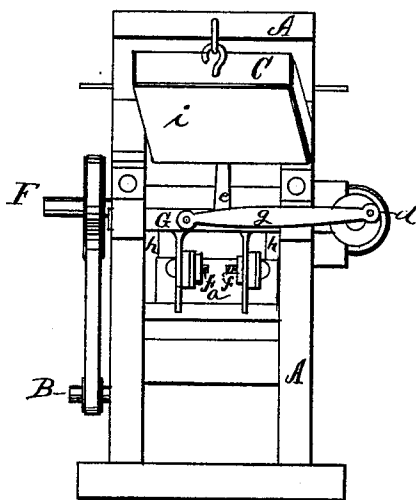


Fig. 3.



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Fig. 4.

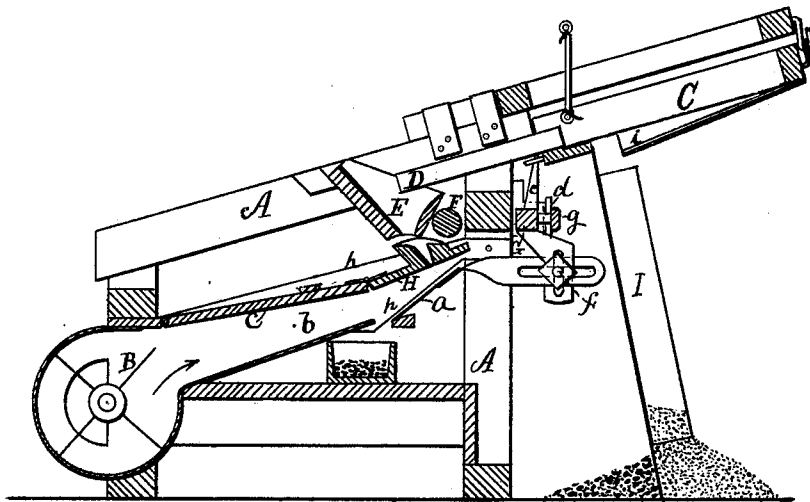
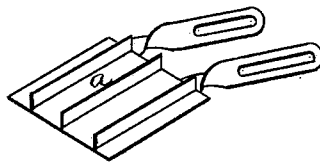


Fig. 5



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UNITED STATES PATENT OFFICE.

OLIVER D. WOODRUFF, OF SOUTHTON, CONNECTICUT.

IMPROVEMENT IN APPARATUS FOR SEPARATING IRON FROM FOUNDRY-REFUSE.

Specification forming part of Letters Patent No. **175,231**, dated March 21, 1876; application filed November 16, 1875.

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 of the vibrating chute, an inclined distributing-apron, and an air-blast directed to the point of the apron upon which the material is deposited, all operating together as hereafter described; also, of the air-chute provided with an adjustable cover and hinged to the base of the hopper, as hereafter described; also, of the dust-arrester placed at the effluent end of the separator, all as herein-after fully described.

It is the general custom in foundries to roll the clinker or scoria in rolling barrels to break it and separate the large pieces of iron, the softer material becoming broken, so that it and the fine pieces of iron will escape through the crevices left in the barrel for such purpose, and the larger pieces remain in the barrel and are saved, while all that runs through the crevices of the barrel is generally considered refuse, and is thrown away.

The object of my invention is to separate the small particles of iron from this refuse, whereby a very great saving is effected.

In the accompanying drawing, Figure 1 is a top view of a separator which embodies my invention. Fig. 2 is a rear-end view of the same. Fig. 3 is a like view with the lower duster removed. Fig. 4 is a vertical section of the same on line *x x* of Fig. 1, and Fig. 5 is a perspective view of the adjustable apron as detached from the machine.

The parts are mounted upon any suitable frame, A, and at one end there is a fan or blower, B, and at the opposite end a vibrating sieve, C, is suspended, substantially the same as in ordinary grain-separators. From the lower end of the sieve C a chute, D, extends to a point over a hopper, E, which leads to the adjustable inclined distributing-apron *a*, Figs. 4 and 5, immediately in front of the air-chute *b* of the fan B. The upper side or cover *c* of the air-chute *b* is adjustable, and can be raised or lowered so as to contract or widen the current or blast of air passing through it,

and thereby throw it upon the apron *a* with greater or less force, as occasion may require. The hopper-base H is also adjustable, and is hinged to the end of the adjustable chute-cover *c*, whereby the effluent end of the chute and the influent end of the air-passage leading to the apron always coincide. F designates the main shaft, propelled by any suitable power and provided with pulleys and belts or other known means for transmitting motion to the blower B and to the crank *d*. A sliding bar, G, extends across the rear end of the frame A, from which an arm, *e*, projects upward into a socket formed on the vibrating sieve C, and to the lower arms of said bar the adjustable apron *a* is secured. This apron is secured to the arm or arms of the sliding bar G by means of bolts *f*, which pass through slots in both parts, as shown in Fig. 1, so that the apron can be adjusted to different angles by means of the vertical slot, and may be adjusted to and from the blower by means of the horizontal slot. This latter adjustment is very useful, as the driving-power will vary under different circumstances, and if the power be insufficient the blast will not be strong enough to blow the coarse dust over the apron. In such an event it can be let down toward the effluent end of the air-chute when the blast will take the dust, coal, &c., over the rear end of the apron. If the blast be too strong, then a part of the iron as well as the coarser dust will be carried over the rear of the apron and wasted; but by adjusting the apron to carry it, and consequently its rear end, farther back, away from the delivery end of the blast, the iron will not be thrown over the rear end of the apron. Thus it will be seen that the apron can be adjusted relatively to the power of the blast, so as to operate in the same manner under different blasts.

The edges of the apron move just under side pieces *h h*, so as to prevent the refuse from falling off the sides of the apron and yet allow the apron to vibrate from side to side. A pitman, *g*, connects the sliding bar G with the crank *d*. Other well-known mechanisms may be employed for imparting motion to the fan, sieve, and vibrating apron. Upon the under side of the sieve a dust-conductor, *i*, is secured, which leads to the dust-arrester I,

which carries the dust and prevents the air-blast from coming in contact with it. This dust-arrester is an upright chute (slightly inclined) inclosed upon all sides, and extending upward above the effluent current of air. The lower end may be left open for a greater or less distance from its base, as may be desired, but I prefer to have it open but a short distance from its base. The upper surface of the apron may be plain, or provided with ledges, as shown in Fig. 5.

The operation is as follows, viz: Rapid motion is imparted to the main shaft, which starts the blower and throws a strong air-blast upon the inclined apron *a*, while the crank *d*, through the pitman *g* and sliding bar *G*, causes the sieve *C* and apron *a* to vibrate rapidly. The refuse is then fed or supplied in any proper manner to the upper end of the sieve *C*, when the finer portion and major bulk of the refuse, dust, ashes, &c., will be shaken through the sieve, and, falling on the conductor *i*, will run down into the dust-arrester *I*, where it falls to its base. So soon as sufficient dust accumulates at its base to close its lower end, no more dust will rise. When the dust-arrester *I* is full, or nearly full, the dust at its base can be removed, when the dust in the conductor will all run out. If desired, instead of leaving the lower end open a little at the base, it might be closed by a sliding gate, which could be raised once in a while, to let out and clear away the dust that has accumulated within the arrester, and then no dust would arise from it when the machine is first started. The coarser portions will work down through the chute *D* and hopper *E* toward the apron *a*. Some of the lighter portions will be thrown backward by this air-blast, and out at the rear of the machine, without falling upon the apron; but as

the material is a heavy one, a large portion of it will fall upon the apron *a*. The air-chute *b* is so placed as to throw the air-blast directly upon the distributing-apron *a*, (which feature is believed to be new,) and blow the refuse on the apron out of the rear of the machine, but the material is so heavy that, without something to aid the air-blast, a large pile of iron and refuse would soon accumulate upon the apron. Such a result is avoided by the vibrating action of said apron, which continually jars the material so soon as it strikes said apron, and thereby exposes all of it to the air-blast, so that the refuse is thrown out at the rear, and the pellets and scales of iron work down the apron and fall into the receptacle *J*, Fig. 3.

Although I prefer to make the apron vibrate laterally, it might be made stationary, with vibrating fingers placed just over the apron to stir the material and prevent an undue accumulation upon the apron.

I claim as my invention—

1. The combination of the vibrating chute *D* with an inclined distributing-apron, and an air-blast chute directed to the point of the apron upon which the material to be cleaned is deposited, all substantially as described, and for the purpose set forth.

2. The air chute *b*, provided with the adjustable cover *c*, in combination with the hopper-base *H*, hinged to said cover, all substantially as described, and for the purpose set forth.

3. The dust-arrester *I*, extending above the air-blast, and placed at the effluent end of a separator, substantially in the manner described, and for the purpose set forth.

OLIVER D. WOODRUFF.

Witnesses:

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