W. O. BOURNE.

Dry Ore Separator.

No. 235,851. Patented Dec. 28, 1880.

Fig. 1

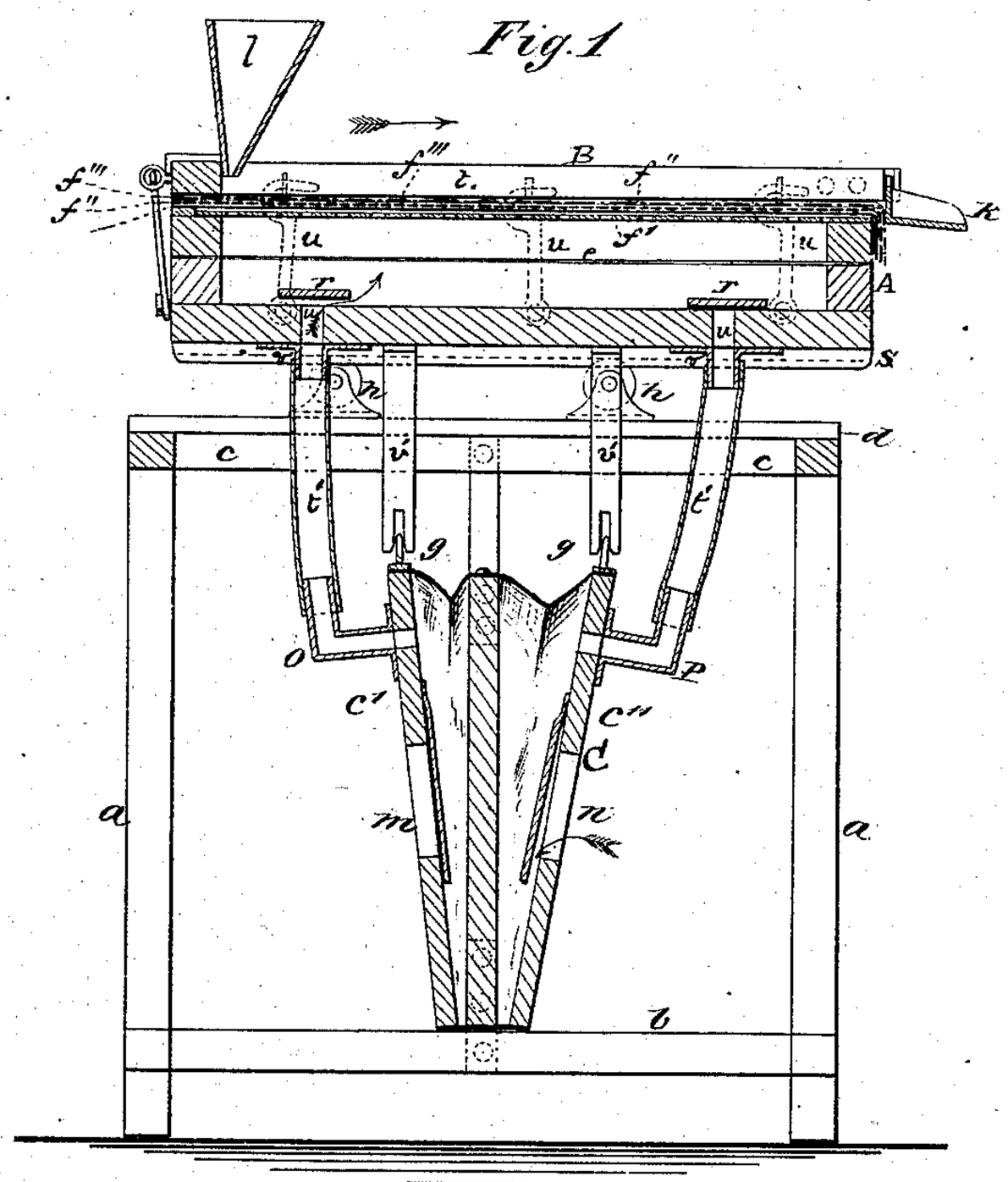
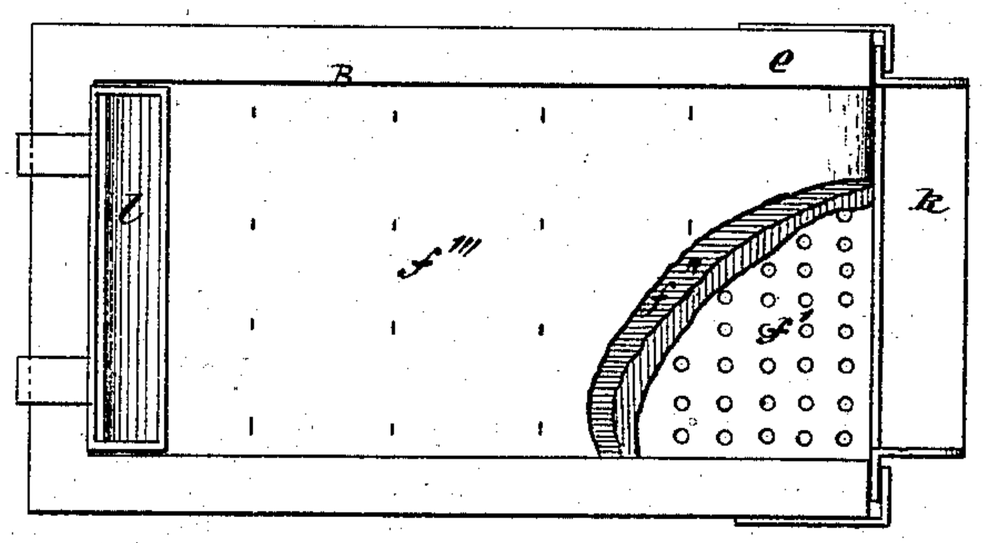


Fig. 2



Witnesses.

L. B. Hyde

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UNITED STATES PATENT OFFICE.

WILLIAM O. BOURNE, OF NEW YORK, N. Y.

DRY-ORE SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 235,851, dated December 28, 1880.

Application filed October 14, 1879.

To all whom it may concern:

Be it known that I, WILLIAM OLAND BOURNE, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Dry-Ore Separators, of which the following is a specification.

My invention relates to that class of machines used for separating dry pulverized mineral substances from any combined earthy or other substance of less specific gravity by the use of vertical puffs of air through a working perforated bed or plate, upon which said pulverized material is gradually supplied from a feeding-receptacle.

My invention is intended as an improvement on the machine for which Letters Patent were granted to me, dated June 14, 1859, No. 24,367, in which the separating-chamber is vibrated and the bellows operated each by a different crank on separate shafts, and the cranks are connected by a belt.

The main object of this invention is to simplify the above-described construction by dispensing with the cranks and their shafts and the belts; and to this end my invention consists of a separating-chamber and bellows directly connected together by arms, as hereinafter more fully set forth.

My invention further consists in certain details of construction hereinafter more fully set forth, and pointed out in the claims.

a shows a frame-work, with its base-rail *b* and top rail, *c*, supporting a top, *d*, which carries the separator case or chamber A, provided at its lower end with an air-chamber, *e*, resting upon friction-rollers *h h*, secured upon the top plate, *d*, and which bear against supporting-rails *s*, secured under the bottom of the separator case or chamber A, and upon which it is moved to and fro in working the machine. *f'* shows the perforated plate, and *f'' f'''* represent the woven-fabric surface-cushion forming the bottom of the receptacle B, all shown as partly cut away in Figure 2, and stitched together, forming a bed for the pulverized ores, which flow automatically from the hopper *l*. *k* is an inclined spout at the opposite end for escape of the waste material. *t* is a curl around the ore-bed. These several parts are readily separated by loosening the hooks *u u*, (shown by dotted lines.) Below this separator-box, and within the supporting frame-work, a double-acting vertical bellows, C, having sides *c' c''*, is secured, the valves of which oscillate upon the base-rail *b* and have inlet air-valves *m n*, with air-outlets by pipes *o p*, which are connected by flexible or jointed tubes *t'* with the lower ends of pipes *v*, attached to the lower face of the separating-chamber, so as to register with the orifices *u* therein, capped by outlet-valves *r*. Upon the top edges of the oscillating sides *c' c''* of the bellows C thin plates *g* are secured, which pass into forks in the ends of suspended plates *v' v'*, fastened on the under side of the frame of the separator-box.

The operation of the apparatus is as follows: The hopper *l* being charged with the pulverized ore, it will fall upon that end of the separator-bed. The box is then pushed endwise by hand or other power, and it will move along the rails by the carrying-wheels *h*, which motion will cause the mineral to spread on the surface of the bed. At the same time the bellows *c'* will collapse, forcing its air by the pipe *o* into the air-chest and through the sieve and bed of ore. The motion is then reversed, when *c'* will take air by the valve *m*, and the bellows *c''* will give out its air to the chest by the pipe *p*, which operations are repeated at will. The action of the air will lift and agitate the powdered ores, causing the heavier or metalliferous portion to concentrate upon the surface of the bed, and the lighter or waste portion remaining at the top will gradually work toward and finally flow out by the spout *k* as "tailings," and when the mineral has collected on the bed in quantity to embarrass working the machine, the material may be collected by a brush and shovel for removal.

I do not confine myself to the use of a vertical bellows, as intermittent air-currents may be generated by other means; nor do I confine myself to operating the machine by hand, since large machines with power-moving appliances may be made on a like plan.

What I claim, and desire to secure by Letters Patent, is—

1. The combination, in a pneumatic separator, of a bellows, C, with a separator-chamber, A, said bellows and separating-chamber being

directly connected by arms, substantially as described, whereby a motion given the separating-chamber or bellows will agitate the material and operate the bellows without the intervention of cranks or their equivalents, substantially as specified.

2. The combination, with the frame *a*, vertical bellows C, and a support on which the separating-chamber may be laterally reciprocated, of the separating-chamber A, provided with the pendent arms *v'*, connecting the separating-chamber and bellows, substantially as described, and for the purpose set forth.

3. The combination, with a separating-chamber, A, carrying a receptacle, B, with a sieve-bottom, *f*, and provided with the rails *s*, pipes *v*, and arms *v'*, notched at their lower ends, of the wheels *h*, bellows C, having projections *g*, and tubes *o p t*, substantially as described, and for the purpose set forth.

WM. OLAND BOURNE.

Witnesses:
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L. FUCOT.