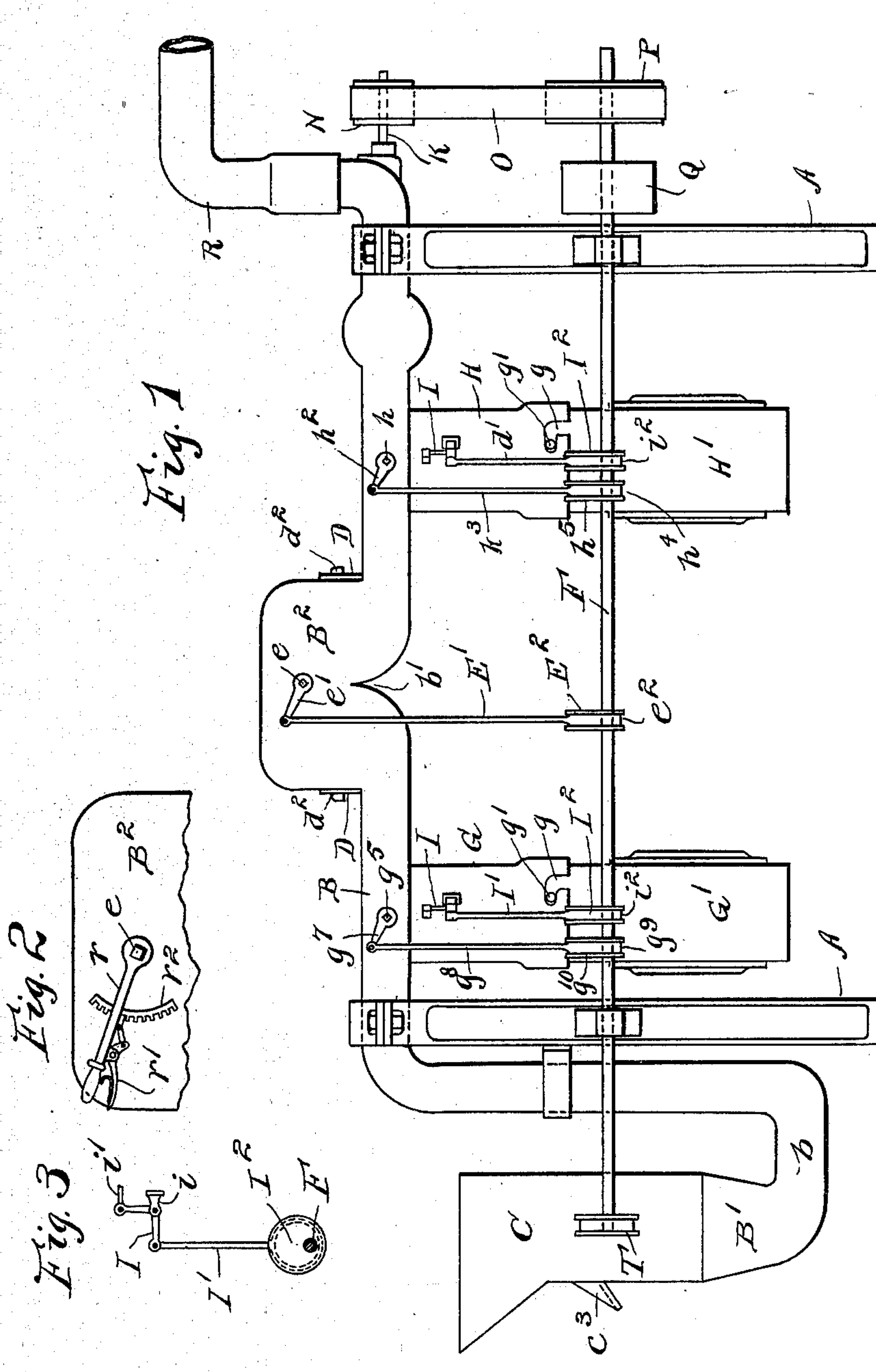


T. J. REID.  
ORE SEPARATOR.

APPLICATION FILED SEPT. 29, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:

G. S. Noble  
A. Gustafson

Inventor,

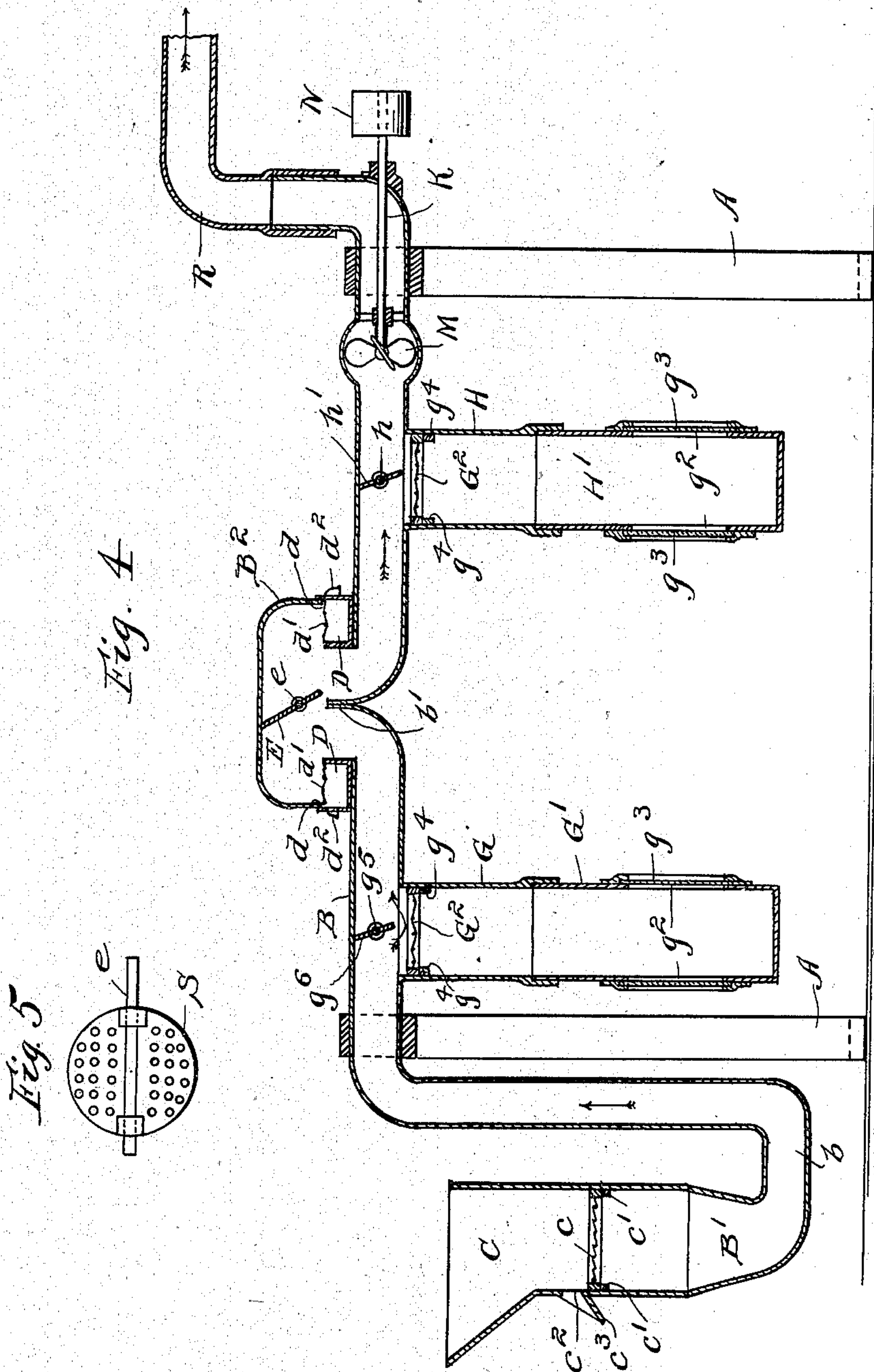
Thomas J. Reid.  
By Chas. A. Tithman  
Att'y.

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2 SHEETS—SHEET 2.



Witnesses:

G. S. Noble.  
A. Gustafson

Inventor,

Thomas J. Reid.  
By *Chas. C. Pittman*  
Att'y.



# UNITED STATES PATENT OFFICE.

THOMAS J. REID, OF CHICAGO, ILLINOIS.

## ORE-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 731,815, dated June 23, 1903.

Application filed September 29, 1902. Serial No. 125,150. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS J. REID, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Ore-Separators, of which the following is a specification.

This invention relates to improvements in an apparatus to be used for separating finer particles from the coarser ones, and while it is more especially intended to be used for separating fine gold from sand and other material in which the gold is found, yet it is applicable for separating the finer from coarser particles of other material; and it consists in certain peculiarities of the construction, novel arrangement, and operation of the various parts thereof, as will be hereinafter more fully set forth and specifically claimed.

The principal object of my invention is to provide a separator of the above-described character which shall be simple and inexpensive in construction, strong, durable, and effective in operation.

Another object of the invention is to provide a separator which shall be compact in form, so as to be easily transported on an ordinary wagon, and which shall be of such construction that the interior of the receivers may be inspected during the operation of the machine without danger of any of the finer particles escaping.

Still another object is to so construct the machine that the valves for controlling the air-current through the draft-conduit may be operated automatically or manually.

Other objects and advantages of the invention will be disclosed in the subjoined description and explanation.

In order to enable others skilled in the art to which my invention pertains to make and use the same, I will now proceed to describe it, referring to the accompanying drawings, in which—

Figure 1 is a view in side elevation of an ore-separator embodying my invention, showing the discharge-pipe shortened for the convenience of illustration. Fig. 2 is a fragmental view of a portion of the draft-conduit, showing a modification in the means for operating the valves therein. Fig. 3 is a detached view, partly in section, showing means

for operating the sieves of the receivers. Fig. 4 is a central longitudinal sectional view of the separator, and Fig. 5 is a detached view of a modified form of one of the valves of the draft-conduit.

Similar letters refer to like parts throughout the different views of the drawings.

A represents the main or supporting frame, which may be made of any suitable size, form, and material, on the upper portion of which is longitudinally mounted the draft-conduit B, which is preferably cylindrical throughout most of its length, but may be of other form, if desired. As shown in the drawings, the front or receiving portion of the conduit B extends downwardly and then upwardly, so as to form a contracted bend *b* of about the size of the main portion of the conduit, and has its free portion *B'* flaring to receive the ore or material from the hopper C, which rests on the upper portion of the flaring portion *B'* of the conduit and is provided with a reciprocating sieve *c*, which rests on horizontal cleats *c'*, secured to the inner surface of the walls of the hopper. Just above the sieve *c* one of the walls of the hopper is provided with an opening *c<sup>2</sup>* and a chute *c<sup>3</sup>* for the discharge of the material which is too coarse to pass through the meshes of said sieve. The central portion of the conduit B is provided with an enlargement *B<sup>2</sup>* to form an eddying or settling chamber, the lower portion of which is transversely divided by means of an upward extension *b'* of the lower portion of the conduit. Each end of the enlargement *B<sup>2</sup>* is provided with an opening *d* to receive a box or drawer D, which is covered with a sieve *d'* and is provided on its outer end with a handle *d<sup>2</sup>*, by means of which it may be withdrawn from the settling-chamber. Journaled in the sides of the enlargement *B<sup>2</sup>* is a valve-stem or shaft *e*, on which is mounted a leaf or disk valve E, employed to regulate the current of air through the enlargement *B<sup>2</sup>* of the conduit. On one end of the stem or shaft *e* is fixed an arm *e'*, to which is pivotally secured at one of its ends a pitman-rod E', the other end of which is connected to a band *e<sup>2</sup>*, which surrounds an eccentric E<sup>2</sup>, mounted on the driving-shaft F, which is journaled longitudinally on the main frame. Communicating with the horizontal portion of the con-



duit between the hopper or feed end thereof and the enlargement B<sup>2</sup> is a receiver for the gold, which receiver preferably consists of two pieces G and G', which are united by means of a bayonet-joint or fastening—that is to say, the lower end of the portion G is provided with an upwardly and laterally extending slot *g* to receive a pin *g'* on the upper portion of the piece G', which latter piece is provided with openings or peep-holes *g*<sup>2</sup>, which are closed by means of glass *g*<sup>3</sup> to prevent the escape or loss of the gold or fine material. The upper portion of the part G of the receiver is provided with a reciprocating sieve G<sup>2</sup>, which rests on horizontal cleats *g*<sup>4</sup>, secured to the inner surface of the walls of the receiver. Just above the opening in the conduit which communicates with the receiver-piece G is journaled in the sides of the conduit a valve-stem *g*<sup>5</sup>, on which is mounted a leaf or disk valve *g*<sup>6</sup>, used to regulate the air-current at said point. Secured to one end of the valve-stem *g*<sup>5</sup> is an arm *g*<sup>7</sup>, which is pivotally connected to the upper end of a pitman *g*<sup>8</sup>, the other end of which is secured to a band *g*<sup>9</sup>, which surrounds an eccentric *g*<sup>10</sup>, mounted on the driving-shaft. Communicating with the horizontal portion of the conduit B between its enlargement B<sup>2</sup> and the exhaust-fan is another receiver, which preferably consists of two pieces H and H', usually of the same construction as just above described. Journaled in the walls of the conduit just above the opening thereof which communicates with the receiver-piece H is a valve-stem *h*, on which is mounted a leaf or disk valve *h'*, used for regulating the air-current at said point. On one end of the valve-stem *h* is fixed an arm *h*<sup>2</sup>, to which is secured one end of a pitman *h*<sup>3</sup>, the other end of which is secured to a band *h*<sup>4</sup>, which surrounds an eccentric *h*<sup>5</sup>, mounted on the driving-shaft. The receiver-piece H is provided with a reciprocating sieve G<sup>2</sup>, which rests on horizontal cleats *g*<sup>4</sup>, as in the receiver-piece G, and just above described. Each of these reciprocating sieves G<sup>2</sup> is operated by means of a bell-crank lever I, (see Fig. 3,) which is fulcrumed on a bracket *i*, secured to the receiver. One arm of the lever I is connected, by means of a link *i'*, to the sieve, and the other arm is pivotally connected to one end of a pitman I', the other end of which is secured to a band *i*<sup>2</sup>, surrounding an eccentric I<sup>2</sup>, mounted on the driving-shaft F, as is clearly shown in Figs. 1 and 3 of the drawings. Journaled longitudinally in the conduit B and near its discharging end is a shaft K, on the inner end of which is mounted an exhaust-fan M of the ordinary or any preferred construction. Mounted on the outer portion of the shaft K is a pulley N, over which passes a belt O, by means of which and a pulley P the shaft K is geared to the driving-shaft F, to which power may be applied through a pulley Q and a belt (not shown) or

otherwise. The rear end of the draft-conduit is upturned and has swiveled thereon a discharge-pipe R, through which the refuse may be directed to the dump.

In Fig. 2 of the drawings I have shown a modification in the means for operating any one or all of the valves in the draft-conduit B, which consists in securing on one end of the valve-stem a hand-lever *r*, which is provided with a spring-actuated grip *r'* to engage the teeth of a rack-bar *r*<sup>2</sup>, secured to the outer surface of the conduit. By releasing the grip from the teeth of the rack-bar it is evident that the lever *r* may be turned so as to give the valve the proper deflection or inclination, at which point it may be held by releasing the grip, so that it will engage the teeth of the rack-bar.

Instead of making the leaf or disk valves imperforate I may make them of perforated pieces S, as is shown in Fig. 5 of the drawings.

Mounted on the end of the driving-shaft F adjacent to the hopper is an eccentric T, which is connected, by means of a pitman, to the sieve *c*, located in the hopper, so as to give said sieve a reciprocatory movement.

The operation is simple and as follows: Power from any suitable source may be applied to the driving-shaft F, which will through its gearing with the shaft K cause the fan M to rotate, so as to create a strong draft through the draft-conduit B, in which operation the sieves *c* and G<sup>2</sup> in the hopper and receivers, respectively, will be reciprocated by reason of their connections with the driving-shaft, and at the same time the valves in the conduit and enlargement thereof will be intermittently raised and lowered by reason of their connections with the driving-shaft. While thus in operation the ore or material to be separated may be thrown or otherwise placed in the hopper C, when the particles which are too coarse to pass through the sieve *c* will be discharged through the opening *c*<sup>2</sup> and chute *c*<sup>3</sup>, as is evident. After the sifted material has passed through the sieve *c* in the hopper it will be carried through the conduit until it reaches the valve *g*<sup>6</sup>, which will cause it to be directed downwardly, so as to pass over the sieve G<sup>2</sup> in the receiver-piece G, which operation will cause the finer particles to pass through the sieve G<sup>2</sup> and be lodged in the receiver. That portion of the material which does not pass through the sieve G<sup>2</sup> in the receiver-piece G will be carried through the enlargement B<sup>2</sup> or eddying-chamber, where a further separation will take place, and the fine gold or flour will be deposited in the boxes or drawers D after passing through the sieves thereon. From the enlargement B<sup>2</sup> the unseparated material will be carried over the screen G<sup>2</sup> in the receiver-piece H, when further separation will take place, said receiver being for the purpose of receiving black and red sand and



gold. From the last-named receiver the material will be forced through the discharge-pipe R to the dump.

If it is desired that the valves in the conduit shall not be operated by means of the driving-shaft, it is apparent that I may disconnect the pitmen on each of the valve-stems and supply said stems with a hand-lever r, as is shown in Fig. 2 and above described.

While I have shown the sieves c and G<sup>2</sup> in the hopper and receivers, respectively, as being movable, yet I may sometimes disconnect them from the driving-shaft, so that they will remain stationary, without departing from the spirit of my invention.

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

1. In an ore-separator, the combination of the main frame, with a draft-conduit mounted thereon, a hopper communicating with one end of said conduit, a movable sieve located in the hopper, a receiver communicating with the conduit, a movable sieve located in the receiver near the conduit, a valve located in the conduit near the upper end of the receiver and also near the said sieve so as to regulate the draft thereagainst, and means to force air through the conduit, to deflect the valve and to move said sieves, substantially as described.

2. In an ore-separator, the combination with the main frame, of a draft-conduit mounted thereon and having its front or feeding portion extended downwardly and then upwardly and provided in its horizontal portion with an enlargement, a removable box located in each end of said enlargement, each having a sieve-covering, a hopper communicating with the feed end of the conduit, a movable sieve located in the hopper, a receiver communi-

cating with the conduit between its enlargement and the hopper, a movable sieve located in the receiver, a valve located in the enlargement of the conduit, a valve located in the conduit near the upper end of the receiver, and means to force air through the conduit, to deflect the valves and to move said sieves, substantially as described.

3. In an ore-separator, the combination with the main frame, of a draft-conduit mounted thereon and having about midway its length an enlargement, a removable box located in each end of said enlargement, each having a sieve-covering, a hopper communicating with one end of said conduit, a movable sieve located in the hopper, a receiver communicating with the conduit between the hopper and said enlargement, another receiver communicating with the conduit between the said enlargement and the discharging end of the conduit, a movable sieve located in each of the receivers, a valve located in the conduit near the upper end of each of the receivers, a valve located in the enlargement of the conduit, and means to force air through the conduit, to deflect the valve and to move said sieves, substantially as described.

4. In an ore-separator, the combination of the main frame, with a draft-conduit mounted thereon, a hopper communicating with one end of said conduit, a sieve located in the hopper, a receiver communicating with the conduit, a sieve located in the receiver near the conduit, a valve located in the conduit near the upper end of the receiver and also near said sieve so as to regulate the draft thereagainst, and means to force air through the conduit, substantially as described.

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Witnesses:

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