

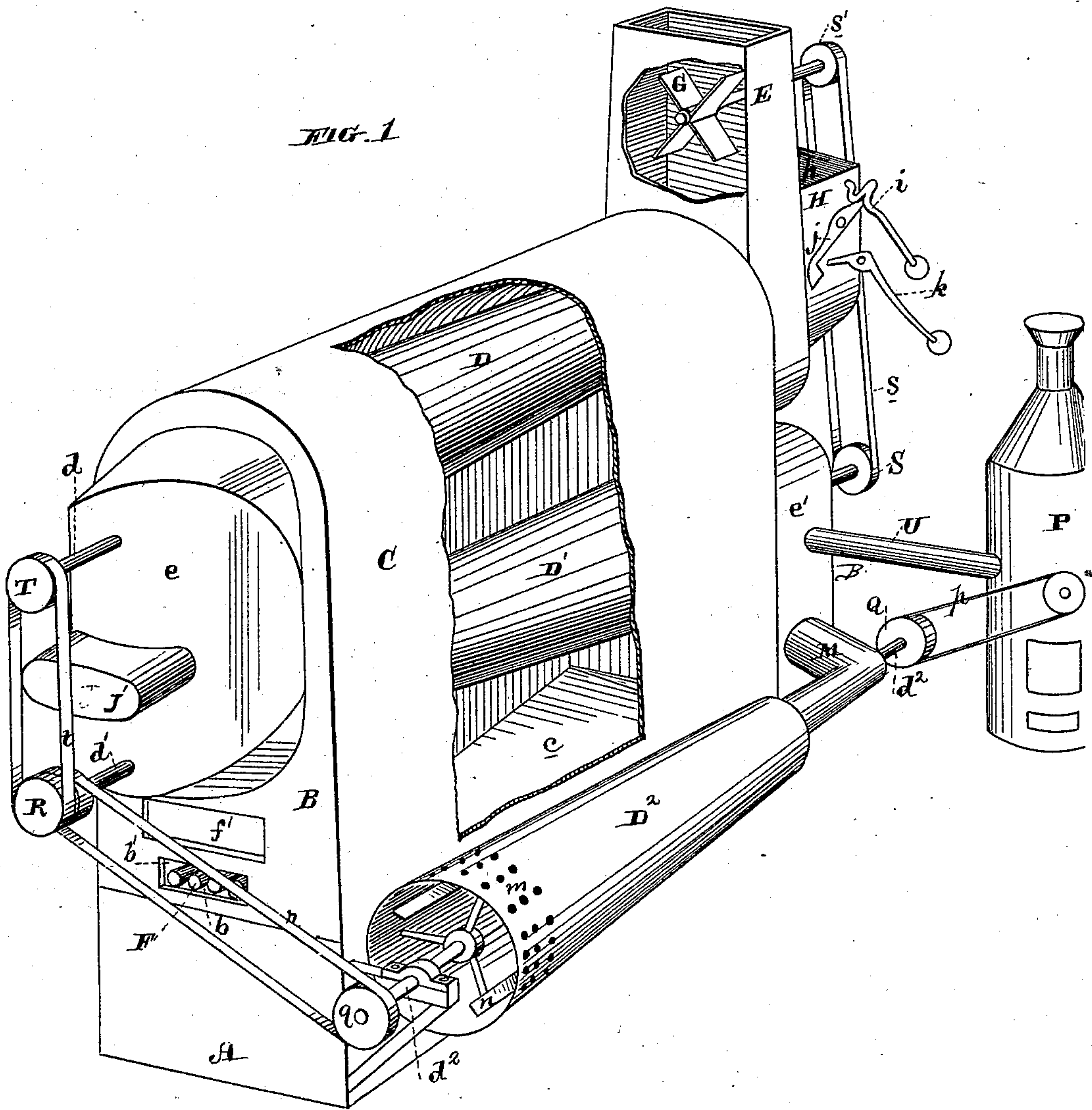
(No Model.)

2 Sheets—Sheet 1.

S. C. CHANEY.
DRY GOLD SEPARATOR.

No. 285,111.

Patented Sept. 18, 1883.



Witnesses,
Geo. H. Strong
J. H. Strong

Inventor
S. C. Chaney
By
Dewey & Co.
Attorneys

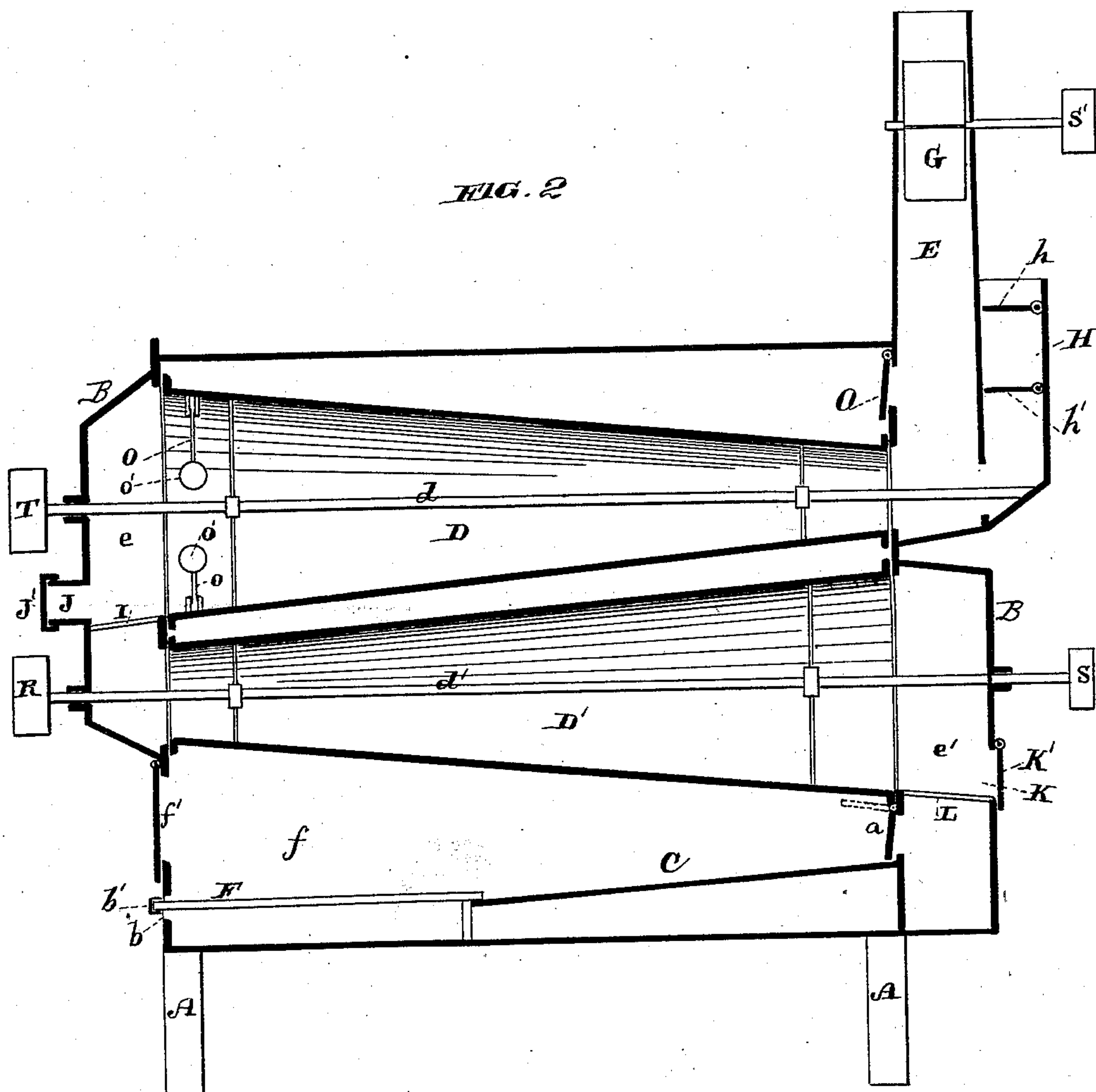
(No Model.)

2 Sheets—Sheet 2.

S. C. CHANEY.
DRY GOLD SEPARATOR.

No. 285,111.

Patented Sept. 18, 1883.



Witnesses,
Geo. H. Strong.
J. H. Strong

Inventor
S. C. Chaney
By Devey & Co.
Attorneys

UNITED STATES PATENT OFFICE.

SALATHIEL C. CHANEY, OF CHICO, CALIFORNIA.

DRY GOLD-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 285,111, dated September 18, 1883.

Application filed May 21, 1883. (No model.)

To all whom it may concern:

Be it known that I, SALATHIEL C. CHANEY, of Chico, in the county of Butte and State of California, have invented an Improvement in a Dry Gold-Separator; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to a new and useful dry gold-separator, and to certain improvements therein, consisting in the means for feeding and progressing the auriferous earth, sand, or gravel; in the means for causing a draft to carry off the dust and concentrate the material; in the means for heating the material and crumbling it; in the means for eliminating the large rocks and for cooling the concentrations, all of which I shall now fully explain by reference to the accompanying drawings, in which—

Figure 1 is a perspective view of my separator, a portion of the casing C and smoke-stack E being broken away. Fig. 2 is a vertical longitudinal section of the same.

The object of my invention is to obtain the precious particles from earth, sand, or gravel without the use of water.

A is the stand or foundation of the machine. B B are the ends; and C is the outer casing, which incloses the sides and top. This may be made to join with the ends in any suitable manner to form a complete casing for the machine.

D is a hollow conveyer having the shape of a truncated cone. It has a central axis or shaft, *d*, which is mounted in bearings in the ends B B and projects at each end. The axis of the conveyer is mounted on a plane parallel with the foundation; but because of the conical shape of the conveyer its bottom is inclined. Its small end opens into the smoke-stack E, while its large end opens into a chamber or passage, *e*, formed on the end B. D' is a similar conveyer having axis *d'*. It is mounted under the first conveyer, with its large end at the opposite side, so that its bottom inclines oppositely to the bottom of the upper conveyer. The small end of the lower conveyer opens into passage *e*, while its large end opens into a passage, *e'*, formed in the other end B.

F are the grate-bars in the fire-chamber *f*, the entrance to which is the door *f'* in one end. The grate-bars are made of gas-pipe

open at each end. These extend but about one-third of the distance of the foundation A, and terminate in an upwardly-inclined passage, *e*, formed by the underlapping edges of the casing C. This passage communicates with passage *e'* through a valve-door, *a*. In the other end is formed an opening, *b*, for the draft to pass through the grate-bars. This opening is covered by a damper, *b'*. In this manner the draft does not pass through the coals, but through the bars, and enters the passage *e* with the flame. The draft is created by a fan-blower, G, placed in the smoke-stack. This draws through conveyer D, passage *e*, conveyer D', passage *e'*, valve-door *a*, passage *e*, grate-bars F, and opening *b*. The flame follows the same course through both conveyers.

H is the feed-hopper, opening through one end B into the upper conveyer. In order to prevent the draft from coming in through this hopper, I have near its top a swinging door, *h*, and another, *h'*, farther down. Upon the pivot-shaft of the upper door is a weighted arm, *i*, which holds the door normally closed. It impinges against the upper end of a pivoted latch, *j*, the lower end of which engages with one end of a bent arm, *k*, on the pivot-shaft of the lower door. The latch *j* is weighted sufficiently to cause its lower end to fall into engagement with the bent arm *k* when it is relieved from the impingement of the upper arm, *i*, and thus to hold the lower door closed. The arm *k* of this door is so weighted as to return it to a closed position, and the latch holds it there. My object in this construction is to keep one door closed all the time, even when putting in a charge of the auriferous earth, so that the fan-blower shall not cause a draft through the hopper, but shall draw from below exclusively.

These devices accomplish the result in the following manner: Normally both doors are closed. The charge is put in the hopper and forces down the upper door. This movement of the door throws its arms *i* up, relieving the weighted latch *j*, which instantly falls into engagement with the bent arm *k*, and thus holds the lower door, which supports the charge. The capacity of the hopper being known, the charge which is put in is small enough to allow the upper door to swing shut. In doing this its

arm *i* comes down on the latch *j* and swings it out of engagement with the bent arm *k*, whereupon the lower door is forced down by the charge, which passes through into the open end of the upper conveyer, D. Thus one of the doors is always closed, and the operation is automatic.

Across the passage *e*, at the point or plane where the upper conveyer discharges into it, are fixed spaced bars I, access to which is had through an opening, J, in the end. This is covered by a door or cap, J', which is to be removed when desired. The object of these bars is to catch the large rocks, while permitting the finer ones, and sand, earth, &c., to fall through into the lower conveyer. From these bars the large rocks may be removed through opening J. In the other end is a similar opening, K, and cap K', and spaced bars L, to catch smaller rocks discharged from the lower conveyer.

From the side of passage *e'*, near its bottom, opens an inclined elbow-pipe, M, which enters the rear end of a conveyer, D², similar to conveyers D D'. This is by means of an axis, *d*², mounted on the side of the machine outside of casing C. Its sides near its larger end are perforated at *m*, and its inner surface is provided with flanges *n*, for better picking up and dropping the earth in its revolution.

The operation of the machine as far as described is as follows: Through suitable pulleys, belts, and a power device motion is transmitted to revolve the conveyers D D' D² and the fan-blower G. A fire is started on the grate-bars. The suction of the fan causes a draft through opening *b*, through the grate-bars, through passage *e*, and also through the conveyer D². Both drafts enter passage *e'*, thence through conveyer D', passage *e*, conveyer D, and out through the stack E. The draft carries the flame with it through both conveyers. The auriferous earth, sand, or gravel is fed in through hopper H, as heretofore described. It passes down the inclined bottom of the upper conveyer, drops through passage *e*, where the large rocks are caught on bars I, passes into and through the lower conveyer into passage *e'*, the smaller rocks being caught on bars L, and passes through pipe M into and through conveyer D² to its end, where it is discharged, the larger portions falling out the end, while the smaller pass through the perforations *m* and are caught in any suitable receptacle. In its course it is gradually concentrated by means of the opposing draft, which carries off the very light dust through the stack. The fire dries it thoroughly, causing a better separation and permitting it to crumble, whereby the action of the draft is had with better effect. This drying process increases as the material progresses, so that throughout the entire operation the draft is able to carry off the dust. It is only the heavy concentrated material which finally passes through pipe M into the conveyer D². This conveyer is not subjected to the fire, and I therefore distinguish it by the

name of "cooler." The object of cooling the concentrations is to allow them to amalgamate better when discharged.

Within the interior of the conveyers D D' are pivoted arms *o*, carrying heavy weights or hammers *o'*. These in the revolution of the conveyers fall down upon and crumble the material.

It becomes necessary sometimes to cut off the flame from the conveyers. To do this I have a valve-door or opening, O, above the upper conveyer and within the casing C. This communicates with the stack. I open this valve O and close the one *a* into the passage *e'* below. The flame then passes up inside of casing C, around the outside of the conveyers, and into the stack through valve O.

I here show the following means by which I transmit power to the machine; though any other means will answer: P is an engine. *p* is the driving-belt to pulley Q on axis *d*² of cooler D². Upon the other end of this axis is a pulley, *q*, from which a belt, *r*, extends to pulley R on shaft-axis *d'*, from which a belt, *t*, extends to pulley T on shaft-axis *d*. Upon the outer end of this axis is a pulley, S, from which a belt, *s*, extends to a pulley, *s'*, on the axis of the fan-blower G. These devices are not unchangeable, but simply show how motion might be given.

It would probably be necessary to drive the fan-blower at a much higher rate of speed than the conveyers, and it would require a more direct or different connection; but for the present purpose I need show no other devices. I may also use any other power device, such as horse or hand power; but by using the engine I obtain an advantage through the following connections: I connect the smoke-stack of the engine with the passage *e'* by means of a pipe, U. The draft sucks the fire from the engine as well as from its own fire-box, and thus a saving may be effected.

I am aware that it is not new in ore roasting and chloridizing machines to cause the ore to travel toward the fire, either by means of rotating cylinders, revolving arms, or by reason of inclined floors; and I am also aware that in dry gold-separators the separation or concentration is effected by means of a blast of air variously applied; but in the former class of machines the heat is the primary principle and no necessity exists for a draft or blast of air, while in the latter class the combination of heat with a draft applied as I have shown, or at all, has never been accomplished.

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

1. In a dry gold-separator, the stand A, casing C, and ends B B, having the draft-opening *b*, the valve-door *a*, and the passages *e' e*, as shown, the hollow grate-bars F, the conveyers D' D, having oppositely-inclined bottoms and connecting with passages *e' e*, and means for rotating said conveyers, in combination with the smoke-stack E, connecting

with the conveyer D, the fan-blower G in said stack, and means for operating it, the fire-chamber *f*, having the hollow grate-bars F, and the passage *c*, connecting through valve-door *a* with passage *e'*; substantially as and for the purpose herein described.

2. In a dry gold-separator, the rotating conveyers D D', having passages *e e'*, the stack E, and the fan-blower G therein, for causing a draft through said conveyers, in combination with the feed-hopper H, opening into the conveyer D, and the normally-horizontal doors *h h'*, for automatically keeping said hopper closed to prevent the draft from being drawn through said hopper, substantially as and for the purpose herein described.

3. In a dry gold-separator, the rotating conveyers D D', having passages *e e'*, the stack E, and the fan-blower G therein, in combination with the feed-hopper H, opening into the conveyer D, and the means for automatically keeping said hopper closed, consisting of the normally-horizontal swinging doors *h h'*, having weighted arms *i k*, and the intermediate gravitating latch, *j*, all arranged and operating substantially as and for the purpose herein described.

4. In a dry gold-separator, the rotating conveyers D D' and the passages *e e'*, in combination with the spaced bars I L therein, and the capped openings J K, substantially as and for the purpose herein described.

5. In a dry gold-separator, the stand A, having fire-chamber *f* and hollow grate-bars F, the ends B B, having openings *b a* and

passages *e e'*, the rotating conveyers D D', having oppositely-inclined bottoms, and connecting with the passages *e e'*, the stack E, and fan-blower G, and the feed-hopper H, in combination with the rotating conveyer or cooler D², mounted outside of the casing C, and having perforations *m*, and the pipe M, connecting the cooler with the passage *e'*, substantially as and for the purpose herein described.

6. In a dry gold-separator, the stand A, having fire-chamber *f*, the ends B B, having an opening, *b*, and a valve-door, *a*, and passages *e e'*, and a top opening or valve-door, O, in combination with the rotating conveyers D D', mounted in said ends, the stack E, and the outside casing, C, substantially as and for the purpose herein described.

7. The rotating conveyers D D', in combination with the hinged arms *o* and the weights or hammers *o'*, substantially as and for the purpose herein described.

8. In a dry gold-separator, the rotating conveyers D D' and passages *e e'*, the stack E and fan-blower G therein, and the fire-chamber *f*, in combination with the power-engine P and the pipe U, connecting its stack with the passage *e'*, substantially as and for the purpose herein described.

In witness whereof I have hereunto set my hand.

SALATHIEL C. CHANEY.

Witnesses:

C. D. COLE,
J. H. BLOOD.