

T. W. IRVIN.

Apparatus for Separating Gold from Sand, &c

No. 166,009.

Patented July 27, 1875.

Fig: 1.

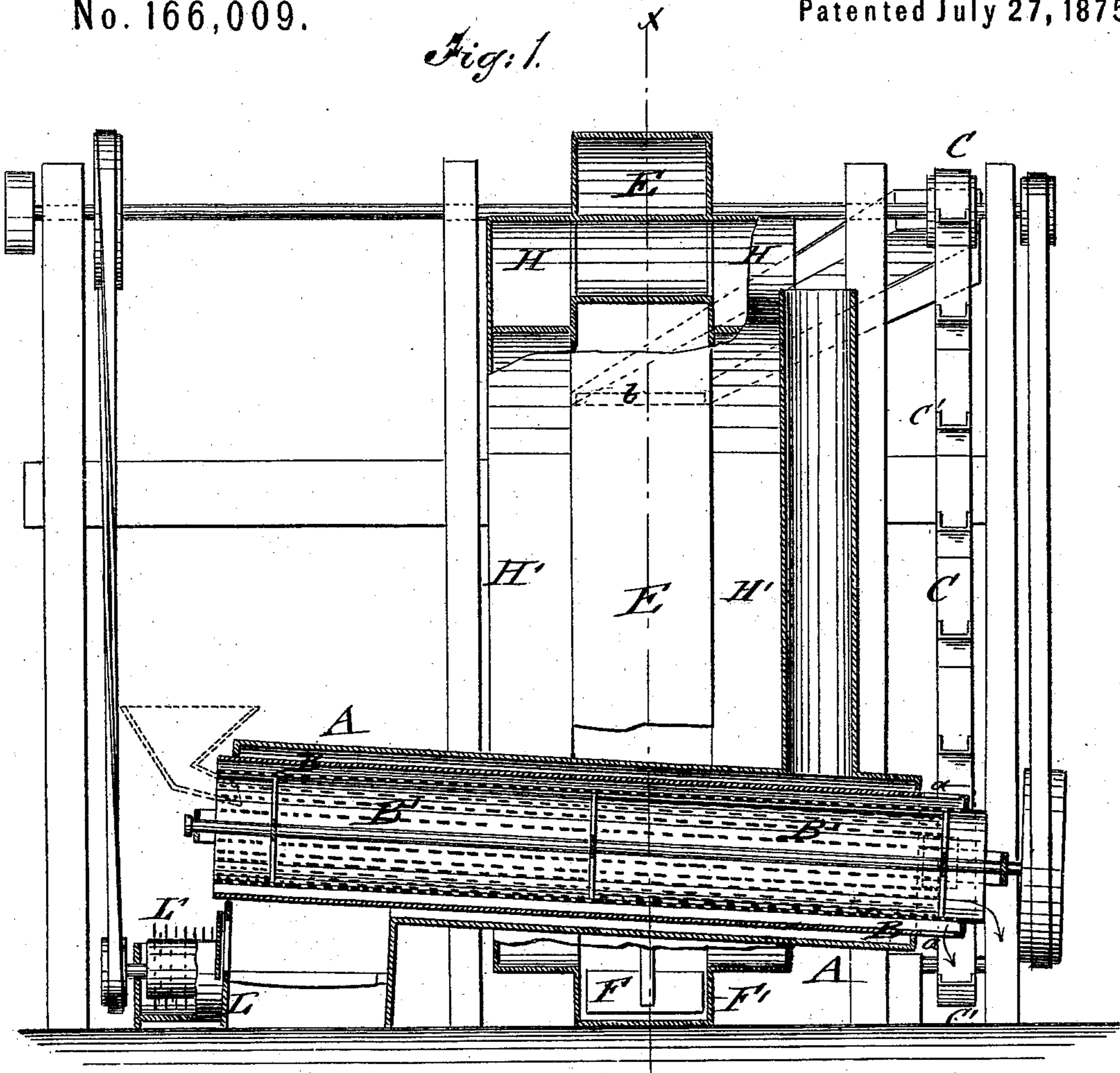
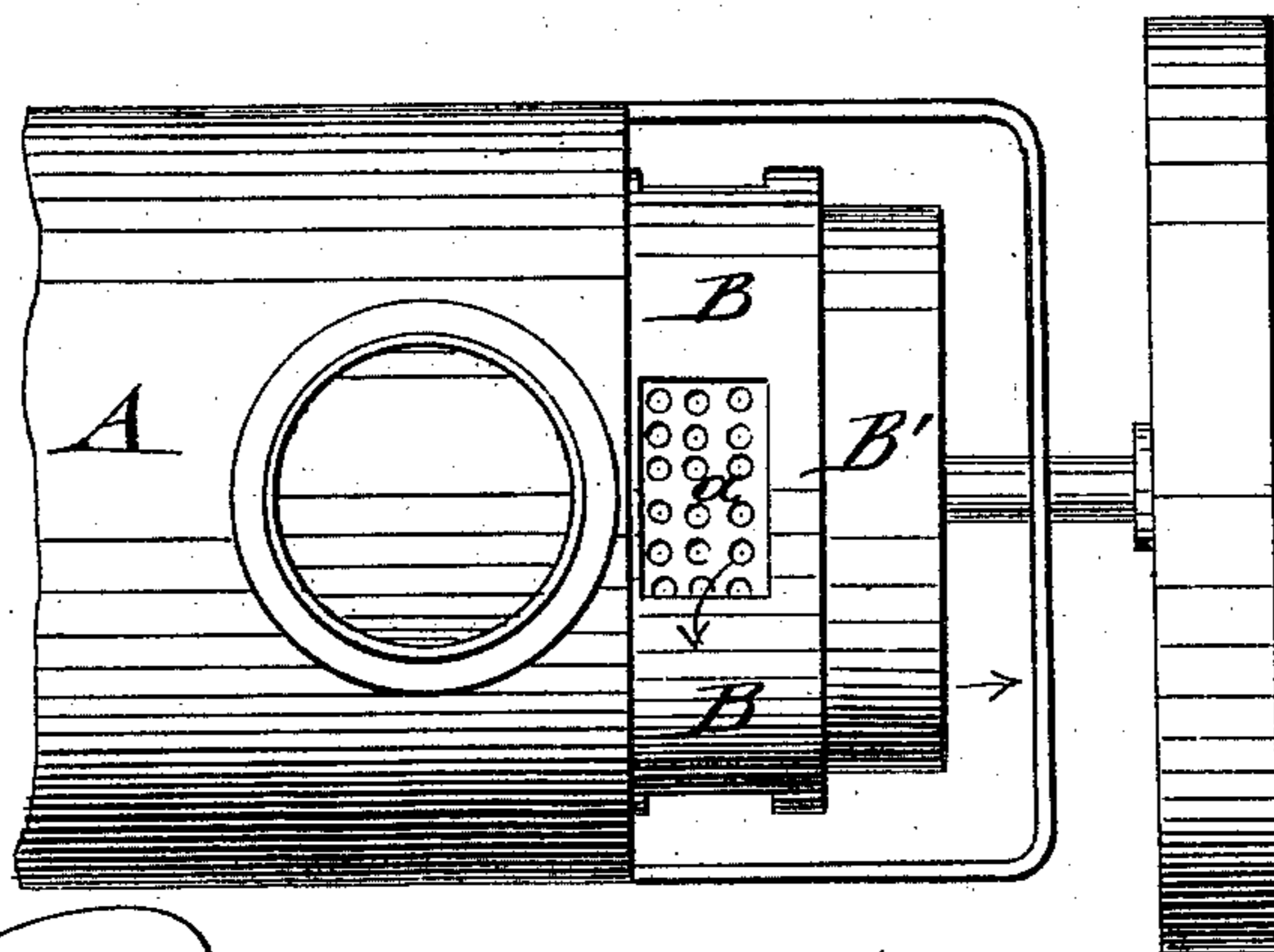


Fig: 2.



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2 Sheets--Sheet 2.

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Fig: 3.

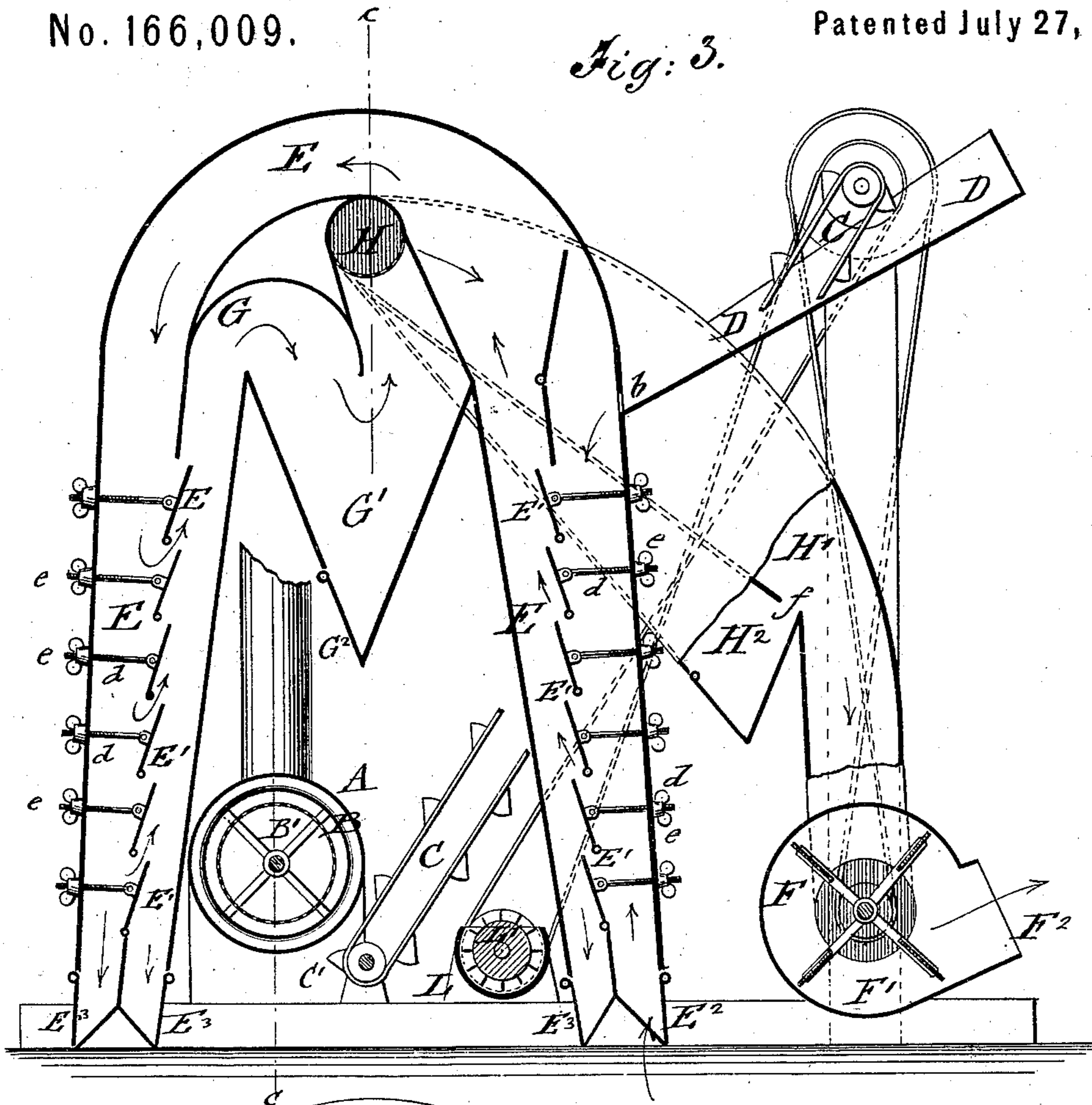
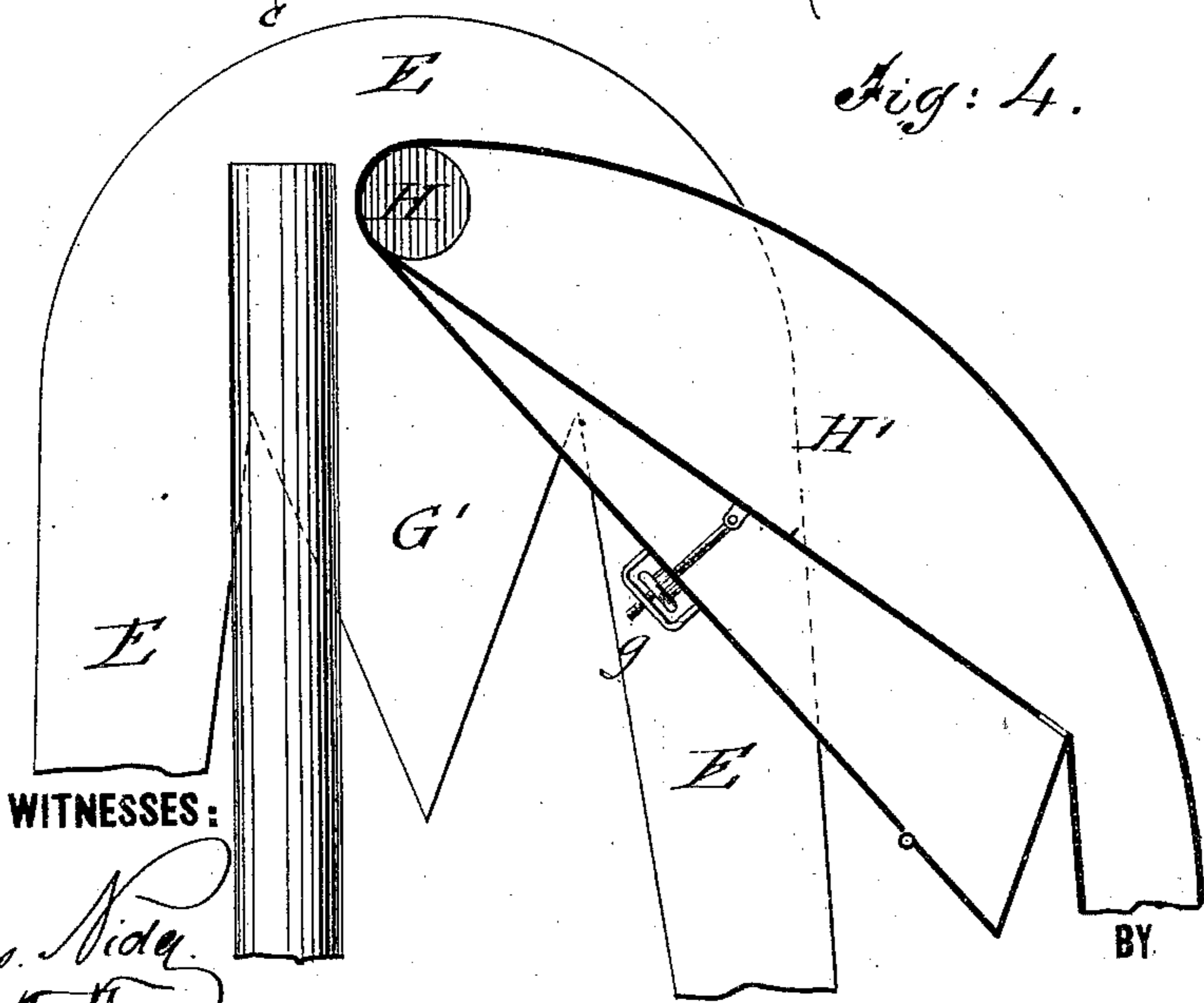


Fig: 4.



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UNITED STATES PATENT OFFICE.

THOMAS W. IRVIN, OF EUREKA, CAL., ASSIGNOR OF ONE-HALF HIS RIGHT
TO ALEX. GILMORE, A. DOLAN, E. BROWN, AND MAURICE F. MOLONEY.

IMPROVEMENT IN APPARATUS FOR SEPARATING GOLD FROM SAND, &c.

Specification forming part of Letters Patent No. 166,009, dated July 27, 1875; application filed
September 19, 1874.

To all whom it may concern:

Be it known that I, THOMAS W. IRVIN, of Eureka, in the county of Humboldt and State of California, have invented a new and Improved Apparatus for Separating Gold from Gold-Bearing Sand, &c., of which the following is a specification:

In the accompanying drawings, Figure 1 represents a front elevation, partly in section, in line *c c*, Fig. 3, of my improved apparatus for separating gold from sand and other substances. Fig. 2 is a detail top view of the revolving drier and separator combined therewith; Fig. 3, a vertical longitudinal section of the apparatus on the line *x x*, Fig. 1; and Fig. 4, a sectional side elevation of the separating sand-conductor.

Similar letters of reference indicate corresponding parts.

The object of my invention is to provide an apparatus for separating gold from sand and other substances, so that the full yield of the gold-bearing sands, &c., is obtained.

My invention consists of suitable apparatus for drying and separating the sand, and conveying the same by an elevator to a system of connected channels and conductors, in which the heavier gold particles are separated from the sand by the current of an exhausting-fan, and the current of air and its force is changed and regulated by adjustable valves, while additional chambers or receptacles collect the finer mixture of gold-dust and sand for transmission to the amalgamator.

In the drawing, A represents a stationary outer cylinder, with fire-box and chimney being placed under suitable inclination, and provided with two interior revolving cylinders, B B', of which the inner one is covered with wire-cloth or perforated sheet-iron, while the larger cylinder is of sheet-iron.

The gold-bearing sand, gravel, or other substance is conducted to the interior cylinder B' by means of a hopper at the front or higher part of the same, so that the sand is sifted in its passage through the cylinders, the coarser matters being retained in the inner cylinder, while the finer particles pass into the outer cylinder B, and are there completely dried by the heat in the incasing stationary cylinder.

The adhesion of the gold and sand particles is thereby destroyed, so that the current of air to which they have to be exposed may act with greater effect thereon.

The gravel or other coarse substance passes from the inner cylinder to some suitable point, to be carried off, while the gold-bearing sand is conducted, by slotted apertures *a* at the projecting lower end of cylinder B, to buckets C' of an elevator, C, which carries the sand up and discharges it into an inclined chute, D. The sand is conveyed into the main separator E from the chute D by a lateral slot, *b*, and is exposed therein to the strong air-current produced by the exhausting or suction fan F. The main separator E consists of two nearly-upright tubular parts, with semicircular connecting top section. A system of lateral pivoted valves, E¹, is arranged in the upright parts of the main separator E, said valves being adjustable from the outside by pivoted rods *d* and screw-nuts *e*, as indicated clearly in Fig. 3, so that the apertures or openings between the valves may be opened or closed, as required, and thereby the force of the current regulated. The descending gold-sand, entering at slot *b* of the main separator, is acted upon by the ascending current of air entering into the main separator through lower valve E², and is thrown violently through the valve-openings. The lighter particles of gold and sand are blown along the top channel to the opposite valve system, while the heavier gold particles settle in the bottom parts of the main separator, and are drawn off by suitable valves E³ of the same. The lighter particles are drawn then in upward direction against a semicircular diaphragm, G, a part thereof settling again in a pointed angular receptacle, G', while the rest passes around diaphragm G, in upward direction, to the cylindrical side-extending channels H, which form the connection with the segmental conductors H', whose vertical end extensions pass down to both sides of the fan-casing F', opening therein, and discharging the sand through the aperture F to the outside. Additional triangular receptacles H² at the lower straight part of conductors H¹ are connected therewith by lateral apertures *f*, and serve, in the same

manner as receptacle G', for the collection of a still finer mixture of gold-dust and sand, which mixture is drawn off by suitable valves of both receptacles into the amalgamator L, to be there finally separated by the revolving stirrer or agitator L', having spirally-arranged teeth or points for working off the sand. The straight part or partition, separating conductor H¹ and receptacle H², is made adjustable by a pivoted guide-bolt and set-screw g, Fig. 4, in similar manner as the valves E¹, so that the position of the same may also be regulated according to the draft and the quality of the gold-bearing sand.

The course of the sand in the main separator and side conductor, as following the suction of the fan, is indicated by arrows in Fig. 3, the fan drier and separator, elevator, and amalgamator being revolved by suitable pulleys and belts from the driving-shaft above the fan.

The successive changes in the direction of the air-current produce, in connection with the gold-collecting receptacles, the nearly-complete extraction of the gold particles, so that a very small, if any, part of the same is lost, and thereby an automatically-working apparatus of great efficacy is obtained.

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

1. The apparatus for separating gold from gold-bearing sands and other substances, composed of a revolving drier and separator, an elevator, an upright main separator, with adjustable valves and segmental side conductors, and a suction-fan, all being combined and operated by suitable motive power, substantially in the manner and for the purpose set forth.

2. The main separator E, consisting of upright parts, with pivoted adjustable valves E¹ and bottom valves E² E³, connected by a rounded-off top part, substantially as specified.

3. The inner semicircular diaphragm G and angular receptacle G' below the same, in combination with conducting-channels H, as shown and described.

4. The main separator E, in combination with segmental conductors H¹, by upper side extending channels H, as described.

5. The segmental conductors H¹, provided with triangular receptacle H² and adjustable partition, for the purpose of collecting a still finer mixture of gold and sand for amalgamation, as described.

THOMAS W. IRVIN.

Witnesses:

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