T. W. IRVIN.

AMALGAMATING APPARATUS.

No. 179,562. Patented July 4, 1876.

Fig: 1.

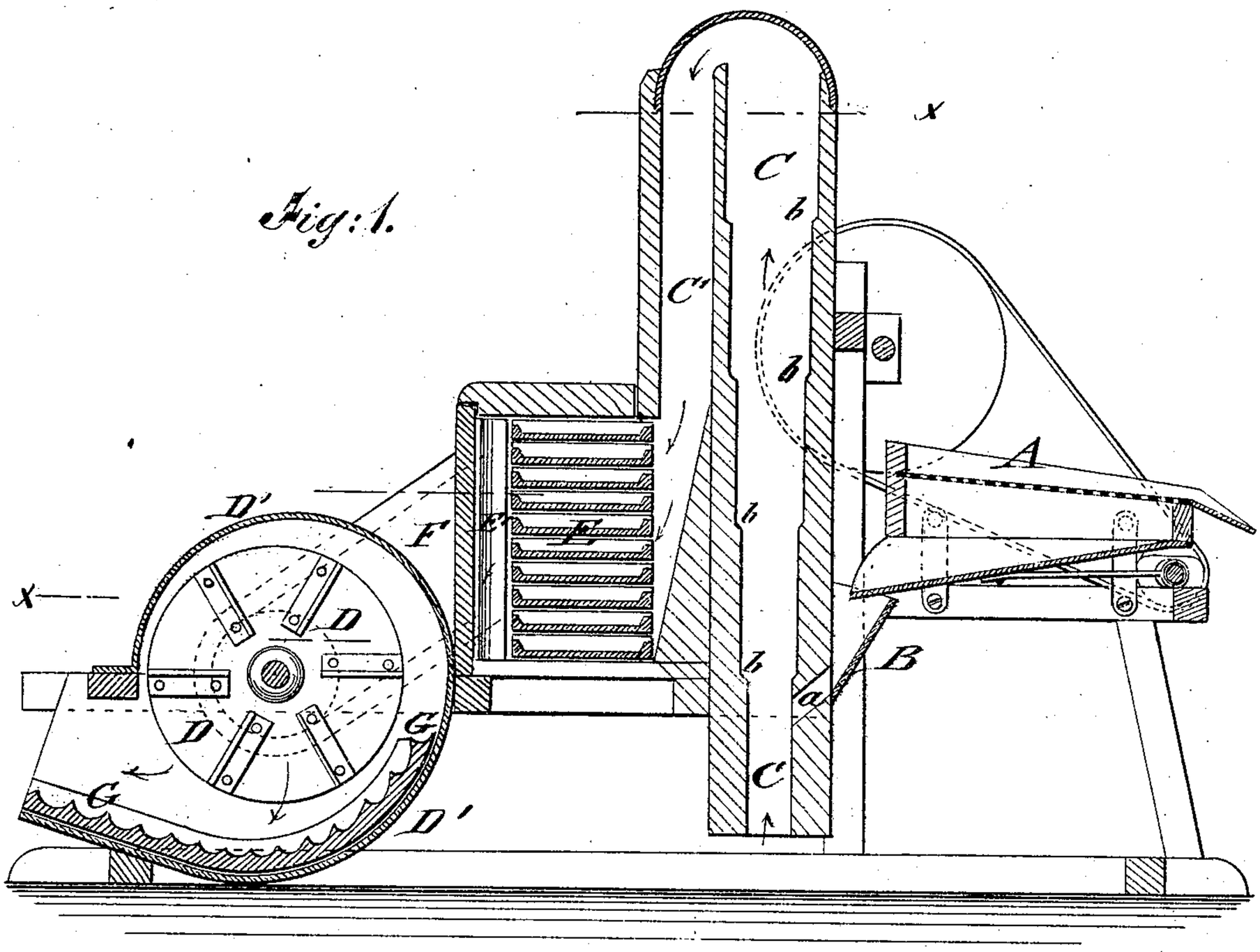
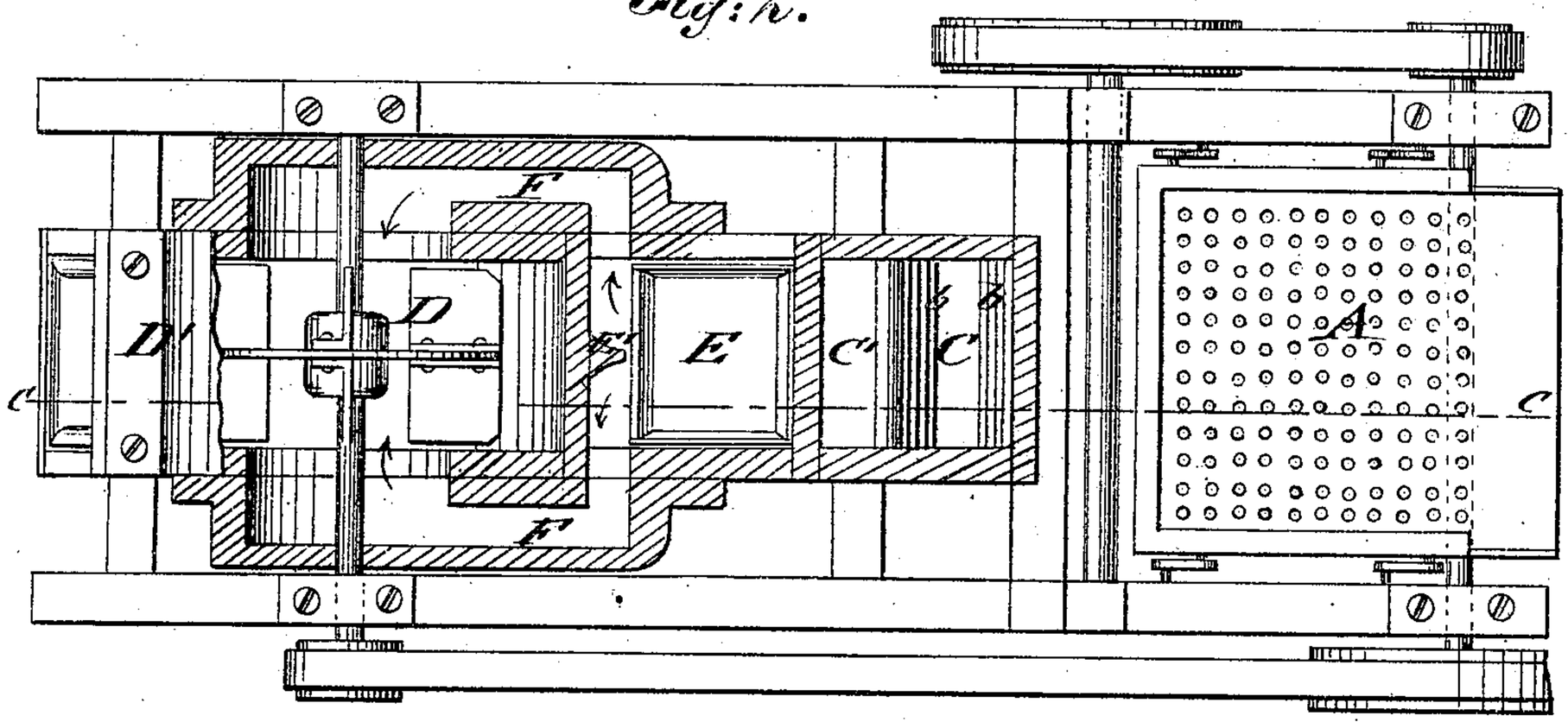


Fig: 2.



WITNESSES:

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THOMAS W. IRVIN, OF PORT MADISON, WASHINGTON TERRITORY.

IMPROVEMENT IN AMALGAMATING APPARATUS.

Specification forming part of Letters Patent No. **179,562**, dated July 4, 1876; application filed March 6, 1876.

To all whom it may concern:

Be it known that I, THOMAS W. IRVIN, of Port Madison, in the county of Kitsap and Territory of Washington, have invented a new and Improved Apparatus for Separating Gold from Sand, &c., of which the following is a specification:

In the accompanying drawing, Figure 1 represents a vertical longitudinal section on the line *c c*, Fig. 1, of my improved apparatus for separating gold from sand, &c.; and Fig. 2 is a horizontal section of the same on the line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts.

My invention relates to an improved apparatus for separating gold from sand and other impurities by means of a suction-blast; and it consists of a reciprocating screen feeding the gold-bearing sand to a vertical suction-tube, which is provided with inclined steps, and connected by a semicircular top and a downward-extending tube to amalgamating-pans, over which the sand is drawn, passing through side ducts to the fan-casing, and over a fluted bottom pan of the same to the outside.

In the drawing, A represents a reciprocating shaker or screen, on which the gold-bearing sand is placed. The screen is set in motion by belt-and-pulley connection with the driving-shaft, and inclined to the outside to carry off the larger pieces, as gravel, small pieces of gold, clods of dirt, &c. The screen may be changed to a greater or lesser degree of fineness, according to the quality of the material to be worked off.

The bottom of the screen is inclined in opposite direction to the perforated part, and conveys the material into a hopper or mouth, B, of the upright suction-tube C, from where it passes through an aperture, *a*, into the lower part of the same to be acted upon directly by a suction-blast from below, the blast being created by a suction-fan, D, arranged at the other side of the suction-tube. The air enters through the open bottom end of the suction-tube, which is made with inclined steps *b*, that produce the gradual widening of the tube toward the top end, as shown in Fig. 1. These steps or offsets serve to throw the sand, dirt, or other substances that slide down at the side of the tube, back into the current of air to be acted upon and carried in upward direction.

The heavier gold particles drop down into a suitable receptacle below the bottom opening of the suction-tube, while the lighter ones pass with the sand along the semicircular top part of the tube, and over the partition-wall into the downward-extending tube *c'*, that conveys the sand, in connection with a steeply-inclined bottom, to a series of amalgamating-pans, E, that are arranged one on top of the other.

The pans E are filled with quicksilver, and placed so close together that the total width of the narrow spaces or interstices between the pans is equal to the width of the entrance-opening of the suction-tube, so that the gold-bearing sand is carried with considerable power through the spaces between the pans, the fine gold particles being absorbed by the passage in close proximity, and the affinity to the quicksilver.

A central tapering partition-strip, E', at the opposite side of the pans, divides the current and conveys the sand sidewise through the side ducts F to the center of the suction-fan, from where the same is thrown by centrifugal power on a curved and tangential fluted pan, G, at the bottom of the fan-casing D'. The remaining particles of gold are amalgamated in the fluted pan, and the light impurities thrown to the outside of the casing. Thus the gold particles are separated in their course through the apparatus, the heavier ones being dropped in the suction-tube, while the lighter ones are amalgamated in the pans, and the remaining ones, that are mechanically carried along, in the fluted pan at the mouth of the fan-casing.

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

1. An apparatus for separating gold from sand and other impurities, consisting of a reciprocating feeding-screen, a vertical upward and downward extending suction-tube, a series of amalgamating-pans, communicating side ducts, a suction-fan, and a curved and fluted amalgamating-pan at the bottom and mouth of the fan-casing, all arranged and op-

erating substantially in the manner and for the purpose set forth.

2. The combination of the vertical suction-tube and downward-extending tube, having inclined bottom, with a series of amalgamating-pans placed one above the other, to pass the gold sand in close proximity to the quicksilver for extracting the finer particles by amalgamation, substantially as specified.

3. The combination, with the suction-fan, of a curved and fluted amalgamating-pan at the bottom and mouth of the fan-casing, for extracting the finer gold particles carried along by the current, substantially as set forth.

THOMAS W. IRVIN.

Witnesses:

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