

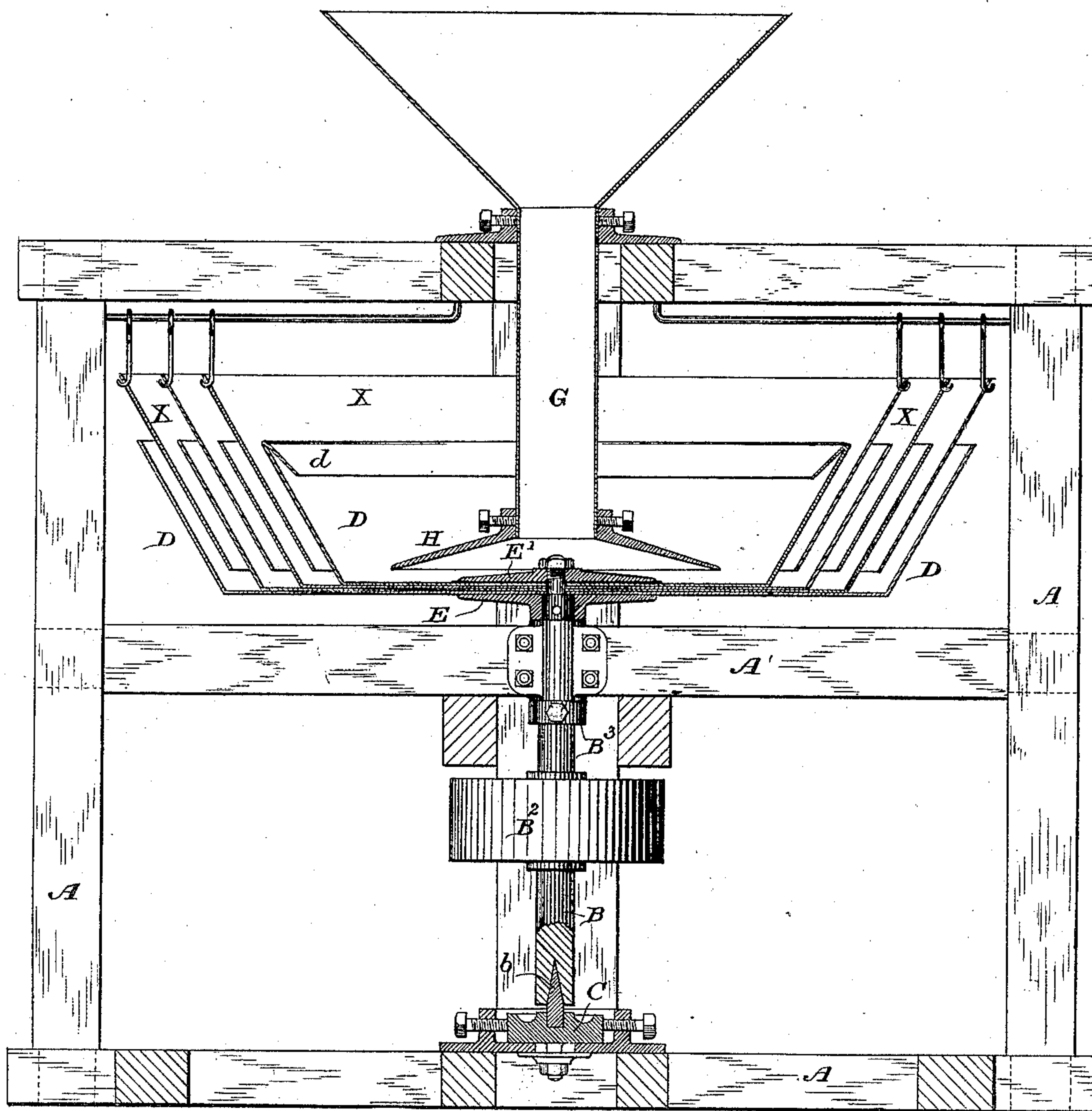
(No Model.)

H. McDOUGALL.

AMALGAMATOR.

No. 301,253.

Patented July 1, 1884.



WITNESSES

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INVENTOR

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UNITED STATES PATENT OFFICE.

HUGH McDOUGALL, OF DENVER, COLORADO.

AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 301,253, dated July 1, 1834.

Application filed August 4, 1883. (No model.)

To all whom it may concern:

Be it known that I, HUGH McDOUGALL, of Denver, in the county of Arapahoe and State of Colorado, have invented an Improved Centrifugal Amalgamator, of which the following is a specification.

The object of my invention is to separate gold from placer, sand, crushed ore, and other finely-divided material by means of a rotary apparatus in which the centrifugal force generated causes the material being operated upon to pass in an up-and-down sinuous course over a series of amalgamated surfaces.

In the accompanying drawing, which is an elevation partly in section through my improved machine, A is the main frame, which may be constructed, as illustrated in the drawing, of beams of timber, or may be made of iron and braced or strengthened in any suitable way. An upright driving-shaft, B, is provided with a hardened steel spindle, *b*, which has its bearing in a hardened steel step, C, which may be adjusted, in the usual manner, by screws. The upper bearing of the shaft is in one of the cross-beams A' of the frame, and is preferably an ordinary babbitted bearing. A collar, B³, is placed on the shaft below its upper bearing, to prevent endwise movement. The shaft is shown as provided with a driving-pulley, B², but may be actuated by gearing or driven in any suitable manner. On the upper end of the shaft is carried a nest or series of pans, D, placed one within the other, the difference in diameter between the adjoining pans, which is preferably about two inches, leaving a suitable space between the sides of the pans. These pans are slipped on the reduced or turned end of the spindle, and are firmly clamped between a flanged collar, E, secured on the end of the shaft and a clamping collar or plate, E', which is firmly drawn down by a nut on the reduced end of the shaft. The sides of the pans are inclined, as shown; but the degree of the inclination may be varied within wide limits. In the spaces between the inclined sides of the pans are suspended correspondingly-inclined circular plates X, the bottom edges of which are about an inch (more or less) from the bottoms of the pans. The pans and plates, which are preferably of the same material, may be made of

tin, copper, brass, or other suitable metal, and are amalgamated on their inner faces. In operation a small quantity of mercury is placed in the inner pan, and the centrifugal force generated by the revolution of the shaft will cause the mercury to be distributed over the side of the pan and to rise to its edge. To prevent its passing over the top, however, a small guard-flange, *d*, is placed upon the rim of the vessel. The feed-pipe G is adjustably held in a bearing in the upper part of the frame, so that it may be raised and lowered. Its upper end is provided with a funnel or hopper, and a flanged collar, H, is adjustably secured upon its lower end by set-screws. This collar H may be formed of cast-iron or other suitable material, and is amalgamated on its under face. This flange is about three inches less in diameter than the bottom of the inner pan, and can be so adjusted as to leave but a small space between its lower edge and the bottom of the pan. In operation the pans are revolved at a suitable speed by the rotation of the shaft B, and the material from which the gold is to be separated is fed through the pipe G. As the pans rotate, the sand and such light gold as has not been amalgamated will pass up over the guard-flange on the pan, and, striking against the first suspended plate, will roll down its amalgamated surface, depositing more of its light gold on that surface, to the bottom of the second pan, and up over the amalgamated face of the second pan, down the amalgamated face of the second plate, and so on. The heavy particles of gold will be retained in the first pan, or in the succeeding ones should they escape from the first. The material thrown from the outer pan may fall into suitable receptacles and be carried away. The gold is recovered from the amalgam and amalgamated surfaces in the ordinary way.

The details of the machine are so simple as to be readily understood without more specific description.

Obviously the structure may be varied without departing from the method of operation here indicated, which is the main feature of the invention.

I claim as my invention—

1. The improvement in the method of dry-separating gold, which consists in causing the

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material to be passed in an up-and-down sinuous course over a series of amalgamated surfaces by the centrifugal force generated by the rotation of the apparatus.

5 2. The improvement in the method of dry-separating gold by amalgamation, which consists in feeding the material to be operated upon into a central pan or receptacle containing mercury, and then, by the centrifugal force
10 generated by the rotation of the pan, causing the material being operated upon to pass up to and over the edge of the rotating vessel, and so on into and out of a series of concentric amalgamated vessels, as set forth.

15 3. The combination, substantially as set forth, of the driving-shaft, the nest of pans or receivers having inclined sides, and the inclined plates suspended in the spaces between the pans.

20 4. The combination, substantially as set forth, of the driving-shaft, a nest of pans or receivers rotated by the shaft having inclined sides, the inclined plates suspended in the

openings between the pans, and a guard-flange on the inner pan.

25 5. The combination, substantially as set forth, of the frame, the driving-shaft, a central pan or receiver, and a series of inclined partitions which form a series of concentric chambers or spaces around said central pan, 30 through which the material operated upon is caused to pass by the centrifugal force generated by the rotation of the apparatus.

6. The combination, substantially as set forth, of the frame, the driving-shaft, the cen- 35 tral pan or receiver, the series of concentric chambers or spaces, the feed-pipe which extends down into the central pan, and the flanged collar on the end of the feed-pipe.

In testimony whereof I have hereunto sub- 40 scribed my name this 31st day of July, A. D. 1883.

HUGH McDOUGALL.

Witnesses:

SETH P. BUELL,

JACOB W. JENKINS.