

(No Model.)

W. L. BROWN.
AMALGAMATOR.

No. 591,587.

Patented Oct. 12, 1897.

Fig. 1.

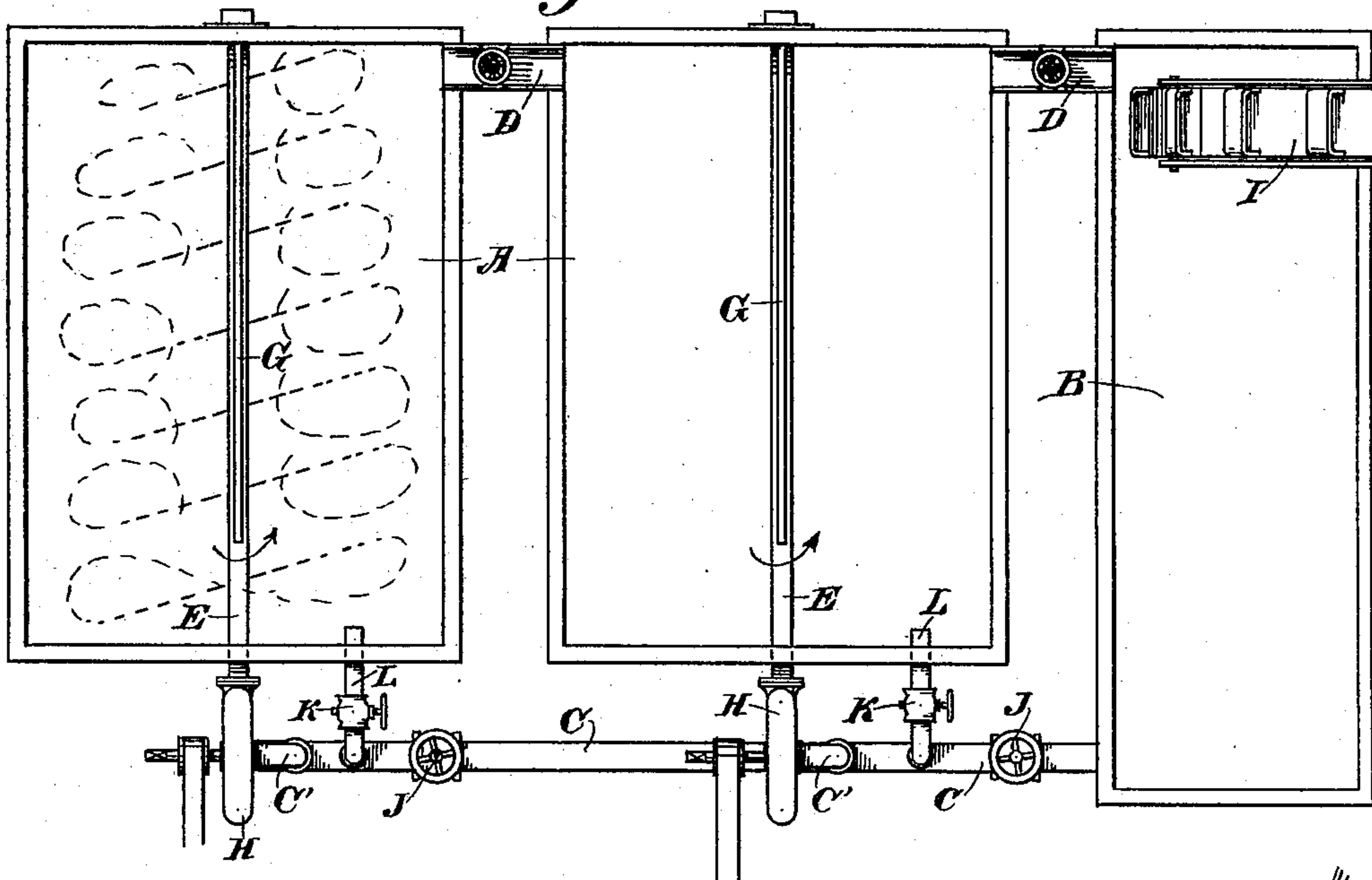


Fig. 2.

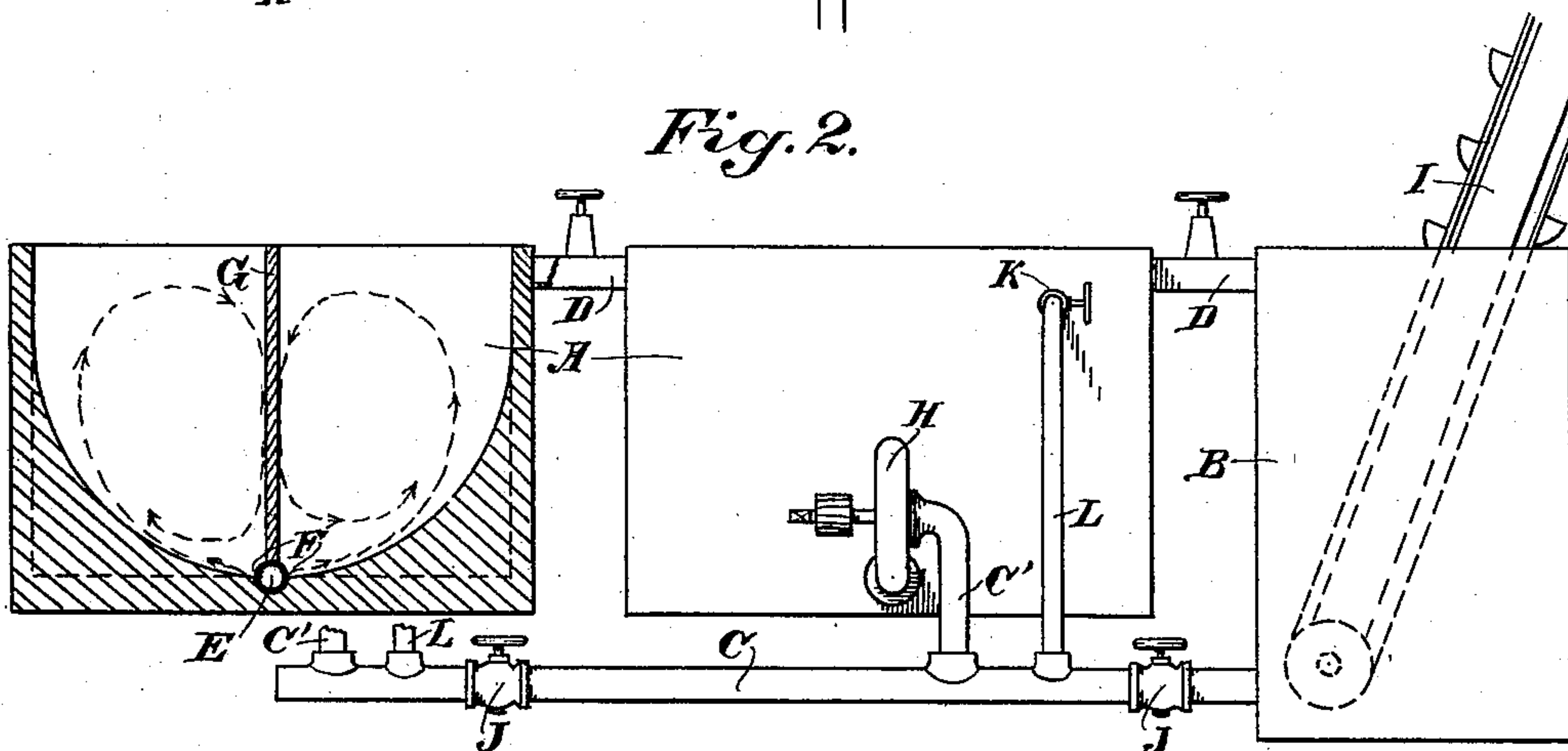
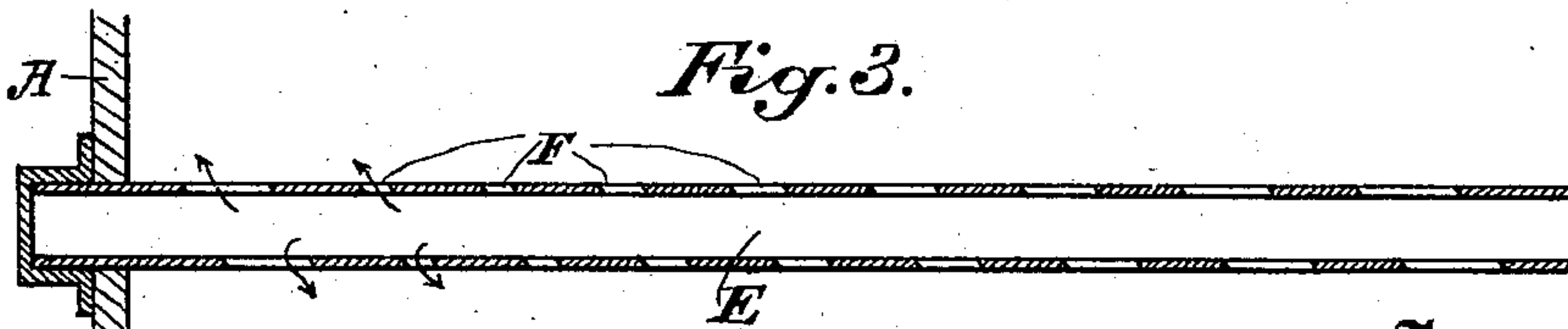


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILFRED L. BROWN, OF SAN FRANCISCO, CALIFORNIA.

AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 591,587, dated October 12, 1897.

Application filed January 29, 1897. Serial No. 621,193. (No model.)

To all whom it may concern:

Be it known that I, WILFRED L. BROWN, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Amalgamators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an amalgamating apparatus for recovering and saving precious metals contained in ores.

The object of the invention is to provide means whereby the ores after being properly pulverized are immersed in a solution placed in a tank, so as to constitute a pulpy or fluid mass, and this mass is caused to circulate with a rotary motion through one or more tanks or troughs by means of suitable mechanism, so that it is continuously caused to impinge upon amalgating plates or surfaces within the tank or tanks.

It consists in certain details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a plan view showing the series of amalgamators and a receiving and supply tank common to the amalgamators. Fig. 2 is an end elevation showing a transverse section of one of the tanks. Fig. 3 is an enlarged section of one of the circulating-pipes.

This invention is an improvement upon a device for which patent was issued to myself and Calvin Brown December 1, 1896, No. 572,353.

In the present case I have designed a continuous apparatus which consists of two or more amalgamating-chambers A and a receiving and supply tank B, which is connected so as to supply the amalgamators through a pipe C and to receive the return of the circulating material by pipe D.

The amalgamators A are made with segmental or prismoidal shaped or sloping sides which upon the interior are formed into tangentially-curved surfaces terminating near the bottom of the tank at the center.

The ends of the tanks may be made vertical. Through the center and along the bottom of these amalgamating-tanks are pipes E, having inclined slots or openings F made through the opposite sides for a purpose to be

hereinafter described. Above these pipes and resting upon them are longitudinal partitions G, which reach to the tops of the tanks and extend from one end to a point near the other, leaving an open space between the end of the partition and the end of the tank, through which the material is allowed to pass from one side to the other, as shown by the arrows in Fig. 1.

The pulpy material is delivered from any suitable source of supply into the first of the amalgamating-tanks A, and water is supplied through the tank B, which is long enough to allow the heavier sediment which is returned to it through pipes D to settle near the inlet end, from which it is removed by an elevator I. Each of the amalgamating-tanks C is provided with a pumping apparatus, shown in the present case as a centrifugal pump H, but it may be of any other suitable or desired form. This pump is connected with the pipe C in each case by a branch C', and the supply passing through the pipe C is sufficient for all of the tanks if all are to be used together. If it is desired to use them successively, connection with either of the tanks may be cut off and the material allowed to pass to the one most distant from the tank B.

The pulp is forced into the tanks through the pipes E, as previously described, and passing out upon each side through the inclined slots F it strikes against the interior curved amalgamated surfaces tangentially, and also is so projected by means of the inclined slots as to have a spiral movement at the same time. The pulp thus discharged strikes against the concaved surfaces, and by the centrifugal action slides or follows up the interior curvature with a continuous pressure upon such surfaces, which, in conjunction with the spiral movement induced by the position of the slots or openings F, makes a very effective amalgamating action upon such particles of valuable ore or material as may be contained in the pulp. This spiral movement, which is indicated in dotted lines in Figs. 1 and 2, takes place in each of the chambers of the amalgamating-tanks upon opposite sides of the partition G, and the surplus material flows from one side to the other through the space at the end of the partition and is continuously subjected to the spiral ro-

tary action in both chambers until it reaches the discharge end, thence passing through the pipe D into the next amalgamator, where it is subjected to the same action in conjunction with the material which is injected through the pipe E of that amalgamator, the whole mass being again revolved in contact with the amalgamating-plates of the second amalgamator, passing gradually around the end of the partition of that one, and thence through the pipe D to the next succeeding one until the pulp has passed through all of the series of amalgamators which it may be found desirable to employ, the gradually-increasing quantity being delivered through pipes of larger capacity, if found necessary, so as to eventually flow into the receiving-tank B, the water returning again through the pipe C and thus being circulated as long as may be found desirable. The heavy sediment settles near the inlet to the tank B and is removed by an elevator I.

If either of the amalgamators is to be operated independently, connection between the tanks and with the supply-tank B is shut off by means of cocks or gates J, and cocks K in the pipes L are opened, so that the circulation takes place through the pipes E, thence returning from the top to the bottom through the pipes L C' and pump into the pipes E again.

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

1. In an amalgamator, one or more tanks having curved sides and amalgamating-plates fitted thereto, a pipe extending axially between the lower edges of the plates having inclined perforations made therein, a vertical partition extending upwardly from the pipe and from one end of the tank to a point near the other leaving an open channel at this end, a device whereby pulp may be impelled through the angular openings of the pipe whereby it is caused to impinge against the

amalgamating-plates upon each side of the partition with a spirally-revolving movement in each of the chambers, a discharge-passage leading from one of said chambers to a succeeding settling-tank through which the circulation may be continued.

2. In an amalgamator, one or more amalgamating-tanks having curved amalgamating-plates in the bottom, a centrally-located pipe extending longitudinally through the lower part of the tank having oppositely-inclined openings upon its opposite sides, a vertical partition extending upwardly from the pipe and extending from one end of the amalgamating-chamber to near the other, whereby the material is allowed to pass from one side to the other of the partition, a settling-tank connecting with the amalgamating-tanks, intermediate forcing mechanism by which the material is forced through the perforated pipes of the amalgamators and given a spirally-revolving motion in each of the chambers, connecting-pipes whereby the surplus material flows successively from one amalgamating-chamber to the next of the series, and thence returns to the supply-tank whereby a continuous circulation of the material is produced through the entire apparatus.

3. In an amalgamator, a series of amalgamating-tanks with connecting-pipes, central longitudinal partitions and circulating-pumps as shown, intermediate gates by which the tanks may be isolated from each other, and pipes extending from the main circulating-pipes to the upper parts of the tanks, with controlling-gates, whereby an independent circulation may be induced in each of the tanks.

In witness whereof I have hereunto set my hand.

WILFRED L. BROWN.

Witnesses:

S. H. NOURSE,

JESSIE C. BRODIE.