

No. 672,739.

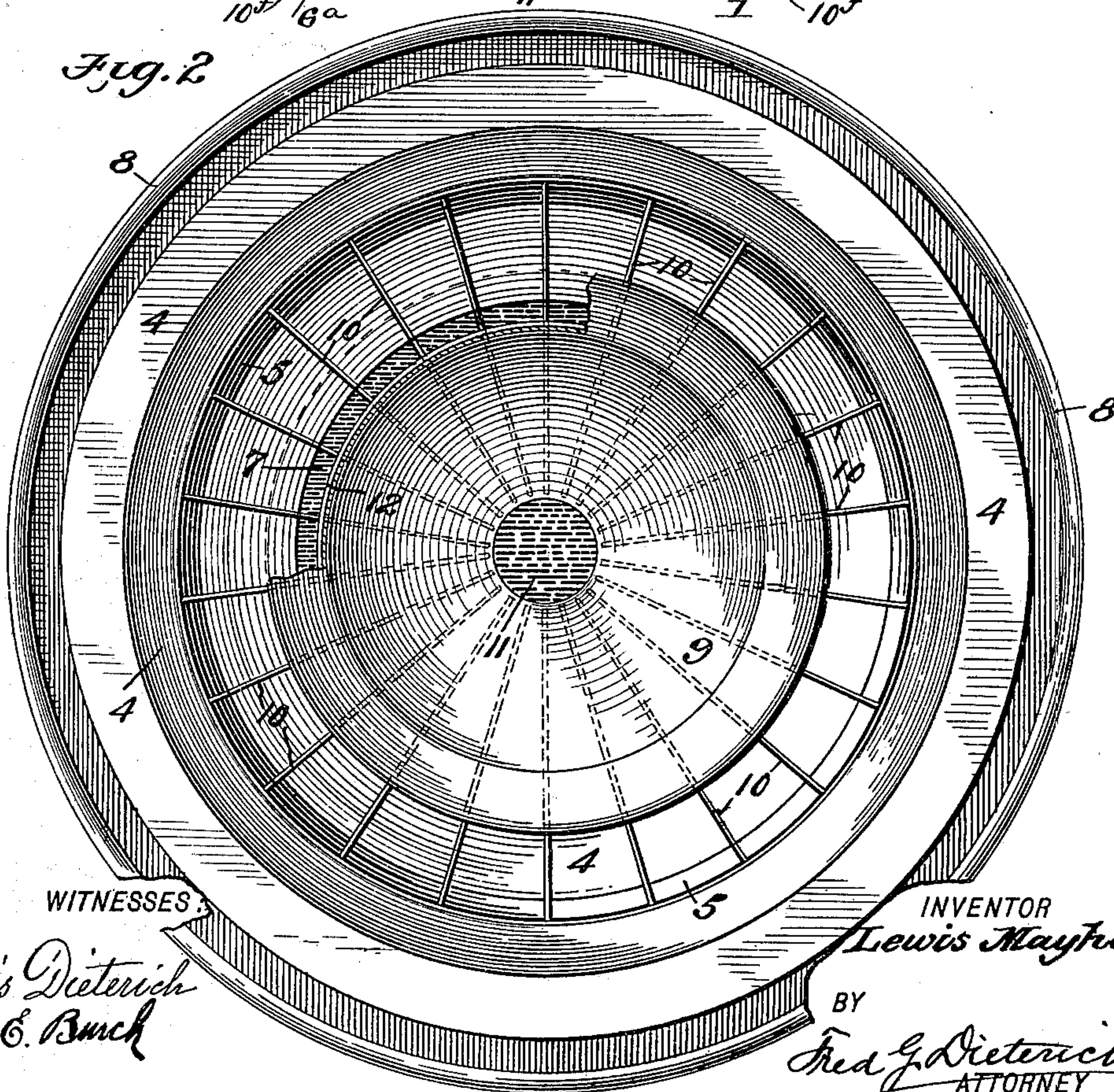
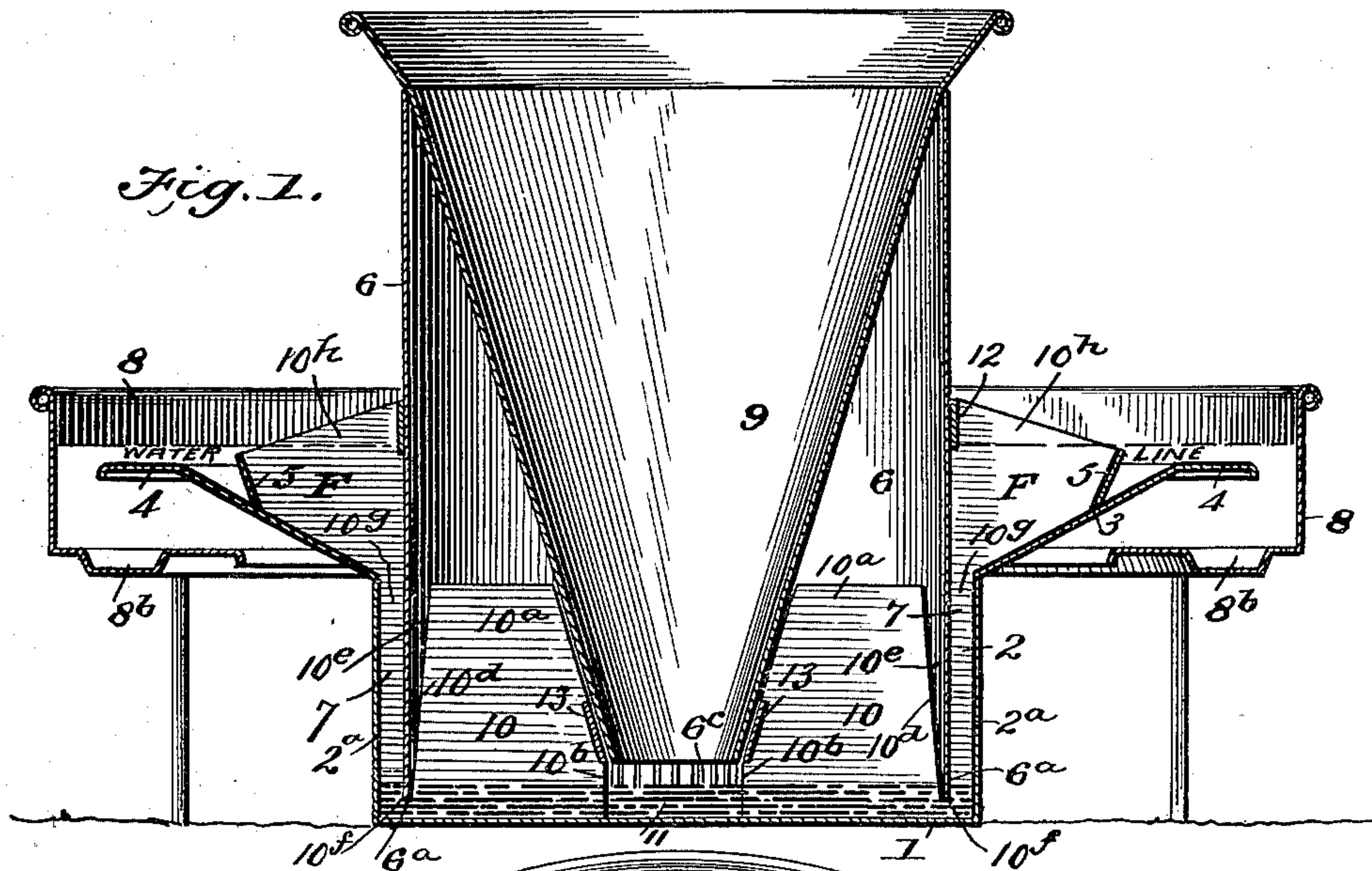
Patented Apr. 23, 1901.

L. MAYHEW.
AMALGAMATOR.

(Application filed Apr. 16, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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No. 672,739.

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L. MAYHEW.
AMALGAMATOR.

(Application filed Apr. 18, 1900.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 3.

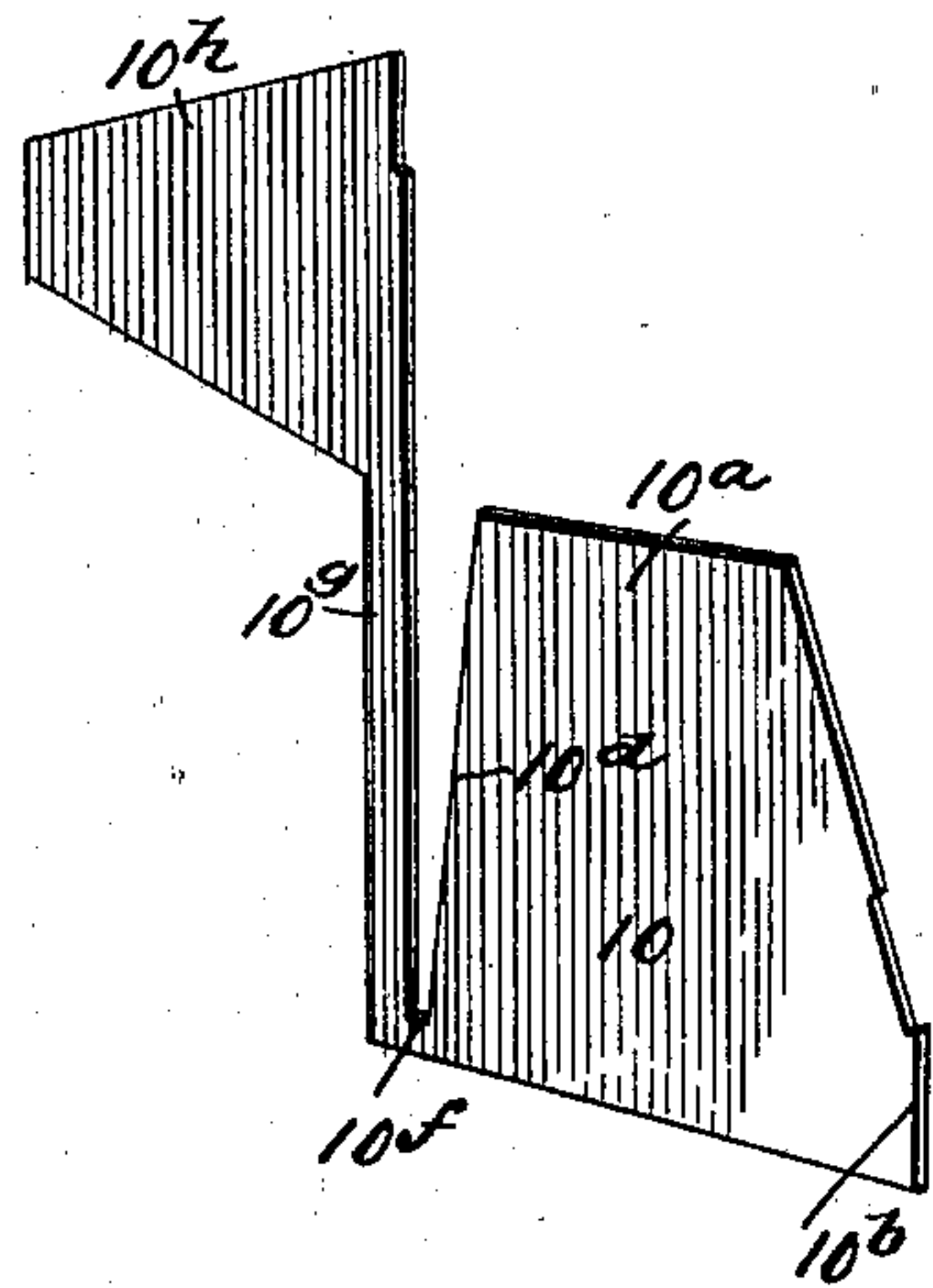


Fig. 4.

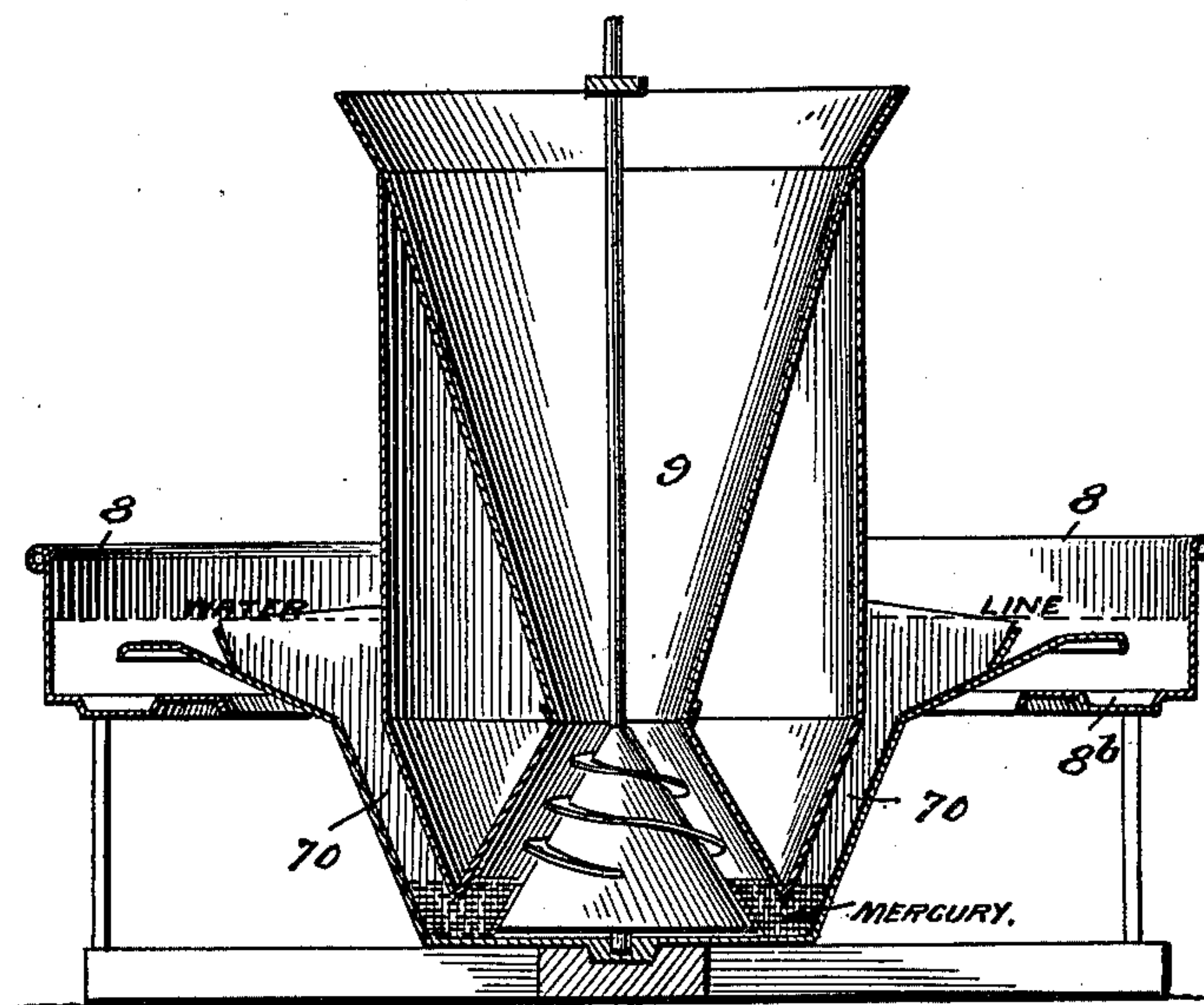


Fig. 5.

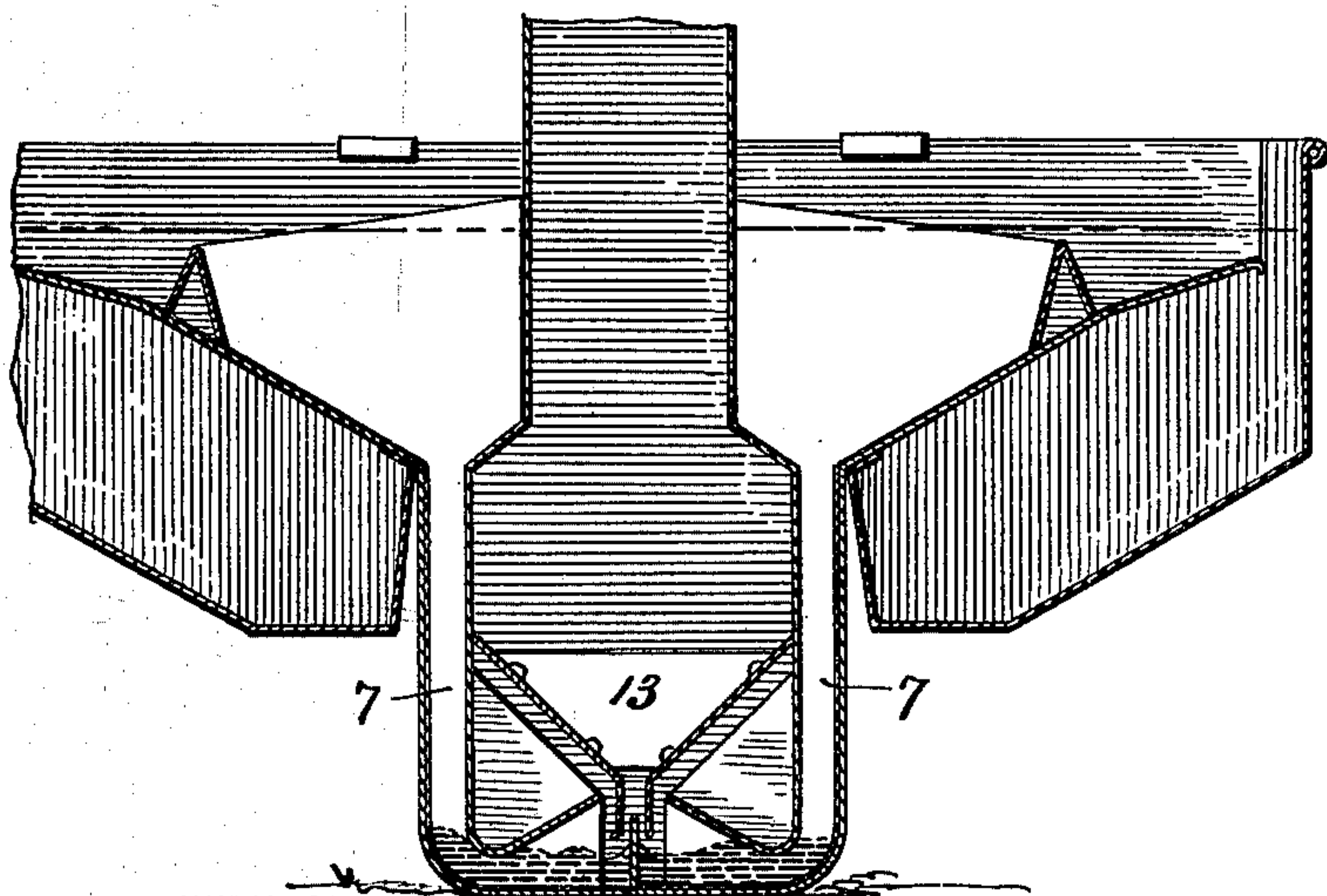
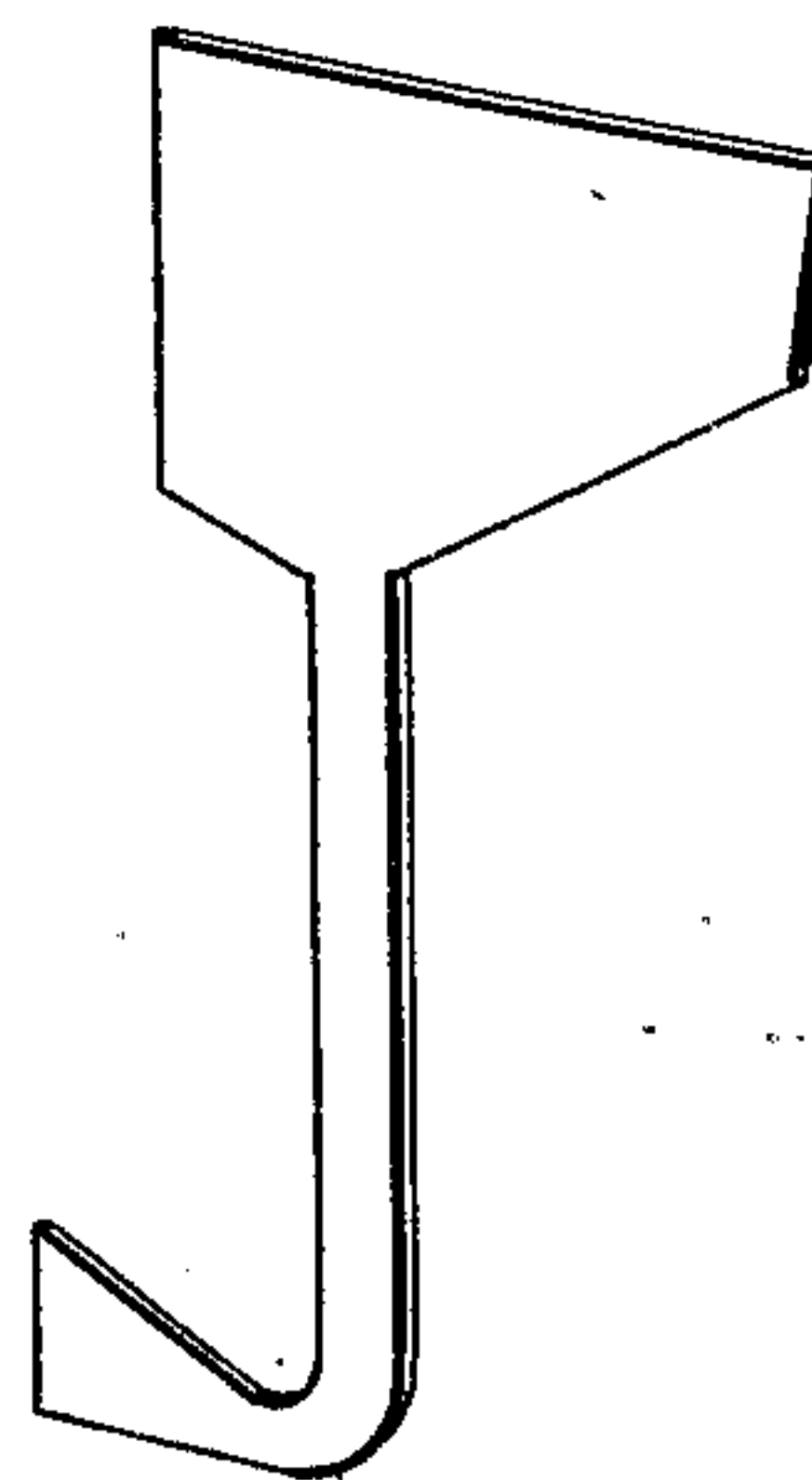


Fig. 6.



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UNITED STATES PATENT OFFICE.

LEWIS MAYHEW, OF NEW WHATCOM, WASHINGTON, ASSIGNOR TO
SANFORD B. MAYHEW, OF SAME PLACE.

AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 672,739, dated April 23, 1901.

Application filed April 16, 1900. Serial No. 13,097. (No model.)

To all whom it may concern:

Be it known that I, LEWIS MAYHEW, residing at New Whatcom, in the county of Whatcom and State of Washington, have invented
5 a new and Improved Amalgamator, of which the following is a specification.

This invention relates to improvements in amalgamators, and particularly refers to that class in which the auriferous material is
10 passed through a mercury-holding well and in which the concentrates are subjected to a panning process.

Primarily my invention has for its purpose to provide a simple and inexpensive apparatus for successfully recovering the precious material from the black sand or other gold-holding material and which can be readily manipulated and employed in connection with any of the ordinary forms of sluice-boxes or
20 stamp-mills.

In the class of amalgamators referred to it has been a common expedient to provide an amalgamator pan or well into which the auriferous material is fed, which after it is passed
25 through the mercury held in the bottom of the well is carried up through narrow passages and discharged unto amalgamator enlargements, over which the mixed ore and water whirls and where the said material receives a panning process before the water passes off to the discharge. The most serious objection encountered in this class of amalgamators is that as the passage from the base of the mercury-well to the enlarged or panning spaces
30 of the machine is usually a continuous one—that is, one uninterruptedly extending the full length of the machine—such passages are usually of such a contracted character that the sand is caused to boil up in the said passages and concentrate the water force in one or two places, at such places causing it to throw the quicksilver. Furthermore, I have found that when such boiling actions have taken place the sand leaves the center of the
40 water and expands sidewise, which causes it to bank very heavily on the rest of the quicksilver, and thereby causes great trouble. To overcome these objectionable actions in amalgamators of the kind stated is an essential
45 feature of my present invention, which comprehends generally a series of division-plates adapted to be operatively connected with

amalgamator-machines involving the general structure above referred to, which will tend to break up the water-current and auriferous material as it passes from the discharge end
55 of the hopper into the mercury into a series of clearly-defined portions, all of which receive a like treatment as they pass through the machine, and which are so reduced in area
60 as to make the boiling actions within the passages from the bottom of the well to the panning-spaces impossible, and also thereby the more positively cause the concentrates to have a whirling or panning action after they leave
65 the said passages.

Another object of this invention is to provide a simplified construction of apparatus in which partition-plates are provided for the purposes stated—that is, preventing boiling
70 within the passages to the pan or pans—and in which supplemental partition members are also provided for breaking up the bulk of the current, sand, or other gold-bearing particles before they enter the said passages.

Again, this invention embodies a novel form of partition-plate having a main portion that fits the vertically-disposed passages and an integral supplemental portion that projects into the well of the apparatus.

In its subordinate features this invention consists in certain details of construction and novel arrangement of parts, all of which will be first described in detail and then specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section of a common form of amalgamator of the class described to which my improvements are applied. Fig. 90 2 is a plan view of the same. Fig. 3 illustrates one of the division-plates used in the forms shown in Figs. 1 and 2 detached. Fig. 4 is a view of a slightly-modified construction of amalgamator, which, however, involves the same general features of the other form illustrated, to which my improvements are applied. Fig. 5 is a view of a still further modification, the same showing an elongated or non-circular pan or body. Fig. 6 is a detail
95 view illustrating one set of main and supplemental partition members such as are used in the form of amalgamator illustrated in Fig. 5.

Referring now to the accompanying draw-

ings, and more particularly to Figs. 1 and 2, which illustrate a type of amalgamator commonly known as the "A. B. B." amalgamator, 1 indicates the pan, made annular and with a central pendent portion or well 2, that has vertical side walls 2^a, the upper ends of which terminate at the inner edge of the pan proper, 3, over which concentrates are passed and whirled before the current passes off to the discharge or overflow rim 4, the panning-surfaces ending, as it were, at an annularly-disposed peripheral rim 5. Within the well is fitted a vertically-arranged cylindrical body 6 on a less diameter than the well and which is held with its upper edge 6^a slightly above the bottom of the well, but sufficiently near the bottom to enter the mercury contained therein, the purpose of thus extending the lower end of the cylinder being to provide a contracted space 6^c, through which the current, together with the material carried out therewith, is made to pass as it enters the vertically-disposed annular contracted passage 7, formed between the outer wall of the well and the cylinder 6.

8 indicates the overflow-collecting trough, that extends annularly under the discharge or overflow rim 4, and to collect any auriferous particles that are carried off with the current said trough has a dished annular pocket 8^b, which preferably is silver-coated, to arrest the precious metal as it falls thereon.

9 indicates the feed-hopper, which is in the nature of an inverted cone and which has its lower or apex end discharging into the bottom of the mercury-well, centrally thereof, but preferably at a plane higher than the annular escape-outlet 6^c, whereby to cause the current, with the auriferous material, to thoroughly penetrate the mercury before they pass out from the said escape 6^c.

So far as described the several parts form a well-known construction of amalgamator, and the operation of the machine, briefly stated, is as follows: The current, together with the ore, by gravitation is forced down through the aperture of the conical hopper into the mercury at the bottom of the well, from whence it passes by centrifugal whirling action toward the circumference of the well, and as its lighter particles, together with the current, are carried under the cylinder 6, through the escape 6^c, by the vertical passage 7, over the panning portion 3, where the concentrates are whirled and agitated sufficiently to precipitate the lighter material upon the pan 3, from whence the water passes over the riffles 5, the rim 4, into the collecting-trough 8, and out into a supplemental collector, if desired, or to waste. As hereinbefore stated, when thus operated the water frequently boils, the sand banks, and the machine fails to properly operate, as hereinbefore fully described.

My improvements consist in providing an amalgamator constructed on the plan herein-

before described, and illustrated in the accompanying drawings with means whereby the body of water and precious metal as it passes therethrough is divided into a series or a number of equiportions, whereby the danger of boiling or the sand banking is entirely avoided and whereby each individual portion of the water and the material carried out therewith is subjected to a like treatment. For this purpose I provide a series of equispaced partitions 10, which when they are to be employed in connection with the form of amalgamator shown in Figs. 1 and 2 each comprises a supplemental or inner member 10^a, that has its base portion adapted to rest upon the bottom of the well and the inner edge of which is beveled on an angle parallel with that of the incline of the cone-shaped hopper and said edge provided with a vertical inner portion 10^b, as shown, said portion being disposed so that when the partitions are properly set the annular space 11 is provided with a nozzle of a diameter at least equal that of the discharge-nozzle. The supplemental member extends up a suitable distance within the cylinder 6, and its rear wall is slightly tapered inward, as at 10^d, whereby to provide a passage-way 10^e to permit of a free circulation of the current and water back of it and prevent danger of clogging where the partition passes under the cylinder 6, and said partitions are also provided with a rest portion 10^f, upon which the cylinder 6 is supported, and which portion merges with the vertical or shank 10^g, which fits within the space 7, and which shank terminates at the upper end in an enlarged portion 10^h, which has the shape and size of the transverse area of the panning or whirling space, (indicated by F.) To hold the several partitions in a proper position, the upper portions thereof are connected by a band 12, as best shown in Fig. 2, and the lower or supplemental portions are similarly connected to a band 13, as best shown in Fig. 1.

By providing the partitions, as described, it will be manifest that the water, together with the material, as it passes through the machine will be divided up into a series of portions, each of which has a like treatment as it passes through the machine, and all danger of the water boiling at any particular point or points and sand banking or clogging at such points is thereby avoided.

In Fig. 3 I have illustrated a slightly-modified form of amalgamator, which differs from the form shown in Figs. 1 and 2 in that the passages 7 instead of being vertical are inclined outward, as indicated at 70, and in this form the hopper has an inverted-cone-shaped portion, which merges with a second or lower cone-shaped portion, in which is held an agitator or deflector, which causes the current, together with the material, to precipitate toward the bottom of the well. In this form the supplemental members of the partitions

may be dispensed with; but in all other parts the partitions are constructed substantially similar to those shown in Fig. 1.

In Figs. 4 and 5 I have illustrated a further modification of my invention, in which the pan instead of being annular is shown of an elongated shape. In this latter form the partitions are provided with the rest portions and inwardly-extending members; but the upwardly-extending portions shown in Fig. 1 are dispensed with and supplemental plates 13 are dropped into the hopper, which in this construction is also provided with the inverted-cone-shaped bottom, this latter construction of hopper forming a feature of the invention disclosed in a copending application filed by me on even date with this application, Serial No. 13,152.

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

1. In an amalgamator; an outer fixedly-held vessel having a central well, an inner vessel, said inner vessel having a supplemental hopper portion that discharges into the well, the said inner vessel being of less width than the outer vessel, whereby an intervening discharging-passage is provided between the two vessels, and a series of partition-plates, adapted to be detachably held in place, said plates each comprising a body portion adapted to fit the discharge-passage between the two vessels, a foot member adapted to rest upon the bottom of the well, said foot member extending inwardly under the inner vessel and having a contracted portion that forms a rest upon which the lower end of the inner vessel seats, substantially as shown and described.

2. In an apparatus as described, the combination with the pan, having a dished bottom that terminates in a central well, a vertical flange 5, projected up from the dished portion of the inner vessel, consisting of the cylindrical body 6 and the cone-shaped hopper 9; of the partition-plates 10, each of the said plates having a vertical portion fitting between the inner vessel and the wall of the

well of the pan, its upper end being extended to fit upon the dished bottom and to abut the flange 5, the lower end of the said plates having inwardly-extending portions, provided with a contracted seat 10^f, upon which the bottom of the cylinder 6, rests, said inwardly-extending portion terminating in a rest or guide for engaging the lower end of the cone-shaped hopper 9, all being arranged substantially as shown and for the purposes described.

3. In an amalgamator as described, the pan having a fixedly-held vessel in the nature of a pan having a central well and side portions having a dished bottom, the flange 5, projected up from the dished bottom, and an inner vessel comprising the cylinder 6, of less diameter than the well, said cylinder being adapted to fit in the well, whereby a vertical discharge-passage is produced between the wall of the well and the said cylinder, said inner vessel also including an inverted-cone-shaped hopper 9, the lower end of which terminates above the bottom of the well; in combination with a series of partition-plates, each comprising an upper outwardly-extending member 10, adapted to rest upon the dished bottom and abut the flange 5, a vertical member 10^g, adapted to extend down and fit within the discharge-passage between the cylinder 6 and the well-wall, said member 10^g, being of a length to extend down and rest upon the bottom of the well, said member 10^g, terminating in an inwardly-extending seat portion 10^f, which forms a rest for the bottom of cylinder 6, said member 10^g, merging with a member 10^h, that extends upward into the cylinder 6, and has its inner edge arranged to engage and form a seat for the lower end of the cone member 9, and means for holding the several plates 10, in their proper vertical positions, substantially as shown and for the purposes described.

LEWIS MAYHEW.

Witnesses:

J. M. LAUBE,
JOHN TREZISE.