

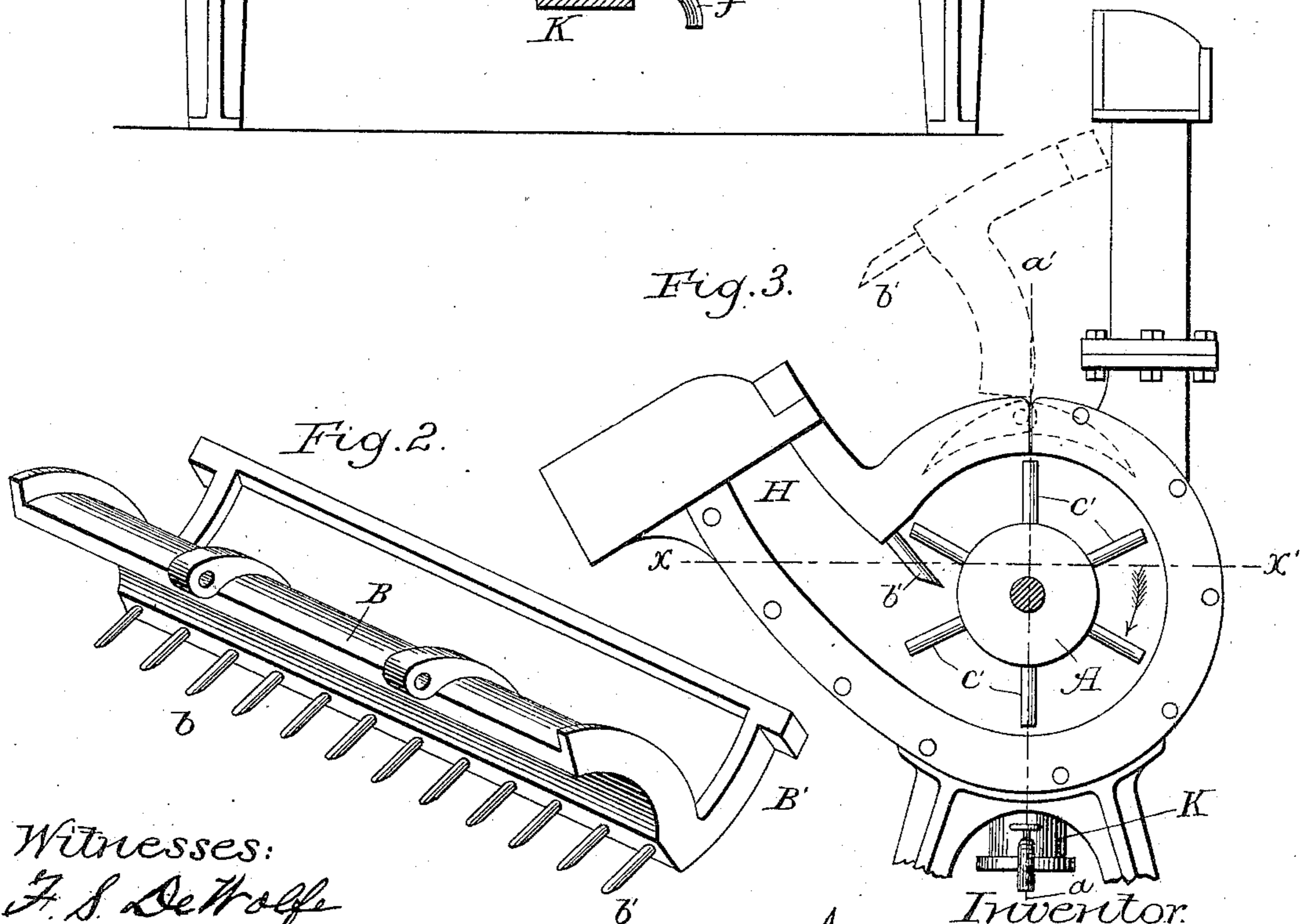
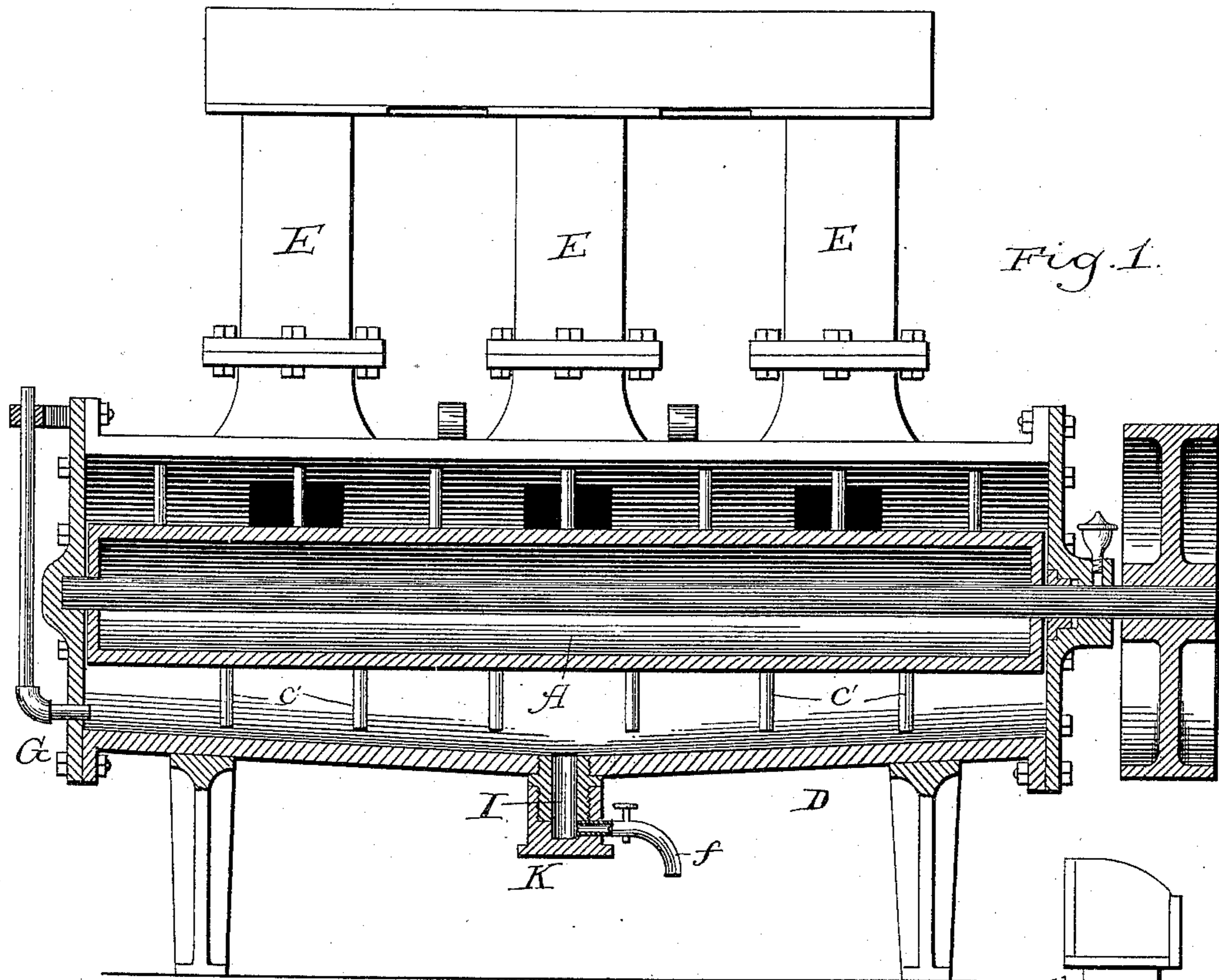
(No Model.)

J. W. VAN BROCKLIN.

AMALGAMATOR.

No. 341,863.

Patented May 11, 1886.



Witnesses:
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Inventor.
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his attorney in fact.

UNITED STATES PATENT OFFICE.

JOHN WESTLEY VAN BROCKLIN, OF SEATTLE, WASHINGTON TERRITORY,
ASSIGNOR OF ONE-HALF TO WILLIAM R. FORREST, OF SAME PLACE.

AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 341,863, dated May 11, 1886.

Application filed July 20, 1885. Serial No. 172,166. (No model.)

To all whom it may concern:

Be it known that I, JOHN WESTLEY VAN BROCKLIN, a citizen of the United States, residing at Seattle, in the county of King and Territory of Washington, have invented a new and useful Machine for Amalgamating with Quicksilver the Precious Metals, of which the following is a specification.

My invention relates to machines for amalgamating the precious metals, especially gold, with mercury, thereby extracting them from the earth or pulp in which they are held, and securing the amalgam. Its special object is to produce a machine or apparatus whereby a thorough, complete, and effective amalgamation is accomplished within a confined bowl or chamber by the aid of hydrostatic pressure operating in conjunction with earth fed upon a mercury bath kept constantly disturbed in such a manner that the pressure and disturbance will carry off the non-yielding ore or pulp and lighter refuse, but will leave behind the amalgam, to be secured in an easy and expeditious manner.

All the parts of my invention are made, preferably, of cast-iron, except as otherwise hereinafter shown.

In the drawings, Figure 1 is a front longitudinal view of my invention, the lid or cover (marked B in Fig. 2) being herein removed and not shown, cut through the dotted line $a a'$ shown in Fig. 3. In it is to be seen the toothed cylinder A. The glass measure-gage, as shown, may be suitably attached to the side of the bowl D to inform the manipulator as to the height of the mercury in said bowl during operation. Said bowl D in this figure is purposely so fashioned that there is a dip or inclination in its bottom line from both its ends and sides toward its center, where is suspended a perpendicular discharge-nipple, upon which works a screwed cap or thimble carrying an outlet-spout. On top of the bowl D are perpendicular feed-pipes, (marked E E E.)

Fig. 2 is a plan view of the lid or cover of my invention, showing the lid B lipped, with its teeth or prongs $b b'$ projecting in a row from the edge of the lip B'.

Fig. 3 is an end view of my machine, the lid B now being closed down on the bowl, as it always is securely in operating. This view

exhibits the toothed cylinder A with its teeth $c c'$, the arrow in the figure indicating the direction of the cylinder's rotation when power is applied. The dotted line $x x'$ is drawn to show the working height of the mercury in the bowl D when the machine is operating, from which it will be observed that the lower half of the cylinder A is submerged in the mercury when properly worked.

My machine is fed with earth, sand, or mineral pulp, and hydrostatic pressure is at the same time applied through the perpendicular feed-pipes or columns, (marked E E in Fig. 1,) which may be of any convenient number, and may be made in sections, if desired, to give varying altitudes. These feed-pipes open into the case or bowl D upon and behind the toothed cylinder A above the level of the mercury in the bowl, and are designedly larger at their outlets or openings into the bowl than they are at their feed-entrances, to prevent clogging or stoppages along the pipes during the feeding process. The mercury in the bowl receives the discharge from the feed-pipes while it is in agitation. This agitation is accomplished by power applied to rotate the toothed cylinder A. This cylinder is purposely made hollow for the sake of lightness, and is connected at its ends to a central shaft, by means of which it is revolved upon its axis within the bowl when power is applied to the shaft, as it may be in any convenient manner, as by means of a drum at its end. (Shown in Fig. 1.)

Fastened into the body of the cylinder A are teeth or prongs $c' c'$, shaped and as many as may be desired, and placed in rows or otherwise, so as to pass and not conflict with the teeth or fingers $b b'$ of the lipped lid or cover B while the machine is operating. These prongs $c' c'$ are preferably made of steel, and if bent or broken can be replaced by others.

The toothed cylinder A is so secured in the bowl D that in revolving its teeth do not touch the sides of the bowl, but cut through the body of the mercury, agitating it, and thoroughly mixing it with the stream of earth, sand, and mineral pulp discharging into the bowl through the feed-pipes and pouring down into the mercury.

The bowl or chamber D carries a suitably-large cover or lid, B, which is hinged at the

back so that it can be upturned from off the bowl, when desired, and the interior of the machine cleansed. This lid B carries a projecting and inverted lip, B', (shown in Fig. 2,) into which are securely inserted a row of fingers or teeth, c' c', made, preferably, of steel. This lip B' and the bowl D are so fashioned that in operating the machine the mutual conformation of the lip and bowl form between them a longitudinal opening or passage, H, (shown in Fig. 3,) and the teeth of the lip B' come close to the cylinder and below the level of the mouth of the outlet H, and do not actually come in contact with the cylinders nor interfere with its teeth, which pass between and through the teeth or fingers of the lip when the cylinder is revolving. It will be noted that in separating these lip-teeth, as well as a portion of the lip itself, are designed to be submerged in the mercury. By this means the amalgamation is made to take place entirely under the cylinder within the bowl and behind the lip B', the lip and its teeth acting as a guard, and preventing the mass in amalgamation from being rotated around the cylinder in an unbroken mass. The heavy amalgam in motion beats more or less against the guard at every revolution of the cylinder, and is thrown back, to be torn through again by the teeth and stirred and mixed thoroughly. The lip, the cylinder, and the intervening prongs or teeth thus combine to form the upper wall of the refuse-outlet, which is designedly constructed to act in addition as a guide or deflector to make the lighter matter and other non-yielding refuse tend to the discharge-outlet and pass out of the machine. The feed thus receives a thorough bath or submergence in the mercury, as well as an intense agitation with it.

I am aware that C. Taylor, in Patent No. 253,785, and H. Hamilton in Patent No. 311,748, have employed cylinders revolving through a bath of mercury or lead; but they have both used ore-conveying cylinders, Taylor's cylinder being provided with ore-conveying beaters or corrugations, and Hamilton's with ore-conveying open distributing-chambers, all of which pushed or carried the earth bodily along through the bath. My teeth are not ore-conveying, and I do not claim an ore-conveying cylinder at all.

I am also aware that Roberts, in Patent No. 284,063, employed a toothed shaft for the purpose of disintegrating and comminuting ores in a lead bath; but this he did without hydrostatic pressure, and not in the manner nor for the purposes I do, and he claimed only the process. I purposely employ a toothed cylinder upon a shaft, which Roberts did not do, and my cylinder is made sufficiently large for the purpose of giving the ore a longer distance of submergence in the bath as it travels under the cylinder, thus facilitating the process of amalgamation, on the principle that the longer the bath the more thorough the amalgamation. I am not aware that a cylinder like mine has

ever been employed as an element in an amalgamating-machine. I disclaim a toothed shaft. The toothed cylinder in my machine is made to perform several new and important operations in the course of its rotation. Its swift rotary whirl imparts to the mercury bath a horizontal motion, which becomes circular by the play against the nether sides of the bowl in the direction that the ore must take to pass through the machine, thereby lessening the resistance of the mercury to the passage of the same. It disintegrates the ore and mixes it with the mercury by its teeth during the passage of the ore through the bowl underneath the cylinder. My toothed cylinder acts also as the first element in forming the upper wall of the longitudinal discharge-outlet.

I am further aware that H. Hamilton employed a lid as one side of a discharge-way; but his lid was simply a straight plate hinged to the cover or bowl. It was not pronged, neither was it lipped. I do not claim a hinged plate. My pronged and lipped lid is so constructed that while forming a portion of the upper wall of the discharge-outlet in a different manner from Hamilton's, it also acts through its prongs or teeth as a guard element to the amalgam and as a deflector element to the lighter materials passing through the bath to guide them or cause them to tend toward the discharge-outlet.

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

1. In an amalgamator fed by hydrostatic pressure, the amalgamating apparatus consisting of the mercury-bowl D, perpendicular feed-pipes E, having expanded outlet-openings into the bowl D, the toothed cylinder A, and the pronged and lipped lid B, substantially as described.

2. In an amalgamator of the character described, the combination, with the bowl D, of the pronged and lipped lid B, the prongs of which project toward the cylinder A, below the level of the longitudinal outlet H, and a toothed cylinder, A, the teeth of which, when the cylinder is rotated, pass between corresponding teeth of the lipped lid B, substantially as and for the purposes set forth.

3. In an amalgamator of the character described, the combination, with the bowl D, of the cylinder A and the lipped lid B, with the intervening prongs or teeth, substantially as and for the purposes set forth.

4. In an amalgamator of the character described, the lid B to the bowl or chamber D, said lid lipped and carrying teeth in a row upon the edge of its lip B', the teeth so arranged as to project into the bowl D toward the toothed cylinder A, substantially as set forth.

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Witnesses:

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