No. 624,533. Patented May 9, 1899.

C. H. PEAD.

SLIME FILTER.

(Application filed May 21, 1898.)

(No Model.) 4 Sheets—Sheet 1.

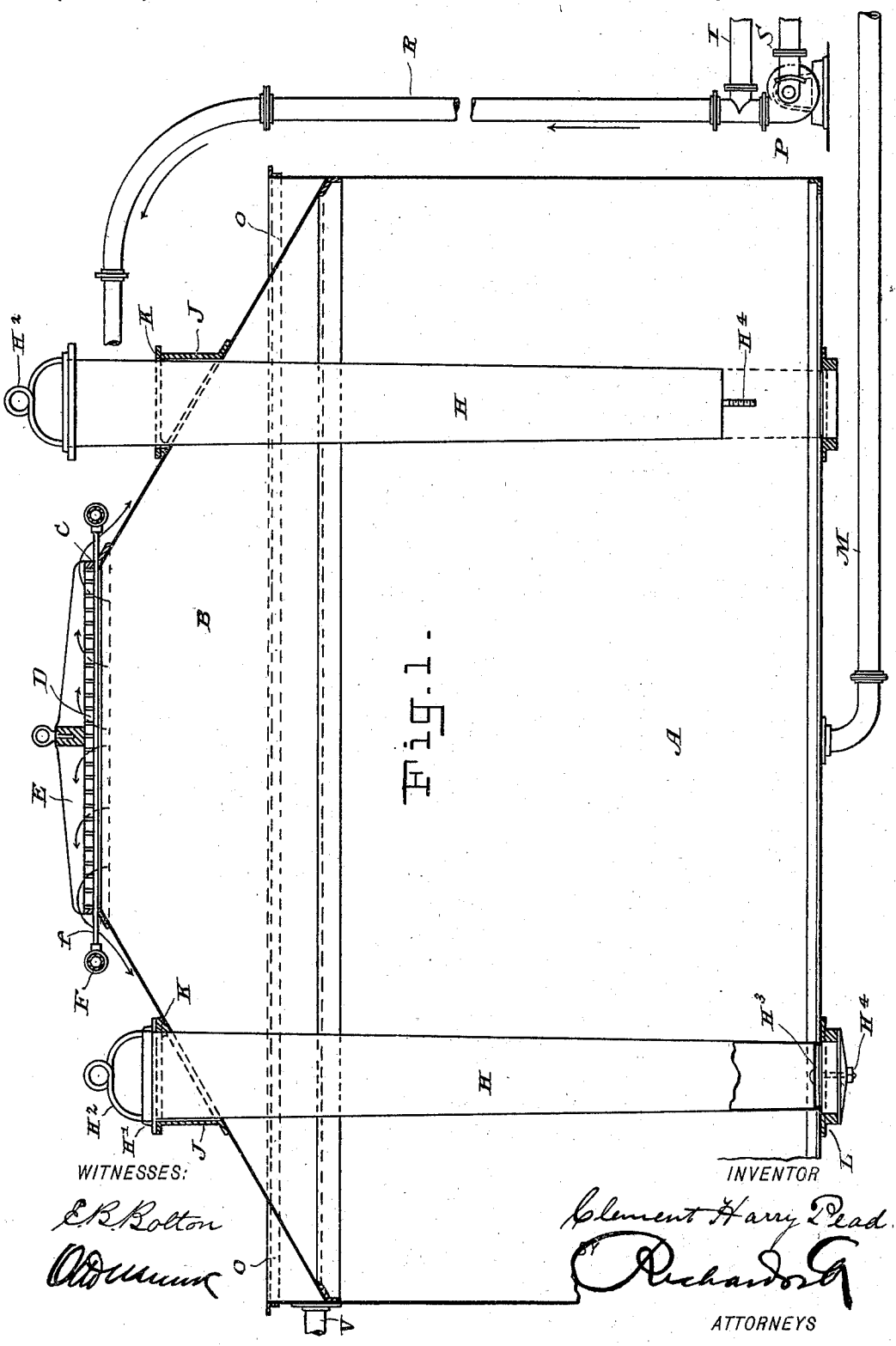


Fig. 1.

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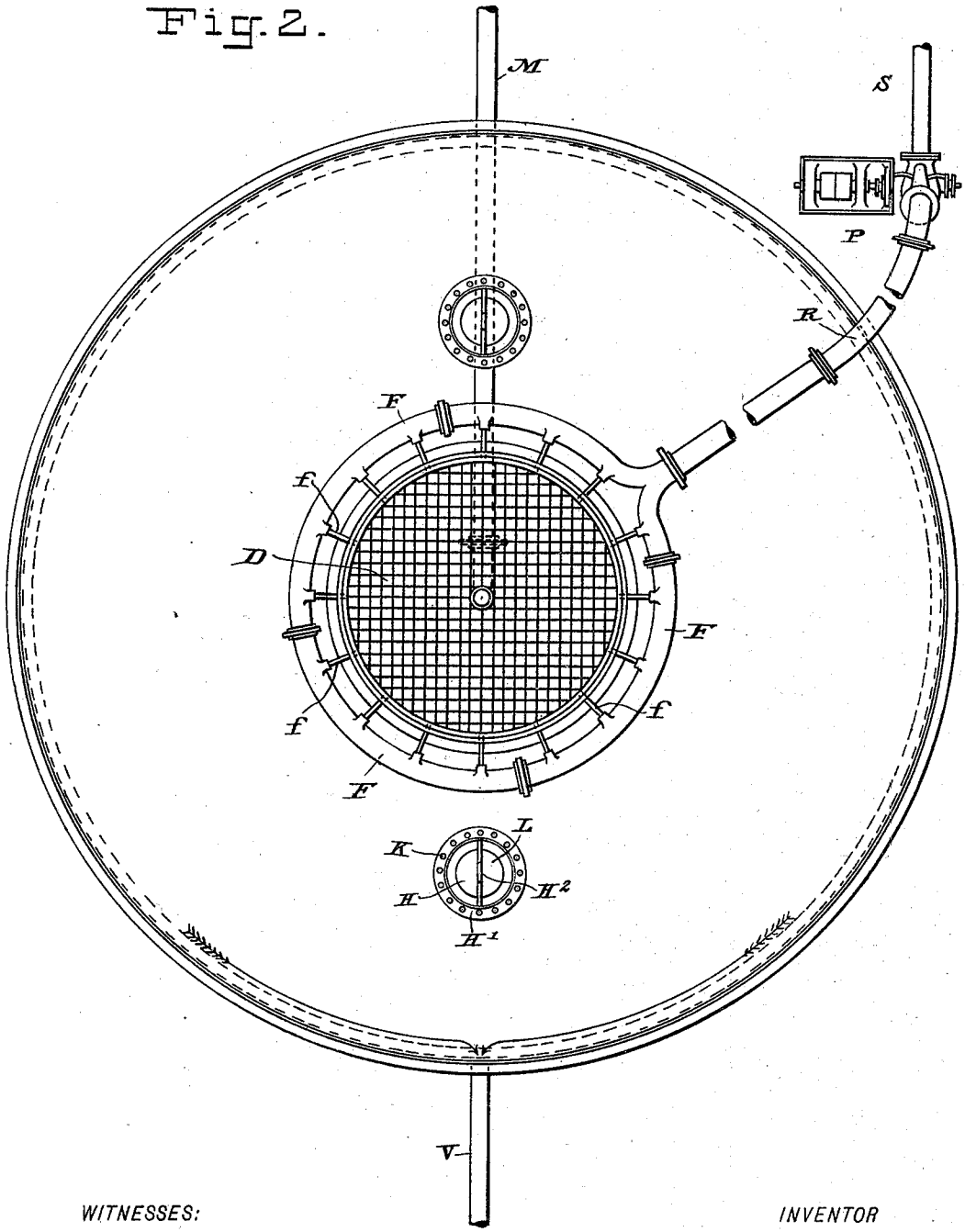
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(No Model.) 4 Sheets—Sheet 2.

Fig. 2.



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(No Model.) 4 Sheets—Sheet 3.

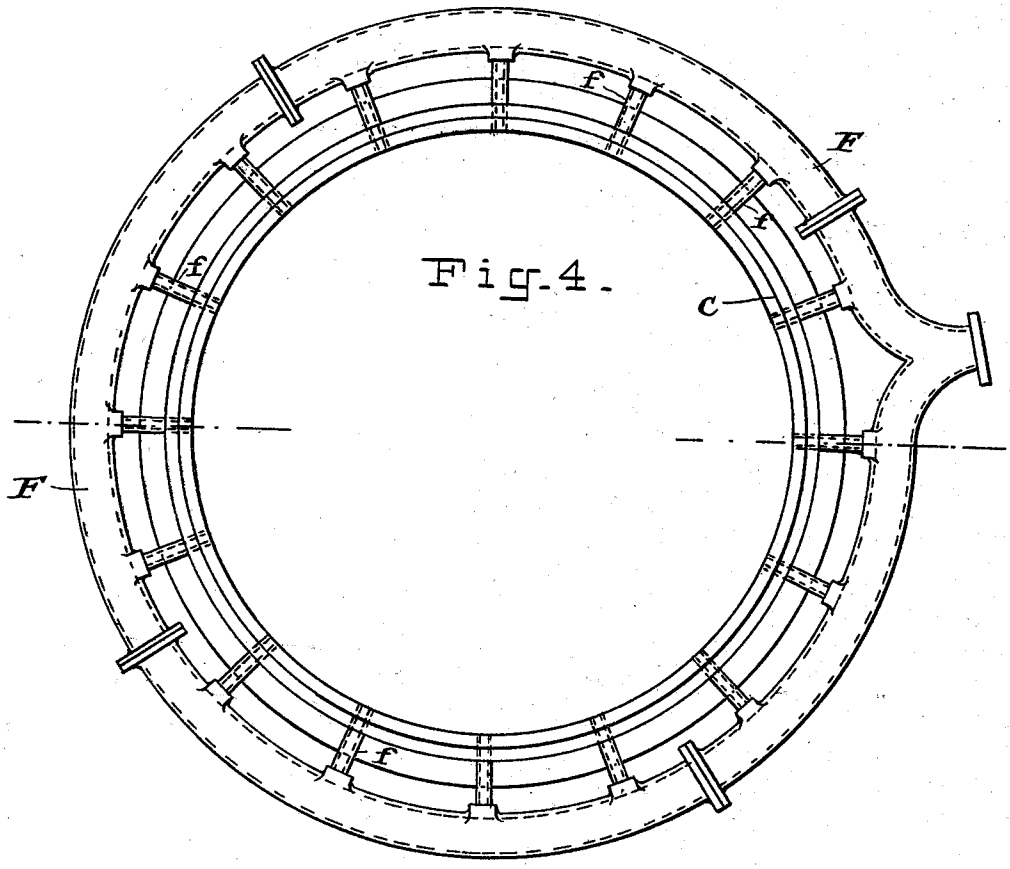


Fig. 4.

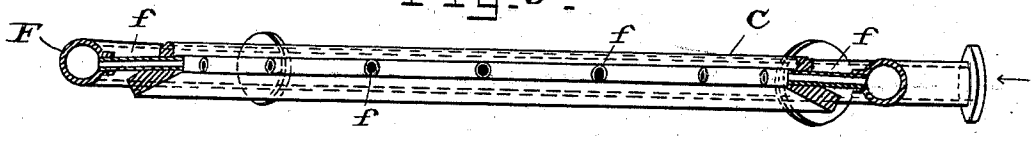


Fig. 3.

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No. 624,533. Patented May 9, 1899.

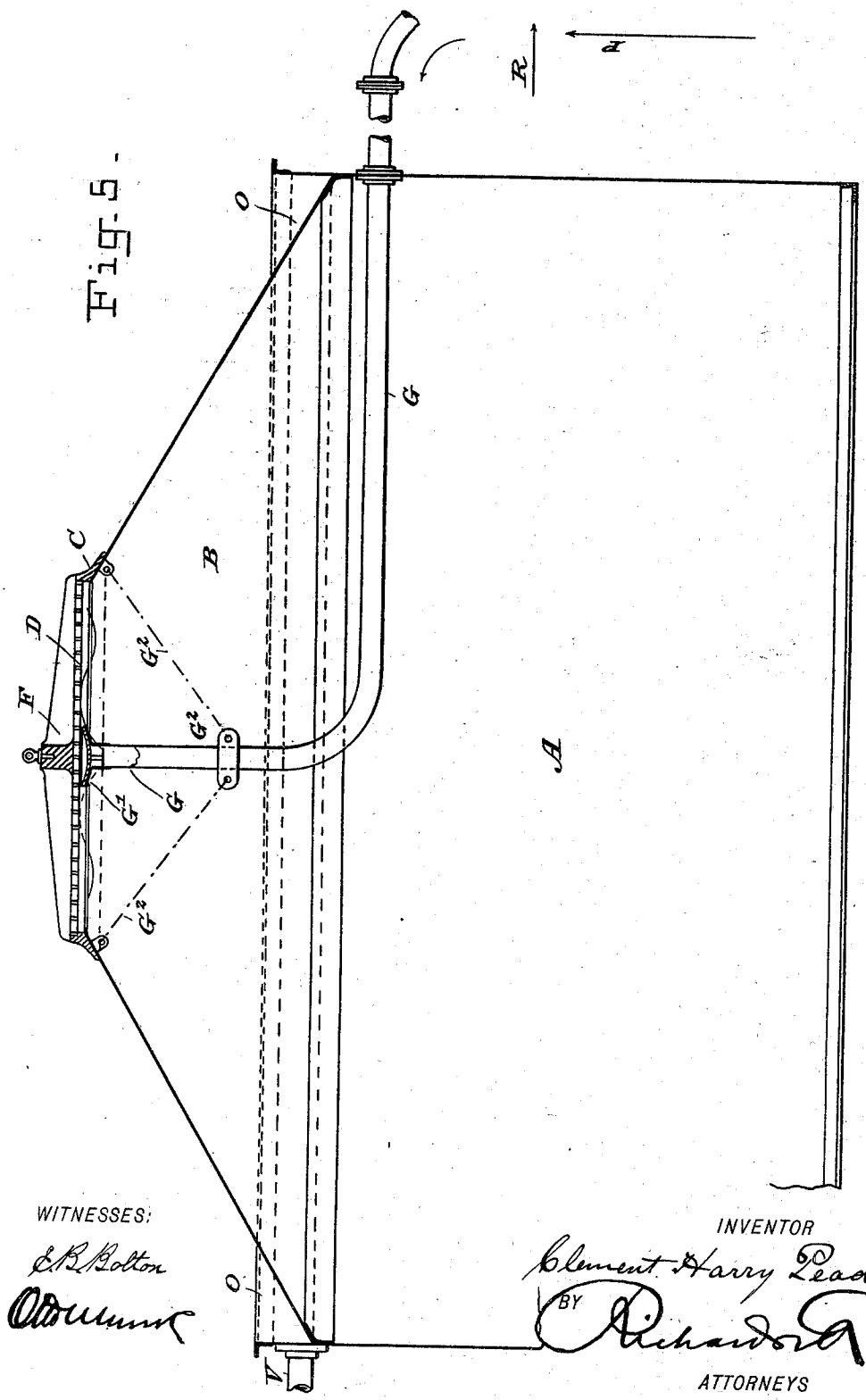
C. H. PEAD.

SLIME FILTER.

(Application filed May 21, 1898.)

(No Model.) 4 Sheets—Sheet 4.

Fig. 5.



WITNESSES:

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UNITED STATES PATENT OFFICE.

CLEMENT HARRY PEAD, OF BOKSBURG, SOUTH AFRICAN REPUBLIC.

SLIME-FILTER.

SPECIFICATION forming part of Letters Patent No. 624,533, dated May 9, 1899.

Application filed May 21, 1898. Serial No. 681,368. (No model.)

To all whom it may concern:

Be it known that I, CLEMENT HARRY PEAD, a resident of Boksburg, near Johannesburg, South African Republic, have invented certain new and useful Improved Slime-Filter Presses, of which the following is a specification.

My invention relates to certain apparatus for the separation of liquids from the fine "slimes" of gold or other ores.

My apparatus consists of a tank fitted with a hood of conical or any other convenient form. The sides of the tank project above the point of attachment of the hood, so as to form an annular space to act as a receptacle forming a launder for discharge of the clear liquid. In the center of the hood is an opening, around which is riveted or bolted a frame or seating arranged to carry a filter composed of one or more layers of filter-cloth or any other well-known filtering medium. The filter is kept in place by means of a protective grid or clamp of suitable form and strength to resist the effective pressure from the interior of the tank. A number of small distribution-pipes set at such an angle as to cause the slimes to impinge on the under surface of the filter are connected to the seating of the latter, through which they pass. They are connected to a main distributer, which in turn is connected with the delivery pipe or column of the slime-pump. One or more taper-shaped plugs or cores constructed of light steel tubes, their number varying according to the size of the tank, pass through the hood and extend to the bottom of the tank. They taper from about eighteen inches at the top to fifteen inches at the bottom. They are fitted at their upper ends with a flange to which is attached a shackle. Their lower ends are closed by means of a dished bottom riveted in place and having a strong bolt or stud fitted to its center. Each plug or core rests on a seating fitted to the outside of the hood and through which the plug or core passes. The seating is attached thereto by means of its flange.

In the bottom of the tank and directly under the aperture in the hood through which the plug or core passes is a discharge-door of the ordinary manhole or other convenient type. The end of each plug or core passes easily into the discharge-opening, and the discharge-door is drawn up onto its seating or joint by means of the bolt or stud on bottom of the plug or core and by its nut. The plugs or cores when in place and holding up the manhole-doors afford an effectual means of resistance against internal pressure.

A special pipe is arranged and fitted to the upper portion of the tank to drain the space forming a launder between the top of the tank and the upper surface of the hood and to conduct the liquid portion which has passed through the filter to the precipitation-boxes or to waste.

In the accompanying drawings, Figure 1 is a sectional elevation of my apparatus; Fig. 2, a top elevation showing protective grid (clamp) off. Fig. 3 is an enlarged section through distributer F and *f* and seating C. Fig. 4 is a plan of the seating C and distributer F. Fig. 5 is a sectional elevation showing the alternative arrangement of distributer G G′ G^2 and seating C.

A is the tank fitted with the hood B and forming a launder O with same on the outside. An opening is provided in the center of the hood, around which is secured the seating C for the purpose of carrying the filter D. The filter is fixed by means of the clamp or protective grid E, which grid has radiating arms resting on top of the filter, as is shown in Fig. 1, one of the arms being shown in section. Through the seating C holes are bored to receive small distribution-pipes *f* and connected to the main distributer F, which in turn is connected to the delivery-pipe R of the slime-pump P, as shown in Figs. 1 and 2.

The small distribution-pipes *f* are slightly inclined from the main pipe F up toward the filter, so that the stream of pulp must impinge against the filter, thus producing a scouring action and preventing clogging. The same action is effected by a central discharge-distributer G, as shown in Fig. 5. This distributer is fitted with a baffle-plate G′, dished and attached. Whichever distributer is used the discharge is so arranged as to take place as close under the filter as possible.

H are the plugs or cores fitted with the flange H′ and shackle H^2 and closed at the bottom by means of a dished end H^3, carrying the bolt H^4. The plugs or cores rest on seat-

ings J, which are secured to the hood B. In the bottom of the tank and immediately beneath the seating J is a discharge-door L, of the ordinary manhole or other convenient type. The end of each plug or core H passes easily into the discharge-opening. The discharge-door L is fixed by means of the bolt H^4, which passes through it. The plugs or cores H when in place therefore act as stays to resist internal pressure. In order to discharge the residues in a "dry" state, the discharge-door L and bolts K are removed and the plugs or cores H withdrawn by means of overhead tackle. This, owing to the tapered form of the plugs, is an easy operation.

P is the slime-pump, which may be a centrifugal pump or centrifugal pumps in series or any other suitable pump.

R is the delivery-pipe, S the suction-pipe from the treatment-tank, and I a by-pass from the delivery-column to the treatment-tank, to be opened in case the pump stops.

The advantages of my system above the old systems are great and numerous. First, instead of allowing the slimes to settle from the water collected with them after passing the spitzkasten they are immediately pumped, together with the water, into the filter-press. As soon as the filter-tank is full the water is forced through the filter-screen D (which prevents the escape of the slime) to the space O, from whence it is drawn away by the drain-pipes V, and considerable pressure being applied by the pumps the water will be rapidly separated from the slimes. The slimes, still containing sufficient water, can be pumped or gravitated back, as may be advisable, by means of the suction or outlet pipe M into the treatment-tanks, where they may be treated as usual. This process may be repeated as often as required.

In separating the slimes from the last wash in the filter-press a double or even larger quantity of slimes from a second charge is forced by means of the pump, as usual, into the filter-press, so that the slimes contained therein have the moisture in them reduced to a minimum till they are considered to be in a fit condition (called "dry") to be discharged by any suitable method. It will be evident that this process is almost automatic, which fact is an enormous saving of time in operation.

The filtering medium by which the slimes are separated from their solutions is easily renewable without excessive cost.

Having now particularly described and ascertained the nature of my invention and the manner in which the same is to be performed, I declare that what I claim is—

1. In combination, the closed vessel having a filter at its upper end, a slime-pump and a distributer arranged to discharge the slimes and water upon the filter, said distributer being located at the top of the closed vessel, substantially as described.

2. In combination, the closed vessel, the slime-pump, the distributer connected therewith and located at the top of the closed chamber, a filter at the top of the chamber and the suction-pipe M extending from the lower part of the vessel, substantially as described.

3. In combination, the closed chamber, the filter at the top thereof, a pressure-pump, a pipe leading therefrom to the top of the chamber and the jet-pipes *f* to discharge the material onto the filter, substantially as described.

4. In combination, the tank A, the hood B covering the same, the filter at the top of the hood, the inlet-pipe to the filter and the channel O about the hood to receive the filtered solution, substantially as described.

5. In combination, the tank A, the hood B covering the same and having sloping sides, the filter at the top of the hood, the inlet-pipe to the filter and the channel O about the hood to receive the filtered solution, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

CLEMENT HARRY PEAD.

Witnesses:
ROGER PRICE,
WALTER ALURACHZELO.