

No. 720,564.

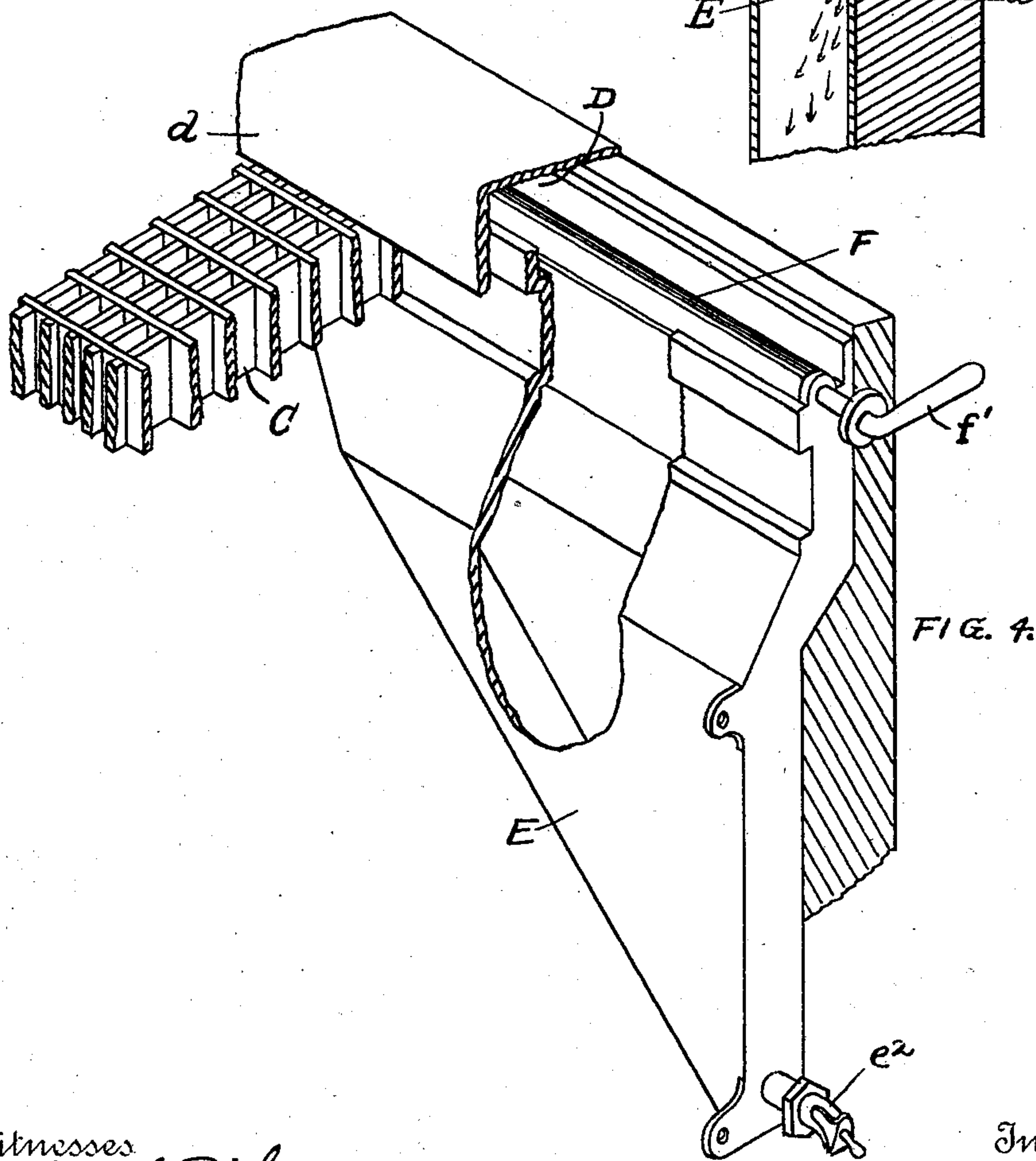
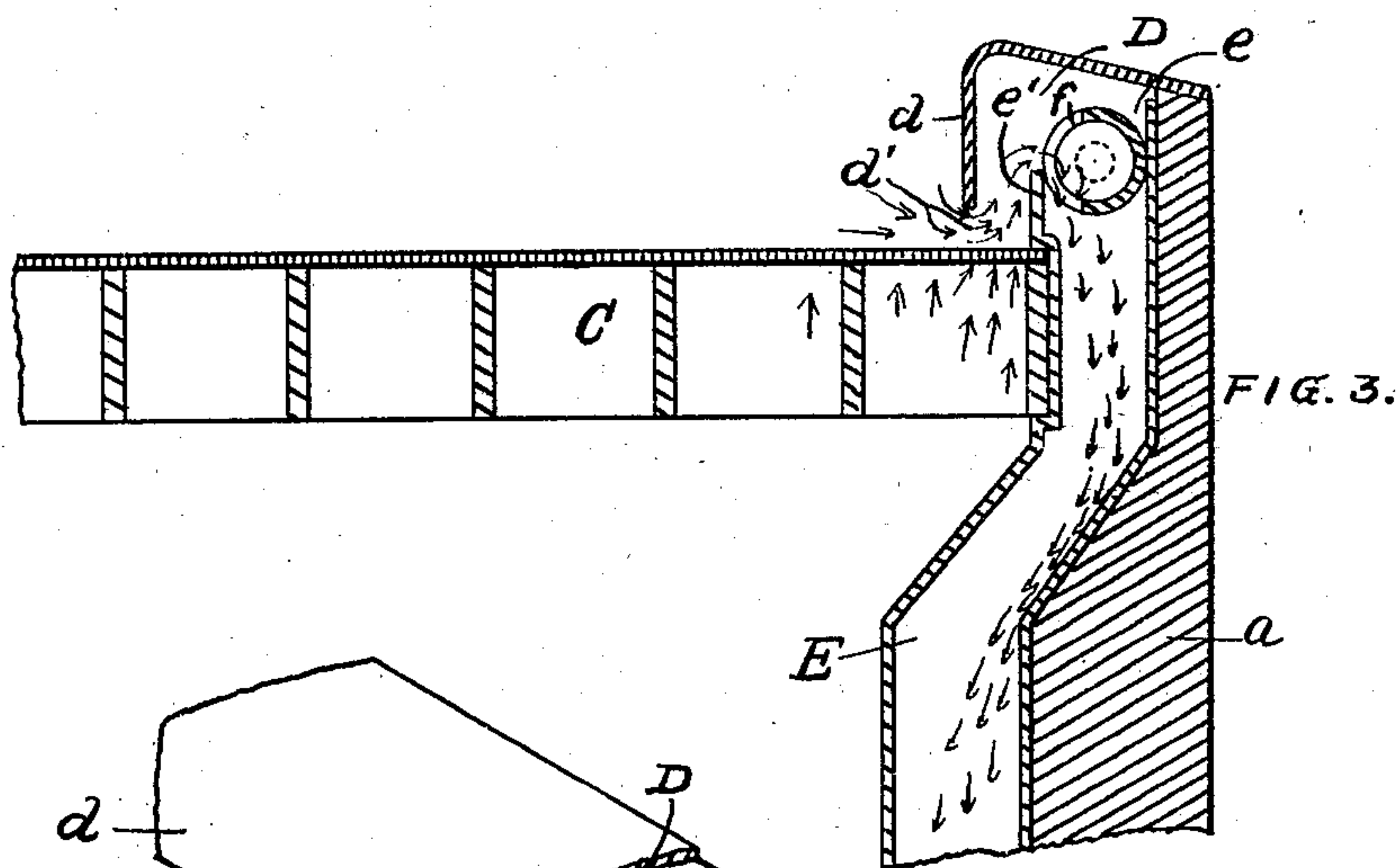
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G. T. COOLEY.
ORE DISCHARGE FOR JIG TANKS.

APPLICATION FILED MAY 18, 1901.

NO MODEL.

2 SHEETS—SHEET 2.



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GEORGE T. COOLEY, OF JOPLIN, MISSOURI.

ORE-DISCHARGE FOR JIG-TANKS.

SPECIFICATION forming part of Letters Patent No. 720,564, dated February 17, 1903.

Application filed May 18, 1901. Serial No. 60,856. (No model.)

To all whom it may concern:

Be it known that I, GEORGE T. COOLEY, a citizen of the United States, residing at Joplin, in the county of Jasper and State of Missouri, have invented certain new and useful Improvements in Ore-Discharges for Jig-Tanks, of which the following is a specification.

Jig-tanks as usually constructed and operated consist of a series of separate tanks or compartments having adjoining grates or sieves on which the material to be treated is fed in a current passing successively over the series of grates or sieves, which for this purpose are arranged in successively lower planes. In another part of each tank or compartment is a reciprocating plunger which forces intermittent currents of water upward through the series of grates. The upward current raises the material from the grate, carrying the lightest material farthest. When the upward current ceases, the materials fall back again, having been carried by the combination of currents some distance toward the discharge end of the grate. As the materials settle the heavier ores fall faster, and so settle on the grate first, the finer ores passing through into the tank below, whence they are removed through a hopper and spout. Mixed with the lighter materials are fine particles, such as sand, small enough to pass through the grate if allowed to fall directly upon it. The passage is prevented by the bed of heavier matter or concentrated ore which reaches the grate before the lighter particles, so that for the satisfactory separation of the ore a suitable bed of the concentrated ore must always be maintained on the grate. The combined effect of the currents on the grate is to cause a flow of the separated ore toward the discharge end, where it tends to accumulate and is discharged by opening a small discharge-spout at the lower outer corner of the grate. In operating the discharge great care must be exercised in order to prevent the destruction of the concentrated ore-bed in the neighborhood of the discharge-opening, and its successful operation depends upon the skill of the operator in alternately permitting an accumulation of ore at this point thicker than the required bed and then drawing this accumulation off by a momentary opening of the discharge-spout. Owing to the location

of the discharge in one corner, only that portion of the excess accumulation in its immediate neighborhood can be withdrawn, leaving a permanent accumulation in the other corner, which must be removed by mechanical means.

The object of my invention is to provide an improved discharge for jig-tanks which will continuously withdraw the ore from the grate, which will automatically maintain the bed at the requisite thickness, and which may be easily and quickly manipulated and adjusted; and the invention consists in the parts, combinations, and arrangements of parts hereinafter described and claimed.

In the drawings, Figure 1 is a front elevation, partially in section, of a series of jig-tanks equipped with ore-discharges embodying my invention; Fig. 2, a section on line 2-2 of Fig. 1; Fig. 3, an enlarged section through the discharge end of the grate; and Fig. 4 a perspective view, partially in section, of the ore-discharge.

Reference-letter A denotes a jig-tank; B, a plunger; C, a concentrating grate or sieve; D, a discharge-compartment; E, a hutch for receiving the discharged ore and conducting it to the outside of the tank, and F a rotary valve in the mouth of hutch E.

The jig-tank A, plunger B, and grate or sieve C are the usual members of a jig-tank, operated in the usual way to produce the intermittent upward currents through grate C. Across the lower end of the grate is placed a shield *d* to form the compartment D, open to the upward currents of water through the grate and provided at its forward bottom portion with an opening *d'*, adapted to permit the passage of the separated ore for the full width of the grate. The shield *d* also serves the purpose of the ordinary dam over which the tailings pass. The hutch E is mounted in the lower end of the concentrating-compartment, being partially set into wall *a*, with its mouth *e* projecting into the rear of the compartment D. At its forward side mouth *e* of hutch E is provided with a wall *e'*, rising above the grate to form a barrier over which the separated ore or concentrates must pass before entering the mouth of the hutch. The mouth of the hutch E is provided with a rotary valve F, by means of which the discharge into hutch E may be

regulated. Valve F preferably consists of a hollow pipe rotatably mounted in the mouth *e* of hutch E and provided with a longitudinal opening *f* for the passage of the ore. At its outer end the pipe F is provided with a crank-arm *f'*, which is extended outside of the front of the tank and which serves as a means for rotating pipe F to regulate the discharge. The bottom of hutch E slopes toward its outer end, where it is provided with a discharge spout or faucet *e*².

In operation valve F is turned as shown in Fig. 3 and faucet *e*² slightly opened to permit a discharge of ore. The separated ore passing through opening *d'* is seized by the currents passing upwardly into compartment D and carried over barrier *e'* through valve F into hutch E, where it is directed to faucet *e*² by the sloping bottom. Owing to the fact that the compartment D is a closed compartment, open to the upward currents through the grate, and to the fact that hutch E is in open communication therewith when faucet *e*² is open, the upward currents in compartment D will flow over into hutch F and carry with them the amount of ore that simultaneously travels over the whole bed. It will also be noted that the flow of discharged ore into hutch F will be in the form of a thin sheet the full width of the bed, so that the discharge is the same for all parts of the bed and, being equal to the simultaneous travel of the ore, will be the amount of ore separated at each pulsation. Thus there will be no accumulations or excessive withdrawal of the concentrated ore, and consequently the bed will remain uniform over the entire sieve, while the separated ore will be continuously and automatically discharged. It will also be noted that the discharge attachment is entirely independent of the rest of the jig-tank and may readily be applied to the sieve or grate of any of the usual forms of jig-tanks. Owing to the fact that the hutch is set into the end wall or partition *a* between the tanks, it permits the utilization of the full length and breadth of the sieve for separating.

It will be noted that the barrier *e'* practically determines the normal depth of the concentrated ore-bed or the line of demarcation between the concentrated ore and the tailings. The discharge may be regulated and the depth of the ore-bed increased within certain limits by means of the valve located behind the barrier.

I claim—

1. The combination in an ore-discharge for jig-tanks of a compartment extended across the discharge end of the grate, open to the upward currents of water through the grate, and open at its forward bottom edge adjacent to the grate for the admission of the separated ore; a barrier in the compartment extending across the grate and of a height equal to the desired normal thickness of the bed; a hutch having a mouth substantially the full

width of the discharge-compartment and communicating with said compartment behind the barrier; a rotary valve beyond the barrier in the mouth of the hutch; and means for discharging ore and water from the hutch, substantially as specified.

2. The combination in an ore-discharge for jig-tanks of a compartment extended across the discharge end of the grate, open to the upward currents of water through the grate and open at its forward bottom edge adjacent to the grate for the admission of the separated ore; a barrier in the compartment extending across the grate and of a height equal to the desired normal thickness of the bed; a hutch having a mouth substantially the full width of the discharge-compartment and communicating with said compartment behind the barrier; a rotary valve in the mouth of the hutch beyond the barrier; a bottom to the hutch sloping toward the outside of the tank; and a faucet adapted to discharge water and ore from the hutch, substantially as specified.

3. The combination in an ore-discharge for jig-tanks of a compartment extended across the discharge end of the grate open to the upward currents of water through the grate, and open at its forward bottom edge adjacent to the grate for the admission of the separated ore; a barrier in the compartment extending across the grate and of a height equal to the desired normal thickness of the bed; a hutch having a mouth substantially the full width of the discharge-compartment and communicating with said compartment behind the barrier; a rotatable pipe mounted in the mouth of the hutch beyond the barrier and partially cut away longitudinally for substantially the full width of the mouth; a bottom to the hutch sloping toward the outside of the tank; and a faucet adapted to discharge water and ore from the hutch, substantially as specified.

4. The combination in an ore-discharge for jig-tanks of a compartment extended across the discharge end of the grate, open to the upward currents of water through the grate, and open at its forward bottom edge adjacent to the grate for the admission of the separated ore; a barrier in the compartment extending across the grate and of a height equal to the desired normal thickness of the bed; an independent hutch set into the end wall of the tank and having a mouth substantially the full width of the discharge-compartment communicating with the compartment behind the barrier; a rotatable pipe mounted in the mouth of the hutch beyond the barrier and partially cut away longitudinally for substantially the full width of the mouth; a bottom to the hutch sloping toward the outside of the tank; and a faucet adapted to discharge water and ore from the hutch, substantially as specified.

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