G. H. ELMORE.

PLUNGER MECHANISM FOR JIG TANKS.

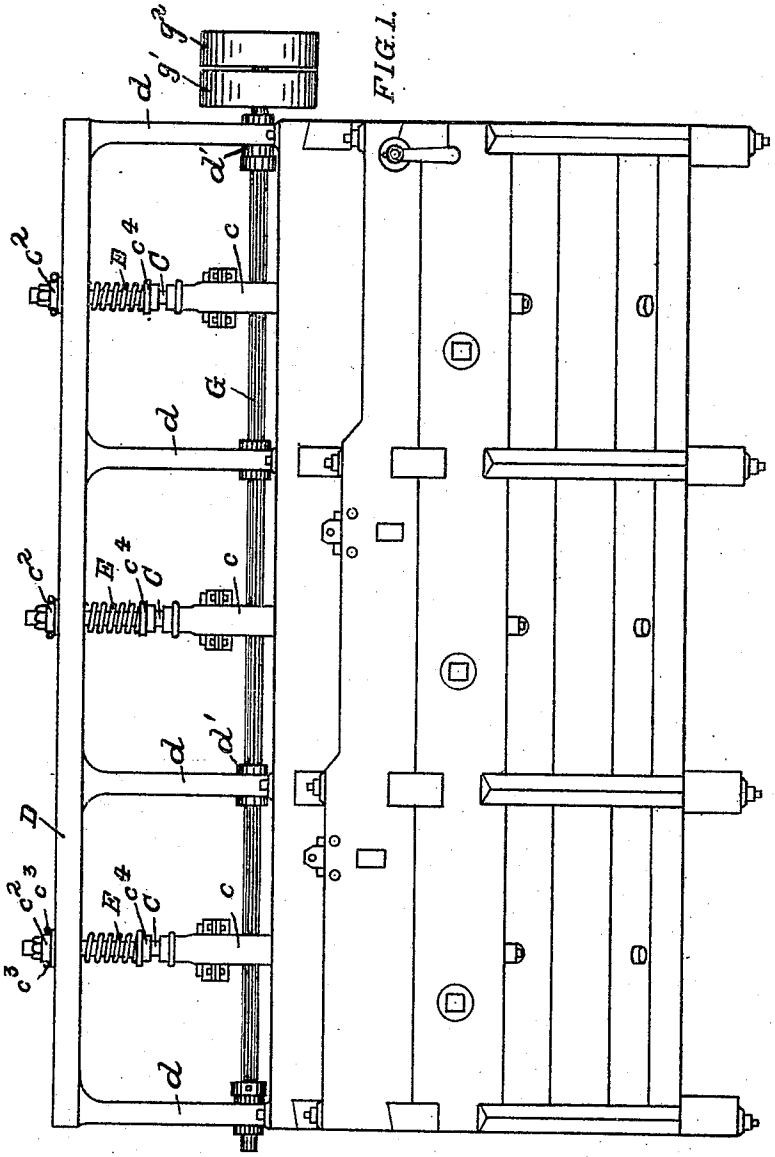
APPLICATION FILED OCT. 23, 1903.

938,307.

Patented Oct. 26, 1909.

2 SHEETS—SHEET 1.

FIG. 1.



Witnesses

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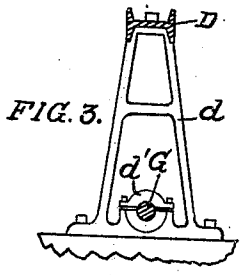

FIG. 3.

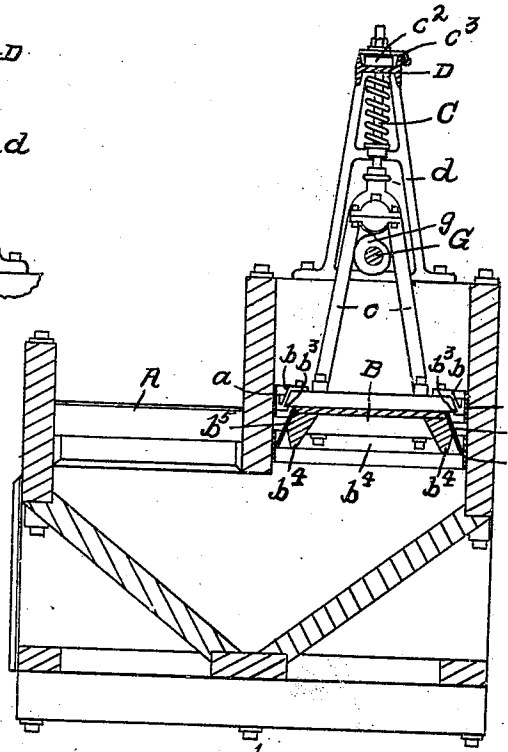

FIG. 2.

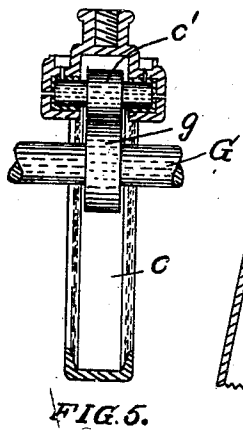

FIG. 5.

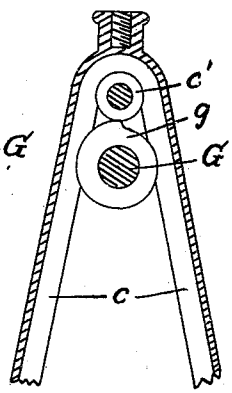

FIG. 6.

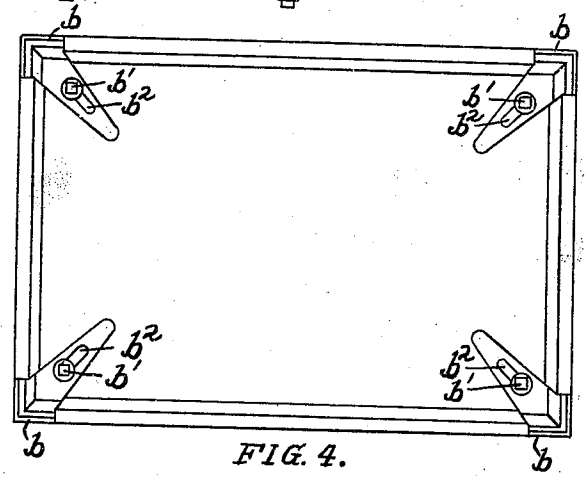

FIG. 4.

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UNITED STATES PATENT OFFICE.

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PLUNGER MECHANISM FOR JIG-TANKS.

938,307. Specification of Letters Patent. Patented Oct. 26, 1909.

Application filed October 23, 1903. Serial No. 178,198.

To all whom it may concern:

Be it known that I, GUY H. ELMORE, 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 Plunger Mechanism for Jig-Tanks, of which the following is a specification.

The object of my invention is to provide improved plunger mechanism for jig tanks and the invention consists in the combination and arrangement of parts hereinafter described and claimed.

In the drawings: Figure 1 is a front elevation of a series of jig tanks equipped with plunger mechanism embodying my invention; Fig. 2, a transverse section of the same; Fig. 3, an end view of the standards for mounting the plunger mechanism; Fig. 4, a top plan view, on an enlarged scale, of the plunger; and Figs. 5 and 6 detail sections of the operating mechanism.

Reference letter A denotes a concentrating grate or sieve; B, a plunger; C, a plunger rod; D, a guide and support for the plunger rod; E, a spring for operating the plunger; *g*, a cam for actuating the plunger; and G, a driven shaft.

The concentrating grate or sieve A is the usual grate or sieve of a jig tank through which plunger B, when actuated, forces intermittent upward currents of water. Plunger B, is of substantially the same shape as the plunger compartment of the tank, but somewhat smaller, and is provided at the corners with extending guide pieces *b* which loosely fit the corners of the plunger compartment. Corner plates *a* are placed in the corners of the plunger compartment to provide a smooth bearing for the pieces *b*. The guide pieces *b* are secured to plunger B by means of bolts *b'* taking through slots b^2 so as to render them adjustable. At their lower portions guide pieces *b* are provided with flanges b^3 which take under the edge of the upper portion of the plunger and assist in the resistance of the upward pressure on the pieces. On the under side, plunger B is provided with side rails b^4 extending around the four sides and beveled as shown. Flexible flaps b^5 are secured along the full length of rails b^4 and contact with the sides of the plunger compartment so as to act as valves to prevent upward flow of water and to permit downward flow past plunger B. At the place where flaps b^5 contact with the side of the plunger compartment, a lining *a'* of enameled sheet steel is provided, to prevent friction on the flaps.

Plunger rod C is secured to plunger B by spreading hangers *c*, which carry between them a roller *c'*, the connected hangers constituting a yoke which straddles or overhangs the cam shaft G, and the roller *c'* being in effect a part of the yoke, and affording a bearing or contact surface for a yoke-lifting cam *g* carried by said shaft. At its upper end rod C passes through guide D and is provided with a stop nut c^2 adapted to contact with guide D on its upper side. Guide D in conjunction with the guide piece *b* causes the plunger to travel vertically.

A prong c^3 is pivoted to guide D and is adapted to engage nut c^2 to prevent its turning. Spring E is mounted on rod C between the under side of guide D and a stop nut c^4.

The guide D consists of an I-beam turned sidewise and mounted on standards *d* which are secured to the plunger compartment walls. In the lower portions of standards *d*, bearings *d'* for shaft G are provided. Shaft G passes between the hangers *c* of plunger rods C and is provided with cams *g* contacting with rollers *c'*. Fixed and loose pulleys *g'* and g^2 are provided on shaft G by means of which the shaft may be driven or stopped as desired. In operation, as shaft G rotates the plungers B are slowly raised by the action of cams *g* on rollers *c'* until the step in the cam comes under the roller when the spring E forces the plunger downwardly to make a sudden stroke. The flaps b^5 act as valves to permit the flow of water past the plunger on its upward stroke and to prevent the flow of water past the plunger on the downward stroke so that water supplied to the plunger compartment is forced upwardly through sieve A in intermittent currents.

It will be noted that by this construction all the parts are readily accessible for adjustment or attention; that owing to the inter-relation of the parts a very light but rigid construction is obtained and that the construction is such that it may be entirely finished in the factory, shipped in knock-down form and put up by unskilled labor.

By providing the four corner guides for the plunger and furnishing a guide for the plunger rod above the operating cam, I ob-

tain a true movement of the plungers and consequently a perfect fit for the side flaps b^5. The spreading hanger C furnishes a wide bearing for the top of the plunger and distributes the strain from cam *g* over practically the full width of the plunger, thus tending to prevent wrenching loose of the fastenings and insuring the true vertical movement of the plunger.

I claim as my invention:

1. The combination in a jig tank, of a plunger; a plunger rod, carrying a yoke attached to the plunger; a support for the plunger rod; a shaft passing beneath the yoke; a cam on the shaft adapted to raise and release the yoke and plunger rod; a spring below the support adapted to force the plunger through its operative stroke; and a stroke-adjusting nut on the plunger rod above the support, adapted to adjust and so limit the drop of the plunger yoke as to prevent dropping contact between the yoke and cam, substantially as specified.

2. The combination in a jig tank, of a plunger; a plunger rod carrying a yoke, attached to the plunger; a support for the plunger rod; a guide for the plunger rod; a shaft passing between the spreading hangers of the yoke; a cam on the shaft adapted to raise and release the yoke and plunger rod; a spring mounted between the support and the guide, adapted to force the plunger through its operative stroke; and a stroke-adjusting nut on the plunger rod above the support, adapted to adjust and so limit the drop of the plunger yoke as to prevent dropping contact between the yoke and cam, substantially as specified.

GUY H. ELMORE.

Witnesses:
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