

(No Model.)

J. J. FLANDERS.
PULP SCREEN.

No. 488,166.

Patented Dec. 13, 1892.

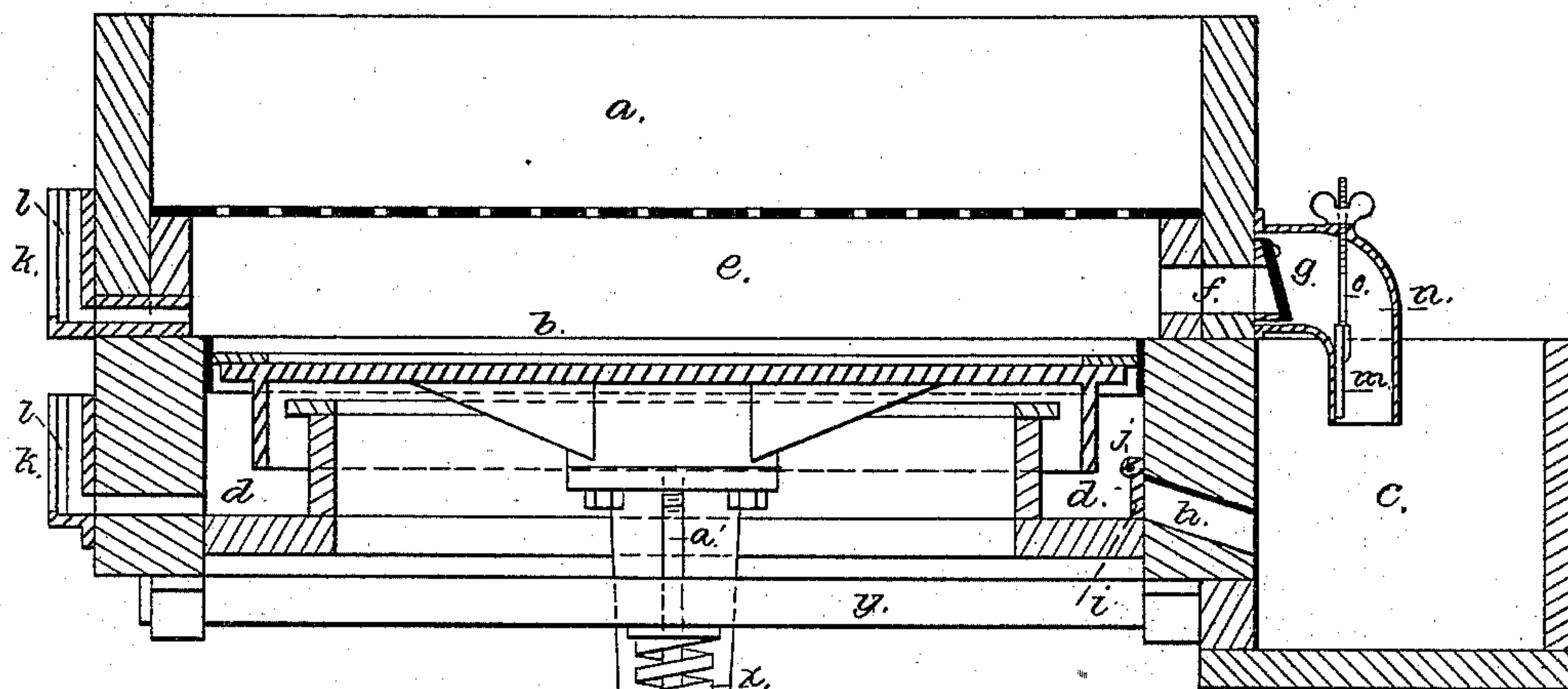


FIG 1.

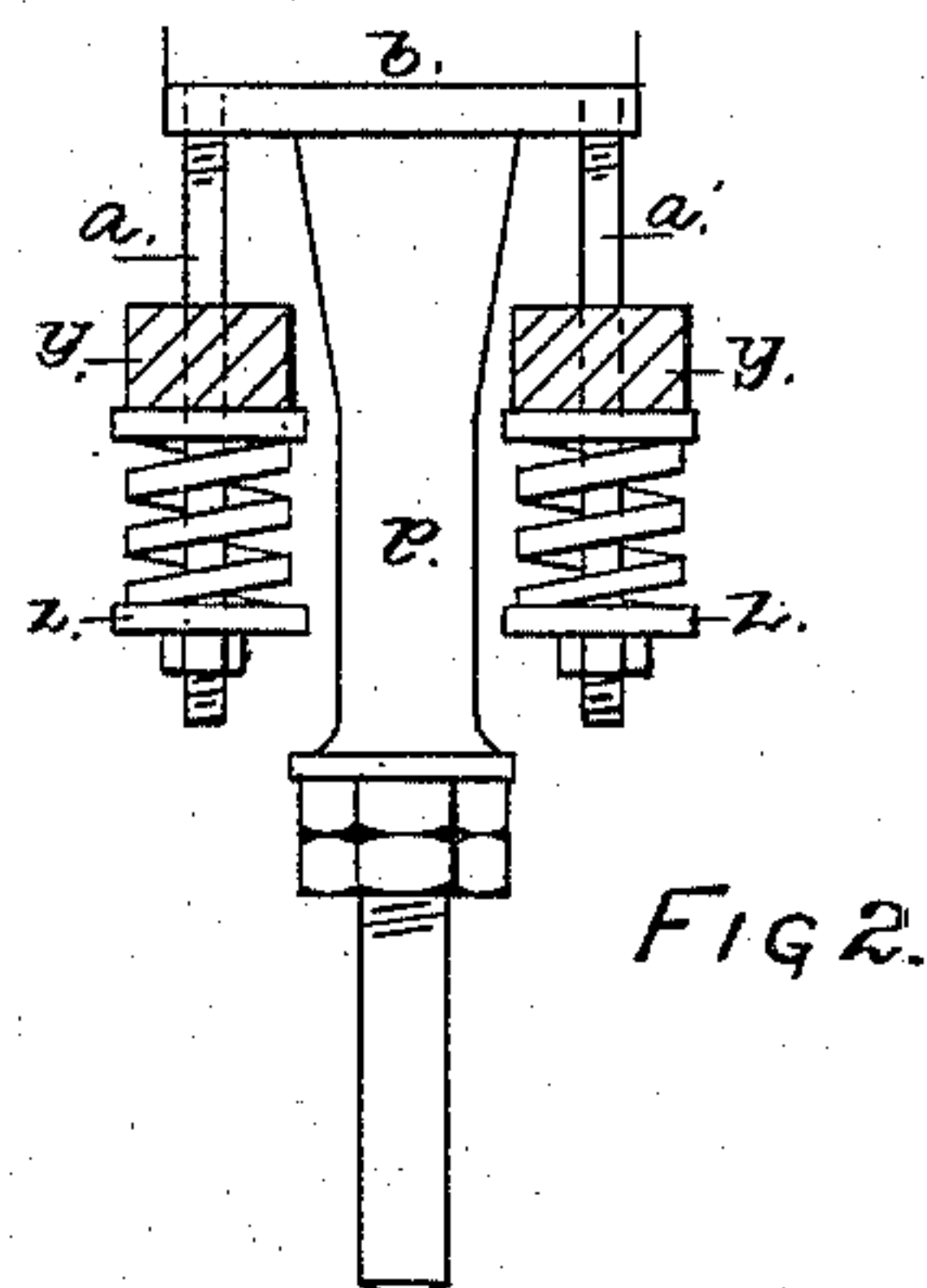


FIG 2.



FIG 4.

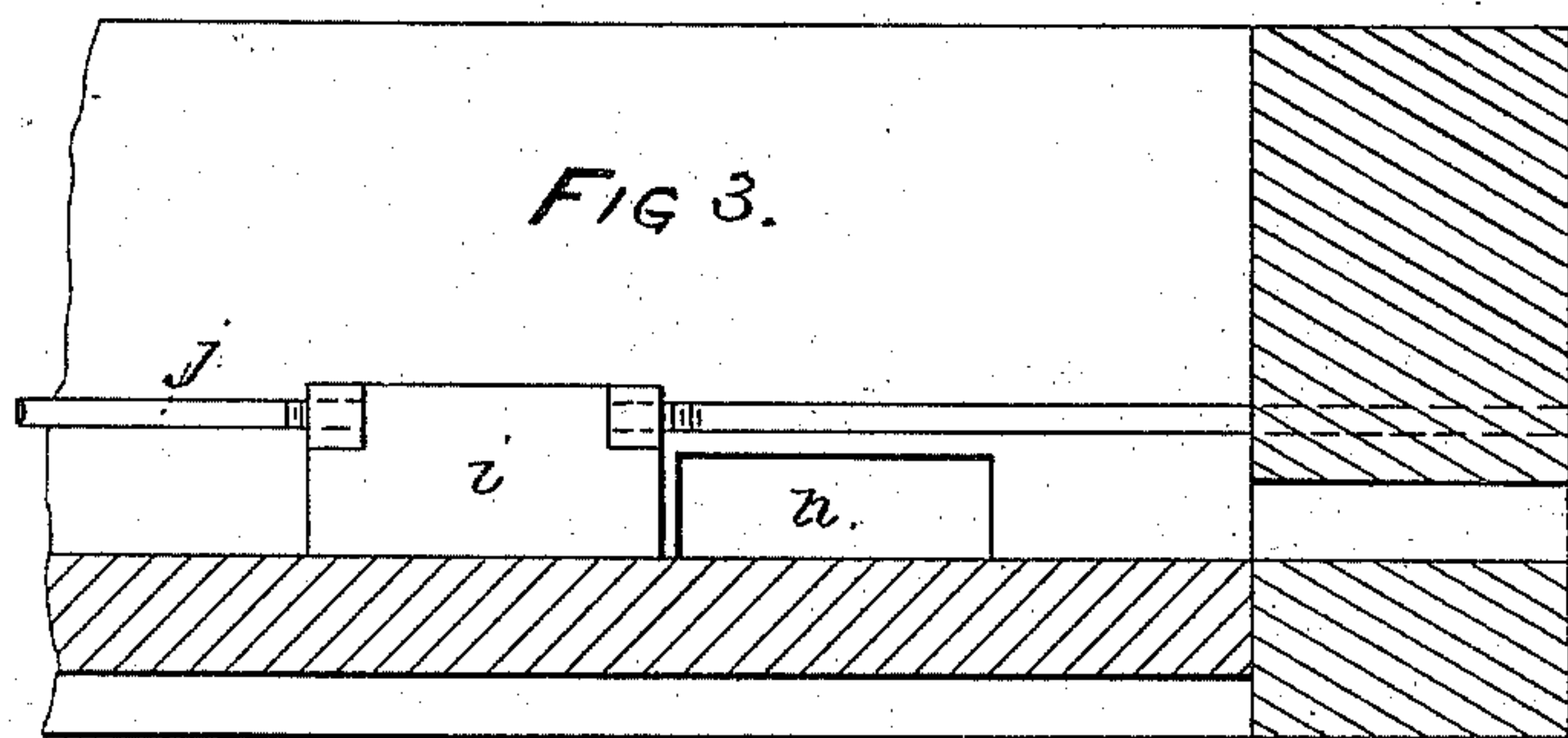


FIG 3.

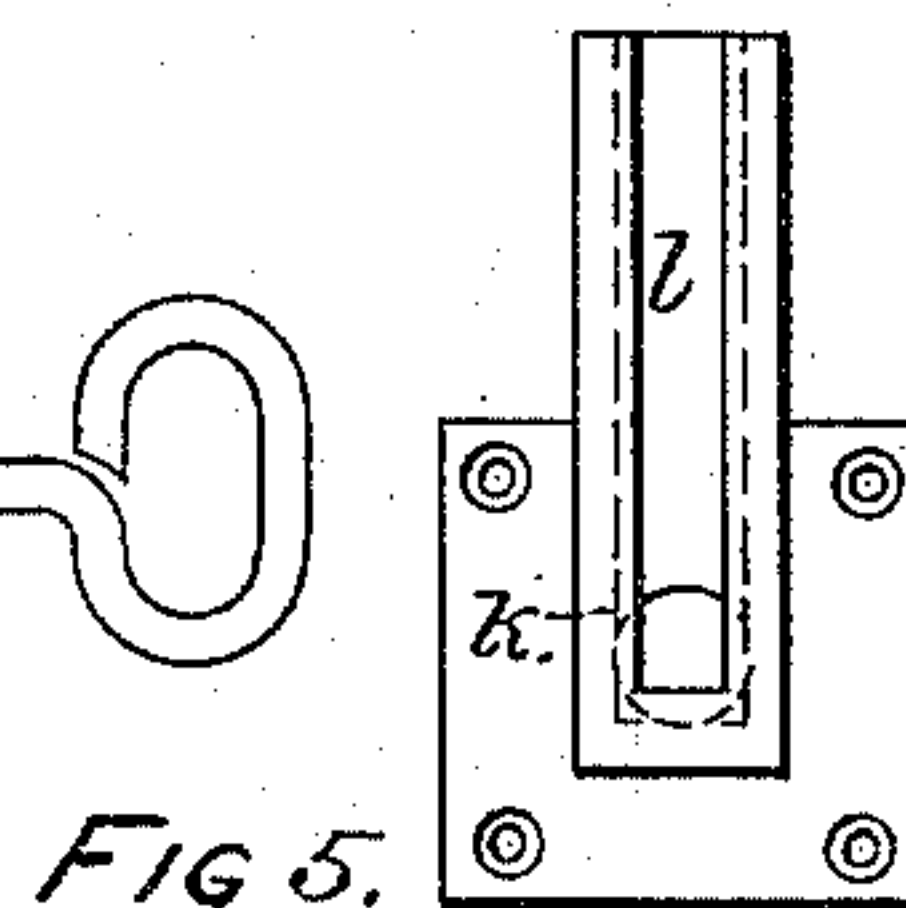


FIG 5.

Witnesses:
Nathan Clifford.
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Inventor:
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By Elmer C. Merrill,
att'y.

UNITED STATES PATENT OFFICE.

JOHN J. FLANDERS, OF PORTLAND, MAINE, ASSIGNOR TO CHARLES R. MILLIKEN, OF SAME PLACE.

PULP-SCREEN.

SPECIFICATION forming part of Letters Patent No. 488,166, dated December 13, 1892.

Application filed January 8, 1892. Serial No. 417,346. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. FLANDERS, of Portland, in the county of Cumberland and State of Maine, have invented certain new and
5 useful Improvements in Pulp-Screens; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference
10 being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification, in which—

Figure 1 is a vertical cross-section of my improved pulp-screen. Fig. 2 is a side view
15 of the connecting-rod and springs. Fig. 3 is a sectional view of the leakage-trough and gate. Fig. 4 is a detail view, side and end, of the gate. Fig. 5 is an end elevation of the gage-glass.

20 Same letters refer to like parts.

My invention relates to improvements in pulp-screens, and particularly to means for operating the diaphragm, means for regulating the stroke of the diaphragms and for
25 stopping the action thereof, means for regulating the depth of pulp in the leakage-trough, and for ascertaining readily the amount of pulp in the leakage-trough and in the chamber between the screen and diaphragm.

30 It also relates to other details of construction, which will be hereinafter fully set forth.

In the drawings herewith accompanying and making a part of this application, *a* represents a vat having a screen-plate resting in
35 the bottom thereof; *b*, a diaphragm located beneath said screen-plate and adapted to vibrate vertically by means hereinafter described; *c*, a collecting-trough arranged outside and in front of the machine, and *d* a
40 leakage-trough located beneath the outer edges of the diaphragm.

Between the screen-plate and the diaphragm is a chamber *e*, having openings *f* in the front thereof, the ends of said openings having
45 downwardly-extending spouts *n*, attached thereto, leading into the collecting-trough. At the end of said openings are automatic check-valves *g*, which permit the pulp to flow out, but prevent it from flowing back.

50 Extending out from the leakage-trough into the collecting-trough are ports *h*. The size of

ports *h* is regulated by a series of gates *i*, attached to a rod *j* and adapted to be drawn back and forward to partially close said ports. Leading out of the leakage-trough and also
55 from the chamber *e* are tubes *k*, which are turned upwardly on the outside of the casing and have a sight-glass *l* therein, by means of which the depth of pulp in the leakage-trough and chamber can be determined at a glance. 60

When it is desired to regulate to a certainty the amount of screened pulp flowing into the collecting-trough, I use a gate *m* in each of the spouts *n*, which have attached thereto a threaded bolt *o*, extending out
65 through the wall of the spout and having a thumb-nut on the end thereof, by means of which said gate can be raised or lowered and the capacity of the spout thereby increased or diminished, inasmuch as the raising of the
70 gate partially closes the opening in the spout. The pulp in the chamber *e* should never be allowed to completely fill the chamber, as in that case no pulp could pass through the screen. The body of air in the chamber *e* is
75 maintained therein by passage of air downward through the meshes of the screen, inasmuch as in this kind of screen only a very thin body of pulp is allowed to be in the vat. The amount of pulp, and consequently of air, 80 in the chamber *e* will be regulated by the gates in the spouts opening therefrom. In order to determine readily and at all times the depth of pulp in the chamber between the screen and diaphragm, the gage-glass be- 85 comes of utmost importance, because if the pulp gets too deep the body of air is insufficient to clear the screens when forced up through them by the upward movements of the diaphragms. 90

Attached to the bottom of the diaphragm *b* is a connecting-rod *p*.

Journalled in the frame of the machine is a rod *q*, upon which is set a cam *r* at a point directly beneath said connecting-rod. In or- 95 der to give stability to the connecting-rod, the end passes through an arm *s*, projecting out from the frame. Between the end of the connecting-rod and said cam *r* is a bar *t*, hinged at one end to the frame and having on its 100 under side a bearing-block of hard metal, as chilled steel, for the cam to strike against.

At one side of shaft *q* and journaled in the framework of the machine is a shaft *u*, having set thereon at a point directly under the end of bar *t* a cam *v* by means of which the length of stroke of the connecting-rod may be regulated. Said shaft *u* may be operated by means of the wheel *w* or in any other convenient manner. The upward motion of the diaphragm is caused by the revolution of cam *r*. The downward motion is caused by gravity aided by springs *x*, resting against the frame-timbers *y* and on steps *z*, in such manner that the springs are contracted or compressed by the upward motion of the diaphragm, said steps being supported on rods *a'*, attached to the bottom of the diaphragm.

While the description hereof relates to only one diaphragm, it will be readily apparent that a number of diaphragms with corresponding duplicate parts may be combined and operated simultaneously.

Having thus described my invention and its use, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a pulp-screen having a vat and screens, the combination, with a vibratory diaphragm having a downwardly-extending connecting-rod, of a shaft carrying a cam and a lever pivotally attached to the frame and interposed between the end of the connecting-rod and cam, the lower end of said connecting-rod resting loosely on the top of said lever, substantially as and for the purposes set forth.

2. In a pulp-screen having a vat and screen, the combination, with a vibratory diaphragm and its connecting-rod, of a shaft carrying a cam and a lever having a bearing-block of hard metal interposed between said cam and the end of the connecting-rod, the lower end of said connecting-rod resting loosely on the top of said lever, substantially as and for the purposes set forth.

3. In a pulp-screen having a vat and screen, the combination, with a vibratory diaphragm having a connecting-rod attached to the bottom thereof, a shaft journaled in the frame and carrying a cam, and a lever pivoted to the frame and interposed between the end of

the connecting-rod and cam, of a shaft carrying a cam, adapted to engage the free end of the said lever and regulate the length of stroke of the diaphragm, substantially as and for the purposes set forth.

4. In a pulp-screen having vat, screen, vibratory diaphragm, and means for imparting a vibratory movement to said platen, the combination, with a leakage-trough located below the platen and the collecting-trough, of ports opening from the leakage-trough into the collecting-trough and sliding gates adapted to be drawn partly over said ports to regulate the depth of pulp in the leakage-trough, substantially as and for the purposes set forth.

5. In a pulp-screen, a vibratory diaphragm, a leakage-trough below said diaphragm, a collecting-trough, ports connecting said leakage and collecting trough, sliding gates adapted to regulate the depth of pulp in the leakage-trough, and a gage-glass opening at one end into the leakage-trough, substantially as and for the purposes set forth.

6. In a pulp-screen having a vat, screen, and vibratory diaphragm and a chamber between said screen and diaphragm, the combination, with a spout leading from said chamber, of a gate arranged in said spout and adapted to be raised and lowered to regulate the flow of pulp therethrough, substantially as and for the purposes set forth.

7. In a pulp-screen, the combination, with a vat having a screen-plate in the bottom thereof, a vibratory diaphragm, a chamber between said screen-plate and diaphragm, delivery-spouts opening from said chamber, and adjustable gates in said spouts, of a gage-glass opening into said chamber, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

Portland, Maine, December 26, 1891.

JOHN J. FLANDERS.

Witnesses:

HOWARD A. SNOWMAN,
ELGIN C. VERRILL.