

(No Model.)

2 Sheets—Sheet 1.

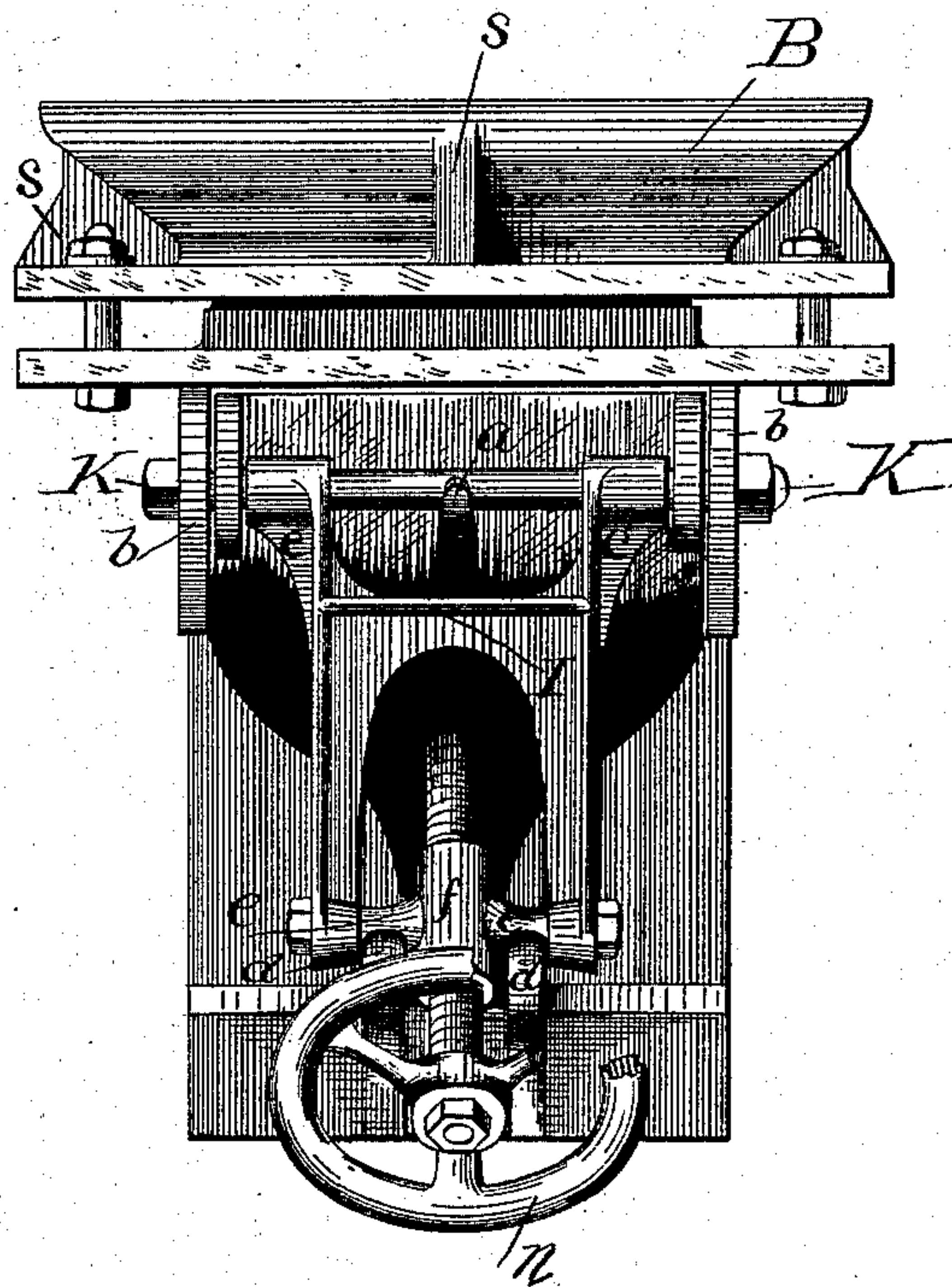
F. W. WOLF.

DISCHARGE VALVE FOR MALSTERS' STEEP TANKS.

No. 282,477.

Patented July 31, 1883.

Fig. 1.



Witnesses:

C. J. Gaylord.
W. H. Dyrenforth

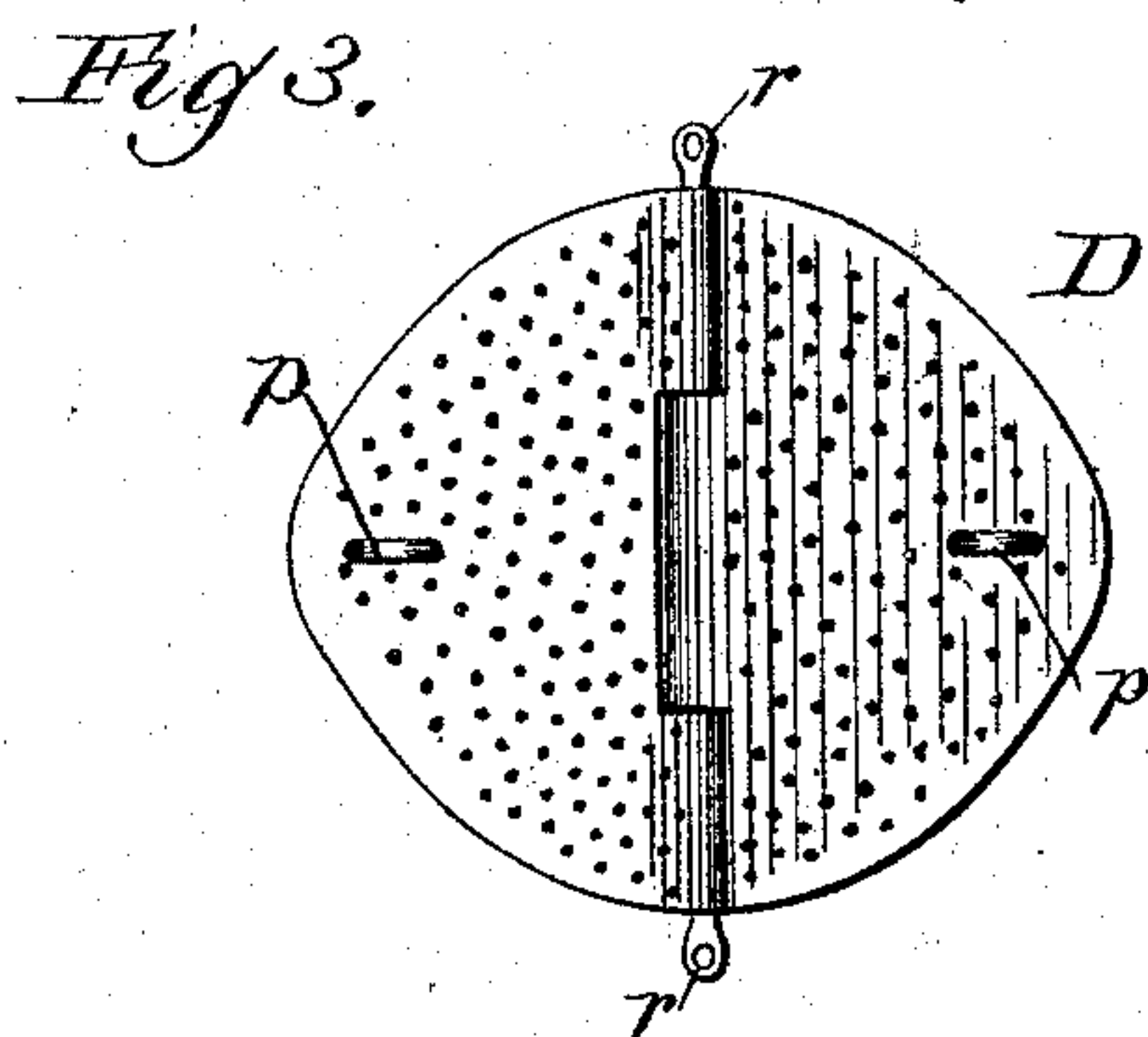
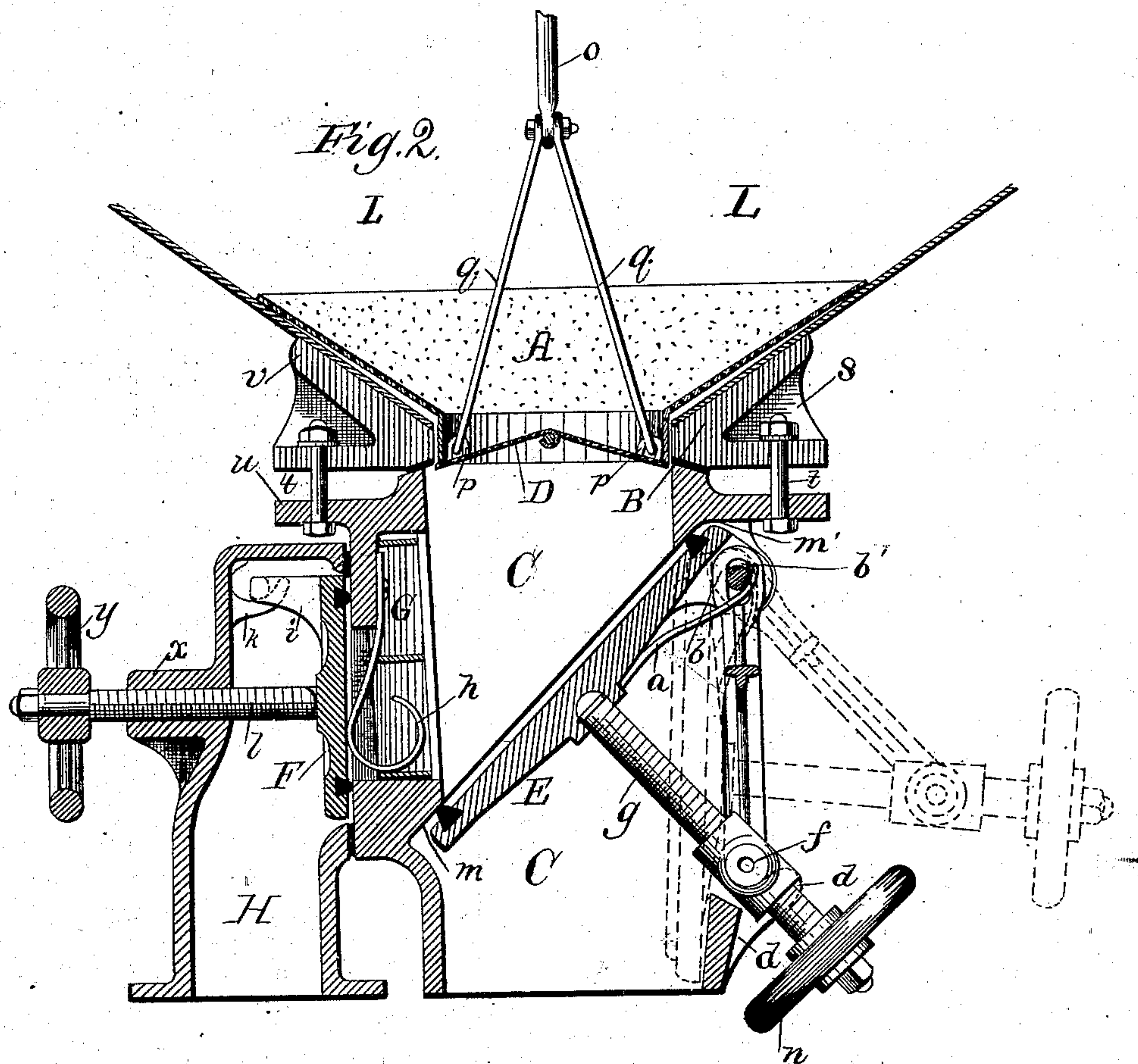
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By R. L. Dyrenforth,
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UNITED STATES PATENT OFFICE.

FREDERICK W. WOLF, OF CHICAGO, ILLINOIS.

DISCHARGE-VALVE FOR MALTSTERS' STEEP-TANKS.

SPECIFICATION forming part of Letters Patent No. 282,477, dated July 31, 1883.

Application filed April 30, 1883. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. WOLF, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Discharge-Valves for Maltsters' Steep-Tanks; and I hereby declare the following to be a full, clear, and exact description of the same.

My present invention is an improvement upon a device for the same purpose for which Letters Patent of the United States No. 187,210, dated February 6, 1877, were granted to me, and which has since been extensively introduced into malt-houses. The practical application of my device last referred to has led to the discovery of the following imperfections:

To operate the device it is adjusted to the bottom, hopped or straight, of a steep-tank, for the purpose of permitting by the means of its internal construction the draining off of the liquid and washing of the material contained in the tank and the discharge of the material itself. It is found, however, for one thing, that the emptying-tube is inconveniently long, and further, and more particularly, that the grain which enters the chamber formed by closing the grain shut-off valve to allow the liquid to escape through the water-discharge swells to such a degree that it chokes up the screen, thus preventing the liquid from escaping, and, besides, the pressure of the mass of grain and liquid in the tank upon the grain in the chamber packs the particles of the latter so closely together that the liquid cannot get between them, whereby the device is rendered inoperative until the cause of the trouble is removed, which requires time and labor, besides being very annoying. It is also very desirable to drain off the liquid from the tank without permitting any of the mass of grain to enter the valve-chamber by allowing the water in which it is being steeped to escape, and supplying fresh water, which operation may be repeated without great trouble or loss of time as often as may be necessary to steep the grain and avoid any disagreeable odor in the same. To overcome these objections I have

invented the device of which the following is an exact description.

Referring to the drawings, Figure 1 is a rear elevation of my device, having a portion of the hand-wheel broken away to show a detail; Fig. 2, a vertical section of the same, and Fig. 3 a plan view of a detail.

A is a funnel-shaped strainer, more converging in form than the bottom of the tank L in which it is placed, and having perforations in its body too small to permit the passage of particles of the grain being steeped, but allowing the water to drain off, by way of the space between the bottom of the tank and the strainer, through a perforated butterfly-valve, D. The spout of the strainer A fits closely within an annular top piece, B, having a flange or rim, *v*, extending around its upper surface, and made flaring to receive the hopped bottom of the tank L, to which it is secured, and a flange or rim, *t*, around its lower surface, provided with bolt-holes through which the bolts *t* pass to secure the device to the top piece, B. This top piece, B, preferably of iron, is cast with strengthening-ribs *s* between the rims or flanges.

C is a chamber, constituting the emptying-tube when unobstructed by the valve E, which would then lie flush with the side, as indicated by the dotted lines in Fig. 2 of the drawings.

The perforated butterfly-valve D is of the form shown to fit closely within the annular top piece, B, against the edges of the spout of the strainer A. It is secured in position in a manner that will allow the leaves to fold together within the chamber C by screwing the ends of the bar, provided with screw-holes for the purpose, and to which each leaf is hinged, into recesses, also having threaded holes to receive the screws, formed one on each side of the inner face of the annular top piece, through the spout of the strainer A; and it is operated by means of the converging rods *q*, hooked into rings *p*, formed upon the upper surface of the valve and secured to a vertical rod, *o*.

When it is desired to drain off the water in which the grain in the vat is being steeped, the hand-wheel *n* of the screw-valve E, the lat-

ter, for convenience of illustration, occupying the position indicated by the dotted lines in Fig. 2 of the drawings, is lowered to the position shown by the full lines in the drawings, whereby the valve-head is made to fit close against the shoulders *m* and *m'*, which form a valve-seat within the chamber C, to separate the upper portion from the lower. If, now, the screw *l*, which is provided with a hand-wheel, *y*, and which works within the female screw *x* to force the valve F (the latter being loosely hung upon shoulders *k*, formed upon the two inner sides of the chamber H, by means of the arms *i*, bent at right angles and projecting backward from the upper side of the valve F) against the frame, holding the screen G flush with the side of the chamber C, thereby preventing the escape of the liquid through it, is loosened, it falls back by its own weight, or, in case the rubber packing-sticks, by the additional action of a suitable spring, *h*, which it is caused to compress when closed, thus permitting the liquid to pass through the screen G into the passage H, and thence into the sewer, with which it is suitably connected.

The screw-valve E consists of the valve-head proper, a screw, *g*, whose point turns within a suitable recess in the back of the valve-head, and the hand-wheel *n*. The thread of the screw *g* works within a female screw, *f*, the latter being loosely supported by means of arms *e* within a pivoted link, I, as shown, the said link being in turn supported by the said arms upon the recessed projections *d*, which extend in an outward direction from the frame of the device. The link I terminates at its upper sides in two diverging arms, *c*, which are made annular at their extremities to receive the horizontal bolt K, which also rests near its extremities within holes formed in the projections *b*.

The holes in the projecting arms of the link are oval in form and sufficiently large to allow the link to be raised from its position in the recesses formed in the projections *d*.

When it is desired to remove the valve E from the position shown by the full lines in the drawings to that indicated by the dotted lines in Fig. 2, a few turns of the hand-wheel will be sufficient to loosen the valve-head in its seat, when the link, by its own weight and that of the whole screw-valve, will sink to rest upon the recessed projections *d*, from which, by using the hand-wheel *n* as a handle, it may be lifted, thus freeing it from the recesses in the projections *d*, and raised sufficiently to bring the valve-seat flush with the inside wall of the device, as shown by the dotted lines, whereby the grain in the vat will have an unobstructed passage through the chamber C.

Both the valves E and F are packed to form tight joints against their respective shoulders. To form this packing and make it effective in every way, the inner face of each valve-head is provided with a rectangular dovetailed recess. Into this recess a piece of

vulcanized rubber of like shape and dimensions is forced, and it fills up the recess in the face of the valve-head by its expansion after being contracted sufficiently to permit of its insertion into the recess. It is found that upon contact with the iron for a time the sulphur contained in the vulcanized rubber acts upon it to form a powerful cement, thus more firmly securing the packing in its place.

The object of the spring *a* is to bring the bolt K and valve-head E closer together when in the position indicated by the dotted lines, to prevent the projecting rubber constituting the packing from catching when the valve is being closed.

For convenience in construction, it is desirable to form the part inclosing the chamber C and that inclosing the chamber H separately. Each may be cast with projecting lips to fit into each other, and securely bolted together.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a discharging device for maltsters' steep-tanks, the perforated butterfly-valve D, secured within the same, in combination with mechanism for operating the said valve, substantially as described, and for the purpose set forth.

2. In a discharging device for maltsters' steep-tanks, the butterfly-valve D, secured within the same, in combination with the strainer A and with mechanism for operating the said valve, substantially as described.

3. In a discharging device for maltsters' steep-tanks, the valve E, in combination with mechanism for adjusting the same in position against the shoulders *m* and *m'* within the chamber C, and for causing it to lie flush with the side of the said chamber, said mechanism consisting of the screw *g* and hand-wheel *n*, female screw *f*, arms *e*, forming part of and loosely supporting link I upon the recessed projections *d*, the said link terminating in diverging arms *c*, made annular at their extremities to receive the horizontal bolt K, which rests within locks *b*, and spring *a*, the whole being arranged to operate substantially as described.

4. In a discharging device for maltsters' steep-tanks, the combination, with the water-escape pipe H, leading from the chamber C, of the valve F, provided at its upper end with the backward-projecting arms *i*, bent at right angles, to rest upon the shoulders *k*, formed one upon each inner side of the chamber H, screw *l*, provided with a hand-wheel, *y*, female screw *x*, screen G, and spring *h*, substantially as and for the purpose set forth.

5. In a discharging device for maltsters' steep-tanks, the combination of the butterfly-valve D, secured within the same and having mechanism to operate it, the strainer A, valve E, provided with mechanism to adjust it in position within the chamber C and to bring

it flush with the side of the said chamber, said mechanism consisting of the female screw *f*, having arms *e*, link *I*, having converging arms *c*, recessed projections *d*, horizontal bolt *K*,
5 resting within the holes *b*, spring *a*, valve *F*, loosely hung by means of the backward-projecting arms *i*, bent at right angles to rest upon the shoulders *k*, formed one upon each inner

side of the chamber *H*, screw *l*, provided with a hand-wheel, *y*, spring *h*, and screen *G*, the whole being constructed and arranged to operate substantially as described.

FREDERICK W. WOLF.

In presence of—

WM. H. DYRENFORTH,
EDW. McCAFFREY.