H. H. TUTTLE.

PUMP PLUNGER.

No. 191,271. Patented May 29, 1877.

Fig. 1

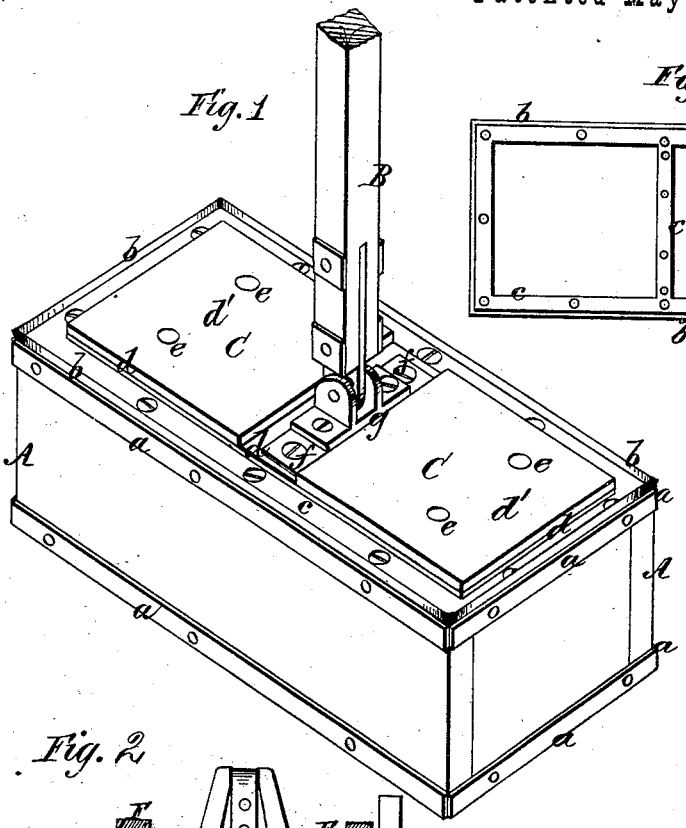


Fig. 4

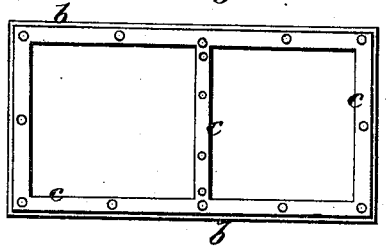


Fig. 2

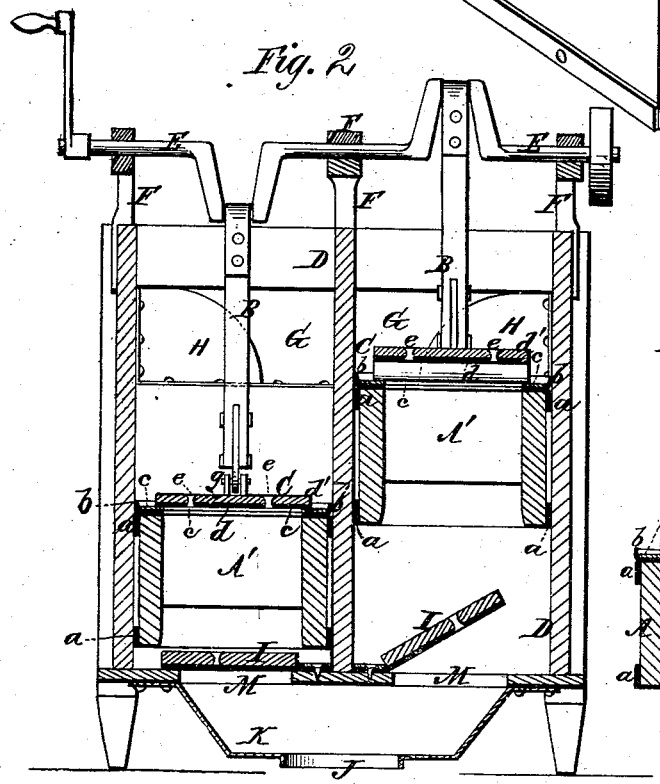
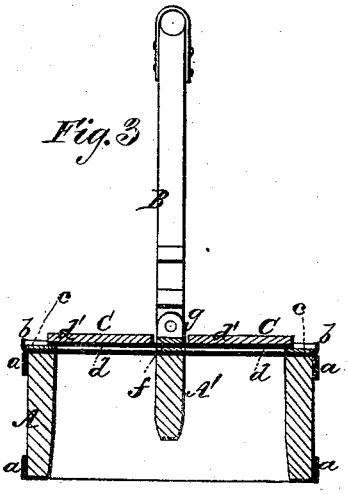


Fig. 3



Witnesses.
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UNITED STATES PATENT OFFICE.

HIRAM H. TUTTLE, OF SAN JOSÉ, CALIFORNIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO FREDERICK FIELD, OF SAME PLACE.

IMPROVEMENT IN PUMP-PLUNGERS.

Specification forming part of Letters Patent No. **191,271**, dated May 29, 1877; application filed April 29, 1876.

To all whom it may concern:

Be it known that I, HIRAM H. TUTTLE, of San José, in the county of Santa Clara and State of California, have invented certain new and useful Improvements in Double-Acting Pumps; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of one of the box-plungers and its attachments. Fig. 2 is a vertical transverse section of my improved pump, with the parts in a working position. Fig. 3 is a detail sectional view of one of the improved box-plungers, and Fig. 4 a plan view of the metal-binding valve-plate and flexible packing.

The nature of my invention consists in certain constructions, combinations, and arrangements of parts, as hereinafter described and specifically claimed, whereby certain beneficial results are attained, as will be presently set forth.

In the accompanying drawings, A represents a rigid box-plunger, provided with a plunger-arm, B, and the valves C C. The box-plunger A is made of wood or metal in rectangular form, and having its sides rigid from top to bottom, and of a depth equal to about one-third the depth of the pump-cylinder D, as shown in Fig. 2 of the drawings. The upper and lower side edges of the said box-plunger are provided with projecting strips of suitable packing material, as shown at *a*, which keep the plunger steady, and free from oscillation, and at the same time isolate the greater portion of the depth of the box from contact with the sides of the chamber in which it moves up and down, and thus while the box-plunger is steadied and kept from vibrating by its packing-strips, it is caused to work with the least amount of friction. On the top edge of the box-plunger a flexible cup-shaped packing, *b*, of any suitable material, is fastened securely. This packing has its outer edge turned up beyond the top of the box-plunger, so as to present a yielding surface for bearing snugly against the inside of the chamber in which the box-plunger moves. *c* is a sheet-metal binding-plate, stamped out of a single piece of metal, in the form shown in Fig. 4. This plate fits snugly upon the packing *b*, and binds it firmly to the top of the box-plunger; and thus the packing is saved from being readily torn from its seat, and when worn can be removed, and new packing substituted, without unnecessary expense or delay.

It will be seen that by making the box-plunger of a depth corresponding to about one-third the depth of the pump-cylinder, and providing its upper and lower exterior edges with projecting strips of suitable packing material, so as to leave a space between the strips, and thus have a long portion of the box-plunger out of frictional contact with the sides of the pump-cylinder, there is little liability of the box-plunger oscillating under strain, and the inconvenience arising from such oscillation avoided, and the amount of frictional contact reduced, so as to lessen the power required for moving the said plunger.

The box-plunger A is divided by a single vertical partition, A′, into separate compartments, each of which is covered by a valve, C. The partition A′ strengthens the box-plunger, so that the sides thereof shall always be kept rigid. The said partition also breaks the supply of water, and divides it equally to each of the compartments.

The valves C are formed together out of a single piece of leather, *d*, and upon certain portions of this piece of leather metal plates *d′* are riveted, as at *e*. The rivets are inserted a little outside of the center of the width of the plates, so as to allow an easy movement of the valves upward at their hinge, and the breakage of the leather thus prevented.

The hinge portion of the said valves C are fastened to the central partition of the box-plunger A by a single metal strip, *f*, and a cap, *g*, to which latter one end of the plunger-arm B is loosely attached. The plunger-arm B is of ordinary construction, having a sleeve on its upper end, by which it is fastened to the windlass or crank E.

The projecting strips *a* may be applied to the box-plunger, so as to just snugly fit the chamber in which the box-plunger moves, as

the cup-leather packing *b* is mostly relied upon for packing the box-plunger water-tight while it is operating, and therefore the danger of the strips *a* wearing off by too close a contact is avoided.

The windlass or crank E is constructed with crank-arms, so that when the pump is in operation, and one plunger-box is discharging water, the other plunger-box will take water. Thus there can be one, two, or more plungers operated at will in this way.

F are braces, of any suitable form and construction, upon which the windlass or crank E is placed. G is an aperture in the cylinder D, through which water from the box-plunger is discharged into the spout H. The said spout H is made with a bolting-flange to secure it firmly to the interior sides of the pump-cylinder D. I are valves placed over the supply-passages M at the bottom of the pump-cylinder. These valves are constructed in the same manner as the valves C of the box-plunger, except that the leather is not united or formed together with two plates upon it; but they are separate, there being one independent valve for each pump-cylinder.

The bottom of the pump-cylinder is constructed so as to leave its center solid, for the purpose of directing the water more perfectly to each of the box-plungers through the passages M, as shown. The valves I correspond in length to both of the valves C, as the passages M are equal to the compartments in the box-plunger A. K is a space or tank of any suitable form, placed beneath the pump-cylinder. This space or tank, is equivalent to the same width and length of the two plungers, so that when either plunger is in full operation this space or tank is full of water, thus supplying each plunger as required. J is a supply-pipe in direct communication with the tank K. The said tank K is secured to the bottom of the pump immediately under the valves I. By placing the tank under the valves I, and both acting with the plunger A, the water is carried directly to the pump-cylinder in a very perfect manner.

The means for operating the pump may be by a crank-handle or pulley connected to the windlass E, in the manner shown.

If desirable to have three or more box-plungers in operation at one time, it may be done by simply extending the length of the windlass E and pump-cylinder, and thus it will be seen that as large amount of water may be pumped as required.

I do not claim a box-plunger made with a depending leather packing, nor do I claim a box-plunger having the form shown in the patent to James R. Mills, No. 36,665, dated October 14, 1862, for a double-acting pump, nor do I claim any part of his construction; but

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

1. In a pump, the box-plunger A, of rectangular form, divided by a single partition, A′, into compartments, in combination with the supply-passage M at the base of the pump, substantially as shown and described.

2. The long stiff box-plunger A, having its sides rigid from top to bottom, the said sides having their upper and lower exterior edges provided with projecting strips *a*, in combination with an upwardly-extended packing, *b*, substantially as described.

3. The binding-plate *c*, stamped out of a single piece of metal, in the form shown, in combination with the packing *b*, for the purpose set forth.

4. The rigid rectangular box-plunger, constructed with the projecting strips *a*, the yielding packing-strip *b*, and binding-plate *c*, substantially as described.

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Witnesses:
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