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W. E. HOLMES.

PUMP CONNECTION FOR WINDMILLS.

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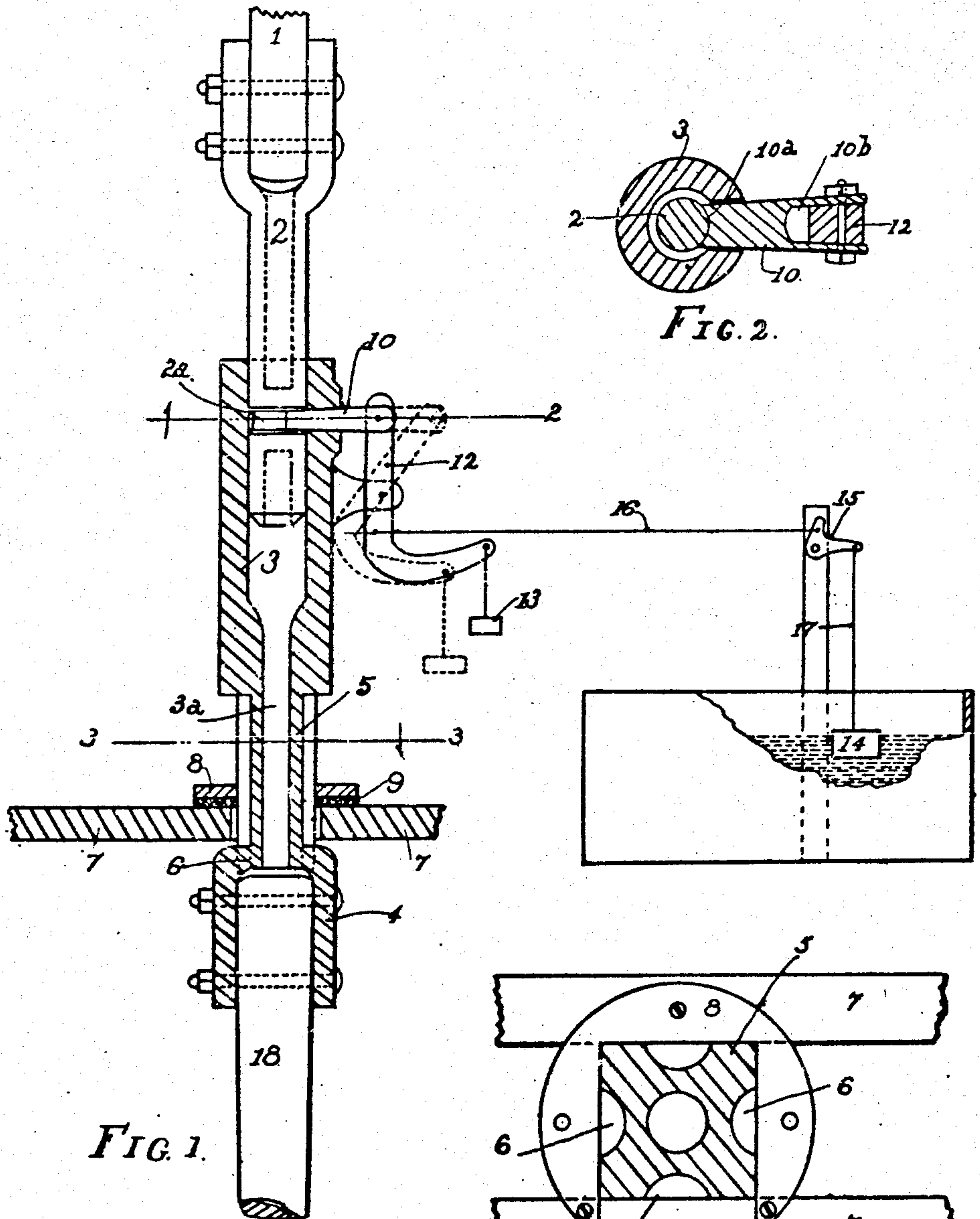


FIG. 1.

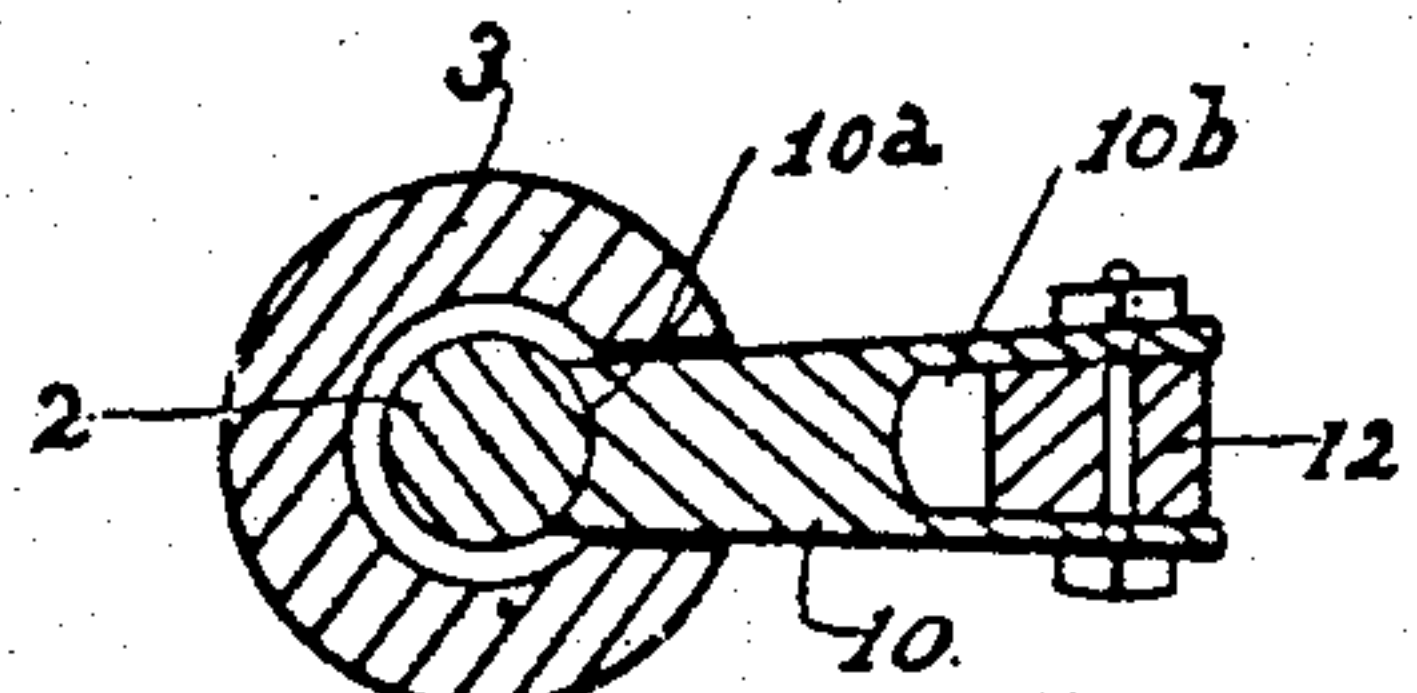


FIG. 2.

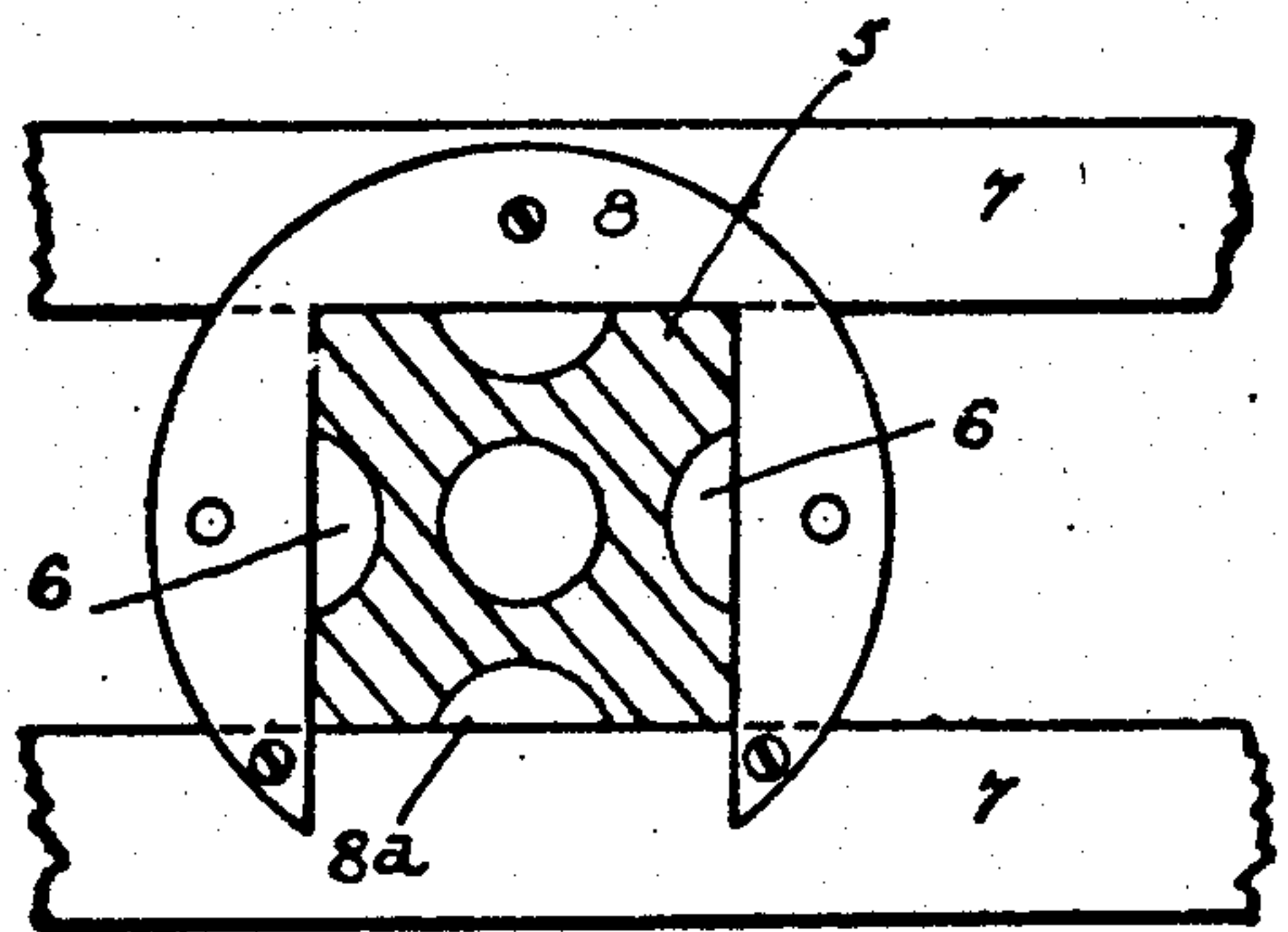
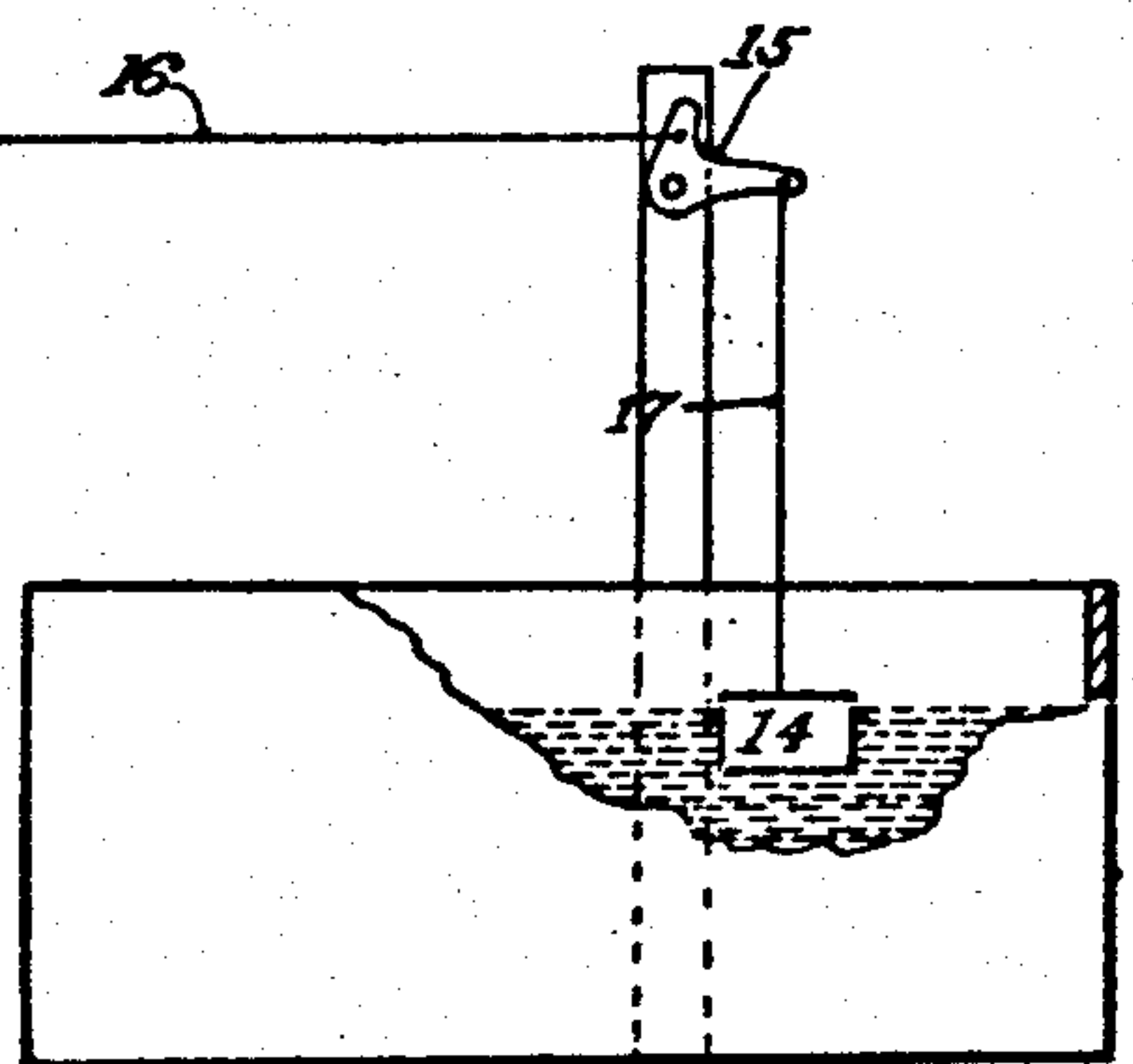


FIG. 3.

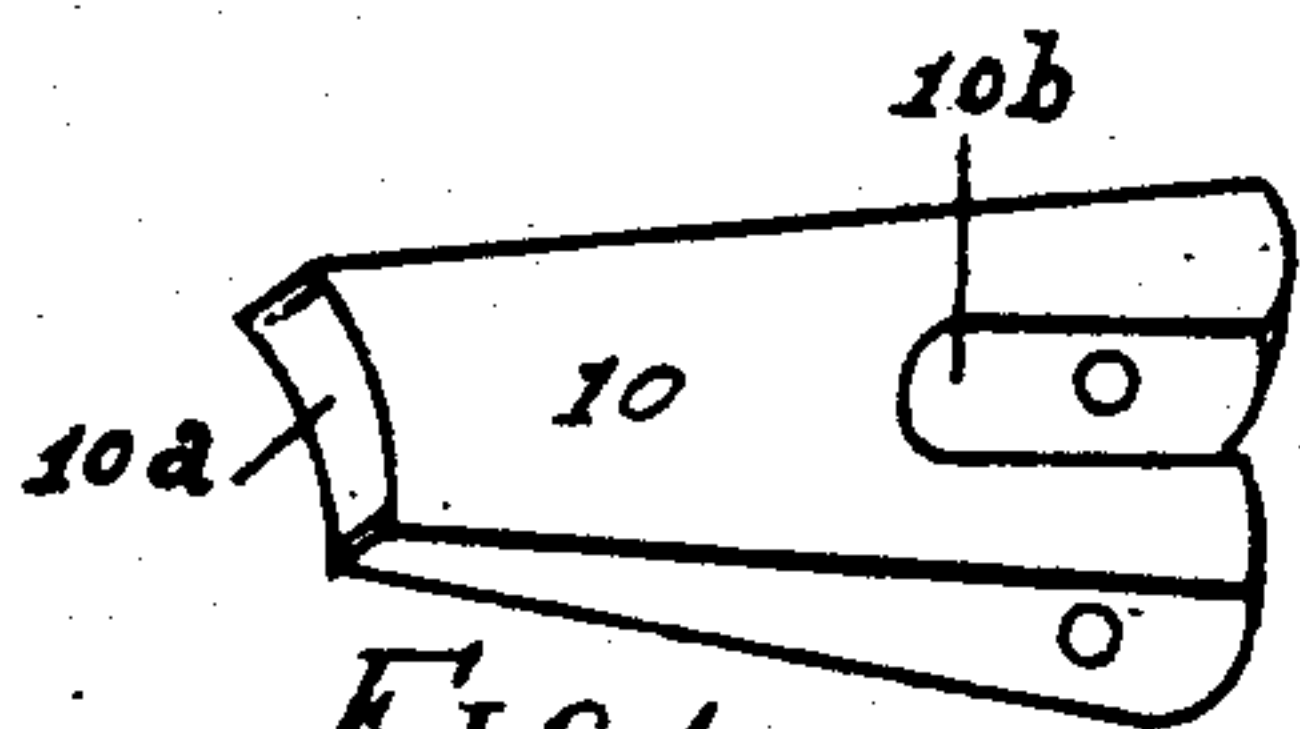


FIG. 4.

Witnesses.
Matabelle Dawes.
C. D. DuBois.

Inventor
WILLIAM E. HOLMES.
By Atty C. D. DuBois.

UNITED STATES PATENT OFFICE.

WILLIAM E. HOLMES, OF LAKE FORK, ILLINOIS.

PUMP CONNECTION FOR WINDMILLS.

No. 837,405.

Specification of Letters Patent.

Patented Dec. 4, 1906.

Application filed April 2, 1906. Serial No. 309,439.

To all whom it may concern:

Be it known that I, WILLIAM E. HOLMES, a citizen of the United States, residing at Lake Fork, in the county of Logan and State of Illinois, have invented a certain new and useful Pump Connection for Windmills, of which the following is such a full, clear, and exact description as will enable others skilled in the art to which it appertains to make and use my said invention.

My invention relates to devices for connecting the crank-rod of a windmill with a pump-rod in such manner that the operation of the pump may be controlled by a float in the tank into which the water is pumped.

The purposes of my invention are to provide a coupling simple in construction and effective in operation, to provide means to prevent lost motion of the plunger-rod, to provide means to prevent the coupling from descending beyond the reach of the plunger-rod, to provide means to guide the movement of the coupling, and to provide means to connect the plunger-rod with the coupling in such manner that the rod may turn in the coupling.

With these ends in view my invention consists in the novel features of construction and combinations of parts shown in the annexed drawings, to which reference is hereby made and hereinafter particularly described, and finally recited in the claims.

Referring to the drawings, Figure 1 is a vertical axial section through the coupling and shows the plunger-rod and the pump-rod in elevation. Fig. 2 is an enlarged horizontal transverse section on the line 2 2 of Fig. 1. Fig. 3 is an enlarged horizontal transverse section on the line 3 3 of Fig. 1, and Fig. 4 is an enlarged perspective view of the key detached.

Similar reference-numerals designate like parts in the several views.

The crank-rod 1 is of the usual construction and is connected in the usual manner with the crank-pin of the windmill.

The plunger-rod 2 is cylindrical in form and has a circumferential tapering channel 2^a, as shown, and for the sake of lightness the rod 2 is partly hollow, as indicated by dotted lines. The plunger-rod 2 turns in the tubular part 3 of the coupling, thereby obviating the necessity for a swivel connection of the crank-rod with the windmill. The coupling consists of an annular upper part 3, a lower forked part 4, and an intermediate squared

part 5. A central bore 3^a extends through the part 5 and communicates with the interior of the part 3, so that water or dirt entering the tube of the part 3 may pass downward and be discharged through the bore 3^a, thereby preventing any obstruction of the tube by water, snow, ice, or dirt. The squared part 5 slides in an angular opening 8^a in a stationary plate 8 and prevents turning of the coupling. Longitudinal channels 6 in the part 5 diminish the surface of the part 5 which rubs on the plate 8, thereby reducing friction between the parts. The channels 6 also serve to permit the passage of dirt and prevent dirt from accumulating on top of the plate in such quantity as to prevent full downward movement of the plunger.

The upper end of the pump-rod 18 is secured in the fork 4.

Timbers 7 are secured parallel to each other on the windmill-tower. A guide-plate 8 is secured on the pieces 7 by screws or equivalent securing devices. The squared part of the coupling 5 slides in the angular opening 8^a of the plate, and the opening extends entirely across one edge of the plate, so that the plate may be conveniently placed in position to guide the coupling. A cushion 9, of rubber or other yielding material, underlies the plate 8 and yields sufficiently to prevent injury to the coupling when the lower end of the coupling strikes the plate.

The key 10 is wedge-shaped in two directions. The reduced end of the key fits in the circumferential channel 2^a around the plunger-rod and the concave end 10^a of the key fits around the reduced cylindrical part of the plunger-rod. A lever 12 is fulcrumed on the coupling 3 and its upper end fits in a fork 10^b in the enlarged end of the key 10 and is pivotally connected therewith. A basket 13, suspended from one end of the lever 12, receives sand or other heavy material in quantity sufficient to counterbalance the weight of the float 14, so that the lever 12 may be easily operated by the rise and fall of a small and light float. The float 14 is situated in the tank into which the water is pumped.

A bell-crank lever 15 is mounted to oscillate on any suitable stationary support. One arm of the lever 15 is connected with the lever 12 by a wire 16 and the other arm of the lever is connected with the float 14 by a wire 17.

When water is pumped into the tank to a

predetermined depth, the float, rising with the water, operates the lever 15 to cause it to relax the wire 16 and permit the weight 13 to operate the lever 12, and thereby retract the key 10. The upper end of the key 10 fits in the tapering cylindrical channel 2^a around the plunger-rod 2, so that when the key is in position in the channel there is no play of the key in the channel. When the key is withdrawn, the coupling 3 descends until the lower end of the cylindrical part of the coupling rests on top of the plate 8. The plunger-rod 2 then slides freely up and down in the coupling 3. The plate 8 prevents the coupling from descending so far that the key will not engage in the channel around the plunger-rod. When the water in the tank falls below the predetermined level, the float pulls on the wire 17, and through the instrumentality of the bell-crank lever 15 and the wire 16 operates the lever 12 to cause the end of the key to move inward, so that at the first downward stroke of the plunger-rod the key will enter the circumferential channel around the plunger-rod and connect the coupling with the rod.

By reason of the construction shown and described the coupling moves vertically up and down and the plunger-rod turns freely in the coupling. Hence the turning of the plunger-rod does not produce any binding of the coupling or any turning of the pump-rod and no swivel connection of the crank-rod with the wind-wheel is required.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An annular coupling having a squared part, in combination with a pump-rod connected with said coupling, a plate in which the squared part of said coupling is slidable, a plunger-rod slidable in the coupling and having a circumferential channel, a crank-rod connected with said plunger-rod, a tapering key fitting in the circumferential channel around the plunger-rod, and means for operating said key substantially, as set forth.

2. In a pump connection for windmills, a key tapering in two directions and having a

concave end; in combination with an annular coupling, a plunger-rod slidable in said coupling and having a tapering circumferential channel in which said key fits, and means for operating said key.

3. In a pump connection for windmills, the combination of an annular coupling having a squared part, a pump-rod connected with said coupling, a stationary plate in which the squared part of the coupling slides, a plunger-rod slidable in the coupling and having a tapering circumferential channel, a tapering key slidable transversely in the coupling and fitting in the circumferential channel in the plunger-rod, a lever mounted on said coupling and connected with said key, a weight on said lever, a tank, a bell-crank lever adjacent to the tank, a float in the tank, means connecting the float with the bell-crank lever and means connecting the bell-crank lever with the lever operating the key.

4. The combination of an annular coupling having an angular part, a plate having an angular opening in which the angular part of the coupling slides, a support for said plate, a cushion between said plate and its support, a plunger-rod slidable and turnable in the tube of said coupling and means detachably connecting the plunger-rod with the coupling.

5. The combination of a slidable annular coupling, a stationary guide adapted to permit sliding of the coupling and adapted to prevent turning of the coupling, a pump-rod connected with said coupling, a plunger-rod turnable and slidable in the coupling and having a circumferential channel, a key mounted on the coupling and fitting in the circumferential channel of the plunger-rod, and means for operating the key to engage and disengage the plunger-rod.

In witness whereof I have hereunto subscribed my name, at Mount Pulaski, Illinois, this 14th day of March, 1906.

WILLIAM E. HOLMES.

Witnesses:

J. F. MYERS,
ED. MEISTER.