

(No Model.)

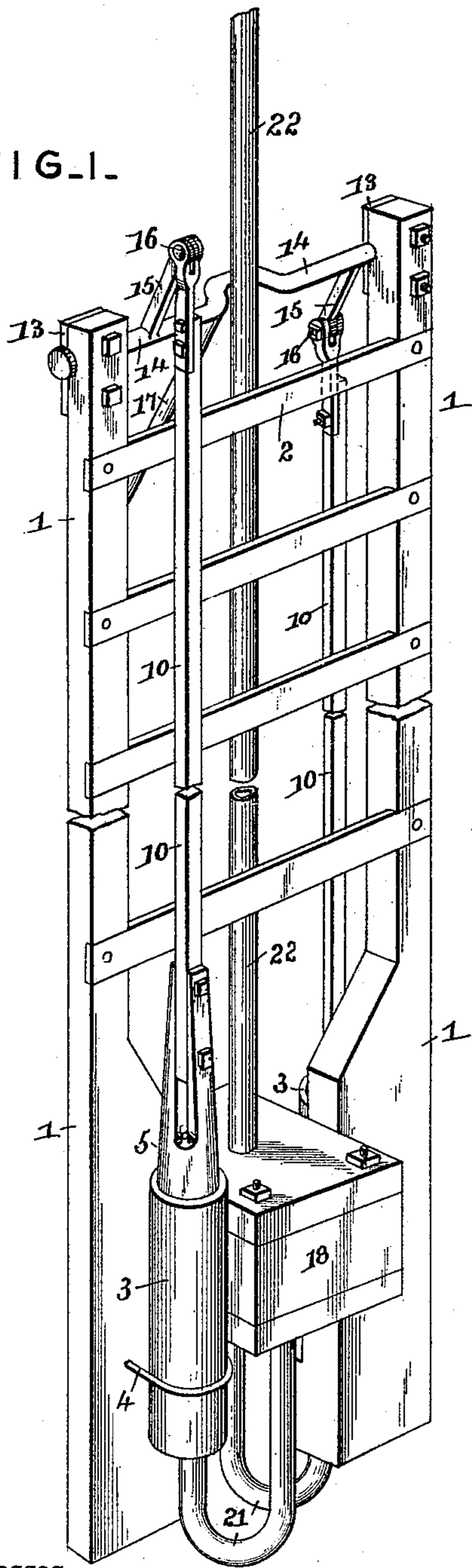
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O. G. HOWELL & J. M. HORN.
PUMP.

No. 490,657.

Patented Jan. 31, 1893.

FIG. 1.

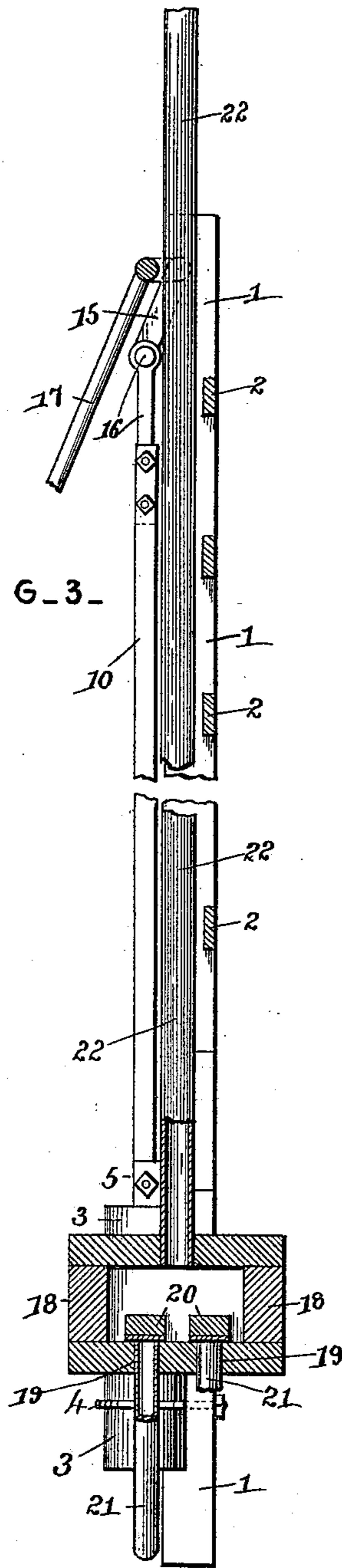


Witnesses

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FIG. 3.



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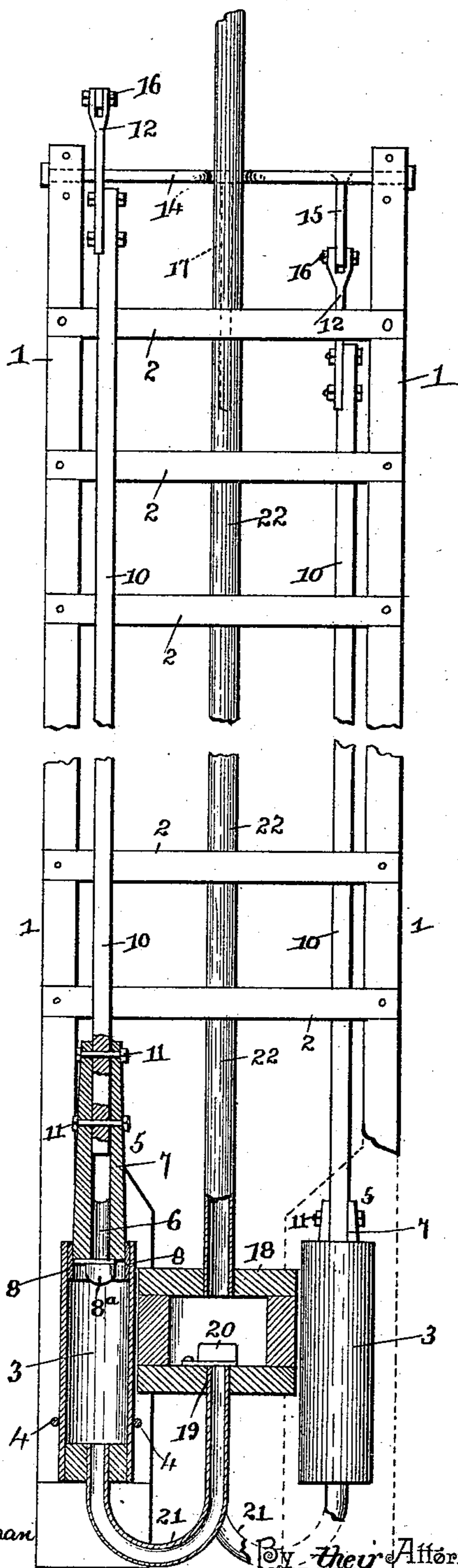
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2 Sheets—Sheet 2.

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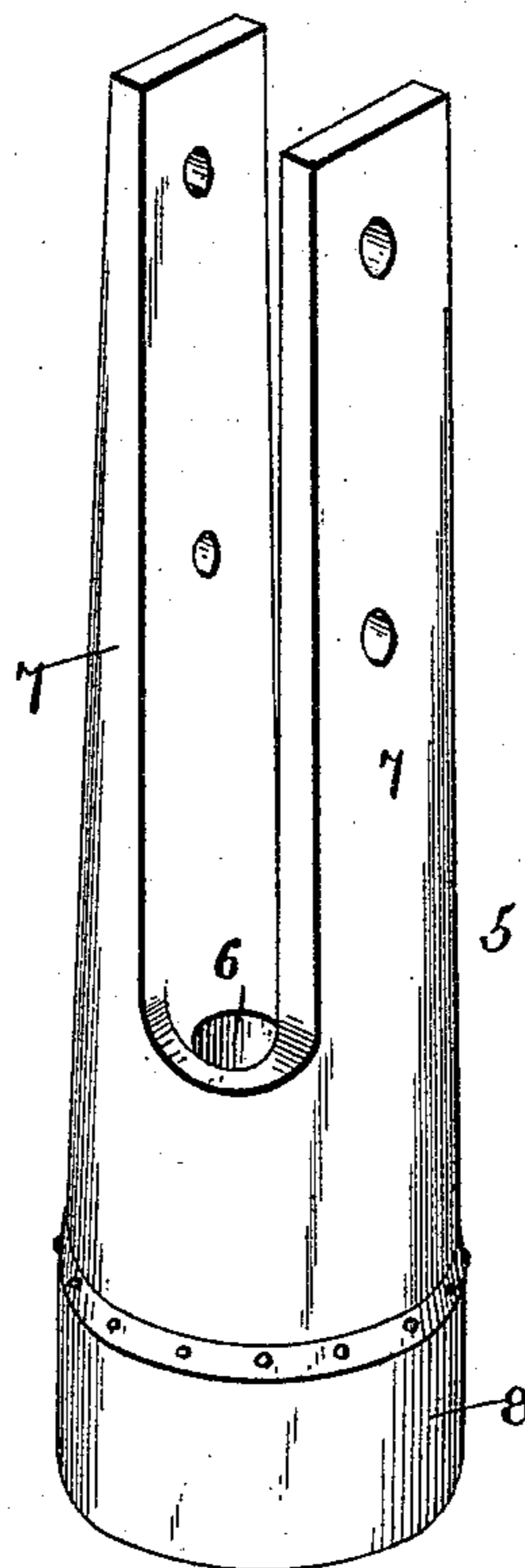


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UNITED STATES PATENT OFFICE.

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PUMP.

SPECIFICATION forming part of Letters Patent No. 490,657, dated January 31, 1893.

Application filed August 18, 1891. Serial No. 403,039. (No model.)

To all whom it may concern:

Be it known that we, OSBORN G. HOWELL and JEREMIAH M. HORN, citizens of the United States, residing at Arba, in the county of Randolph and State of Indiana, have invented a new and useful Pump, of which the following is a specification.

Our invention relates to improvements in portable pumps of that class in which twin cylinders are employed for the purpose of forcing a continuous stream of water; and it has for its object to provide a pump, simple in construction and operation, which will force a continuous stream of water from a well in which it is arranged with a minimum expenditure of power; to provide a simple and compact supporting frame-work to maintain the parts of the pump in operative position; to provide means for arranging the cylinders and operating mechanism in such relative positions as to avoid the use of pitmen or jointed piston-rods; and to so arrange and combine the parts as to cause the duplicate arms or cranks of the rock-shaft, the piston-rods, and the pistons to counter-balance each other, and thereby reduce the required power for operation to that which is necessary to overcome unavoidable friction and the weight of the water elevated.

Further objects and advantages of our invention will appear in the following description and the novel features thereof will be particularly pointed out in the appended claim.

In the accompanying drawings;—Figure 1 is a perspective view of a double cylinder pump constructed in accordance with our invention. Fig. 2 is a vertical longitudinal sectional view taken on one side of the supporting ladder and through one of the pump cylinders and plunger rods. Fig. 3 is a vertical transverse sectional view of the same. Fig. 4 is a detail in perspective of one of the plunger heads or pistons.

Referring to the accompanying drawings; 1—1 represent vertical parallel supports that extend down into a well from the top thereof and are designed to carry the various parts of the pump. The said supports or standards are transversely connected by means of the cross-bars or rounds 2 which not only

serve to brace together the said supports but also serve to complete a ladder carrying the parts of the pump and thus providing means whereby one can conveniently and easily descend into the well whenever it may be required to repair or adjust the parts of the pump. Secured upon opposite and alternate sides of said supports at their lower ends are the pump cylinders 3 which are securely held to said supports by means of the clips 4. The said cylinders open at their top ends are designed to be submerged at all times and thus held in position to be readily filled with water, and the contents of the same are alternately discharged by means of the plungers 5 working therein. The said plungers are constructed of a suitable material and are designed to fit snugly within the barrels of the alternately and oppositely disposed pump cylinders, the same each comprising a body having a central perforation 6 and upwardly extending arms 7 by means of which the plungers are connected to the operating means, and between which arms the water in its ascent is designed to flow and thence through the perforations 6 into the cylinder from which it is discharged by the down stroke of the plunger. The lower end of the body of the plunger is provided with a depending circular flange 8 constructed of leather or other suitable material and which incloses the downwardly opening flap-valve 8^a which incloses the bottom of the central bore of the plunger and which as said, as the said plunger arises allows the water to flow therethrough and into the cylinders, and as the plunger descends closes and forces the water out of the same in the manner to be presently described, the said flange allowing the plunger a full stroke within the cylinders and protecting the inclosed valve from injury. Secured between the upwardly extending arms 7 of said plunger or pistons is suitably secured the operating plunger rod 10 which is designed to work within the clips or staples 11 secured along the sides of said vertical standards or supports and are provided at their upper ends with the bifurcated iron 12, by means of which the said plunger rod is connected to the operating means. Journaled in the boxings 13 located at the upper

ends of said supports, is the transverse shaft 14, which is provided with the oppositely disposed and extending perforated arms or cranks 15, which are pivotally secured by means of the bolts 16 to the bifurcated ends of the plunger rods working upon opposite and alternate sides of the vertical supports, and said shaft is further provided with the extended handle portion 17 by means of which the pump may be readily operated with but a small expenditure of power, inasmuch as the weight of the plungers upon opposite sides of said shaft is quite evenly balanced and therefore it requires but sufficient pressure to elevate the weight of the water. The said plunger rod previously referred to, may be constructed of any suitable material and provided with a supplemental bifurcated iron, as described, but is preferably, in order to lighten the pump as much as possible, of hollow pipe terminating at its upper end in a construction substantially as described, whereby the same may be easily connected to the oppositely disposed arms of said shaft.

Centrally located between the opposite supports comprising the sides of the ladder and between the cylinders located at the lower ends thereof is the common reservoir or receiver 18, which is constructed of any suitable material and is provided with the bottom perforations 19, which are inclosed by the upwardly opening and weighted flap-valves 20, which are designed to be normally closed by the weight of the water within said reservoir or receiver. Curved connecting pipes 21 connect the perforations 19 in the bottom of said central reservoir or tank with the bottom of the oppositely disposed cylinders secured upon the opposite supports or standards, and at their joint with the perforations in said receiver are provided with suitable connections whereby a water tight joint is made. Communicating with the interior of said reservoir and extending upwardly through the top thereof to the top of the well is the discharge tube or pipe 22 through which the elevated water finds escape. It can be readily seen as the operating lever is controlled that the alternate motion of the opposite plunger rods will cause a continuous stream of water to be jetted within the common receiver or reservoir and up through the discharge pipe, while when the said pump is not operated the valves, in said receiver remaining closed leaves the water the full height of the discharge pipe and thus allows the same to commence flowing immediately upon again operating the plunger rod.

From the above description it will be obvious that the vertically-disposed cylinders are arranged, respectively, upon opposite sides of the plane of the supporting frame-work, whereby the oppositely-extending and counter-balancing arms or cranks of the rock-shaft are disposed, respectively, in the verti-

cal planes occupied by such cylinders, the distance from the center of the frame-work to the points of connection of the upper ends of the piston-rods to the arms or cranks being equal to the distance between the center of the said frame-work and the axes of the cylinders. It will also be noted that by this peculiar construction and arrangement, in addition to balancing the working parts of the pump, and thereby enabling the same to be operated with a less expenditure of power than if the arms or cranks extended in the same direction from the rock-shaft and the cylinders were arranged upon the same side of the plane of the supporting frame-work, we are enabled to employ inflexible piston-rods, as shown clearly in the drawings, thereby doing away with unnecessary joints in the working parts of the mechanism. The advantages derived by the omission of these unnecessary joints are that less friction is produced in the operation of the pump and there are less working parts to become worn or damaged and need repair or replacement, and furthermore, the initial cost of the mechanism is materially reduced. But there is another advantage attained by this construction, namely; we do away with intermediate guides or ways which are necessary when a jointed piston-rod is employed.

We are aware that the construction, as described, namely with inflexible or rigid piston-rods, necessitates a slight rocking movement of the plungers in the cylinders, but the distance between the arms or cranks and the cylinders, or, in other words, the length of the piston-rods is such as to reduce the transverse or horizontal movement caused at the upper ends of the said rods by the swinging movement of the arms or cranks, to an insignificant factor. Such movement we have found does not interfere, in any way, with the satisfactory operation of the pump mechanism.

Furthermore, it will be apparent from the above description, that the diagonal disposition, with relation to the plane of the supporting frame-work, of the cylinders and the connecting receiver economizes space, and enables the pump mechanism, having a given size of cylinders, &c., to be introduced into a smaller well, namely, a well of less diameter, than if both cylinders were arranged upon the same side of the plane of the frame-work.

Having thus described our invention, what we claim and desire to secure by Letters Patent is;—

The combination with a portable frame-work having vertical parallel supports, connected by spaced cross-bars to form a ladder, of twin vertically-disposed single-acting pump cylinders, attached to the lower ends of said supports, respectively upon opposite sides of the plane of the frame-work, an interposed receiver connecting such cylinders and arranged between the supports, a service-pipe

communicating at its lower end with the receiver, a rock-shaft journaled in bearings at the upper ends of the supports and provided with oppositely-extending arms or cranks which operate vertically above and in the planes of the axes of the cylinders, respectively, the rigid piston-rods pivotally connected at their upper ends to the arms or cranks of the rock-shaft and provided at their lower ends with plungers operating in the cylinders, and means to operate the rock-

shaft, substantially as and for the purpose specified.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures 15 in presence of two witnesses.

OSBORN G. HOWELL.
JEREMIAH M. HORN.

Witnesses:

CHAS. A. KELLEY,
GEO. H. WARD.