

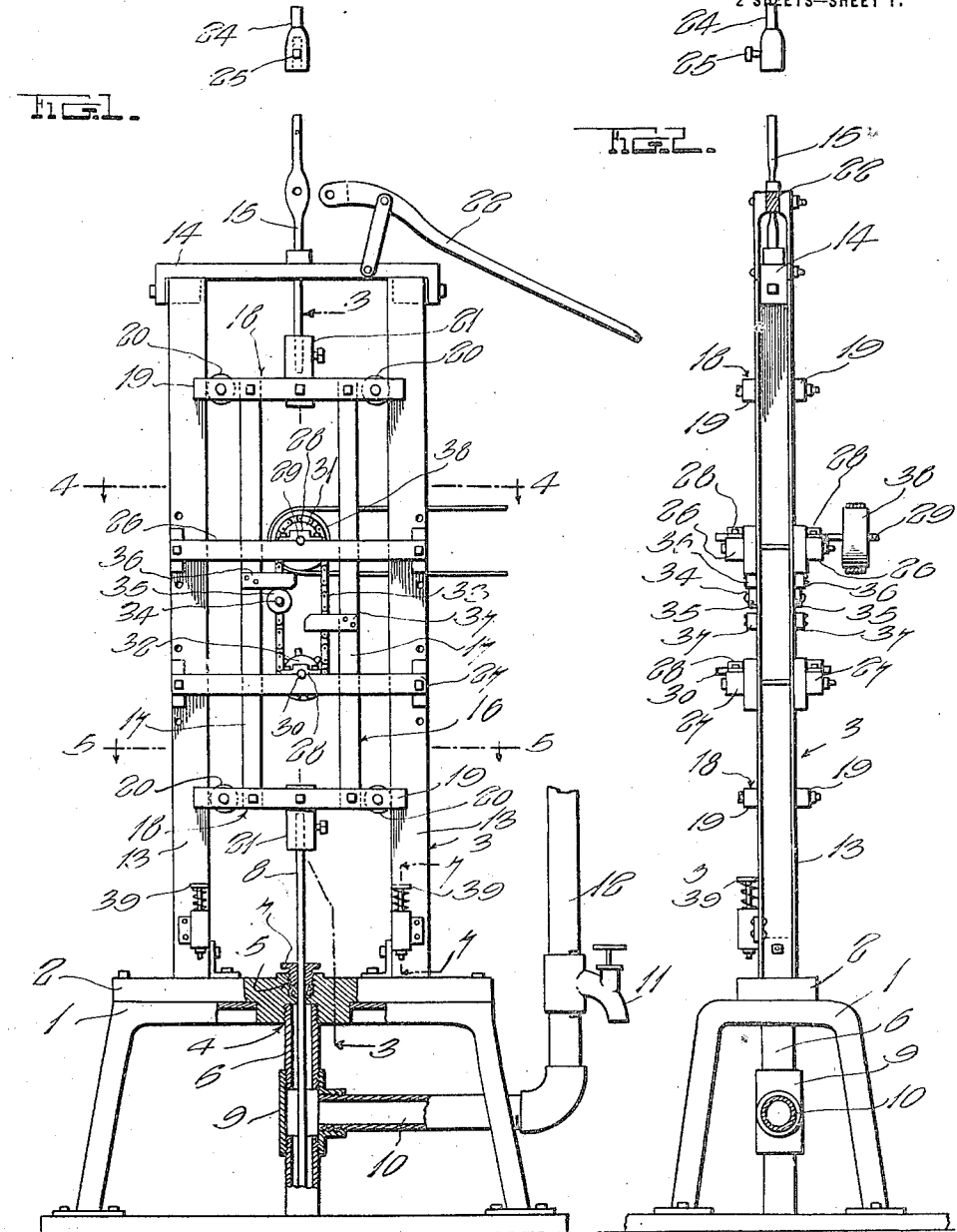
E. HARDS.
PUMP JACK.

APPLICATION FILED JAN. 15, 1917.

1,239,909.

Patented Sept. 11, 1917.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

FIG. 3.

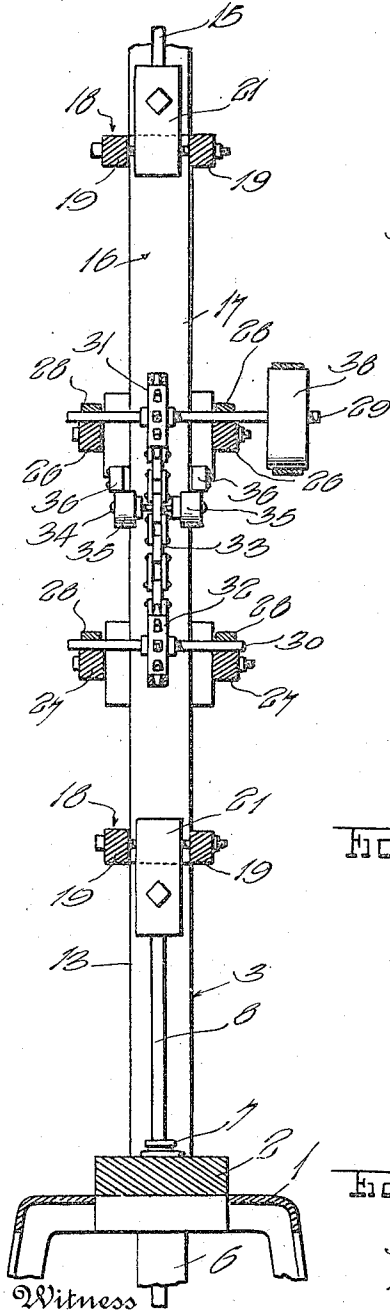


FIG. 4.

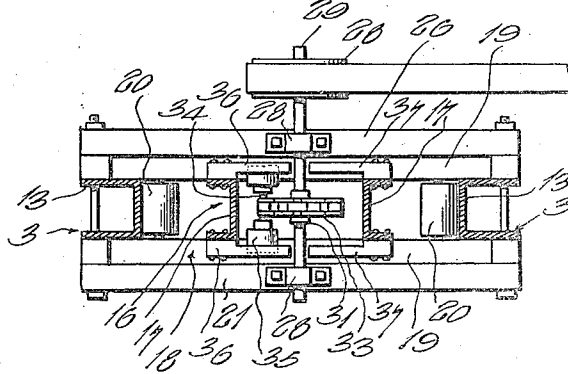


FIG. 5.

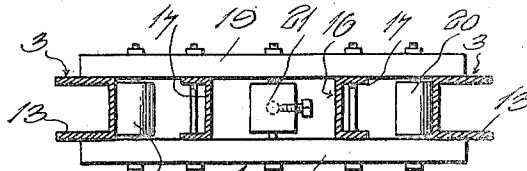


FIG. 6.

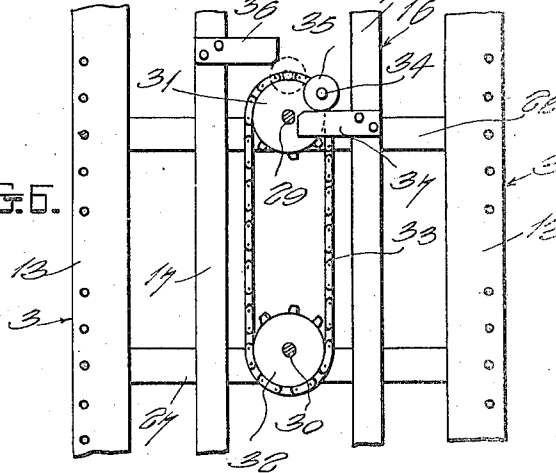
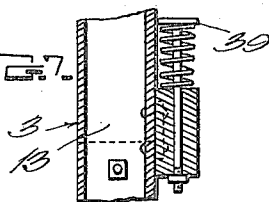


FIG. 7.



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UNITED STATES PATENT OFFICE.

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PUMP-JACK.

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To all whom it may concern:

Be it known that I, EDWARD HARDS, a citizen of the United States, residing at Phoenix, in the county of Maricopa and State of Arizona, have invented certain new and useful Improvements in Pump-Jacks; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain new and useful improvements in pump jacks.

The primary object of the invention is to provide a pump jack in which the friction of moving elements is reduced to a minimum, thereby being very economical in the use of the motive power for operating the same.

Another object of the invention is to improve upon a device of this character by the provision of a simple, strong, comparatively durable and inexpensive construction, and one which will be efficient and reliable in operation and well adapted to the purpose for which it is designed.

With these and numerous other objects in view, the invention consists of certain novel features of construction, and the combination and arrangement of parts as will be hereinafter fully described and claimed.

In the accompanying drawings forming part of the application and in which like parts are designated by similar reference characters throughout the several views:

Figure 1 is a front elevation of a device constructed in accordance with this invention;

Fig. 2 is an end view of the same;

Fig. 3 is an enlarged vertical sectional view taken on the plane indicated by the line 3—3 of Fig. 1;

Figs. 4 and 5 are enlarged transverse sectional views taken on the planes of the lines 4—4 and 5—5 of Fig. 1;

Fig. 6 is an enlarged front elevation of portions of the two frames, illustrating more clearly the manner in which the smaller frame is reciprocated by the chain mounted on the larger frame; and,

Fig. 7 is a detail sectional view taken on the plane indicated by the line 7—7 of Fig. 1.

Referring more particularly to the drawings, the reference numeral 1 designates a supporting stand upon which is firmly secured a base 2, which forms the lower horizontal member of an upright open rectangular guide frame 3. The base 2 is provided

with alined openings 4 and 5, the opening 4 being internally threaded to provide for the reception of the upper end of a pump pipe 6, while fitted in the opening 5 is a packing box 7 through which slides a reciprocating pump rod 8.

The pump pipe 6 is provided at a point above the plane of the bottom of the supporting stand 1, but below its top, with a T-coupling 9 to which is connected in the usual manner a horizontal pipe 10. The free end of this pipe 10 is bent upwardly and provided with a valved discharge faucet 11, and an upright pipe 12 leading to an elevated reservoir or tank not shown. By this construction it may be seen that as the pump rod 8 is reciprocated in a manner hereinafter described, water will be drawn upwardly through the pipe 6, and then through the pipes 10 and 12 to the reservoir. If, however, the valve in the faucet is open, a certain portion of the water will be discharged at this lower level.

The upright members 13 of the frame 3 above referred to are composed preferably of channeled steel, as shown by the drawings, and have their upper ends connected by the horizontal member 14. This member 14 is provided intermediate its ends with an opening through which reciprocates a vertical rod 15, the purpose of which will be described.

The reference numeral 16 designates as a whole a smaller upright open rectangular frame composed of upright members 17 and horizontal upper and lower members 18. These horizontal members 18 are shown as each being in the form of a pair of horizontally spaced bars 19, the ends of which extend beyond the upright members 17 of the frame 16 and have revolubly mounted therebetween, rollers 20.

This smaller frame 16 is mounted within the larger frame 3, the ends of the bars 19 overlapping the opposite sides of the upright members 13 of the frame 3, and the rollers 20 engaging the inner edges of the latter. This construction provides a simple and efficient means for slidably mounting the frame 16 vertically within the frame 3.

Fixed between the spaced bars 19 of the upper and lower horizontal members 18 of the frame 16 are blocks 21, the lower block 21 being connected in a suitable manner to the pump rod 8, while the upper block 21 is connected to the herein mentioned rod 15,

Pivotally mounted in any convenient manner to the upper horizontal member 14 of the frame 3 is an operating handle 22, the inner end of which may be connected by a detach-
 5 able pin, to the rod 15. By this construction, whenever the handle 22 is operated, the rod 15 will be reciprocated and through the medium of the frame 16, the pump rod 8 will also be reciprocated. It is to be herein
 10 noted that if the pump jack is to be used in connection with a windmill, a rod 24 is reciprocated in the usual manner by a windwheel at the top of the tower of the mill and is connected to the rod 15 by a detach-
 15 able pin, the other pin being removed so that the handle 22 will not be in operative position.

Connected at their ends to the upright members 13 of the frame 3 and in a slightly
 20 spaced relation with respect to the sides of said members, are pairs of upper and lower horizontal supporting bars 26 and 27 respectively. These supporting bars 26 and 27 are provided midway of their ends with
 25 suitable bearings 28 in which are revolvably mounted upper and lower shafts 29 and 30. Fixed to the shafts 29 and 30 in any convenient manner are sprocket wheels 31 and 32 respectively, over which passes a suitable
 30 sprocket belt or chain 33.

This sprocket belt or chain 33 carries a driving element in the form of a pin 34, the ends of which project beyond the side edges of the belt and have revolvably mounted
 35 thereon a pair of rollers 35. Fixed to the opposite sides of the upright members 17 of the frame 16 and extending inwardly from the same are lugs 36 and 37, the lug 36 being disposed in a plane slightly above
 40 the lug 37. The inner ends of these lugs 36 and 37 are spaced a sufficient distance apart so that when the frame 16 is moved up and down, they will not contact or touch the shafts 29 and 30.

The upper shaft 29 is extended through one of the bearings 28 and provided with a pulley 38, over which a belt may be passed for driving said shaft. When this is done, the belt 33 will consequently be moved
 50 around the sprocket wheels 31 and 32, and the rollers 35 will engage the lugs 36 on their upward stroke and raise the frame 16. As the portion of the belt 33 carrying the roller 35 passes around the sprocket wheel
 55 31, the rollers will pass from under the lugs 36 and begin their downward stroke, pushing downwardly upon the lugs 37. Sometimes the weight of the frame 16 and the parts of the pump connected to the same
 30 will be sufficient to return said frame to its lowermost position without the engagement of the rollers 35 with the lugs 37. To provide a means for preventing breakage of the parts should this occur, a pair of spring-
 35 pressed plungers or bumpers 39 are mounted

at the lower end of the frame 3 for engagement with the opposite ends of one of the spaced horizontal bars 19 of the frame 16.

In some instances, it may be desired to use the pump jack in connection with a
 70 windmill, and in this connection it may be used in the manner above described, or it may be placed at the top of the tower of the windmill, and the pulley 38 substituted by the windwheel thereof. The operation of
 75 parts is in this case the same as before.

The length of the stroke of the smaller frame 16 may be adjusted by mounting the supporting bars 26 and 27 adjustably upon the upright members 13 of the frame 3.
 80 This, of course, necessitates also an adjustment of the belt or sprocket chain 33.

From the foregoing description taken in connection with the accompanying drawings, the construction and operation of the
 85 invention will be readily understood without a more extended explanation.

As various changes in form, proportion, and in the minor details of construction may be resorted to without departing from the
 90 spirit of this invention, I do not wish to be limited to the construction herein shown and described other than that claimed.

I claim:—

1. A device of the class described comprising an upright open rectangular guide
 95 frame, a smaller upright open rectangular frame slidable vertically within said guide frame and adapted to be connected to the reciprocating piston rod of a pump, pairs
 100 of upper and lower horizontal supporting bars connected at their ends to the upright members of said guide frame intermediate the ends thereof and being provided with
 105 bearings, upper and lower shafts mounted in said bearings and extended transversely of said frames and within the smaller frame, sprocket gears on said shafts, a sprocket chain passing over said gears and having a
 110 driving element thereon, and lugs extending inwardly from the upright members of the smaller frame for alternate engagement with said driving element, whereby to reciprocate said smaller frame upon the ap-
 115 plication of power to one of said shafts.

2. A device of the class described comprising an upright open rectangular guide
 120 frame, a smaller upright open rectangular frame disposed within said guide frame, the upright members of said smaller frame being spaced inwardly from the upright members of the guide frame, the upper and lower horizontal members of said smaller frame being composed of horizontally spaced bars having their ends overlapping the opposite
 125 sides of the upright members of said guide frame, rollers revolvably mounted between the ends of said spaced bars and in engagement with the inner edges of the upright members of said guide frame, rod attaching
 130

blocks fixed between said spaced bars intermediate the ends thereof, pairs of upper and lower horizontal supporting bars connected at their ends to the upright members of said guide frame intermediate the ends thereof and being provided with bearings, upper and lower shafts mounted in said bearings and extended transversely of said frames and within the smaller frame, sprocket gears on said shafts, a sprocket chain passing over said gears and having a driving element thereon, and lugs extending inwardly from

the upright members of the smaller frame for alternate engagement with said driving element whereby to reciprocate said smaller frame upon the application of power to one of said shafts. 15

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

EDWARD HARDS.

Witnesses:

HENRY T. WELDON,
JOHN A. MOORE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."