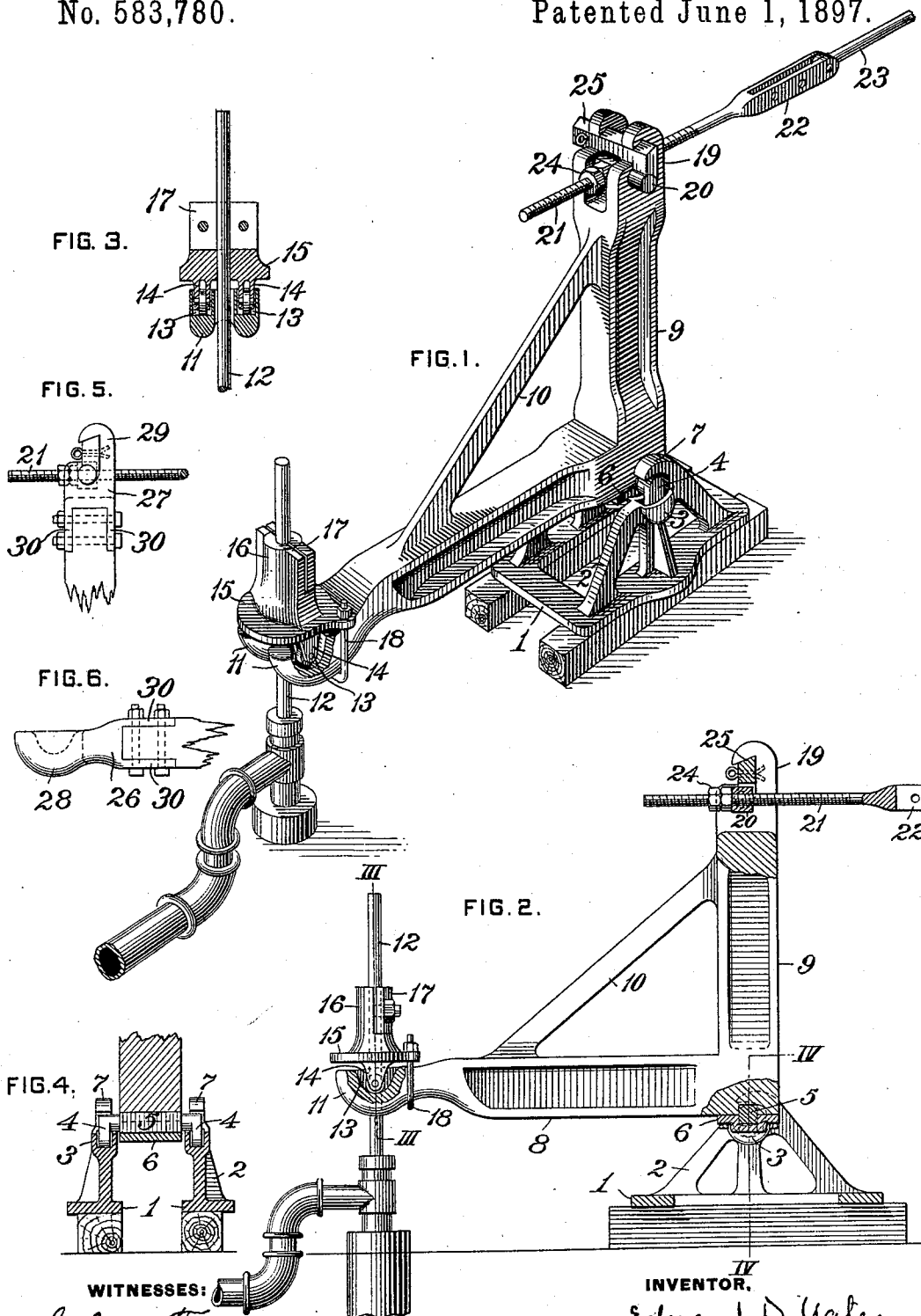


(No Model)

E. D. YATES.
APPARATUS FOR PUMPING WELLS.

No. 583,780.

Patented June 1, 1897.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR PUMPING WELLS.

SPECIFICATION forming part of Letters Patent No. 583,780, dated June 1, 1897.

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To all whom it may concern:

Be it known that I, EDWARD D. YATES, a citizen of the United States, residing at Franklin, in the county of Venango and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Apparatus for Pumping Wells, of which improvements the following is a specification.

The invention described herein relates to certain improvements in mechanism for translating the horizontal reciprocating movements of rods extending from a central pumping-station to a vertical reciprocating movement, such as is required in pumping wells, &c. It has heretofore been the practice to effect such translation by means of a bell-crank lever having one of its arms connected to a rod leading to a central station. The opposite or horizontal arm of the bell-crank or "V," as it is termed, is connected by a pitman to a beam pivoted at one end to the derrick-frame in such relation to the well that the opposite end of the beam, termed the "grasshopper," is in line with the axis of the well to be pumped. The polish-rod is usually connected to the free end of the grasshopper by means of an adjuster clamped against the rod by bolts. This clamp rests upon the beam which serves to raise the rod, its downward movement being due to its weight. Lateral deflection of the polish-rod is prevented by passing it through a hole in a plank secured to the derrick above the grasshopper. As will be readily understood, this mechanism, as it is formed of heavy beams and planks, is very cumbersome and exceedingly difficult to keep in proper adjustment and repair.

The object of the present invention is to provide suitable means whereby the polish-rod may be directly connected to the horizontal arm of the bell-crank or V and in close proximity to the casing-head, thus avoiding the extension of the tubing above the platform of the derrick, which is objectionable on account of the liability of freezing up in winter and injuring in case of the blowing down of the derrick.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a per-

spective view of my improved mechanism, showing it connected to the polish-rod and to the rod extending to the central station. Fig. 2 is a side elevation of the same, certain portions being broken away to illustrate features of construction. Fig. 3 is a sectional detail view, the plane of section being indicated by the line III III, Fig. 2. Fig. 4 is a similar view, the plane of section being indicated by the line IV IV, Fig. 2. Figs. 5 and 6 are detail views illustrating modifications in the construction of the bell-crank or V.

In the practice of my invention the base or supporting-frame 1 is secured on timbers resting in a suitable foundation, as the floor of a derrick. The upper ends of the sides or standards 2 of the frame are provided with cup-like bearings 3 for the reception of the bosses or projections 4 on the gudgeon 5. The bearing portions or ends of the bosses are rounded and rest upon the curved bottom of the bearing-cups 3, which are adapted to contain a suitable lubricant. The middle or body portion of the gudgeon is preferably angular in cross-section and is secured to the angle of the bell-crank or V by a suitable cap-plate 6. The sides 2 are preferably provided with lugs 7, which project over the ends of the gudgeon and prevent its accidental removal from its bearings.

The bell-crank or V is preferably formed of iron or steel and has its arms 8 and 9 formed integral with each other. It is also preferred to prevent the spreading of the arms by means of a brace 10. The horizontal arm 8 is provided at its ends with two horns 11, between which the polish-rod 12 passes. Bearing-cups 13 are formed in the upper sides of the horns 11 for the reception of the lugs 14 of the adjuster-head 15. The ends of the lugs 14 are rounded or provided with friction-rollers, so as to facilitate the movement of bottoms of the cups on the lugs, as clearly shown in Figs. 2 and 3. The adjuster-head has a vertical opening for the passage of the polish-rod, and one member 16 of the rod-clamp is preferably formed integral with the head on its upper side. The other member of the clamp is formed by a plate 17, which is drawn against the member 16 by bolts or other suitable means. In order to cause the adjuster-head

to move down with the arm 8, a stirrup 18 is passed under the arm and secured to the head, which is preferably made sufficiently large or provided with a laterally-extended apron to protect the lubricant contained in the bearing-cups 13.

The vertical arm 9 is provided with horns or prongs 19, which are formed with notches for the reception of the cross-bar 20. The portion of the cross-bar between the horns is provided with an opening sufficiently large to permit of the free movement of the threaded stem 21 through it. This stem is provided with suitable means, as the straps 22, whereby it may be adjustably connected to the actuating-rod 23, leading to the central power-station. The stem 21 is held from being pulled through the cross-bar by the rod 23 by means of nuts 24 or other suitable device, which can be adjusted along the threaded stem. The notches in the horns 19 are so shaped as to prevent the cross-bar being forced out by the movement of the rods and additional security as against such accidental displacement of the cross-bar by inserting a key 25 in the notches above the cross-bar.

While it is preferred to form the bell-crank or V of metal and the prongs 11 and 19 integral therewith, as described, the bell-crank may be formed of suitable wooden beams. In such case iron or steel heads 26 and 27, having prongs 28 and 29 similar in construction to the horns 11 and 19, are attached to the ends, the beams forming the bell-crank by means of straps 30, formed integral with the heads, as shown in Figs. 5 and 6.

It will be observed that by my improvement the horizontal arm of the bell-crank can be connected directly to the polish-rod and that the connection is so formed that the rod is not subjected to any lateral strains, such as would tend to bend it.

It is also characteristic of my improvement that the translating mechanism is entirely in-

dependent of the derrick or any superstructure.

The constructions shown in Figs. 5 and 6 can be applied to the ordinary form or construction of walking-beams where it is preferred to employ that form of translating mechanism.

I claim herein as my invention—

1. A mechanism for pumping wells having in combination a lever provided at one end with horns or prongs having cup-like bearings, a clamping-head provided with lugs adapted to rest in said bearings, a stirrup attached to the head and passing under the lever, and means for connecting the opposite end of the lever to the actuating power, substantially as set forth.

2. A mechanism for pumping wells, having in combination a lever, a clamping-head movably mounted on one end of the lever, slotted prongs or horns on the opposite end of the lever, a cross-bar mounted in said notches, a rod or stem adjustably connected to the cross-bar, and provided with means whereby it may be adjustably attached to the actuating-rod, substantially as set forth.

3. A mechanism for pumping wells having in combination a lever provided at one end with slotted prongs or horns, a cross-bar provided with a transverse opening intermediate of its ends and mounted in said notches, a threaded rod or stem passing through the opening in the cross-bar, nuts for adjusting the rod back and forth through the cross-bar, and a clamp on the opposite end of the lever for connecting the latter to the pump-rod, substantially as set forth.

In testimony whereof I have hereunto set my hand.

EDWARD D. YATES.

Witnesses:

W. S. WHITAKER,
W. L. WEST.