

W. ELLSWORTH.
PUMP OPERATING APPARATUS.
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1,046,161.

Patented Dec. 3, 1912.

Fig. 1.

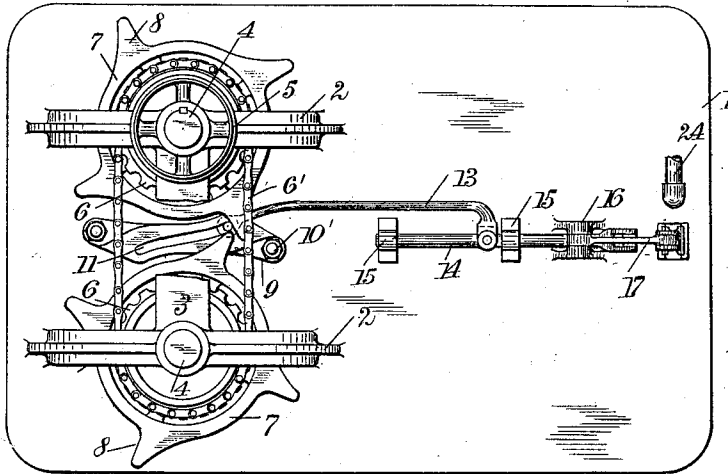


Fig. 3.

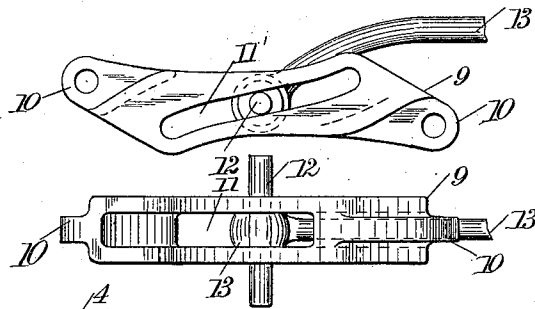
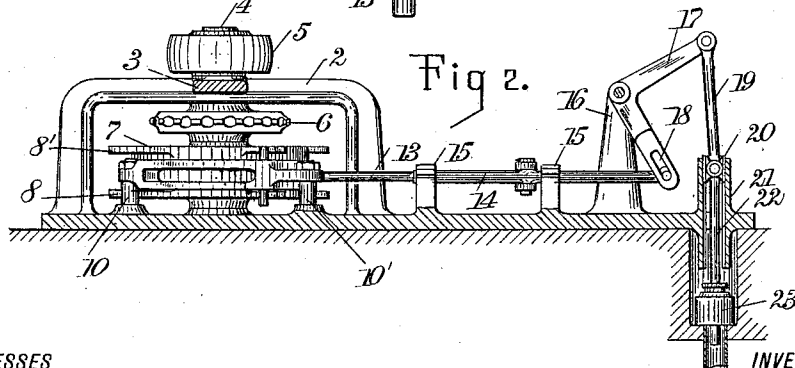


Fig. 2.



WITNESSES

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PUMP-OPERATING APPARATUS.

1,046,161.

Specification of Letters Patent.

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Application filed June 14, 1911. Serial No. 633,079.

To all whom it may concern:

Be it known that I, WILLIAM ELLSWORTH, a citizen of the United States, and a resident of Red Rock, in the county of Grant and State of Washington, have invented a new and Improved Pump-Operating Apparatus, of which the following is a full, clear, and exact description.

My invention is an improvement in means for converting rotary motion into reciprocating motion for the purpose of operating pumps and other machinery, and it comprises certain novel features of construction which will be fully pointed out in the accompanying description and particularly specified in the claims appended thereto.

Reference is to be had to the accompanying drawings forming a part of this specification, in which the same characters of reference indicate the same parts in all the views.

Figure 1 is a top plan of my improvement; Fig. 2 is a transverse vertical section thereof; and Fig. 3 shows both a top plan and a side elevation of the guide in which the end of the main operating arm is mounted.

My improvement comprises a suitable bed plate 1 having a pair of standards 2, in the top of each of which and in the bed plate 1 is mounted a vertical shaft 4. One of these shafts, preferably the upper one shown on Fig. 1, has a pulley wheel 5 on the upper end, over which a power belt can be passed to operate the apparatus; and each of these shafts 4 carries just beneath the top of the standard 2, a sprocket wheel 6, these two sprocket wheels being connected by a sprocket chain 6', so that motion can be transmitted from one to the other. Below each sprocket wheel 6 is placed a bullwheel 8, each of these wheels having an equal number of projections 8 and 8' extending from its lower and upper edges, respectively, as shown on Fig. 2, the projections 8' being directly above the projections 8 for a purpose which will presently appear.

9 is a guide frame having extensions 10 at each end, which are perforated to receive anchor bolts 10', to hold the guide 9 in position between the shafts 4, the anchor bolts 10' being secured of course to the bed plate 1. This guide 9 has a horizontal passage 11 extending through it from one side to the other; and 11' is a slot of suitable shape formed in the upper and lower side of the guide 9 to receive a short spindle 12 mounted

in the end of an operating rod 13. This operating rod 13 has a head 13' which fits within the horizontal passage 11, and is securely fastened to the short spindle 12. The operating rod 13 is pinned to a connecting rod 14, which is mounted to slide in bearings 15 on the plate 1.

16 is a standard beyond the bearings 15, in the upper ends of which is pivoted a bell-crank lever 17, having its lower arm slotted at 18 to receive the end of the rod 14. The other end of the lever 17 is joined by means of a link 19 to a cross-head 20, mounted in guides 21, supported by the bed plate 1, and connected by a piston rod 22 to a pump plunger 23.

24 is a discharge pipe through which water is pumped when the apparatus is in use.

In operation, when motion is transmitted to the belt pulley 5, the upper bullwheel shown on Fig. 1, will rotate clockwise, its projections 8 and 8' engaging the bottom and top of the short spindle 12, respectively, moving the rod 13 to the left. The other bullwheel 7 will be caused to rotate in the same direction, and as soon as one pair of projections 8 and 8' on the first wheel slips past the ends of the spindle 12, a pair of similar projections on the other bullwheel will engage the ends of this spindle and move the rod 13 to the right. The slot 11' is not perpendicular to a line joining the centers of the shafts 4, but rather makes an acute angle therewith, as shown on Fig. 1, so that as the ends of the spindle 12 move along the slot in either direction, the spindle gradually passes farther away from the center of the shaft of the bullwheel which is pushing it, until it is so far removed from the center that the projections 8 and 8' will release the spindle 12. When this happens, the spindle 12 will be in position to be engaged by the projections on the other bullwheel, to be pushed in the opposite direction.

My invention is especially useful for pumping water in irrigated districts, for emptying deep wells, or for supplying water from springs and streams. It is simple and easy to operate and very efficient in use.

It will be understood that I may dispense with the pulley 5, and substitute a windlass or sweep, to rotate the shaft 4, so as to permit of the operation of the pumping ap-

paratus by means of a draft animal instead of requiring an engine.

While I have shown and described a pulley wheel 5 as the means for transmitting motion to one of the shafts 4, it is obvious that I may use gearing such as cog-wheels or miter gearing, if desired, instead. In any case, the shaft 4 will be connected up to a source of power in the speed relation which conditions require, in order to apply the power of the engine to operate the pump plunger 23 with the greatest possible efficiency.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a device of the kind described, the combination of a pair of wheels, means for rotating said wheels in the same direction, projections carried by the circumferences of said wheels, a guide between said wheels, said guide having a slot extending horizontally through the same from one end to the other, and likewise having a vertical slot formed therein, the said slots both extending transversely of a line joining the centers of said wheels, a reciprocating rod having a head received in the horizontal slot, and a stud or spindle carried by said head and extending through said vertical slot, whereby, when the wheels are rotated, the projections will engage said stud or spindle and reciprocate said rod.

2. A device of the kind described comprising a pair of wheels, means for moving said wheels in the same direction, projections extending from the circumferences of said wheels adjacent the upper and lower edges of the same, a guide between said

wheels, said guide having a horizontal slot therein and a vertical slot therein, said slots both extending transversely of a line joining the centers of said wheels, and a rod having a head received in the horizontal slot, said rod carrying a spindle extending through the vertical slot in position to be engaged by the projections on the wheels to reciprocate said rod.

3. In a device of the kind described, the combination of a pair of wheels, means for rotating said wheels in the same direction, said wheels having projections extending outward from their circumferences adjacent the upper and lower edges of the same, the projections adjacent the lower edges being directly below and spaced from the projections at the upper edges, a guide located between said wheels, said guide having a horizontal passage therethrough, said guide lying between the projections on the top and bottom edges of the said wheels as the said projections pass by the guide, said guide also having a vertical slot extending transversely of a line joining the centers of said wheels, above and below said horizontal passage, a spindle received in said slot, and a reciprocating rod having a head received by the horizontal passage and secured to said spindle, the projections on said wheels engaging the ends of said spindle in turn to move said rod back and forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM ELLSWORTH.

Witnesses:

JNO. W. WEBSTER,
WALTER ZIMMERMAN.