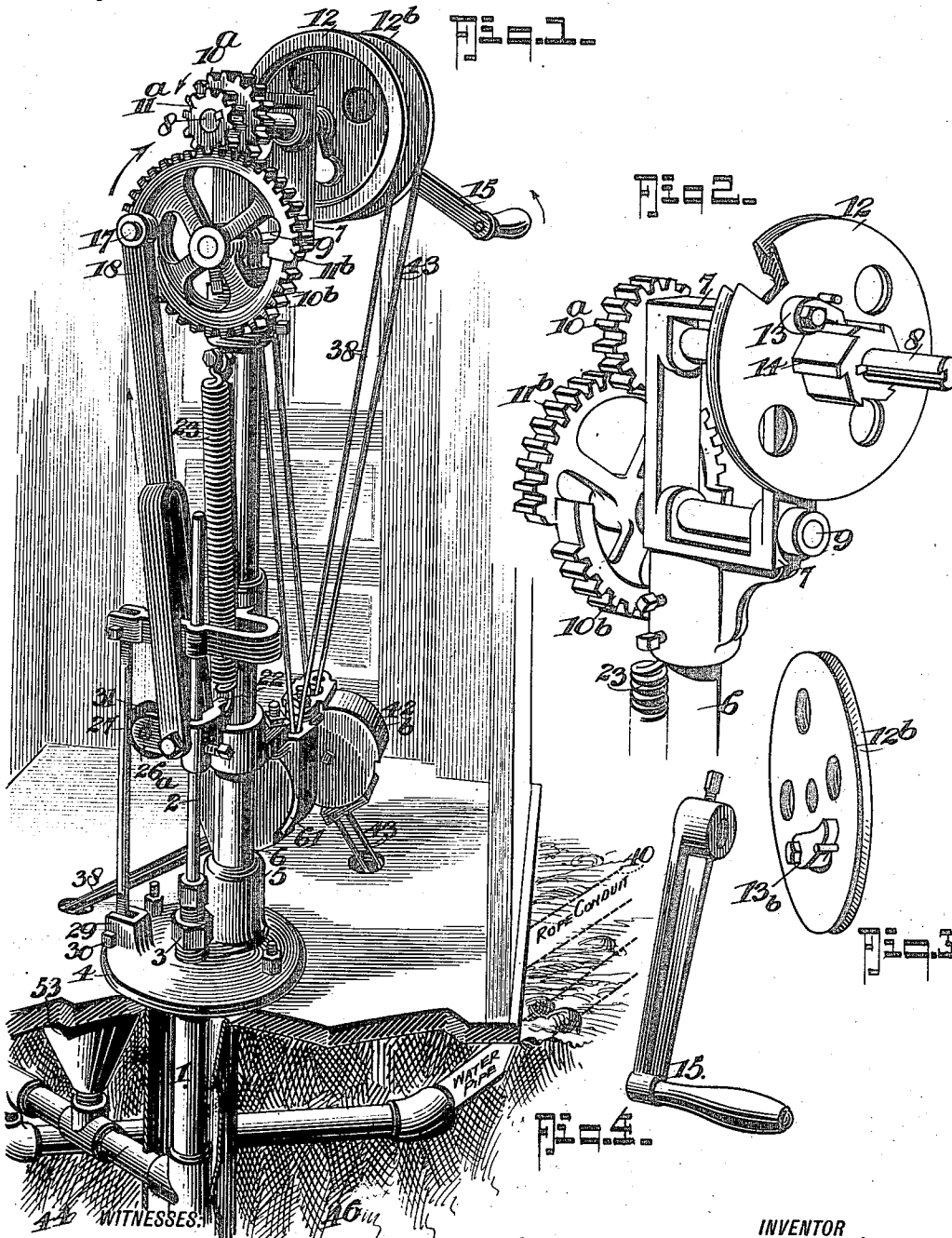


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 OPERATING MECHANISM FOR PUMPS.
 APPLICATION FILED MAY 22, 1915.

1,209,837.

Patented Dec. 26, 1916.

3 SHEETS—SHEET 1.



WITNESSES:
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 L. A. Stauley

INVENTOR
 William A. Harris
 BY Munn & Co.

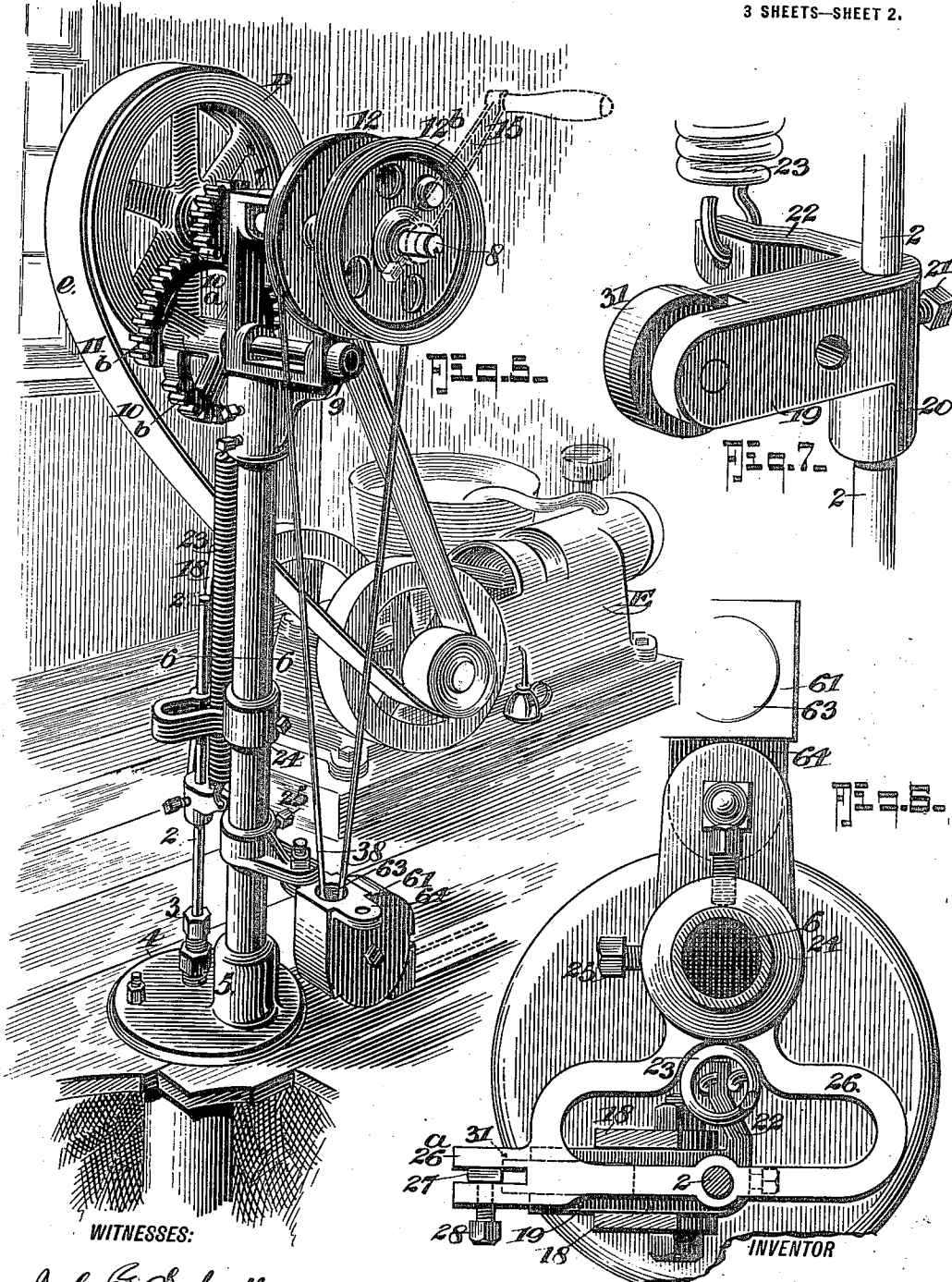
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WITNESSES:

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L. A. Stanley

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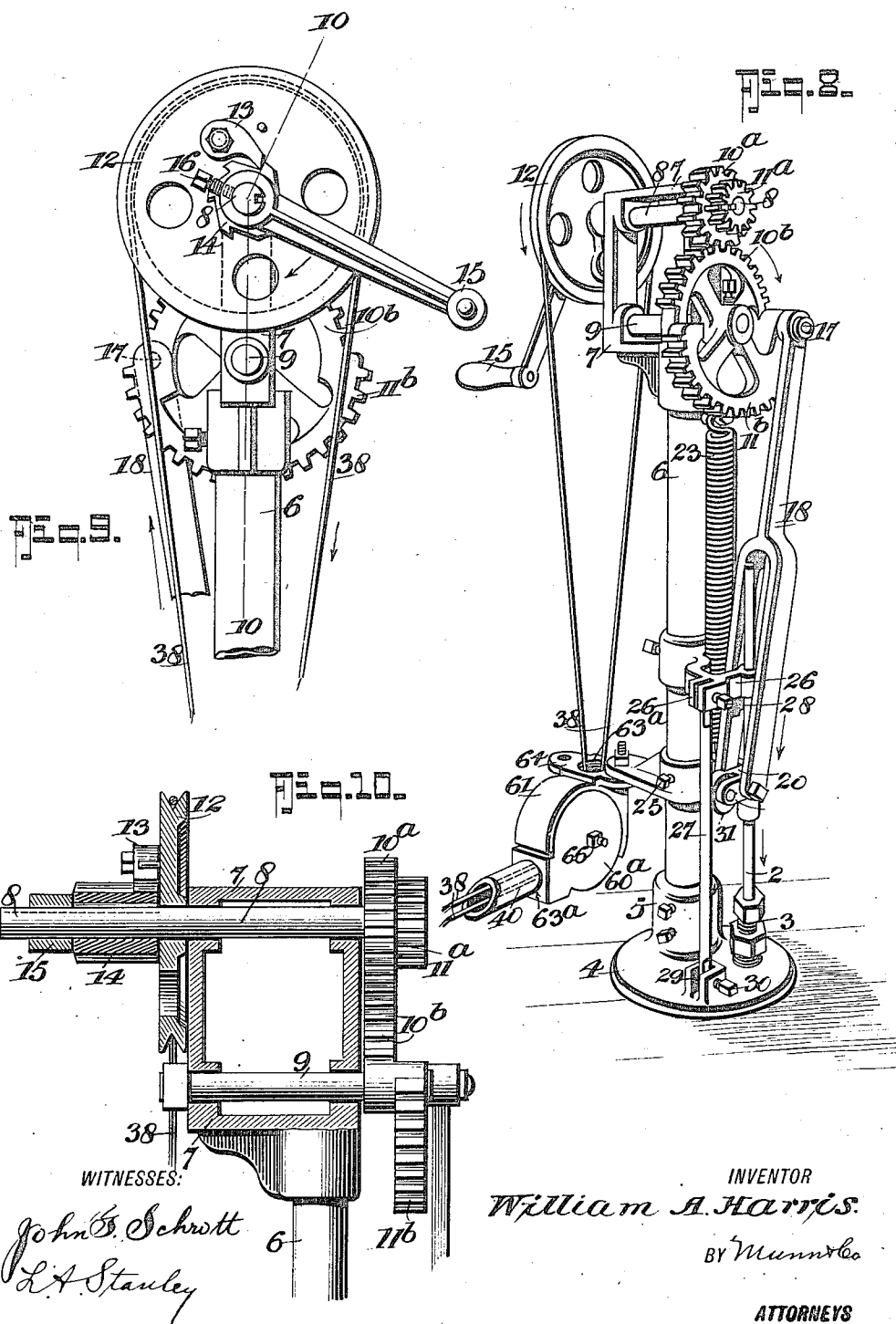
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

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TO WILLIAM D. ROCK, OF CHARLOTTE, NORTH CAROLINA.

OPERATING MECHANISM FOR PUMPS.

1,209,837.

Specification of Letters Patent.

Patented Dec. 26, 1916.

Application filed May 22, 1915. Serial No. 29,792.

To all whom it may concern:

Be it known that I, WILLIAM A. HARRIS, a citizen of the United States, and a resident of Greenville, in the county of Greenville and State of South Carolina, have invented a certain new and useful Improvement in Operating Mechanism for Pumps, of which the following is a specification.

My invention relates to improvements in operating mechanism for pumps, and it consists in the combinations, constructions, and arrangements herein described and claimed.

An object of my invention is to provide a novel form of pump in which a steady movement is secured by a novel arrangement of gears and springs.

Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings forming part of this application, in which—

Figure 1 is a perspective view of the pump on low gear. Fig. 2 is a perspective detail view of a portion of the pump; Fig. 3 is a detail view of one of the pump pulleys. Fig. 4 is a perspective view of the handle. Fig. 5 is a perspective view of a motor driven pump. Fig. 6 is a section along the line 6—6 of Fig. 5. Fig. 7 is a perspective detail view of a guide member. Fig. 8 is a perspective view of the pump on high gear. Fig. 9 is a perspective view looking from the rear of the device shown in Fig. 8. Fig. 10 is a section along the line 10—10, of Fig. 9.

In carrying out my invention I provide a pump of the type shown in the drawings. This includes a pump cylinder 1 adapted to receive a piston or plunger not shown, whose plunger rod 2 passes through a stuffing box 3 just above a floor plate 4 to which the pump cylinder is attached. The floor plate 4 bears an integral socket 5 arranged to receive an upright 6 which forms the main support for the operating mechanism of the pump. At the top of this support 6 is secured a rectangular frame 7. Journaled in the frame 7 is an upper shaft 8 and a lower shaft 9. The former bears a pair of gears 10^a and 11^a respectively on the outer side of the frame 7, while the shaft 9 bears a gear having certain teeth 10^b arranged to mesh with the gear 10^a and other teeth 11^b ar-

ranged to mesh with the gear 11^a. It will be observed from the drawings that the teeth 10^b extend for substantially half the circumference of the gear while the teeth 11^b extend around the other half, these two sets of teeth being in planes parallel to the gears 10^a and 11^a respectively.

On the shaft 8 is disposed a pulley 12, see Figs. 8, 9, and 10, which turns loosely on the shaft and which is provided with a pawl 13 arranged to engage a ratchet 14 keyed to the shaft so as to revolve with it. A handle 15 is secured to the shaft 8 by means of a set screw 16.

Carried by the gear which bears the teeth 10^b and 11^b is a crank pin 17 to which is pivotally secured a forked pitman 18 whose lower end straddles an arm 19 carried by a sleeve 20, see Figs. 6 and 7, which is adjustably secured to the plunger rod 2 by means of a set screw 21. The sleeve 20 is provided with a lateral extension 22 to which the lower end of a coiled spring 23 is secured. The upper end of this spring is secured to the top part of the standard 6 just below the bearing frame 7.

As will be seen from Fig. 6, I provide a collar 24 which is adjustably secured to the standard 6 by a set screw 25 and which bears an oblong yoke 26. This yoke is provided with a bore arranged to receive and guide the plunger rod 2, and at one end of the yoke is a slotted extension 26^a arranged to receive a guide member 27, this guide member being held by means of set screws 28. The lower end of this guide member is received in a slotted lug 29 on the floor plate 4, the lower end of the guide member 27 being held in position by means of a set screw 30. A roller 31 is journaled in the slotted end of the arm 19, see Fig. 7, and is arranged to bear against the guide rod 27 as the pitman 18 is reciprocated in order to take up the angular thrust of the pitman and thus relieve the stuffing box 3 and the guide yoke 26 of the side thrust to which they would otherwise be subjected.

The operation of the pump is as follows: The shaft 8 is turned, as for instance by the handle 15, and this causes the rotation of the gears 10^a and 11^a. When the jack has the position shown in Fig. 1, it will be observed that the small gear 11^a is in engagement with the teeth 11^b. The pump jack may now be said to be in low gear so that

greater power is exerted in the direction of the arrow shown at one side of the pitman 18, upwardly and outwardly. The outward thrust is taken care of by the roller 31 which rides in the guide rod 27 and the upward movement is communicated to the plunger rod 2 thus tending to raise the water. In the position of the apparatus shown in Fig. 8, the thrust of the pitman is in the opposite direction as far as its length is concerned but it is still toward that side of the plunger rod toward which the guide member 27 is located. As the plunger descends, the spring 23 is stretched, and this tends to check what would otherwise be a very rapid turn. Furthermore, it will be observed that in the position of the pump shown in Fig. 8, the gear 10^a has now come into mesh with the teeth 10^b so that the power is diminished. The diminishing of the power tends to return the plunger to its lower position, together with an increase of power tending to oppose the return of the plunger, *i. e.*, the spring 23 causes the uniform action of the pump; that is to say, it distributes the load so that when the handle 15 is revolved the action of the pump is more uniform than it would be if the plunger were allowed to fly back into its lowest position while the same power was being applied at the handle 15, and without the changing of the gears.

As has been before stated, the pump is designed to be operated from a distance, and to this end I may use one or more pulleys depending upon whether the jack is to be operated from one or more places at a distance from the pump. In Figs. 1 and 5 I have shown the shaft 8 as being provided with two pulleys 12 and 12^b. Both of these pulleys are loosely mounted on the shaft 8. In Figs. 2 and 3 I have shown these two pulleys. In Fig. 2 it will be seen that the pulley 12 has, as stated before, a pawl 13 adapted to engage a ratchet 14. This ratchet 14 is made of such a length as to be engaged by the pawl 13^b carried by the pulley 12^b as shown in Fig. 3.

I claim:—

1. In a pump, a floor plate, a standard, gearing carried by said standard, a plunger rod, a pitman connecting said gearing with said plunger rod for operating the latter, means for operating the said gearing, a spring attached to said standard at one end and to said plunger rod at the other end, and adapted to be put under tension during the downward movement of the rod, and a bracket secured to said standard, said bracket being provided with an opening to permit the passage of said spring and having a second opening for receiving and guiding said plunger rod.

2. In a pump, a floor plate, a standard, gearing carried by said standard, a plunger rod, a pitman connecting said gearing with

said plunger rod for operating the latter, means for operating the said gearing, a spring attached to said standard at one end and to said plunger rod at the other end and adapted to be put under tension during the downward movement of the rod, and a bracket secured to said standard, said bracket being provided with an opening to permit the passage of said spring and having a second opening for receiving and guiding said plunger rod, said pitman having a forked end, one leg of which passes through said first named opening, the other leg passing outside of the bracket, the forked portion of the pitman being arranged to straddle the upper end of the plunger rod in the movement of the pitman.

3. In a pump, a floor plate, a standard, gearing carried by said standard, a plunger rod, a pitman connecting said gearing with said plunger rod for operating the latter, means for operating the said gearing, a spring attached to said standard at one end and to said plunger rod at the other end and adapted to be put under tension during the downward movement of the rod, and a bracket secured to said standard, said bracket being provided with an opening to permit the passage of said spring and having a second opening for receiving and guiding said plunger rod, said pitman having a forked end, one leg of which passes through said first named opening, the other leg passing outside of the bracket, the forked portion of the pitman being arranged to straddle the upper end of the plunger rod in the movement of the pitman, a guide rod secured at one end to said bracket and at the other end to said floor plate, and a roller secured to said plunger rod and bearing on said guide rod.

4. In a pump, a floor plate, a standard, gearing carried by said standard, a plunger rod, a pitman connecting said gearing with said plunger rod for operating the latter, means for operating said gearing, and a bracket secured to said standard, said bracket being provided with an opening for receiving and guiding said plunger rod, said bracket having an elongated opening, said pitman having a forked end, one leg of which passes through said elongated opening, the other leg passing outside of the bracket, the forked portion of the pitman being arranged to straddle the upper end of the plunger rod in the movement of the pitman.

5. In a pump, a floor plate, a standard, gearing carried by said standard, a plunger rod, a pitman connecting said gearing with said plunger rod for operating the latter, means for operating said gearing, and a bracket secured to said standard, said bracket being provided with an opening for receiving and guiding said plunger rod, said

5 bracket having an elongated opening, said
pitman having a forked end, one leg of
which passes through said elongated open-
ing, the other leg passing outside of the
bracket, the forked portion of the pitman
being arranged to straddle the upper end of
the plunger rod in the movement of the pit-
man, a guide rod secured at one end to said

bracket and at the other end to said floor
plate, and a roller secured to said plunger 10
rod and bearing on said guide rod.

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Witnesses:

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