

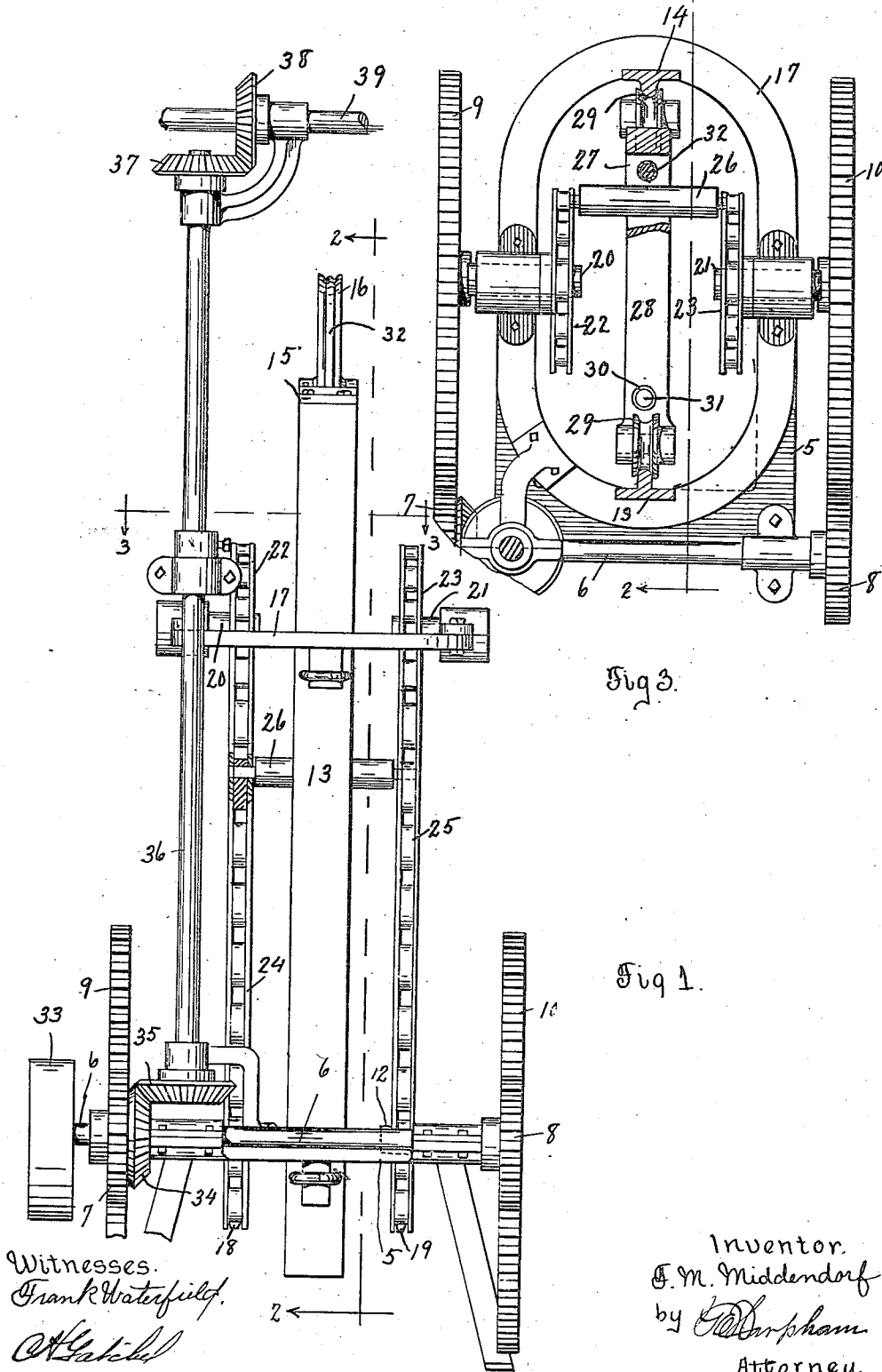
F. M. MIDDENDORF.
PUMP HEAD.

APPLICATION FILED JUNE 24, 1912.

1,064,359.

Patented June 10, 1913.

2 SHEETS—SHEET 1.



Witnesses.
Frank Waterfield.
O. Hatch.

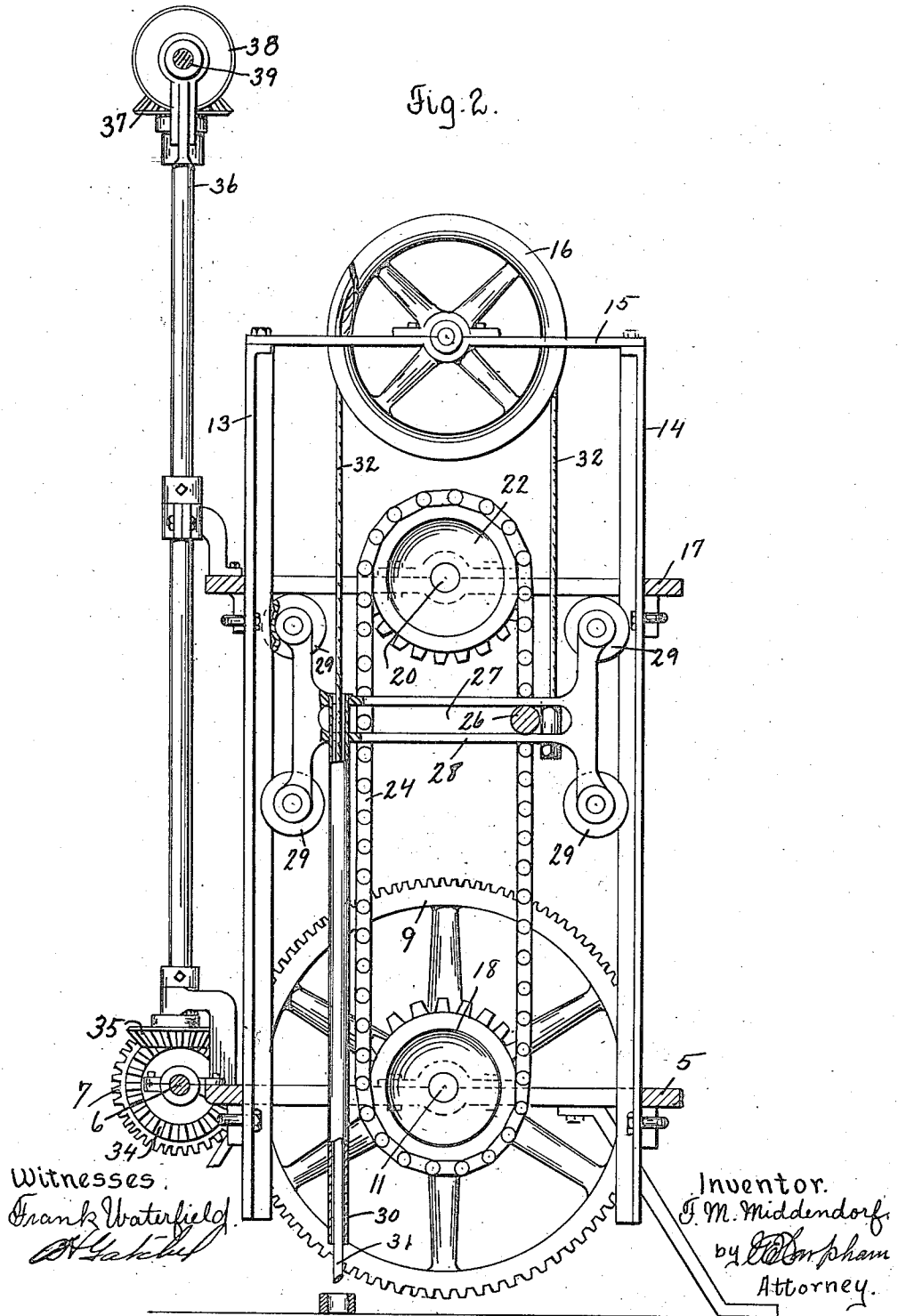
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UNITED STATES PATENT OFFICE.

FRANCIS M. MIDDENDORF, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO THOMAS H. OULSNAM, OF LOS ANGELES, CALIFORNIA.

PUMP-HEAD.

1,064,359.

Specification of Letters Patent.

Patented June 10, 1913.

Application filed June 24, 1912. Serial No. 705,485.

To all whom it may concern:

Be it known that I, FRANCIS MARION MIDDENDORF, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Pump-Heads, of which the following is a specification.

My invention relates to a pump head for operating a double plunger pump; and the object thereof is to construct a pump head that will produce a substantially constant flow of water and in which the maximum efficiency of the operating power is utilized. I accomplish this object by the pump head described herein and illustrated in the accompanying drawings forming a part hereof in which:

Figure 1 is an end elevation. Fig. 2 is a section on the line 2—2 of Fig. 1. Fig. 3 is a section on the line 3—3 of Fig. 1.

In the drawings 5 is the base frame which is suitably secured to the ground at the top of the well (not shown). A driven shaft 6 is mounted on the base frame. This shaft carries two pinions 7 and 8 which mesh with gears 9 and 10 having axles 11 and 12 which are mounted in bearings secured to the base frame at opposite sides thereof. At the ends of the base frame and secured thereto are the vertical guide beams 13 and 14 which carry on the top thereof the pulley frame 15 in which is mounted pulley 16. These guide beams are preferably T-shaped. Below the pulley frame is the top frame 17 which is secured to the guide beams and supported thereby. On the inner ends of the axles 11 and 12 are sprocket wheels 18 and 19. Secured to stub axles 20 and 21 which are mounted in bearings on the top frame are sprocket wheels 22 and 23 which are directly over sprocket wheels 18 and 19. A sprocket chain 24 runs around sprocket wheels 18 and 22 and connects them. A like sprocket chain 25 runs around sprocket wheels 19 and 23 and connects them. Sprocket chains 24 and 25 carry a horizontal operating bar 26 which passes through a slot 27 in the plunger frame 28. At the outer ends of the plunger frame and secured thereto are guide pulleys 29 which travel upon the guide beams 13 and 14 and guide the frame in its movement.

To one end of the plunger frame and near the guide beam at that end is the hollow polished rod 30 which carries the upper

plunger which works in the pump barrel. The solid polished rod 31 works through the hollow rod and carries the lower plunger which works in the pump barrel. I have not shown the pump barrel and plungers as they are of well known construction and form no part of my invention. To the upper end of rod 31 is secured a cable 32 which passes over pulley 16 and is secured to the plunger frame at the end opposite the upper end of rod 30. This cable is long enough to reach from the plunger frame when at the lowest point and up over the pulley and down to the top of the solid plunger rod when it is at the top of the stroke.

When the pump is to be driven by steam, electric or water power I provide a power pulley 33 on the driven shaft to which power may be applied or it may be driven in any suitable way. When the pump head is to be driven by wind power I mount on the driven shaft a bevel gear 34 which meshes with a bevel gear 35 on a vertical shaft 36 that carries on its upper end a bevel gear 37. Gear 37 meshes with bevel gear 38 on shaft 39 which is driven by the wind wheel (not shown).

By this construction it will be observed that as the plunger frame is raised it carries the hollow polished rod upward and permits the solid rod to pass downward in the pump barrel and that the operating bar would then be at the end of the slot in the plunger frame adjacent the hollow rod. When the operating bar reaches the upper sprocket wheels the chains shift its position to the other end of the slot as they pass over the sprocket wheels and it bears on the other end of the plunger frame and forces the frame downward. The downward movement of the plunger frame carries the solid rod upward and permits the hollow rod to pass downward in the pump barrel, thus applying power to the end of the plunger frame that has to lift the load. When the operating bar reaches the bottom sprocket wheels the chains shift its position to the other end of the slot and the frame again travels upward. It will be observed that there is a continuous flow of water as one or the other of the plungers in the pump barrel is forcing the water upward except during the short period that the operating bar is being shifted from one end of the slot to the other end and that even in this shift

there is a small amount of water flowing which fluctuates and that at all other times the flow is constant.

Having described my invention what I claim is:

1. In a pump head, a plunger frame, means to raise and lower said frame; a guide for said frame; in combination with a hollow plunger rod, and a solid rod operable through the hollow rod both being connected to and operable by said plunger frame, said rods being so connected and arranged that the downward movement of said frame raises the solid rod and the upward movement raises the hollow rod.

2. In a pump head, a bottom frame; a top frame; guide beams secured to said frames, said beams forming the support of the top frame; a pulley frame secured to the top of said guide beams; a pulley mounted in said frame; a driven shaft; pinions mounted on said shaft; stub axles mounted on the bottom frame; gears on said stub axles meshing with the pinions on the driven shaft; stub axles mounted on the top frame;

sprocket wheels mounted on the stub axles of the top and bottom frames there being two sprocket wheels on each side; sprocket chains connecting the sprocket wheels of each side; a slotted vertically movable plunger frame mounted between the guide beams, and guided in its movement thereby; an operating bar connected to said chains and extending through the slot in the plunger frame; a hollow plunger rod connected to said plunger frame near one end thereof; a second plunger rod workable in and through said hollow rod; and a cable secured to said second rod and passing over the pulley in the pulley frame and secured to said plunger frame near the other end of the slot in said frame.

In witness that I claim the foregoing I have hereunto subscribed my name this 14th, day of June, 1912.

F. M. MIDDENDORF.

Witnesses:

G. E. HARPAM,
FRANK WATERFIELD.