

G. M. BRADRICK.
 MEANS FOR OPERATING WALKING BEAMS OF DEEP WELL PUMPS AND DRILLS.
 APPLICATION FILED JUNE 20, 1910.

987,427.

Patented Mar. 21, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

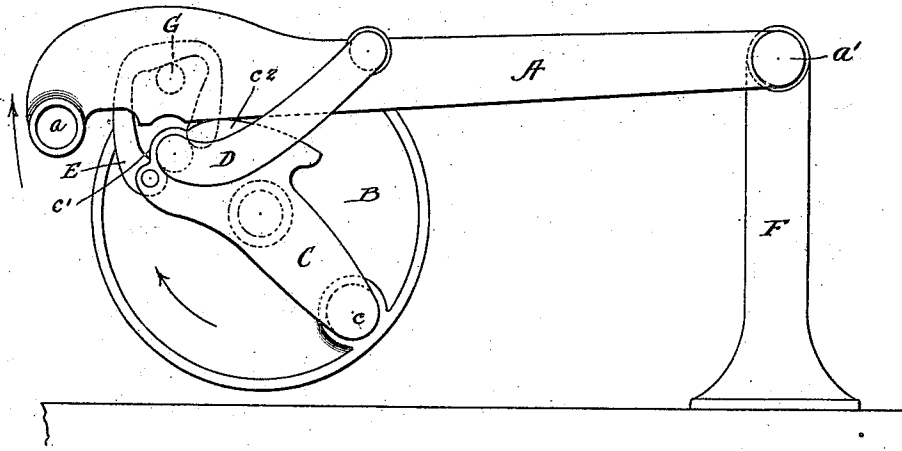
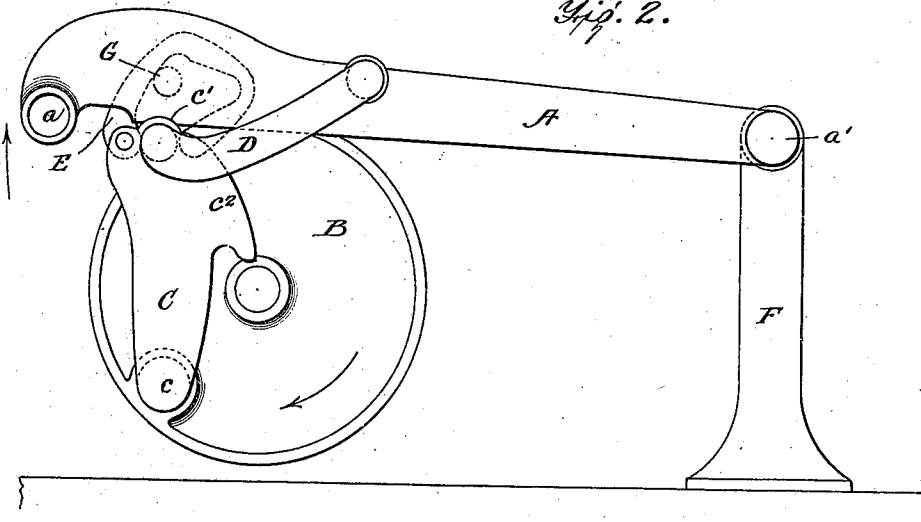


Fig. 2.



WITNESSES:

L. H. Schmidt.
 Amos W. Hart

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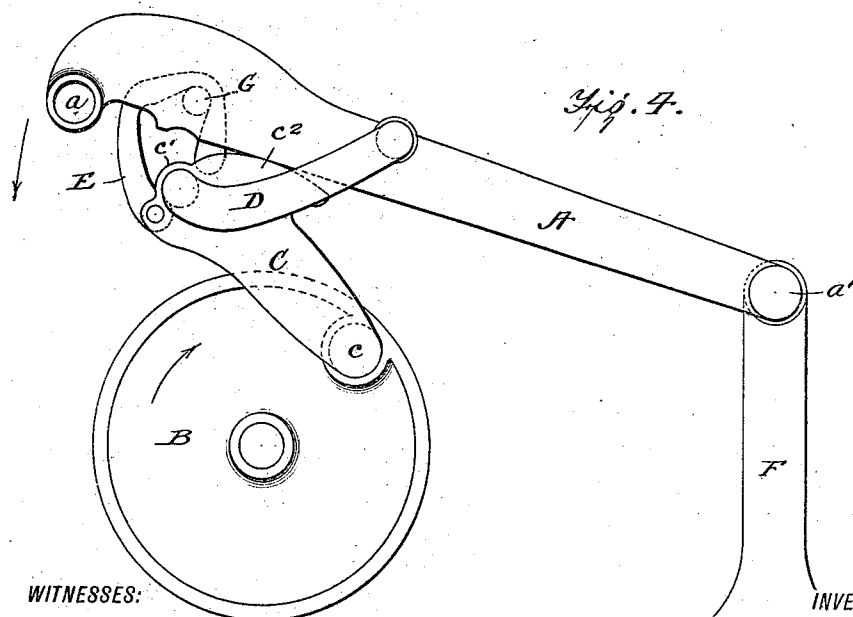
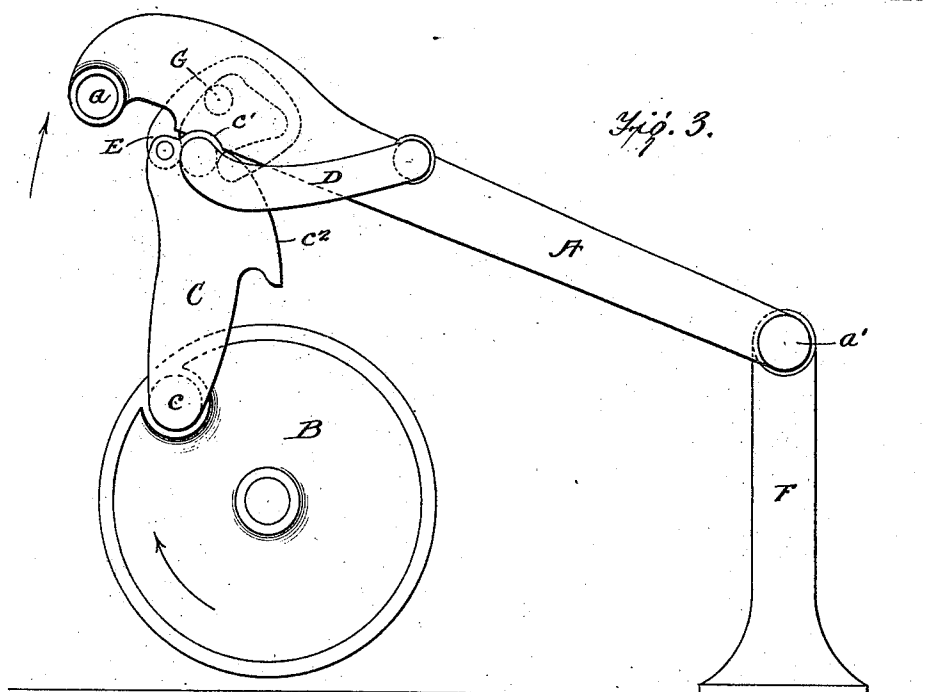
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UNITED STATES PATENT OFFICE.

GEORGE M. BRADRICK, OF PORTERSVILLE, CALIFORNIA, ASSIGNOR OF ONE-HALF TO
GEORGE W. OGLE, OF PORTERSVILLE, CALIFORNIA.

MEANS FOR OPERATING WALKING-BEAMS OF DEEP-WELL PUMPS AND DRILLS.

987,427.

Specification of Letters Patent.

Patented Mar. 21, 1911.

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To all whom it may concern:

Be it known that I, GEORGE M. BRADRICK, a citizen of the United States, and a resident of Portersville, in the county of Tulare and State of California, have invented an Improved Means for Operating Walking-Beams of Deep-Well Pumps and Drills, of which the following is a specification.

My invention is an improved cam lifter for so-called walking-beams to which the piston rods of single- and double-acting deep-well pumps and the rods of drills in well-boring rigs are attached. In such apparatus, a slow upward movement and quick return of the piston or drill is desired, and this is attained by my invention without jerk or jar of the operating parts, the apparatus working smoothly and practically noiselessly.

In practice, the load to be lifted is suspended from the free end of the walking-beam or lever, whose other end is pivoted to a fixed support, and the beam rests, near its free end, on a rocking cam to which it is also connected by a link, the said cam being pivoted to a constantly rotating gear by which it is carried around in a vertical plane and thus lifts the beam once in each revolution.

The details of construction and operation of my invention are hereinafter described, and illustrated in the accompanying drawings, in which—

Figures 1, 2, 3, and 4 are side views showing different positions of the walking-beam and lifting cam.

In the several figures, A indicates the walking-beam or lever, B, a rotating gear arranged in a vertical plane, C, the rocking cam, D, a link connecting the lever and cam, and E, a device which may be termed a yoke. The load to be lifted, that is to say, the rod of a deep-well pump piston or the lifting-rod of a drill, is attached at *a* to the free end of the lever or walking-beam A, and the other end of the same is pivoted at *a'* to a vertical, or other rigid, support F. Thus, the lever or walking-beam A is arranged in a nearly horizontal position and adapted to swing in a vertical arc.

Beneath the free portion of the lever is arranged a rotatable gear B, which is driven constantly in one direction, as indicated by arrow, by means of a pinion meshing therewith. A rocking cam C is pivoted to the

gear B at a point *c* near its periphery, and is of such length that it extends nearly across the face of the gear, its head being enlarged and provided with a rounded projection or knuckle *c'* and with a longer convex portion *c''*. The under side of the walking-beam or lever A has a recess corresponding to the projection *c'* of the cam, and the longer convex portion *c''* of the latter works in contact with an adjacent straight portion of the lever A.

In order to hold the head of the cam C duly engaged with the lever A, a link D is employed, the same being pivoted to the lever near its middle and to the cam at a point adjacent to the projection *c'*.

The operation of the apparatus may now be understood. The gear B being constantly rotated in the direction of the arrow, the pivotal point *c* of the cam will be carried around and the cam will pass successively from the position shown in Fig. 1 to that in Fig. 2, then to the position shown in Fig. 3, and lastly to that indicated in Fig. 4. In the first three figures, the lever is ascending or being pushed upward by the cam, but in Fig. 4, the pivotal point *c* of the cam has passed the highest point of the gear, and is descending, and consequently the lever is also descending. It will be seen that, in the lifting action, the contact and friction of the lever and cam are mainly borne by the knuckle joint formed by the corresponding parts *c'*, *c''*, and that this construction aids materially in holding the cam steady. In the descent of the lever A, the longer curve *c''* of the cam-head is alone in contact with the lever, as will be understood by reference to Fig. 4. It will be further seen that, when the lifting strain is greatest, the pivotal point of the cam and the point of contact of the same with the lever are practically in vertical alinement and that the leverage becomes less and less as the pivotal point of the cam approaches the highest part of the gear.

The device E, called a yoke, is in the nature of a hook, it being pivoted at one end to the head of the cam just forward of the pivotal attachment of the link D. The free portion embraces and engages a lateral pin G carrying a friction roller and projecting from the side of the lever A. The hook is so formed that, in the descending stroke illustrated in Fig. 4, it presses upon the pin G

and thus serves to hold the lever steadily engaged, or in contact, with the cam during the entire downward portion of the stroke.

My invention is adapted to produce a slow upward and quick downward action of a pump-rod or drill, and thus the flow of water upward is practically continuous so that it is discharged in a constant or uniform stream, without pulsation. The pump rods or drill rods are subjected to no jar, but the apparatus runs smoothly and noiselessly and with minimum friction.

What I claim is:—

1. The combination with a lifting lever pivoted on a fixed support so as to swing vertically and adapted for sustaining a load at its free end, of a rotatable gear arranged vertically beneath it, a cam pivoted to said gear and thus adapted to be carried around with it, the head of the cam having a long

convex portion arranged for working contact with the under side of the lever, and a pivoted link for holding the cam head in the proper position relative to the lever during the rotation of the gear, substantially as described.

2. The combination with a lever pivoted to a fixed support and adapted for attachment of a load at its free end, and a rotating gear arranged beneath the lever, of a cam pivoted to the gear and having an enlarged head adapted for rolling contact with the lever, and a hook-like yoke pivoted to the cam and engaging a lateral projection of the lever, as and for the purpose specified.

GEORGE M. BRADICK.

Witnesses:

GEO. W. OGLE,
W. W. BROWN.

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