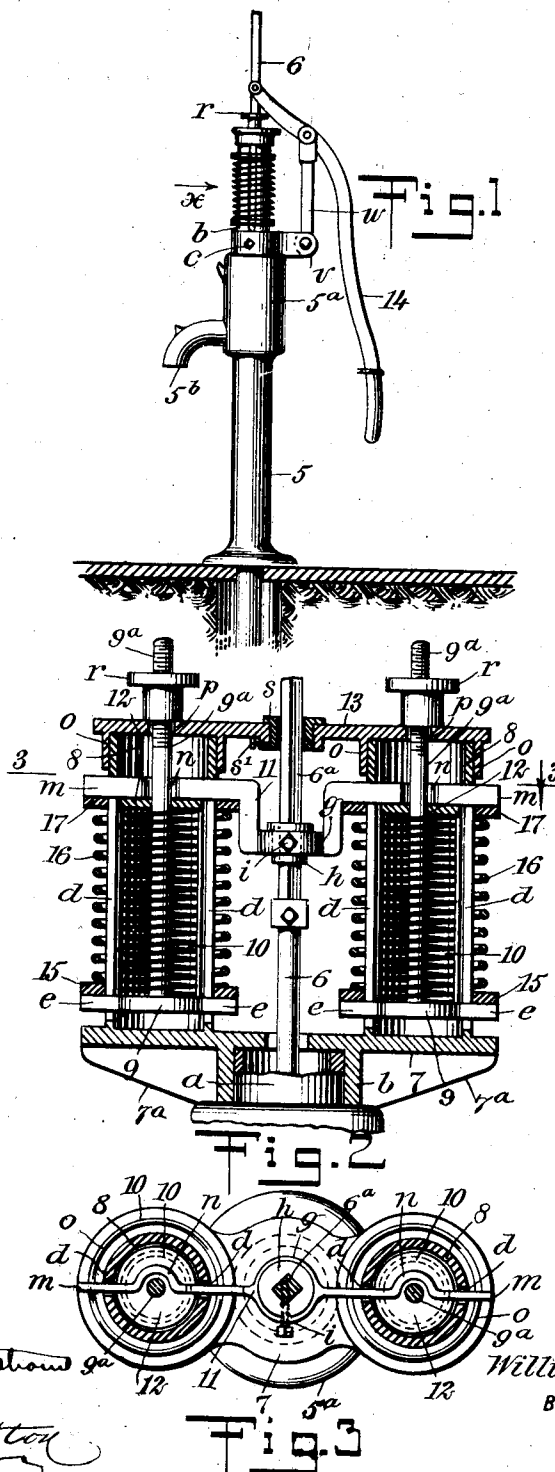


W. KOETHE, JR.
 COUNTERBALANCE FOR WATER PUMPS.
 APPLICATION FILED APR. 19, 1909.

948,227.

Patented Feb. 1, 1910.



WITNESSES
 John S. Thompson
 J. P. Patton

INVENTOR
 William Koethe Jr.
 BY *Murphy*
 ATTORNEYS

UNITED STATES PATENT OFFICE.

WILLIAM KOETHE, JR., OF BRINKMAN RIDGE, WISCONSIN.

COUNTERBALANCE FOR WATER-PUMPS.

948,227.

Specification of Letters Patent.

Patented Feb. 1, 1910.

Application filed April 19, 1909. Serial No. 490,662.

To all whom it may concern:

Be it known that I, WILLIAM KOETHE, JR., a citizen of the United States, and a resident of Brinkman Ridge, in the county of Vernon and State of Wisconsin, have invented a new and Improved Counterbalance for Water-Pumps, of which the following is a full, clear, and exact description.

The purpose of this invention is to provide novel features of construction for a counterbalance that is an attachment for a water pump, which will balance the weight of the pump rod and the bucket on it, and of water lifted by the rod and bucket, thus reducing labor in operating a pump having the improvement placed thereon.

The invention consists in the novel construction and combination of parts, as is hereinafter described and defined in the appended claims.

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

Figure 1 is a side view of a pump erected for service, and having the improvement thereon; Fig. 2 is an enlarged sectional front view of the improvement, seen in the direction of the arrow *x* in Fig. 1; and Fig. 3 is a sectional plan view of details, taken substantially on the line 3—3 in Fig. 2.

The invention is designed for use on a well-known class of water pumps that may be used for raising water manually or by other power, from wells of different depths and lessen the labor required in the operation of the same.

In the drawings, 5 indicates the barrel and 5* the upper water chamber of a pump of ordinary construction, said chamber having a reduced cylindrical open upper end *a* as usual. A rod 6, whereon a bucket of any preferred construction is affixed at its lower end, extends centrally upward through the barrel 5 and chamber 5*, and at a suitable distance above the chamber the upper portion of said rod has a rectangular body 6* as shown in Fig. 2.

The improved counterbalance device that is mounted for service on the upper end or collar *a* of the chamber 5*, comprises the following details: A base plate 7 consisting of a mainly flat metal body, is provided with a circular depending flange *b*, that projects centrally from the lower side thereof, hav-

ing an interior diameter that loosely receives the collar *a* whereon said flange is mounted and secured by one or more set screws *c*, as shown in Fig. 1. The base plate 7 is centrally perforated for the free passage of the pump rod 6 upwardly through it, and at opposite points therefrom said base plate is extended, these extensions having similar spring casings 8 erected thereon that are equally distant from the pump rod. The spring casings 8 are hollow cylinders of suitable dimensions. The base plate 7 is strengthened by the webs 7* that are formed on the base plate and flange *b*. In the same vertical plane with the axis of the pump rod 6 and diametrically opposite each other, two longitudinal slots *d*, *d*, are formed in the wall of each spring casing 8, said slots extending from near the lower ends of the casings to near their upper ends, as is shown in Fig. 2. A circular guide plate 9 is loosely fitted in each spring casing 8, each of said plates having two diametrically opposite ears *e*, *e*, formed thereon which project outward through the respective slots *d*, *d*, when the guide plates are placed within the casings. In each casing 8, a strong coiled spring 10 is introduced from the upper end thereof, and is seated on a respective guide plate 9, said springs having an equal length that adapts them to extend to nearly the height of the slots *d* and their diameter is such that they fit loosely within the casings. A yoke piece 11, preferably bent at its center into substantially U-shape, is formed at said center with an integral circular collar *g*, wherein a sleeve *h* is fitted and secured by a set screw *i*, said sleeve having a rectangular vertical opening therein which receives the square body portion 6* of the pump rod 6, into which the set screw *i* is also inserted, as is indicated by dotted lines in Fig. 3. From the U-shaped central portion of the yoke piece 11, two arms *m*, *m* are oppositely extended, which pass through the slots *d* in the respective casings 8, said arms each having a lateral concavity *n* formed therein. In each spring casing 8, at the center of the guide plate 9, a stem 9* extends upward from said guide plate, and is of a length that adapts it to project a distance above the upper edge of the casing, each stem passing loosely through a respective concavity *n* in the horizontal arm *m*, thus affording clearance for the arms *m*. Upon each spring 10, a centrally perforated disk 12 is seated

that is mounted upon a respective stem 9^a, and upon each disk a respective arm *m* is imposed as shown in Fig. 2. A laterally-elongated cap plate 13 is provided, having at each end thereof a collar *o* which loosely encircles the upper end of a corresponding casing 8, and concentric with each collar an opening *p* is formed in an end portion of the cap plate, through which extends the upper portion of a respective stem 9^a, said ends of the stems being threaded for the reception of clamping nuts *r* that are screwed thereon and bear upon the cap plate. At the center of the cap plate 13, a circular opening is formed wherein the body of a guide box *s* is fitted and secured by a set screw *s'*, and has a rectangular opening through which the rectangular portion 6^a of the rod 6 is upwardly extended and adapted for reciprocation. Two spaced ears *v* are formed at one side on the depending flange *b*, receiving between them the lower end of a link bar *w* that is pivoted thereto and thence projects upwardly. Upon the rod 6, the upper end of a handle lever 14 is pivoted, and thence curves outward and downward, and as shown in Fig. 1 the upper end of the link bar *w* is lapped and pivoted upon said lever.

In case the pump and improvements so far as described, are to be placed over a well of moderate depth, so that the pump rod 6 is of moderate length, the tensional force of the springs 10 will compensate for the weight of the pump rod, and of the water lifted by a depression of the free end of the handle lever 14 and a corresponding upward movement of said rod, and water that is discharged from a spout 5^b on the chamber 5^a.

When the pump and improved counterbalancing device is to be used for the lifting of water from a well of considerable depth, additional counterbalancing means are employed that cooperate with that already described, said supplementary means consisting of the following details: The ears *e*, *e*, project from each of the guide plates 9, sufficiently for the reception and support of a flat metal base ring 15, and upon each base ring 15 a spiral spring 16 is seated, said springs respectively encircling a corresponding casing 8. There is an annular bearing ring 17 seated upon the upper end of each spring 16 and the height of the latter is equal with that of the springs 10, so that the end portions of the arms *m*, *m*, will bear upon the springs 10 and 16 with equal force. It will be evident that the cooperation of the springs 16 with the springs 10, will add to the support of a pump rod of increased length and the weight of water lifted at each upward stroke of said rod, so that the manual labor performed in working a water pump in a deep well or one of less depth, may be reduced to a minimum by the em-

ployment of the improved counterbalancing device.

It is apparent that either the outer set of springs or the inner set thereof may be dispensed with, if the weight to be lifted does not require both sets of springs as a supplementary force in the operation of the pump.

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

1. The combination with a pump barrel and a pump rod reciprocal in the barrel, of a pair of spring casings supported from the barrel at opposite sides of the rod, a cap plate for the casings and in which the pump rod has guided movement, a spring in each casing, said casings each having a pair of vertical slots therein, and a yoke centrally mounted on the rod and having two arms oppositely extended therefrom that respectively pass through the slots in the casings and bear upon the upper ends of the springs.

2. The combination with a pump barrel and a rod reciprocal therein, of two cylindrical spring casings disposed equally and oppositely from the rod, said casings each having two diametrically opposite longitudinal slots therein, a guide plate in each casing having two ears thereon that are slidable in the slots, a disk-like bearing plate seated on each spring, and a yoke piece having a perforated center portion through which the rod passes, and two arms oppositely extended through the slots in the casings and seated upon the bearing plates.

3. The combination with a pump barrel having a collar on the upper end thereof, and a pump rod reciprocal in the barrel, said rod having its body squared in the upper portion, of a base plate having a depending circular flange thereon that encircles the collar and is thereon secured, upright spring casings opposite the rod and equally distant therefrom, each casing having two longitudinal slots therein, a guide plate in each casing having two ears that loosely pass through the slots, a coiled spring in each casing, a yoke secured on the rod at the center of said yoke, two arms oppositely extended from the center of the yoke, said arms passing loosely through the slots, an annular plate on each spring, the arms of the yoke bearing on said plates, stems extended vertically from the guide plates through the annular top plates, and a cap plate secured on the upper ends of the casings and through which the pump rod may reciprocate.

4. The combination with a pump barrel, of a rod reciprocal therein, a base plate mounted on the barrel and having a spring casing on each end, equally distant from the rod, said casings having opposite slots therein, a guide plate in each casing having ears that extend loosely through the slots, a

coiled spring in each casing, a stem extended centrally upward through each casing, a coiled spring loosely encircling each casing and seated on the extended ends of the ears, 5 an annular plate on the upper end of each inner spring, a ring plate encircling each casing and seated on the outer spring, a yoke mounted upon the pump rod and having arms that project through the slots in the 10 casings, said arms bearing upon the annular plates and the ring plates, each arm having clearance from a respective stem, a cap plate having depending annular flanges that encircle the upper ends of the casings, the 15 stems having threaded upper portions that pass through the cap plate, and clamping nuts on the upper ends of said stems.

5. A counterbalance for pumps, comprising a base plate having an opening therein 20 and a depending circular flange around the opening, a pair of spaced and vertically slotted casings on the base plate, a cap plate closing the upper ends of the casings and provided with an opening in alinement with 25 the opening of the base plate, a spring in each casing, and a yoke having its ends extending through the slots of the casings and against which the tension of the springs is exerted.

30 6. A counterbalance for pumps, comprising

ing a base plate having an opening therein and a depending circular flange surrounding the opening, a pair of spaced casings on the base plate, each casing having oppositely 35 arranged vertical slots, a cap plate having at each of its ends on the under side a collar receiving the upper ends of the casings and provided at its middle with a guide box, said guide box being in alinement with 40 the opening of the base plate, a guide plate in each casing and having ears projecting into the slots of the casing, a stem secured to each guide plate and extending through the cap plate and provided with a nut, a spring 45 in each casing, and a yoke provided with an opening in alinement with the guide box and opening of the base plate and having its ends extending through the slots of the casings and against which the tension of the 50 springs is exerted, the ends of the yoke within the casings having cavities for the passage of the stems of the guide plates.

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

WILLIAM KOETHE, JR.

Witnesses:

GEORGE L. REUDLER,
E. RUDOLPH KOETHE.