

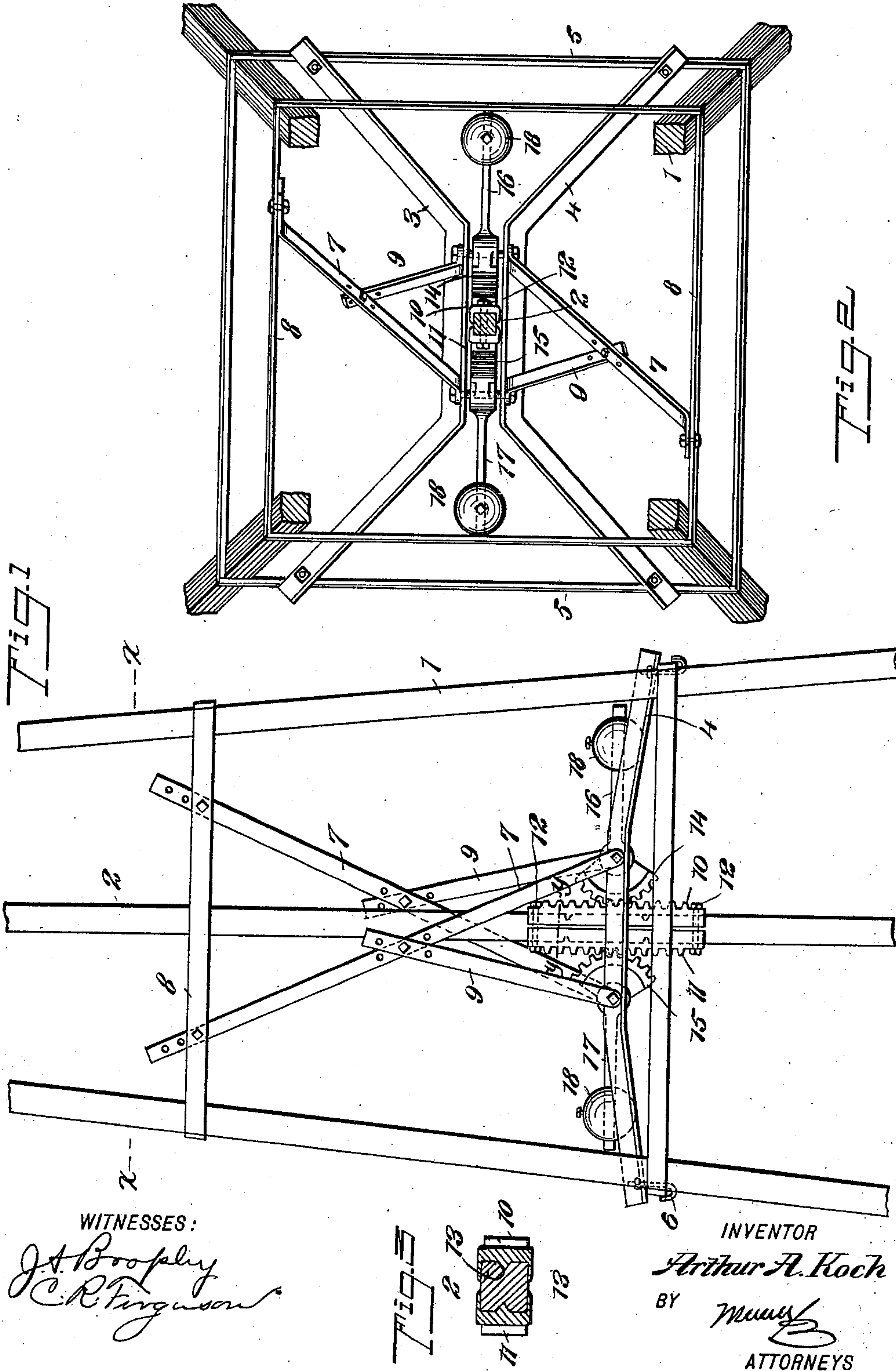
No. 685,617.

Patented Oct. 29, 1901.

A. A. KOCH.  
PUMP ROD BALANCE.

(Application filed Mar. 27, 1901.)

(No Model.)



WITNESSES:

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# UNITED STATES PATENT OFFICE.

ARTHUR A. KOCH, OF MONTEZUMA, IOWA.

## PUMP-ROD BALANCE.

SPECIFICATION forming part of Letters Patent No. 685,617, dated October 29, 1901.

Application filed March 27, 1901. Serial No. 53,063. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR A. KOCH, a citizen of the United States, and a resident of Montezuma, in the county of Poweshiek and State of Iowa, have invented a new and Improved Pump-Rod Balance, of which the following is a full, clear, and exact description.

This invention relates to balancing devices for pump-rods operated in deep wells by wind-wheels or any power, the object being to provide a simple device for balancing the weight of the water and pump-rod above the cylinder in the well, thus increasing the power and materially aiding the operation of the wind-wheel on the upward stroke of the pump-rod.

I will describe a pump-rod balance embodying my invention and then point out the novel features 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 figures.

Figure 1 is a side elevation of a balancing device embodying my invention. Fig. 2 is a section on the line *xx* of Fig. 1, and Fig. 3 is a section on the line *yy* of Fig. 1.

Referring to the drawings, 1 designates the windmill-tower, of the usual construction, and 2 indicates the pump-rod. Arranged in the lower portion of the tower is a frame consisting of the side sections 3 and 4, which are preferably made of angle-iron, as shown. The central portions of these frame-sections are turned inward, and the outer ends are connected to the cross-bars 5 of the tower by means of hook-bolts 6. These hook-bolts are passed through openings in the frame-sections and engage around the under sides of said cross-bars. By this construction the frame may be readily removed or attached.

The frame is made rigid by means of brace-rods 7, extended from the frame-sections upward to connections with the cross-bars 8 of the tower, and short braces 9 extend from the frame-sections to connections with the long braces 7. The short braces are secured to the long braces by means of bolts, while the long braces are secured to the cross-bars 8 also by means of bolts, and the braces may be provided with a number of holes, so that the frame may be adjusted to the distance

between the upper and lower cross-bars of the tower.

Arranged on opposite sides of the pump-rod are racks 10 and 11. Each rack is concaved or trough-like on its inner side to embrace the pump-rod, and the racks are held in position by means of bolts 12, passing through the ends of said racks and also through the pump-rod. They may be further held from possible displacement on the pump-rod by means of lugs 13, extended from the inner surfaces of the racks and engaging in notches formed in the pump-rod.

Mounted to swing in the frame comprising the sections 3 and 4 are the segment-gears 14 and 15. The segment-gear 14 engages with the rack 10, and the segment-gear 15 engages with the rack 11. Arms 16 and 17 extend outward from the segment-gears, and adjustably mounted on these arms are weights 18. The object in making the weights adjustable is to provide for the force or power of the wind-wheel and to balance the weight of the water and the pump-rod, which varies in different wells.

In operation as the pump-rod moves downward the racks will operate the segment-gears to swing the weights 18 upward. Then as the rod is moved upward by the wind-wheel the weights 18 will materially aid in the upward movement of the rod to lift the weight of the said rod and the water from the well.

By applying the weights on opposite sides of the pump-rod the said rod is evenly balanced and will be held in a straight line in its movement. In other words, it will not be deflected or bent, as might be the case were a weighted lever placed at one side only.

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

1. In a pump-rod balance, racks applied to opposite sides of the pump-rod, segment-gears engaging with said racks, a frame in which said gears are mounted, arms extended outward from the gears, and weights adjustable on said arms, substantially as specified.

2. In a pump-rod-balancing device, racks connected to the pump-rod, segment-gears engaging with said racks, a tower, a frame consisting of two sections secured in the tower and having their central portions extended in-



ward, the said segment-gears being mounted to swing between these inwardly-turned portions, weighted arms extended from the segment-gears, and braces extended from the frame-sections to connections with the tower, substantially as specified.

3. In a pump-rod-balancing device, a tower, a frame comprising two sections, hook-bolts at the outer ends of said frame-sections for engaging with cross-bars of the tower, braces extended from said frame-sections to connections with cross-bars of the tower, short braces extended from said frame-sections to connections with the first-named braces, segment-gears mounted to swing in said frame, weighted arms on said segment-gears, and racks on

the pump-rod with which said segment-gears engage, substantially as specified.

4. The combination with a pump-rod, of racks on opposite sides thereof, said racks having concaved inner surfaces to fit around the rod, lugs extended from the inner sides of said racks for engaging in notches formed in the rod, and weighted segment-gears engaging with said racks, substantially as specified.

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

ARTHUR A. KOCH.

Witnesses:

W. A. HARNER,  
EMORY JONES.