March 26, 1929. C. C. MILLER ET AL 1,706,407

SLIDING BEAM COUNTERBALANCE

Filed Aug. 31, 1927

Fig. 1.

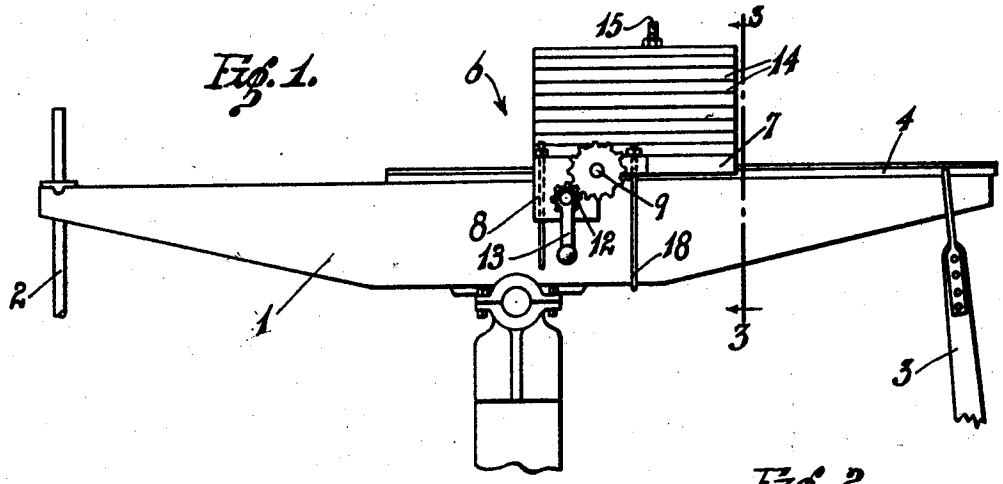


Fig. 2.

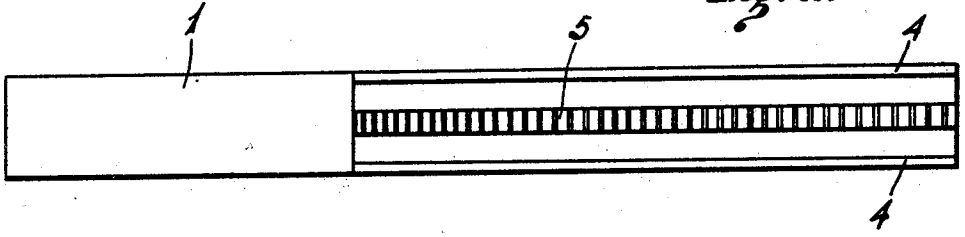


Fig. 3.

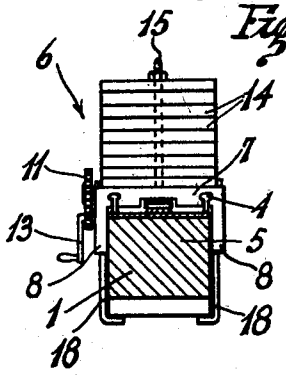


Fig. 4.

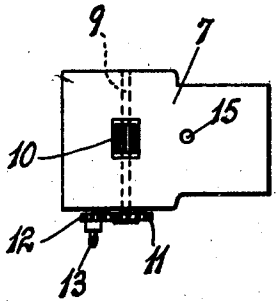
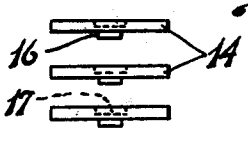


Fig. 5.



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UNITED STATES PATENT OFFICE.

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SLIDING BEAM COUNTERBALANCE.

Application filed August 31, 1927. Serial No. 216,584.

In the pumping of deep wells it is necessary to counterbalance the column of liquid in the well so that the pumping machinery may be relieved of this strain, and so that the pump will operate smoother and with less jerk on the rods, pump, and the like. Heretofore, the counterbalances have been placed on the band wheel or have been hung to the end of the walking beam. When working on the well it was necessary to remove these counterweights, which required a great deal of effort and labor and meant a loss of considerable time.

An object of our invention is to provide a counterweight which is adjustably mounted on the walking beam.

Another object is to provide a counterbalance which may readily be moved to inoperative position with a minimum amount of labor expended.

Other objects, advantages, and features of invention may appear from the accompanying drawing, the subjoined detailed description, and the appended claims.

In the drawing—

Fig. 1 is a side elevation of a walking beam with our counterweight mounted thereon.

Fig. 2 is a plan view of the walking beam.

Fig. 3 is a sectional view taken on line 3, 3, Fig. 1.

Fig. 4 is a plan view of the bottom plate of the counterbalance.

Fig. 5 is an end view of the weight plates.

Referring more particularly to the drawing:

The numeral 1 indicates a walking beam which is mounted and oscillated in the usual manner. The polish rod 2 which extends to the sucker rods in the well is secured to one end of the beam and a suitable operating link 3 is mounted on the other end and extends to the usual engine. A pair of tracks 4, 4 are formed or secured to the top of the beam 1 and a rack 5 is positioned between the two tracks 4. The tracks 4 and rack 5 may be integrally cast on a plate which is secured to the beam, or they may be individually formed and secured to the beam, or any other well-known method may be employed in mounting these units on the beam.

Our counterbalance 6 is slidably mounted on the tracks 4, 4 and is moved along the beam by the rack 5, as will be further described. The counterbalance 6 comprises a bottom plate 7 which has a pair of depending ears 8, 8 extending downwardly along the side of the beam which act as guides or braces for the weight. A shaft 9 is journaled in the plate 7 and a gear 10 is secured to said shaft and meshes with the rack 5. A gear 11 is secured to the outer end of the shaft and meshes with a pinion 12 which pinion is journaled in one of the ears 8, and a handle 13 is secured to said pinion whereby the same may be rotated.

Thus it will be seen that as the pinion 12 is rotated by the handle 13, which rotates the gear 11, shaft 9 and gear 10, it moves the weight backwards and forwards along the track 4 and over the rack 5. To provide the required weight a plurality of plates 14 are piled on the bottom plate 7 and are held in position by a bolt 15 which rises from the bottom plate and extends through the weight plates. Also, the juxtapositioned plates are provided with lugs 16 and sockets 17, thus preventing the plates from turning out of their set positions.

When the counterweight has been moved along the beam to the required position it is locked in place by hook bolts 18, 18 which extend through the bottom plate 7 and under the bottom of the beam. These bolts are tightened by any suitable means, such as quick-acting lock nuts, or the like. It will be evident from the foregoing description that our counterbalance can be moved along the beam to the point where the liquid column is exactly balanced and there secured in position. When it is desired to work on the well the hook bolts 18 are quickly released and the counterbalance is moved over the center of the beam where it remains until the working on the well has been completed. It is never necessary to remove the weight from the beam and one man can easily adjust the weight back and forth as desired.

Having described our invention, we claim:

1. In a walking beam, a track on said beam, a rack on the beam, a counterbalance comprising a bottom plate, a plurality of set plates detachably secured to the bottom plate, a shaft journaled in said bottom plate, a gear on the shaft meshing with the rack, a second gear on the shaft, a pinion meshing with the last named gear, a handle on the pinion, and hook bolts extending through said bottom plate and under the beam.

2. In a walking beam, a track on said beam, a rack on the beam, a counterbalance comprising a bottom plate, a plurality of set plates detachably secured to the bottom plate, a shaft journaled in said bottom plate, a gear on the shaft meshing with the rack manually operatable means connected to said shaft whereby the shaft is rotatable, and hook bolts extending through said bottom plate and under the beam.

In testimony whereof, we affix our signatures.

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