Feb. 1, 1927. 1,616,100

M. F. YOUNT

COUNTERWEIGHT

Filed Nov. 18, 1926

Fig. 1.

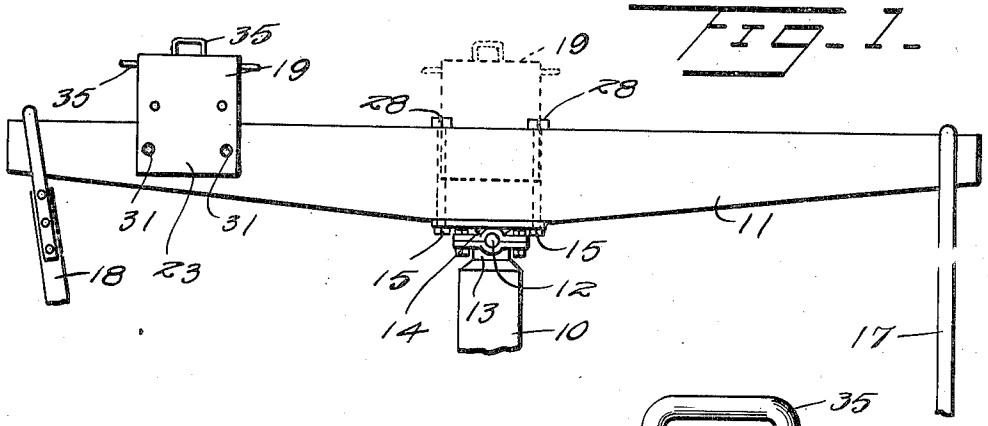


Fig. 2.

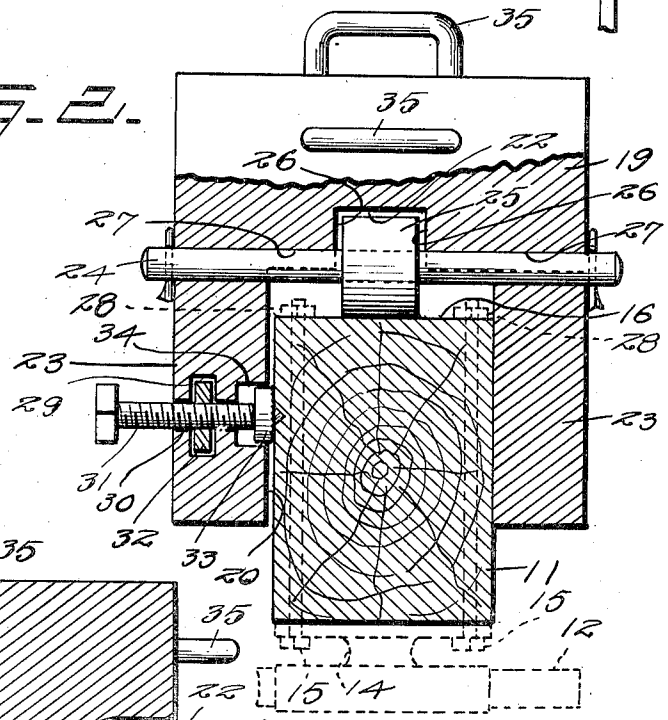


Fig. 3.

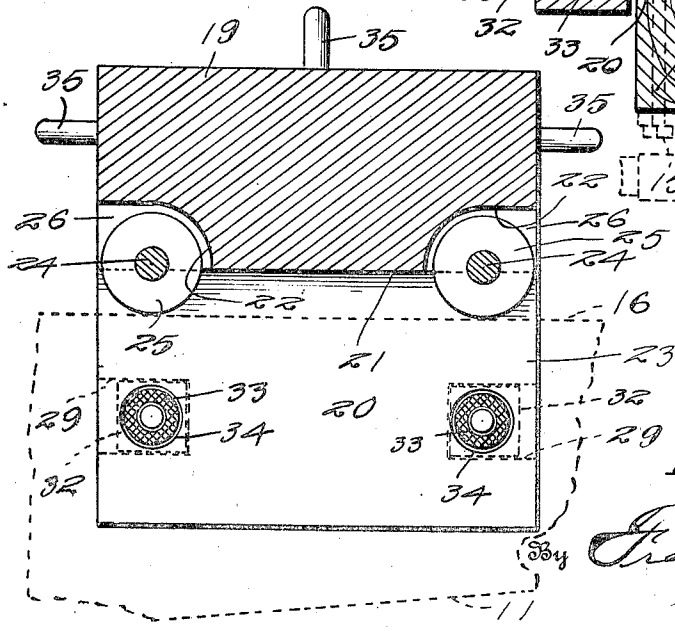
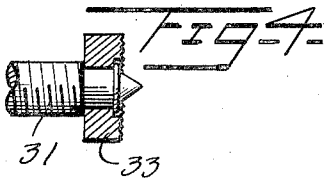


Fig. 4.



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UNITED STATES PATENT OFFICE.

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COUNTERWEIGHT.

Application filed November 18, 1926. Serial No. 149,160.

This invention relates to counterweights and more particularly to a counterweight for the walking beam structure of well pumping apparatus.

An important object of the invention is to provide a device of this character which is so constructed that it may be readily shifted upon the walking beam and readily held in any adjusted position thereon. It is here pointed out that the purpose of a counterweight of this character is to counterbalance the weight of the rods of the well and since these rods weigh from four to six thousand pounds, depending upon the depth of the well, the counterweight must, therefore, be of such size that it would be considerably in the way and awkward to handle when the rods are disconnected from the walking beam. As the rods must often be disconnected, it will be obvious that a counterweight suitable for use in counterbalancing the weight thereof must be capable not only of the ready adjustment above called for, but must likewise be capable of being secured firmly in position over the center of balance of the walking beam, so that it will not unbalance the walking beam, and render the operation of disconnecting and re-connecting the rods extremely difficult.

A further object of the invention is to provide a device of this character which may be readily and cheaply produced, which will be durable and efficient in service and a general improvement in the art.

These and other objects I attain by the construction shown in the accompanying drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention and wherein:—

Figure 1 is a side elevation of a fragment of a well drilling rig showing a counterweight constructed in accordance with my invention applied to the walking beam;

Figure 2 is an end elevation partially in section of the counterweight;

Figure 3 is a longitudinal sectional view through the counterweight;

Figure 4 is a detail view showing the construction of the swivel head of the clamping screw.

Referring now more particularly to the drawings, the numeral 10 generally designates the Sampson post of well pumping apparatus and 11 the walking beam supported thereby through a pintle shaft 12, the ends of which engage in bearings provided by a saddle 13 carried by the upper end of the Sampson post. The pintle shaft 12 is a portion of a casting 14 secured to the under surface of the walking beam by bolts 15 extending vertically therethrough adjacent opposite side edges of the beam. The upper surfaces 16 of these beams are usually flat. One end of the beam is connected with the upper end of a rod string 17, while the opposite end is connected through a pitman 18 with a suitable crank (not shown) through which the beam may be oscillated.

In accordance with my invention, I provide a counterweight comprising a heavy metallic block 19 formed centrally of its bottom face with a longitudinally extending channel 20 of slightly greater width than the walking beam. The upper wall 21 of this channel is provided at its ends with coves 22 and the arms 23 formed by the channel and coves are connected in alignment with each cove by shafts 24 having arranged thereon rollers 25 prevented from transverse movement with relation to the casting 19 by engagement of the side faces of these rollers with the side walls 26 of the coves. It will be obvious that the coves are of less width than the channel and that the shafts are so positioned that between the side edges of the coves and the arms 23, these shafts are supported from the body of the casting against any vertical movement. The upper faces of the shafts between the arms 23 and the walls of the cove preferably operate within grooves 27 formed in the upper wall 21 of the channel. Rollers 25 are of such width that they will pass readily between the nuts 28 upon the upper ends of the securing elements 15 and thus permit the counterweight to be located immediately above the saddle 13 and accordingly at a point where its weight offers the least possible resistance to manipulation of the beam 11.

One arm 23 has formed in each end thereof a pocket 29 which is intersected by a transversely extending bore 30. Rotatably directed through this bore is a bolt 31 which is threaded through a nut 32 positioned within the pocket. The inner end of the bolt 32 has swiveled thereto a serrated disk 33 which, by retraction of the bolt, may be withdrawn within a recess 34 provided at the inner end of the bore by countersinking the same. These disks, by proper operation of the bolts, may be forced into engagement with the side face of the beam and will se-

curely lock the weight in adjusted positions. To further facilitate manipulation of the counterweight, eyes 35 may be cast into the top and in opposite ends thereof when the body 19 is constructed.

It will be obvious that during operation, the counterweight will be located at the pitman engaged end of the beam 11 and in this position will counterbalance the weight of the rod 17. When it is desired to disconnect the rod 17 from the beam, the counterweight may be shifted to the center of the beam and there secured in position. At this time, the weight will offer but little resistance to movement of the beam, such as is necessary to shift the beam out of the pumping position to the position which it occupies when it is tilted to permit removal of the rods or well tubing.

Since the construction hereinbefore set forth is capable of a certain range of change and modification without materially departing from the spirit of the invention, I do not limit myself to such specific structure except as hereinafter claimed.

I claim:—

1. In a counterweight structure for the walking beams of well pumping apparatus, a heavy metallic body provided in its under face with a channel receiving the walking beam, rollers within the channel adapted to engage the upper surface of the walking beam centrally thereof and means directed through the body at one side of the channel for clampingly engaging the walking beam to maintain the body in adjusted positions thereon.

2. In combination with the walking beam of well pumping apparatus, a counterweight having supporting rollers engaging the top of the beam whereby it is readily shiftable upon the beam from a position where it is disposed adjacent one end of the beam to a position where it overlies the pivotal center of the beam and means for securing the counterweight in adjusted positions.

3. In a counterweight structure for the walking beams of well pumping apparatus, a heavy metallic body provided in its under face with a channel receiving the walking beam, rollers within the channel adapted to engage the upper surface of the walking beam centrally thereof and means directed through the body at one side of the channel for clampingly engaging the walking beam to maintain the body in adjusted positions thereon, the upper wall of the channel having coves into which said rollers extend and against the side faces of which the rollers engage to limit movement of the rollers transversely of the body.

4. In a counterweight structure for the walking beams of well pumping apparatus, a heavy metallic body provided in its under face with a channel receiving the walking beam, rollers within the channel adapted to engage the upper surface of the walking beam centrally thereof and means directed through the body at one side of the channel for clampingly engaging the walking beam to maintain the body in adjusted positions thereon, the upper wall of the channel having coves into which said rollers extend and against the side faces of which the rollers engage to limit movement of the rollers transversely of the body and shafts upon which the rollers are mounted directed through openings formed in the arms produced by the channel and having those portions thereof lying between said arms and the adjacent edges of the rollers abutting the upper wall of the channel to be supported thereby.

5. In a counterweight structure for the walking beams of well pumping apparatus, a heavy metallic body provided in its under face with a channel receiving the walking beam, rollers within the channel adapted to engage the upper surface of the walking beam centrally thereof, one of the arms produced by the channel having sockets in its end edges, said arm having bores intersecting said sockets, nuts within the sockets, bolts directed through the bores and engaging the nuts and clamping heads upon the inner ends of the bolts for engaging the walking beam to maintain the body in adjusted positions thereon.

6. In a counterweight structure for the walking beams of well pumping apparatus, a heavy metallic body provided in its under face with a channel receiving the walking beam, rollers within the channel adapted to engage the upper surface of the walking beam centrally thereof, one of the arms produced by the channel having sockets in its end edges, said arm having bores intersecting said sockets, nuts within the sockets, bolts directed through the bores and engaging the nuts and clamping heads upon the inner ends of the bolts for engaging the walking beam to maintain the body in adjusted positions thereon, the inner face of the arm having recesses into which said heads may be withdrawn.

In testimony whereof I affix my signature.

MILES F. YOUNT.