A. S. ANDERSON.

EQUALIZER FOR HOISTS.

APPLICATION FILED JULY 1, 1918.

1,337,111. Patented Apr. 13, 1920.

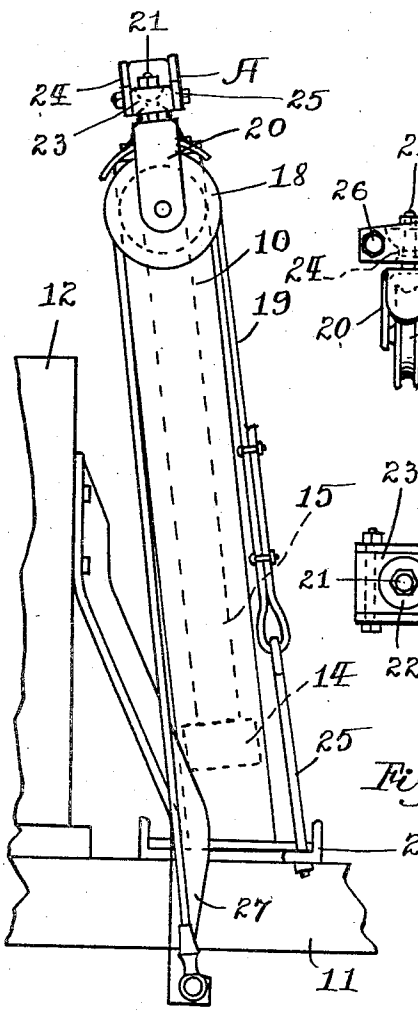


Fig. 1.

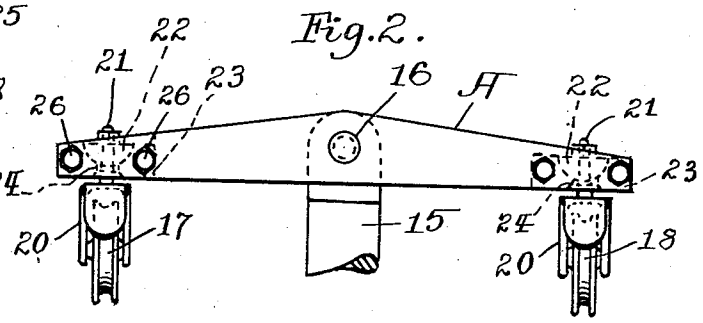


Fig. 2.

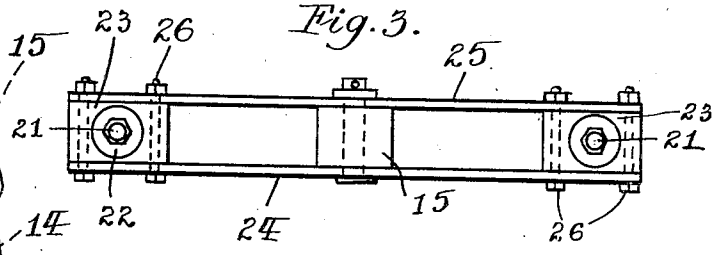


Fig. 3.

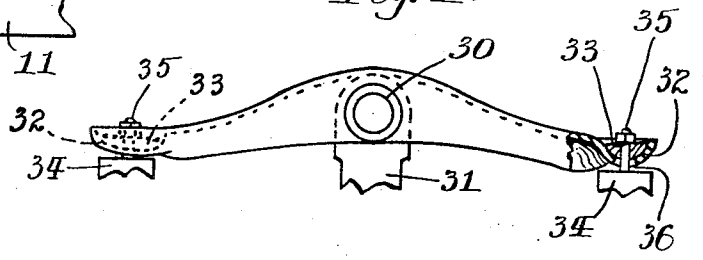


Fig. 4.

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UNITED STATES PATENT OFFICE.

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EQUALIZER FOR HOISTS.

1,337,111. Specification of Letters Patent. Patented Apr. 13, 1920.

Application filed July 1, 1918. Serial No. 242,806.

To all whom it may concern:

Be it known that I, ALBERT S. ANDERSON, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented a new and useful Improvement in Equalizers for Hoists, of which the following is a specification.

This invention relates to improvements in equalizers for hoists, the primary object being to provide improved means for equalizing any uneven tendency between the hoist and the load which it is adapted to raise and lower.

In the accompanying drawing forming part of this specification, Figure 1 is a side elevation of a hoist shown applied to a portion of a truck having the usual type of dumping body, which is arranged to swing up and down and showing my improved equalizer; Fig. 2 is a side elevation of the equalizer arm shown attached to the upper end of the piston rod; Fig. 3 is a plan of the structure illustrated in Fig. 2, and Fig. 4 is a side elevation partly in section of an alternative construction.

My invention is particularly applicable for use in connection with a hoist having the usual hydraulic cylinder 10 mounted upon the frame 11 of a truck, said truck having the usual dumping body 12, which is arranged to swing up from said frame of the vehicle at its forward end. The cylinder 10 contains the usual piston 14, which may be of any suitable construction and adapted to reciprocate up and down, said piston having a piston rod 15 projecting through the upper end of the cylinder and having my improved equalizer arm A pivotally mounted between the ends of said arm on the upper end of said piston rod by means of the pivot pin 16. This equalizer arm takes the place of the rigid cross bar formerly used at the upper end of the piston rod and of the equalizer used at the bottom of the hoist fastened to the base plate. The equalizer arm carries a pair of sheave pulleys 17 and 18 at its opposite ends which in turn carry the cables 19 which lift the body. Each sheave pulley is journaled in a sheave housing 20 and each sheave housing carries an upwardly projecting stud bolt 21 which is secured through a half ball bearing 22 which is seated in a cup block 23. The equalizer arm comprises a pair of side plates 24 and 25 secured together in parallel spaced relation at their ends with the bearing cup blocks 23 clamped between the side members and serving as spacing blocks by means of bolts 26, thus producing a rigid, strong, inexpensive structure, leaving an intervening space in which the upper end of the piston rod 15 is secured on the pivot pin 16. The cup blocks 23 may thus be easily case hardened to reduce wear and produce an efficient bearing for the half balls 22 through which the sheave supporting bolts 21 are fastened. The lower portion of the bearing cup block 23 is provided with a passage 24 through which the bolt 21 is free to swing and turn, thus allowing the sheave which is supported to move and evenly distribute and compensate the load on the piston rod. One end of each of the cables 19 is anchored by the bolt 25 to the base member 26 on the frame 11 and the opposite end is connected to the hanger 27, which is fastened to the body 12, so that as the piston 14 is forced upwardly the body 12 is raised into tilting position. Thus the ball and socket joints coöperating with the equalizer arm pivoted between its ends on the piston rod give perfect alinement of the sheaves and cables which obviously is an advantage when lifting heavy loads.

The equalizer arm may be variously modified within the spirit of my invention so long as the ball and socket joints are employed for accomplishing the results stated. In Fig. 4 one modification is illustrated in which said equalizer arm is formed out of a single piece of material of inverted U shape and cross section between its ends and journaled between its sides by the pin 30 over the upper end of the piston rod 31. The extremities of said equalizer arm are formed with cups 32 in each of which a half ball 33 is seated. The sheave housing 34 as in the preferred construction has its hanger bolt 35 secured through the half ball, a passage 36 being provided as in the preferred construction in the lower portion of the cup through which the hanger bolt is free to swing and turn to compensate for any uneven tendency.

In accordance with the patent statutes, I have described the principles of operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof, but I desire to have it understood that the construction

shown is only illustrative and that the invention can be carried out by other means and applied to uses other than those above set forth within the scope of the following claim.

Having described my invention, what I claim as new and desire to protect by Letters Patent is:

An equalizer, comprising, in combination, an arm having two sides, pivotally supported between its ends, blocks between the sides at the opposite ends of said arm, said blocks having bearing cups in their upper surfaces and ball members seated in and hanging from said cups.

In testimony whereof, I have signed my name to this specification.

ALBERT S. ANDERSON.