

Dec. 12, 1944.

A. HICKS

2,364,901

COUNTERBALANCE

Filed Oct. 27, 1942

Fig. 1.

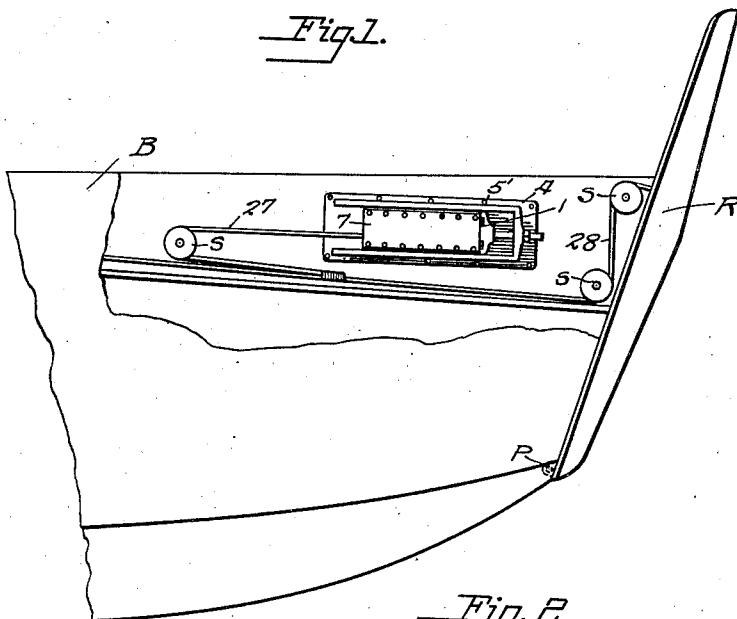


Fig. 2.

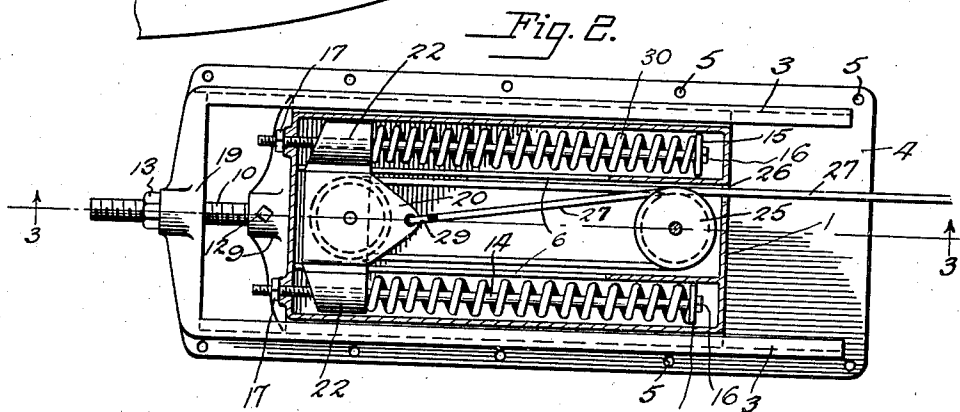


Fig. 3.

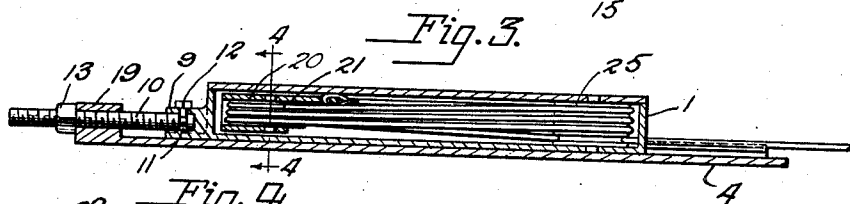
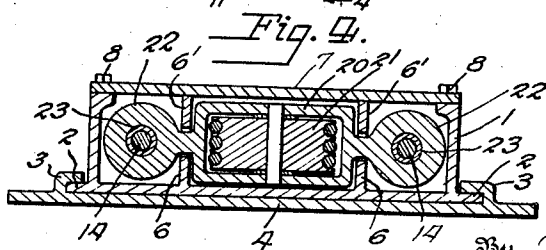


Fig. 4.



Inventor
Albertson Hicks

By *Mason Fenwick Lawrence*
Attorneys

UNITED STATES PATENT OFFICE

2,364,901

COUNTERBALANCE

Albertson Hicks, St. Petersburg, Fla., assignor of
one-half to John D. Mitchell, Newport, Fla.

Application October 27, 1942, Serial No. 463,528

3 Claims. (Cl. 267-70)

This invention relates to counterbalances and more particularly to counterbalances for heavy pivoted members such as derrick booms or ramps or the like.

In such heavy pivoted members operating on horizontal axes the load on a counterbalance increases from a minimum when the boom or ramp is in a vertical position to a maximum when it is in a horizontal position and therefore it is important that the counterbalance have a force corresponding proportionally to such load.

It is also important in connection with such a counterbalance that it be compact so that it will not occupy an undue amount of space and further desirable qualities are adjustability and strength without undue bulk or weight.

The recent development of landing barges in connection with military operations has presented an urgent demand for a suitable device of this character for controlling the heavy pivoted ramps with which said barges are provided at their bows and which can be lowered upon a beach to permit the discharge of trucks, tanks and the like.

The object of the present invention is to provide a counterbalance embodying the qualities heretofore mentioned and which lends itself to economy in the use of critical materials.

The invention consists in the novel construction, arrangement and combinations of parts more particularly hereinafter set forth and described.

In the drawing:

Figure 1 is a fragmentary side elevation partially broken away of the bow of a landing barge having a pivoted ramp controlled by a device embodying the present invention;

Figure 2 is a plan view of the improved counterbalance with the top plate of the base removed;

Figure 3 is a longitudinal vertical cross section taken on line 3-3 of Figure 2; and

Figure 4 is a vertical transverse cross section taken on line 4-4 of Figure 3.

The present invention is herein illustrated as applied to a landing ramp R having a horizontal pivot P positioned at the bow end of a boat B. The ramp R is connected as by a cable 28 which is guided by suitable sheaves S to the operating cable 27 forming a portion of the present counterbalance device.

The counterbalance comprises a base 1 which is preferably formed as a substantially rectangular box-like member having projecting flanges 2-2 on its opposite long sides adapted to seat

in spaced parallel guide ways 3-3 on an auxiliary anchoring base plate 4 which is provided with a plurality of holes 5 through which it may be secured as by lag screws 5' to the side or deck of the vessel or to the mast or boom of the derrick (not shown) as desired. Within the base 1 are formed parallel upstanding flanges 6-6 parallel with the long sides of the base and of less height than the side walls thereof which flanges 6-6 are aligned with similar flanges 6'-6' on the lower face of the cover plate 7 of the base 1 which cover plate 7 is secured to the base 1 as by bolts 8. The flanges 6-6 being of less depth than the side walls of the base 1 leave a space between their edges which constitute guide ways, the purpose of which will more clearly appear.

The base 1 is provided on one end with a lug 9 having a hole to receive the end of a bolt 10 having a peripheral groove 11 engaged by a bolt 12 threaded in the lug 9 and the bolt 10 is threaded through a lug 19 provided on the end of the auxiliary anchoring plate 4, a lock nut 13 being effective to secure the bolt 10 in adjusted position. This structure permits the adjustment of the base 1 with respect to the base plate 4 longitudinally thereof.

Within the base 1 which is divided, it will be noted, by the flanges 6-6 into three parallel compartments are positioned the tensioning means. These include a fixed multiple sheave pulley 25 positioned in the medial compartment adjacent the end of base 1 and a slidable multiple sheave pulley 21 mounted in a pulley block 20 which pulley block is provided with oppositely disposed lateral flanges 22-22, each of which flanges are provided with through orifices and bushings 23. Through these bushings extend rods 14 which extend substantially the length of each of the compartments adjacent the medial compartments and carrying on their inner ends stop washers 15 which abut against heads 16 formed on the rods. The opposite ends of the rods 14 extend through the opposite end wall of the base 1 and are threaded and provided with nuts 17 by means of which the effective length of rods 14 may be adjusted. Upon each of the rods 14 is mounted a compression spiral spring 30 the opposite ends of which abut respectively against the washers 15 and the lateral lugs 22. By the structure thus described it will be apparent that any slight inequality in the strength of the compression springs 30 can be adjusted so as to properly balance these springs by means of the nuts 17. A flexible cable 27 is threaded around the

sheaves of the pulleys 21 and 25 having one end secured to one of these pulleys or blocks as at 29 and its free end extending out of the base 1 as through a suitable orifice 26 provided in an end wall thereof. By reason of the structure thus described it will be apparent that the movable block 20 can be adjustably balanced between the spaced compression springs 30 and that the effective length of the cable 27 can also be readily adjusted by means of the screw 10. Further by reason of the inherent characteristics of compression springs it will be observed that the force exerted on cable 27 is least when the movable block 20 is furthest removed from the fixed block 25 and that this force increases proportionally as the movable block 20 is drawn toward the fixed block 25 and with this in view the device will, of course, be installed so as to properly control the ramp or boom in its rocking movement from the vertical to the horizontal.

Various modifications in the precise structure will readily suggest themselves to those skilled in the art, but all within the scope of the present invention as claimed.

What I claim is:

1. Counterbalance, for horizontally pivoted members, comprising a base, two multiple sheave pulleys carried by the base, one of said pulleys movable toward and away from the other, spring means forcing said pulleys normally apart, a flexible cord member operatively threaded around the sheaves of said pulleys, and a secondary base member formed with guideways in which the first mentioned base is adapted to slide and means for

adjusting the position of said first mentioned base member with respect to said secondary base member.

2. Counterbalance for horizontally pivoted members comprising a base having guide means constituting a runway, a second base plate slidable in said runway, means interconnecting the bases for adjusting their relative positions, the second mentioned base plate having side walls and partitions forming a medial and side compartments, a pulley mounted at one end of the medial compartment, a pulley block arranged to slide in the medial compartment having laterally extending lugs forming slidable abutments in the side compartments and compression springs in the side compartments engaging said abutment lugs and arranged to normally force the said pulley and pulley block apart, with a cord member operatively threaded around the sheaves of said pulley.

3. Counterbalance for horizontally pivoted members, comprising a base, two multiple sheave pulleys carried by the base, one of said pulleys moveable toward and away from the other, spring means forcing said pulleys normally apart, means for adjusting the tension of the spring means, a flexible cord member operatively threaded around the sheaves of said pulleys, and a secondary base member formed with guideways in which the first mentioned base is adapted to slide and means for adjusting the position of said first mentioned base member with respect to said secondary base member.

ALBERTSON HICKS.