Feb. 4, 1930. D. JACQUES 1,745,932

GEAR RETAINING DEVICE

Filed May 7, 1926

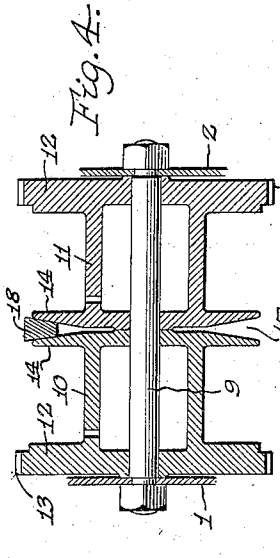
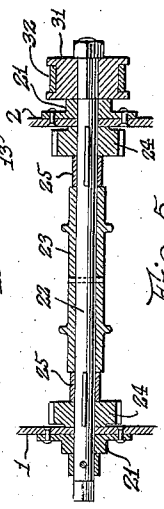


Fig. 4.



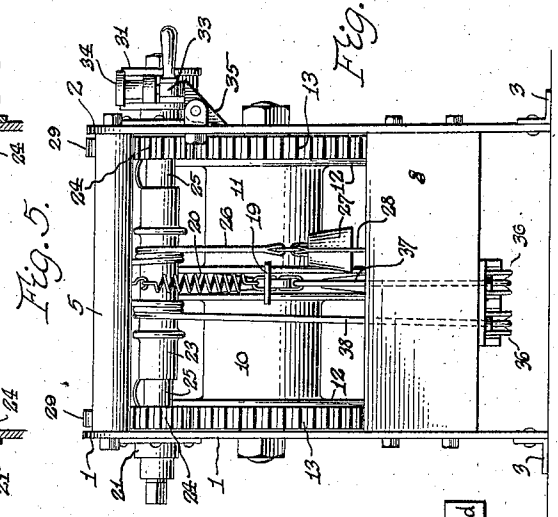


Fig. 3.

Fig. 5.

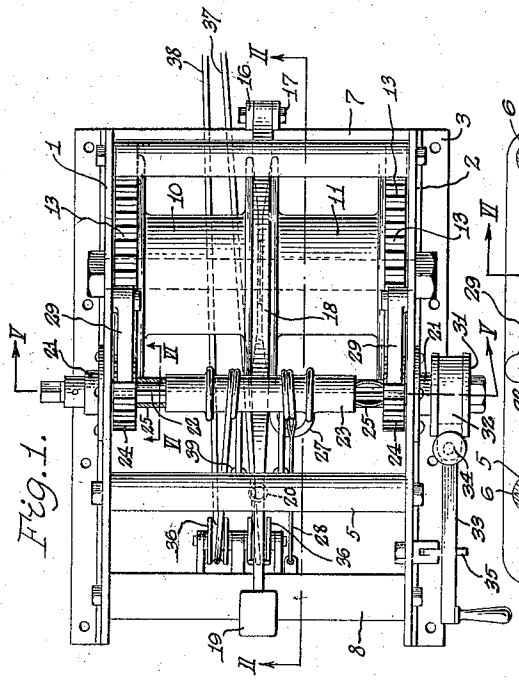


Fig. 1.

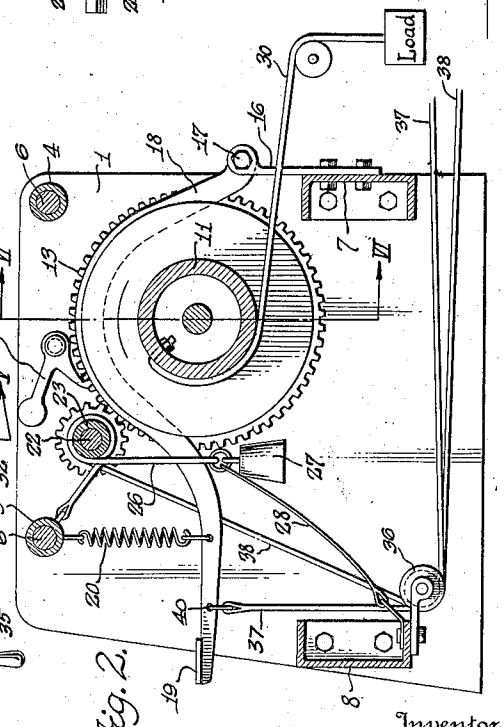


Fig. 2.



Fig. 6.

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UNITED STATES PATENT OFFICE

DAMASE JACQUES, OF DETROIT, MICHIGAN

GEAR-RETAINING DEVICE

Application filed May 7, 1926. Serial No. 107,352.

This invention relates to a gear retaining device for winches and is an improvement in connection with that type of winch disclosed in my Patents Nos. 1,059,998, granted April 29, 1913; 1,125,107, granted Jan. 19, 1915, and 1,564,417, granted Dec. 8, 1925.

In raising a life boat from its cradle it is essential that the boat be as level as possible, therefore provision is made for taking up any slack in fall lines or boat connections. It is in this connection that one end of the boat may be lower than the other, so provision is made for placing the boat on even keel and this is accomplished by an adjustment in connection with the driving means of the winch. Such adjustment is by a mechanism other than the usual form of clutch, for instance as shown in my Patent No. 1,564,417, the mechanism being of such nature that it cannot be accidentally shifted during any excitement incident to the manipulation of a life saving boat, consequently the winch possesses the characteristic of being fool proof.

Other advantages gained by my improved winch will be apparent from a description of the winch construction and its operation, so reference will now be had to the drawing, wherein

Figure 1 is a plan of the winch;

Fig. 2 is a vertical cross sectional view of the winch taken on the line II—II Fig. 1;

Fig. 3 is a front elevation of the winch;

Fig. 4 is a longitudinal sectional view of co-axial drums adapted to form part of the winch;

Fig. 5 is a longitudinal sectional view of an operating shaft of the winch taken on the line V—V of Fig. 1, and

Fig. 6 is a cross sectional view taken on the line VI—VI of Fig. 1.

As with my former winches, there is a substantial framework which is mounted on a vessel or may be attached to a davit or secured to any suitable support in proximity to a boat cradle or boat to be swung outboard and lowered to the water.

The framework is composed of end frames 1 and 2 and these end frames may be secured on a deck or support by angle bars 3 or other securing means. The frames 1 and 2 are spaced apart by sleeves 4 and 5 on tie rods 6 connecting what may be considered as the upper ends of the frames 1 and 2, while the lower ends of said frames are connected by longitudinal frames 7 and 8, preferably in the form of channel bars having end flanges attached to the confronting faces of the frames 1 and 2.

Mounted in the end frames 1 and 2 is a shaft 9 and rotatable on said shaft are coaxial hoisting drums 10 and 11, said drums having outer heads 12 formed with peripheral teeth so as to afford large gear wheels 13 by which said drums may be rotated, as will hereinafter appear. The drums 10 and 11 have inner confronting heads 14 forming an annular groove or shoe-way 15 which, in cross section, tapers inwardly from the peripheries of the heads 14 to approximately the axis of the drums.

Attached to the longitudinal frame 7 is a bracket 16 and pivotally connected to said bracket, as at 17, is an arcuate lever or shoe 18 which extends between the heads 14 and has a wedge portion in the groove 15. The lever or shoe 18 has a lateral portion extending between the longitudinal frame 8 and the sleeve 5 and on the free end of said lever is a pad 19 which may be pressed, by hand or foot, to wedge the lever or shoe between the drum heads 14 and retard, if not eventually stop rotation of either drum 10 or 11, when one or the other of said drums is held stationary, or both of said drums.

A coiled retractile spring 20 connects the free end of the lever 18 to the sleeve 5 and the retractile force of said spring is sufficient to hold the lever 18 so that either or both drums may be rotated.

The outer walls of the frames 1 and 2 are provided with longitudinally alining bearings 21 and journaled in said bearings and the frames 1 and 2 is a longitudinal drive shaft 22.

Centrally of the driving shaft 22 is a fixed spool 23 and splined or otherwise slidably mounted on the drive shaft 22 between the ends of the spool 23 and the frames 1 and 2, are small gear wheels 24 normally meshing

with the large gear wheels 13. To retain the small gear wheels 24 in mesh with the large gear wheels 13 there are detachable spacing members 25 about the drive shaft 22, between the ends of the spool 23 and the confronting side faces of the small gear wheels 24. These spacing members 25 have been shown in the form of substantially U-shaped resilient clips that may be snapped over the shaft 22 to prevent longitudinal movement of the small gear wheels 24 on the drive shaft. The spacing members are detachable in order that they may be removed to permit of either small gear wheel 24 being shifted towards an end of the spool 23 to disengage it from its large gear wheel 13. This arrangement is provided in order that either of the drums 10 or 11 may be driven from the drive shaft 22 independent of the other drum. Furthermore, while one drum is held stationary, against an unwinding operation as will hereinafter appear, the other drum may be rotated to take up any slack of a line attached to and wound on the drum.

The operation of removing either of the spacing members 25 requires a positive and understanding movement, so that an attendant of the winch positively knows what he is doing when removing one of the spacing members to shift one of the small gear wheels. This is in contradistinction to any lever actuated clutch mechanism that might control the driving relation between the drive shaft 22 and the drums 10 and 11. In my Patent No. 1,564,417 there is an outwardly extending clutch lever and during the excitement of a life saving operation, this clutch member might be actuated to a disadvantage, so in building this winch I have aimed to make the same fool proof by eliminating any protruding lever that might be accidentally actuated and result in an accident. It is to be noted that these spacing members are rotatable with the shaft and constitute means carried thereby, wholly within a small compass, less than that of the small gear wheels 24, for holding the small gear wheels against any sliding movement, yet permitting of either gear wheel being shifted when one drum is to be rotated or adjusted independent of the other.

Attached to the sleeve 5 and wound about the spool 23 is a flexible member 26 that may have two or three convolutions or wrappings on the spool and its free end provided with a weight or counterbalance 27. To prevent this weight or counterbalance from unduly swinging about it may be attached by a member 28 to the longitudinal frame 8. The flexible member 26 constitutes a friction governor for controlling rotation of the drive shaft 22 and lowering of a predetermined load, as will hereinafter appear.

The inner walls of the frames 1 and 2 are provided with pivoted weighted gravity pawls 29 normally engaging the large gear wheels 13 to prevent an unwinding operation of the drums 10 and 11 and any cable or flexible member 30 attached to and wound on said drums.

Either end of the drive shaft 22 may be provided with a crank or source of power for driving the shaft 22 and the drums 11 and 12. I prefer to provide that end of the drive shaft 22, adjacent the frame 2, with a fixed brake wheel 31, and surround said brake wheel with a brake band 32 provided with a crank 33 by which rotation may be imparted to the drive shaft 22 when the brake band 32 is clamped on the brake wheel 31 by a set screw 34 or other band adjusting means. This brake band will afford braking means for the drive shaft 22 when the crank 33 is held stationary, which may be accomplished by providing the end frame 2 with a pivoted bracket 35. This bracket may bear against the end wall 2, as shown in Fig. 3, and form an abutment to prevent counterclockwise movement of the crank 33. Then by tightening or loosening the set screw 34 the brake band 33 may control rotation of the drive shaft 22 and the drums 10 and 11 incident to lowering any load on a cable attached to either drum.

Supported from the longitudinal frame 8 are sheaves 36 for control lines 37 and 38. These control lines extend under the sheaves and upwardly towards the spool 23. The control line 38 is wound about the spool 23, possibly two or more convolutions or wrappings and has its end attached to the sleeve 5, as at 39. The control line 37, preferably a wire cable, is connected to the free end of the lever 18, as at 40. For the purpose of construction of the winch as well as the improvements, I have shown the cable 30 in Fig. 2 as provided with a load, representing a life saving boat or an end thereof. Assuming that the life saving boat has been raised from its deck cradle and swung outboard by davits, the life boat tends to race or accelerate counterclockwise rotation of the drums 10 and 11, viewing Fig. 2. If such racing were permitted there would be a dangerous impact of the life boat with the water tending to capsize the life boat. To prevent this acceleration or racing of a descending boat, the friction governor is used in connection with the spool 23 and the weight or counterbalance 27 is proportioned to the weight of a loaded life-boat so that there will be enough slippage of the flexible member 26 on the spool 23 to permit of the drums unwinding and a loaded life-boat gradually descending. This descent may be manually controlled from the life-boat by either of the lines 37 or 38, the former being preferably a wire cable, so that in case of fire abroad a vessel the line 37 cannot be quickly destroyed. This line controls rotation of either of the drums

10 and 11, when one or the other of said drums is otherwise held stationary, but when said drums control the lowering of both ends of the boat, the drums 10 and 11 are free to revolve under the control of the lever 18. This lever being connected to the line 37 permits of occupants of the boat stopping descent at will. The line 37 may be used only in emergency, because the line 38 wrapped on the spool 23 can also be used for stopping the drums at will.

During the operation of the drums 10 and 11 the gravity pawls 29 are thrown out of engagement with the large gear wheels 13, said gravity pawls constituting locking devices for holding the drums against accidental rotation when not otherwise controlled.

When a life saving boat is being raised in its cradle and it is discovered that some of the hoisting cables are slack, such cables may be made taut by removing one of the spacing members 25, shifting the small gear wheel 24 associated therewith out of engagement with the large gear wheel, then rotating the drum to take up the slack hoisting cable, replace the small gear wheel in mesh with the large gear wheel, and then replacing the spacing member. As pointed out in the beginning, this is a positive operation that must be performed at the drive shaft 22. The operator has time to realize just what he is doing and the possibility of doing the wrong thing is practically removed. In other words, there are no protruding levers or devices that may be accidentally shifted to cause an accident. The spacing members constitute quick detachable means to permit of the small gear wheels being manually shifted and it is by virtue of such means that all hoisting cables may be maintained in proper relation to the drums 10 and 11 for maintaining a life boat or any other load on an even keel.

My former winches have been mounted on a vessel deck in proximity to davits, and it is believed that these improvements further perfect the winches and materially reduce the cost of manufacture. While in the drawing there is illustrated a preferred embodiment of my invention it is to be understood that the structural elements are susceptible to such variations and modifications as fall within the scope of the appended claims.

What I claim is:—

1. In combination with a shaft having a gear slidable thereon and another surrounding member mounted thereon, and a substantially U-shaped clip spring on said shaft, in engagement with said gear and surrounding member, and having out-turned extremities whereby it may be expanded and removed from said shaft.

2. In combination with a shaft having a gear slidable thereon and another surrounding member mounted thereon, and a substantially U-shaped clip spring on said shaft, in engagement with said gear and surrounding member, and having out-turned extremities whereby it may be expanded and removed from said shaft, said extremities being disposed in a field closely surrounding said shaft.

3. A spacer for retaining a gear against sliding on a shaft, comprising a substantially U-shaped member of spring metal adapted to be sprung on a shaft and having out-turned extremities whereby it may readily be expanded and removed from the shaft.

In testimony whereof I affix my signature.

DAMASE JACQUES.