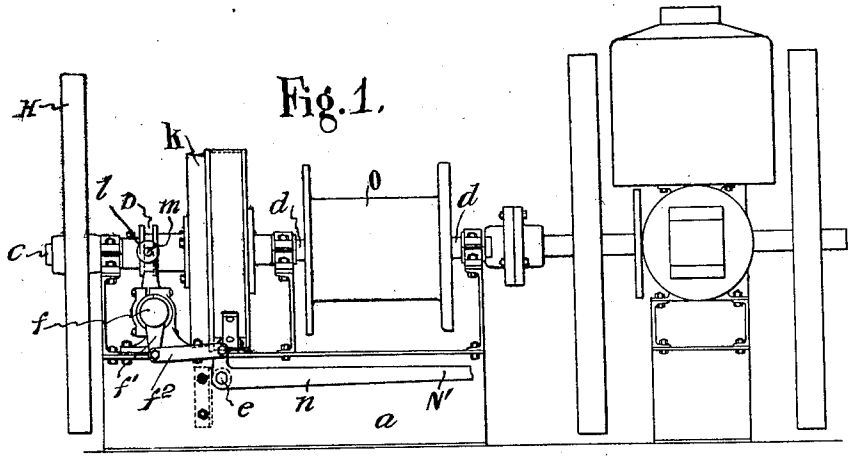
Dec. 2, 1924. 1,517,616

A. CLAYDEN

WINCH

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Fig. 1.



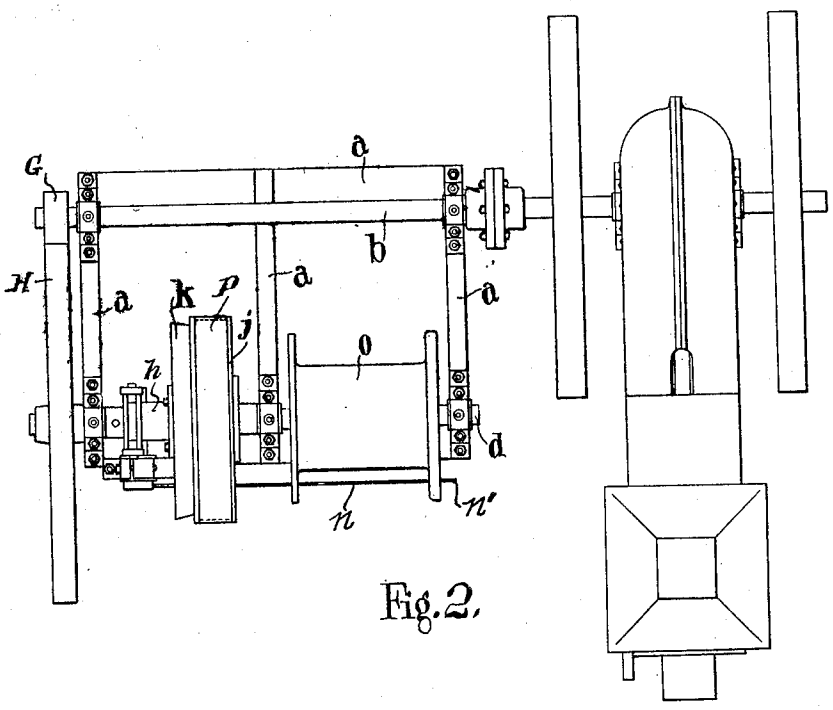


Fig. 2.

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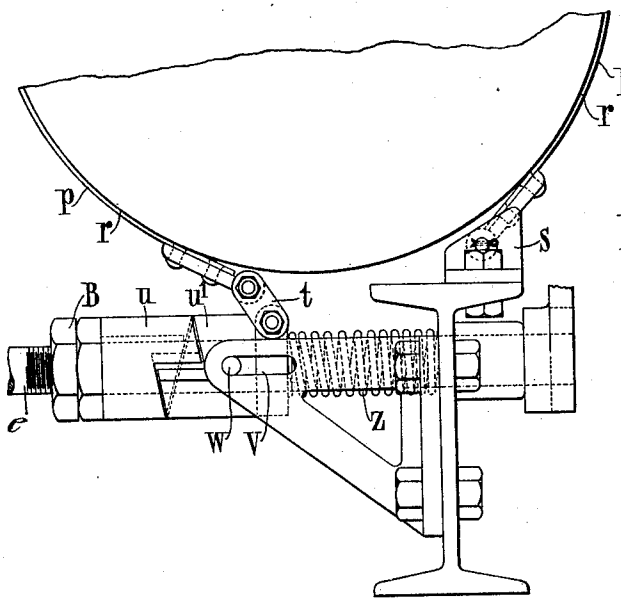


Fig.4.

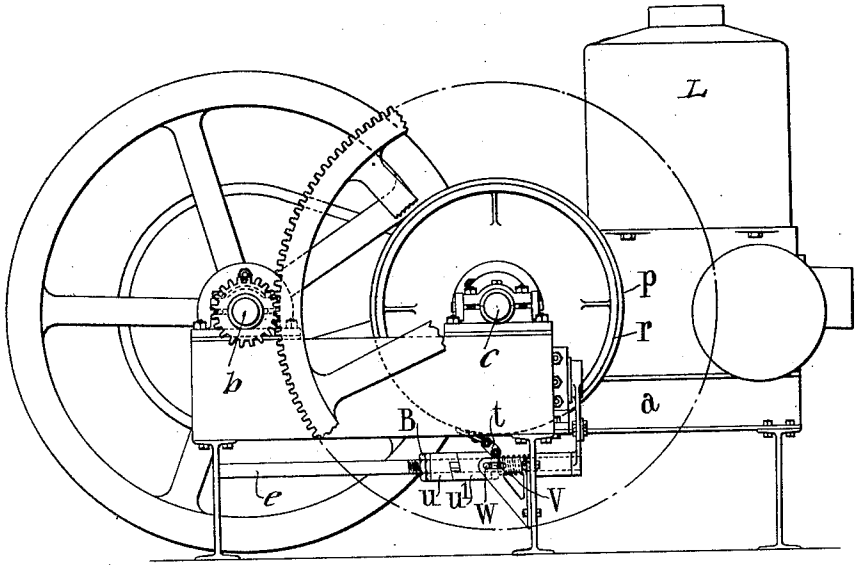


Fig.3.

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UNITED STATES PATENT OFFICE.

ARTHUR CLAYDEN, OF RICHMOND, ENGLAND.

WINCH.

Application filed December 28, 1920. Serial No. 433,567.

To all whom it may concern:

Be it known that I, ARTHUR CLAYDEN, a subject of the King of Great Britain, and residing at No. 1 Red Lion Street, Richmond, in the county of Surrey, England, have invented certain new and useful Improvements in or Connected with Winches, of which the following is a specification.

This invention relates to means or apparatus for lifting or hauling purposes which may be referred to as a "winch" of the kind in which a single lever or pedal controls the clutching and braking operations.

The object of the invention is to provide a construction of winch which will permit ready engagement and disengagement of the power transmitting parts so that the winch can be easily put in or out of action and this is effected by the provision of a combined clutch control and brake mechanism wherein the latter is cam-actuated and whereby a gradual or a full application or withdrawal of the braking and control actions can take place.

The invention consists of a cam-actuation device for the brake mechanism of a winch comprising winding means mounted and geared with a source of power and controlled according to the invention by a combined clutch device and brake mechanism, the latter of which is characterized by cam-actuation and further in which a cam-member has axial movement produced by rotation of the brake shaft. Both devices are operable simultaneously by a common lever to apply the clutch and withdraw the brake or to withdraw the clutch and apply the brake.

The accompanying drawings, illustrate the combined clutch control and cam-actuated brake mechanism according to this invention applied to a single drum winch, but it will be readily understood that the said combined devices may be used in a winch having a plurality of winding drums.

In the drawings:—

Fig. 1 is a general elevation showing a single drum two gear winch coupled to a prime-mover, and braking on the stationary member of the clutch and provided with a horizontally disposed operating lever.

Fig. 2 is a plan thereof.

Fig. 3 is an end elevation showing the cam-actuated brake mechanism; and

Fig. 4 is an enlarged detached view, in detail, of cam-actuated "braking" device for putting the brake strap in and out of action.

In carrying the invention into effect a is a cast iron base and standard, webbed and strengthened in those parts where strength is required.

The clutch is of a known type and comprises a movable member h provided with a non-slipping composition around its gripping surface, and a stationary member j; the former is preferably made of aluminium, carries a spigot end k and is grooved at l to take the T-pieces of the fork m which comprises a combined fork and lever actuation member (see Fig. 1). The stationary member j is preferably of cast iron, lightened by the provision of comparatively large holes and accurately machined on its inner annular face to co-act with the face of the spigot end k of the movable member h.

The fork member m is fitted to the clutch actuation shaft f to which is connected a bell crank or other lever system n located at the outside of the frame a and to this lever system at the end N^1 is attached a control rope or other actuating means. The stationary member j is carried on the shaft d to which is key-seated a drum o preferably of cast iron taking the load rope.

The movable clutch member h is arranged on a sliding key way and a comparatively short longitudinal movement is sufficient to effect engagement of the spigot end of the clutch and vice versa.

The brake strap p which is shown more clearly in Fig. 4 is of spring steel and is fitted around the outer rim r of the stationary clutch member j. One end of the band p is secured positively to the boss s, which is a fixed point, the other end of the band p is fastened to a lug t, against which, face cam u^1 operates to tighten or slacken the frictional contact of the band upon the rim. The said cam u^1 is slidably mounted upon the brake shaft e and is moved longitudinally thereon by the rotary movement of cam u carried on the shaft e which is actuated by the lever system n attached thereto and to the clutch actuation shaft f, so that the clutch and brake control devices are connectively combined and operable together.

A slot v in a fixed bracket has a pin w, slidable therein, carried by the cam u^1, and a spring z upon the shaft e, allows of such movement of the cam u^1. The application of the brake puts the spring into compression, and on taking off the brake the cam u

is withdrawn from contact with the cam u^1 and the recoil of the spring slides the cam u^1 back again to the released position of the brake band.

The actuation upward of the lever n throws the clutch in, through link f^2 and lever f^1 operating clutch actuation shaft f, and releases the brake through the shaft e, on this taking place, the winch is ready for work.

The actuation downward of the lever n throws the clutch out and applies the brake, either fully or gradually as required, the co-acting cam-faces lending themselves to a gradual application, and when the clutch is at its intermediate position the operator can through the said lever, "free wheel" the winding drum so as to permit the load to reach the desired level. Only a comparatively small movement on the cams is required to put the braking action on or off.

The brake action is adjustable by the moving up or release of a nut B on the brake-shaft e.

Although elements are described and shown herein which are common knowledge in the art, no claim is laid to such broadly, but only when associated with a combined clutch and brake control in which the brake control is cam-actuated.

What I claim is:

1. A brake control device comprising co-acting cams, one of which is adjustably and the other slidably mounted, a brake actuation shaft on which the said cams are mounted, a lug against which the slidably mounted cam abuts, an attachment between the said lug and the free end of a band adapted to grip upon a "braking" surface, a boss forming a fixed point to which the other end of the band is secured, an attachment between the said boss and the secured end of the band, to positively secure the latter to the boss and means for operating the brake actuation shaft to apply or withdraw the braking action.

2. A brake control device comprising co-acting cams, a brake actuation shaft upon which the said cams are carried, one adjustably and the other one slidably thereon, a lug against which the slidably mounted cam abuts, an attachment between the said lug and the free end of a band adapted to grip upon a "braking" surface, a pin carried upon the slidable cam member, a slot formed in a fixed bracket within which the said pin is slidable, a boss forming a fixed point to which the other end of the band is secured, an attachment between the said boss and the secured end of the band to positively secure the latter to the boss, and means for operating the brake actuation shaft to apply or withdraw the braking action.

3. A brake control device comprising co-acting cams, a brake actuation shaft upon which the said cams are mounted, one adjustably, the other slidably, a pin carried upon the slidable cam member, a slotted bracket in the slot of which the said pin works, a lug against which the slidably mounted cam abuts at one side, a re-action spring against one end of which one side of the said lug abuts, an attachment between the said lug and the free end of a band adapted to grip upon a "braking" surface, a boss forming a fixed anchorage to which the other end of the band is secured, an attachment between the said boss and the secured end of the band to positively secure the latter to the boss, and means for operating the brake actuation shaft to apply or withdraw the braking action.

4. A combined brake and clutch control, comprising co-acting cams, a brake actuation shaft upon which the said cams are carried, one adjustably, the other slidably, a lug against which the slidably mounted cam abuts at one side, a reaction spring against one end of which one side of the said lug abuts, an attachment between the said lug and the free end of a band adapted to grip upon a braking surface, a boss forming a fixed anchorage to which the other end of the band is secured, an attachment between the said boss and the secured end of the band to positively secure the latter to the boss, a clutch, a clutch actuation shaft, and a lever system operatively connecting the brake actuation shaft with the clutch actuation shaft, so that the two are movable together.

5. A winch having a combined brake and clutch control comprising co-acting cams, a brake actuation shaft carrying the cams, one adjustably, the other slidably, a lug against which the slidable cam is adapted to press when moved by the action of the other cam, a spring compressed by the movement of the slidable cam and reacting to return the cam, an attachment between the said lug and a free end of a brake strap, a braking surface upon which the said strap is adapted to grip, a boss forming an anchorage to which the other end of the band is secured, an attachment between the said boss and the secured end of the band to positively hold the latter to the boss, a clutch having a movable clutch member, a clutch actuation shaft by which the movable clutch member is caused to engage and disengage the stationary clutch member, and a lever system operatively connecting the brake actuation shaft with the clutch actuation shaft so that the two shafts are operable together.

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

ARTHUR CLAYDEN.