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BRAKE BAND STRUCTURE FOR WINCHES

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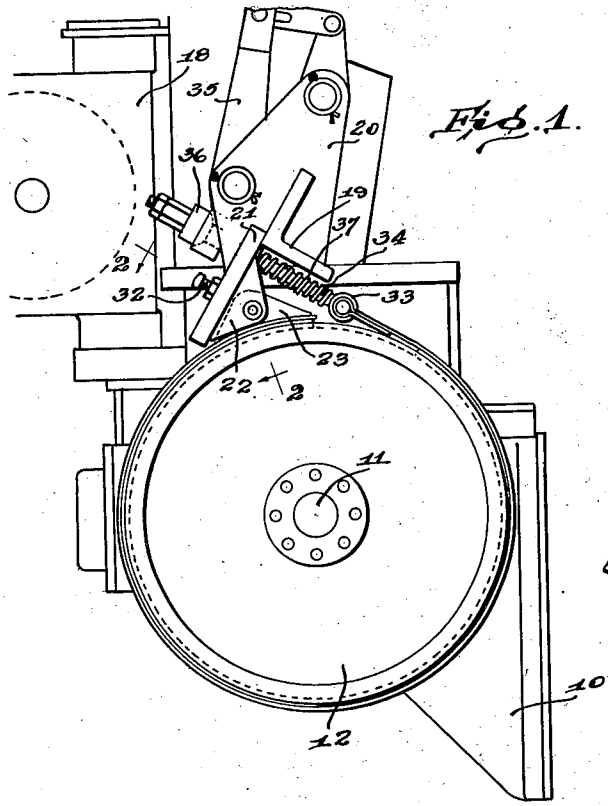


Fig. 1.

Fig. 3.

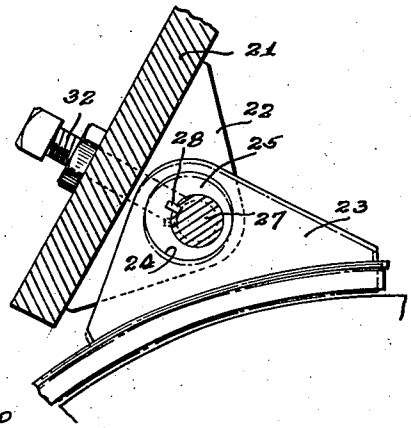
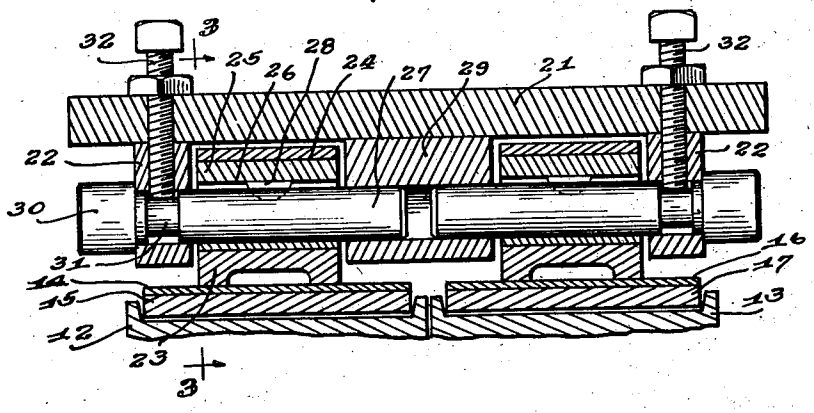


Fig. 2.



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BRAKE BAND STRUCTURE FOR WINCHES

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2 Claims. (Cl. 188—77)

This invention relates to winches but particularly to winches of the planetary type equipped with brake band engaging drums whose functions are operatively to connect the driving shaft to the cable drum in one case and to apply a braking force to the cable drum for holding it stationary or to reduce its speed of rotation.

Heretofore in winches or power control units of the above character, considerable trouble has been occasioned in the application of the brake band to the drum. The force thus imparted is of such nature and of such power as to impose a strain on the drum carrying shafts to the end that not infrequently these shafts have been broken. This necessitates expense and delay in repairing the winch because this is not a repair which can be readily and conveniently made in the field.

An object of this invention is to overcome the above difficulties and to provide a winch of this character with a brake structure which does not impose such objectionable strains on the winch shaft.

Another object is to produce a brake structure for winches of the planetary type which provides an increased contact surface between the brake band and the drum and which is sturdier and more reliable in operation.

Other objects and advantages of the invention will hereinafter appear and for purposes of illustration but not of limitation, an embodiment of the invention is shown on the accompanying drawing in which

Figure 1 is a side elevation of a portion of a power control unit or winch, the upper portions of the winch being broken away;

Figure 2 is an enlarged sectional view substantially on the line 2—2 of Figure 1 showing particularly the means for adjusting the brake band relative to the associated drum; and

Figure 3 is an enlarged transverse section substantially on the line 3—3 of Figure 2.

The illustrated embodiment of the invention comprises a winch or power control unit having a frame 10 which is adapted to be attached to a tractor. Winches of this character are used for many purposes such as controlling the positioning of bulldozer blades, operating scrapers, etc. The complete showing of the winch is not considered necessary nor is it believed necessary fully to describe its operation. Suffice it to say that the winch is of the planetary type having a power driven shaft 11, a brake drum 12, and a cable receiving drum equipped with a brake receiving rim or flange 13. About the drum 12 is a brake band 14 having a lining 15 and about the flange or rim 13 is a brake band 16 equipped with its brake lining 17. The arrangement is such that upon applying the brake band 14 to hold the drum 12 against rotation due to the planetary gear mechanism within the winch, the cable drum will be driven from the shaft 11. The brake band 16 is applied to hold the cable drum stationary or to reduce the speed of rotation thereof. It is believed that those skilled in this art will understand the construction involved but for more complete description and illustration, reference is hereby made to my copending application Serial No. 420,174 filed November 24, 1941, wherein a winch of this type is more completely shown. 18 represents a fairlead under which the cable (not shown) passes from the winch as will be readily understood.

Rigid with the winch frame 10 is a transversely disposed angle bar 19. Secured as by welding to the bar 19 is a bracket 20 which is vertically disposed and welded to the bracket 20 and also to the angle bar 19 is a bar 21 which is disposed at an angle and is arranged approximately tangentially to the brake drum 12. As indicated in Figure 2, the bar 21 is slightly wider than the width of the brake drum 12 and brake receiving flange 13.

Rigidly secured to the underside of the bar 21 are two triangular shaped brackets 22, one being disposed adjacent the outer side of the brake drum 12 and the other adjacent the inner side of the flange 13. Fixed to each of the brake bands 14 and 16 is a triangular shaped bracket 23 which, it will be apparent, engages the respective brake band over a substantial portion of its length, the bracket being secured thereto at the end portion of each of the brake bands. Each of the brackets 23 has a transverse bore 24 to receive a sleeve 25 which is formed with an eccentric bore 26. Fitting each of the eccentric bores 26 is a separate pin 27 which is secured to the sleeve 25 for rotation therewith by a key 28. The inner end of each of the pins 27 is rotatable within a bracket 29 which is rigid with the bar 21 and is arranged between the brake band brackets 23. The outer end portion of each of the pins 27 is rotatable in the respective bracket 22, an enlarged knob 30 on the outer end of each pin 27 providing a hand hold to enable manual adjustment as will hereinafter appear. In the region of the bracket 22 each pin has a reduced portion 31 againt which the end of a set screw 32 may bear to hold the respective pin in its adjusted position.

It will be apparent that the bracket **23** is connected to the pin **27** approximately midway of its length so that a substantial portion of each brake band extends forwardly therefrom. The opposite end of each brake band has an eye **33** which receives a rod **34** which passes through an opening in the lower end portion of an operating lever **35**. A nut **36** on the rod forms an abutment to be engaged by the lever **35** in drawing the brake band about the drum **12**. A spring **37** on the rod **34** normally holds the brake band in released position. It will be apparent that similar mechanism is provided for actuating the brake band **16** about the flange **13** and as a consequence, further description thereof is not considered necessary.

It will be manifest that the force exerted by the lever **35** to apply the brake band **14** to the brake drum **12** normally exerts a lifting force to the drum thereby imparting a bending strain upon the shaft **11**. However such difficulty is overcome since the force tending to lift up on the shaft **11** is resisted by the bracket **23**, the latter transmitting its force through the pin **27** to the brackets **22** and **29** and the rigid bar **21**. This arrangement militates satisfactorily against the imposition of strains upon the winch shaft which, as above explained, has been a serious cause of complaint.

From the above description it will further be clear that the brake band can be adjusted with much nicety with relation to the brake drum or flange **13** by first loosening the respective set screw **32** and by turning the knob **30**, the bracket **23** can quickly and conveniently be adjusted relative to the brake surface. After the problem of adjustment has been made, the set screw **32** can again be tightened in place. It will further be apparent that a greater area of contact is obtained between the brake band and the drum or flange. This is due to the arrangement of parts and particularly the bracket **23** which extends forwardly toward the free end of the band. As a result, a greater braking force can be secured with less effort.

It is to be understood that numerous changes in details of construction, arrangement and operation may be effected without departing from the spirit of the invention especially as defined in the appended claims.

What I claim is:

1. In a winch of the planetary type having an operating shaft and a planetary gear controlling drum rotatable about said shaft, a brake band for said drum, means to exert a force against one end of the brake band in a direction substantially tangentially of the drum, a bracket secured to the opposite end portion of said brake band and extending over a substantial length thereof, one end of said bracket being disposed in close juxtaposition to said first end of the brake band, a rigid mounting bracket arranged adjacent said first bracket, a pin providing a connection between said brackets, an eccentric sleeve fitting said pin whereby rotation of said sleeve enables adjustment of said first bracket toward or away from said drum, and means for holding said sleeve in adjusted position.

2. In a winch having an operating shaft and a drum rotatable about said shaft, a brake band for said drum, a bracket secured to one end of the brake band and extending over a substantial length thereof, a rigid stationary mounting bracket arranged adjacent said first bracket, a pin providing a direct connection between said brackets, means to adjust said first bracket toward or away from said drum, and means in the region of said mounting bracket for exerting a force against the opposite end of said brake band in a direction toward said mounting bracket and in substantial alignment with said opposite end of the brake band.

ROBERT B. MAGEE.