Feb. 27, 1934. G. E. EDMUNDS 1,948,652

BRAKE OPERATING MECHANISM

Filed March 14, 1932 2 Sheets-Sheet 1

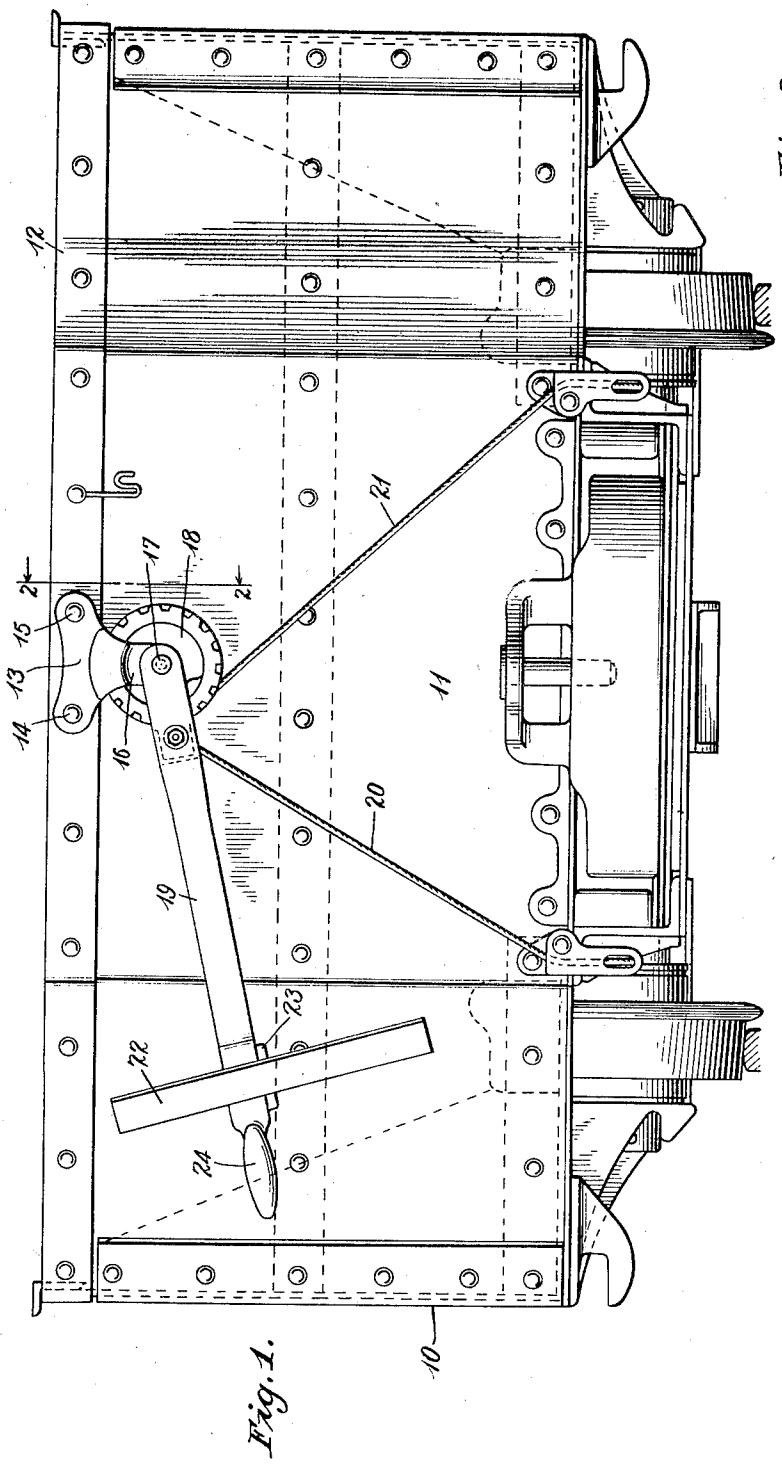


Fig. 1.

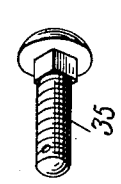


Fig. 8.

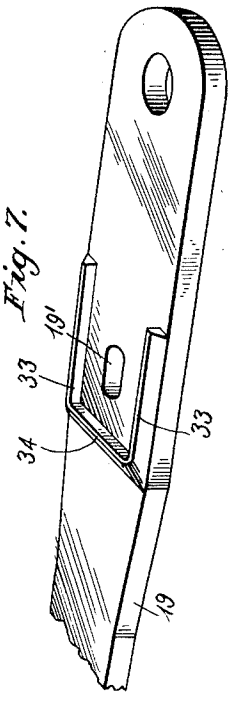


Fig. 7.

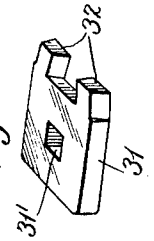


Fig. 6.

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Feb. 27, 1934. G. E. EDMUNDS 1,948,652

BRAKE OPERATING MECHANISM

Filed March 14, 1932 2 Sheets-Sheet 2

Fig. 2.

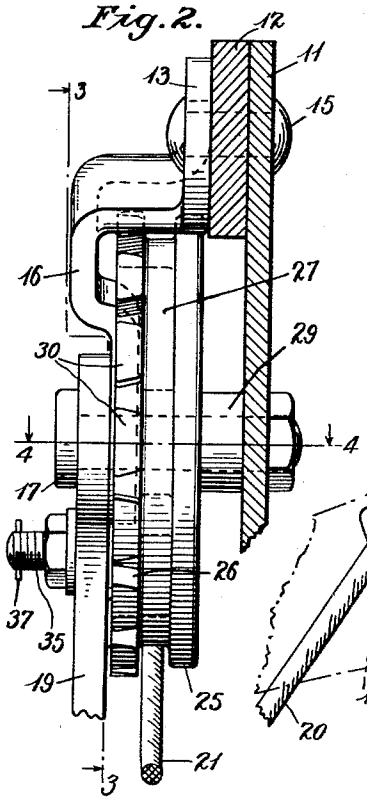


Fig. 3.

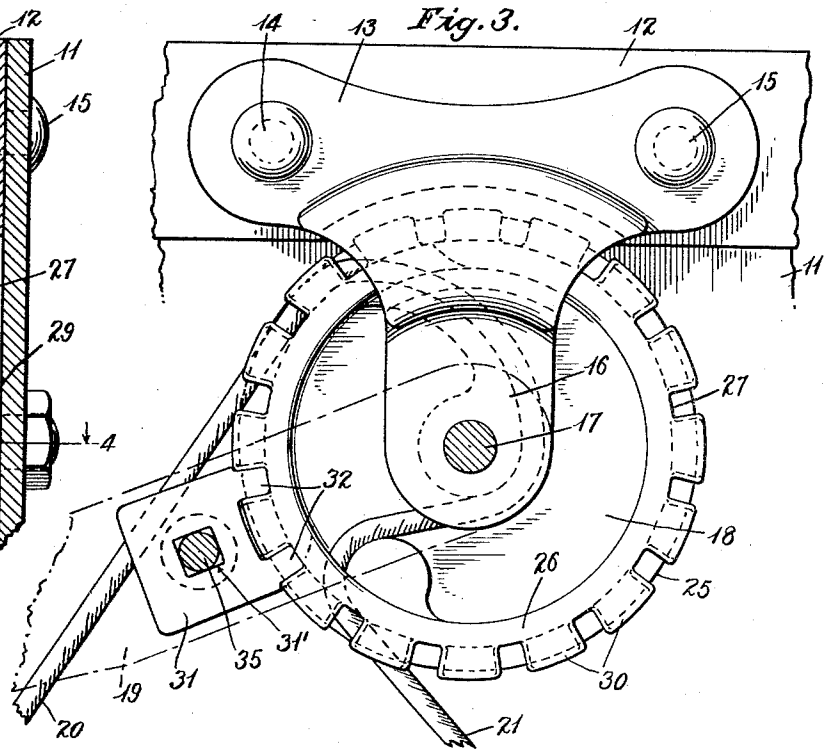


Fig. 4.

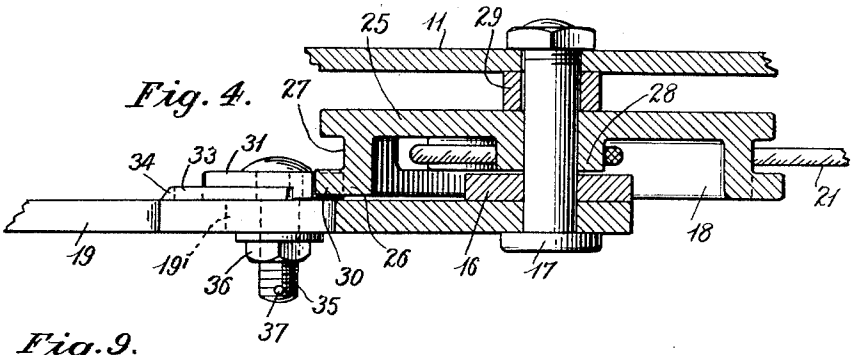


Fig. 9.

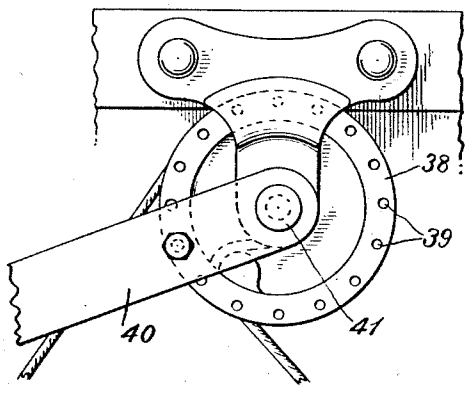
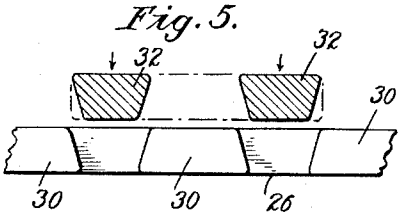


Fig. 5.



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UNITED STATES PATENT OFFICE

1,948,652

BRAKE OPERATING MECHANISM

Glenn E. Edmunds, Columbus, Ohio, assignor to The Bonney-Floyd Company, Columbus, Ohio, a corporation of Ohio

Application March 14, 1932. Serial No. 598,810

4 Claims. (Cl. 74—112)

The present invention relates to brake operating means of the drum and lever type and particularly to means for operatively connecting the drum and lever to facilitate their relative angular adjustment. I have chosen to illustrate the invention in connection with a mine car and shall particularly describe hereinafter only the features appertaining directly to the present invention, since the general arrangement involved has been fully described in my copending United States application Serial No. 546,107 for "Mine car brake mechanism", filed June 22, 1931.

The general combination into which the apparatus of the invention enters, as applied to a brake system, includes cable lengths tensionable upon drum rotation to effect engagement of suitable wheel brakes. Due to the necessarily restricted swing of the lever, stretching of the cable lengths and wear of the brakes must necessarily be compensated if proper action is to be maintained. The cable slack may be taken up most simply by disconnecting the drum from the lever, rotating it relative to the latter until proper cable tension is secured, and then securing the lever to the drum in its new angular relation thereto. The present invention contemplates means permitting this corrective operation to be quickly and easily carried out, the means in question being also designed to afford a strong connection for the transmission of operating force from the lever to the drum.

In the accompanying drawings, illustrative of the invention,

Figure 1 is an end elevation of a mine car with the drum and lever arrangement of the present invention applied thereto.

Figure 2 is a view taken on line 2—2 of Figure 1.

Figure 3 is a view taken on line 3—3 of Figure 2.

Figure 4 is a section on line 4—4 of Figure 2.

Figure 5 is an edge view of a portion of a flange forming a part of the drum and a sectional view of a locking member which cooperates with the flange.

Figures 6 to 8 are perspective views of details, and

Figure 9 is an elevation of a modified form of drum and lever arrangement.

Referring to the drawings and first to Figures 1 to 8, reference numeral 10 designates generally a mine car and 11 an end wall thereof. As here shown, the end wall 11 is provided externally with a top reinforcing strip 12 centrally of which is secured a bracket 13 by means of bolts or rivets 14 and 15 passed through the strip and end wall.

Bracket 13 has a depending tongue 16 pierced to receive a pin or bolt 17, which passes through an axial bore of a drum 18, disposed behind tongue 16, and through a bore provided in the end wall of the car. Outwardly of tongue 16, bolt 17 passes through a bore in one end of a drum actuating lever 19, the lever being retained on the bolt by the head of the latter and the bolt being retained in position by a nut engaged on its threaded end on the inner side of wall 11.

Through means to be described lever 19 is securable to drum 18 and cable lengths 20 and 21 engaged with drum 18 are tensionable upon upward movement of the lever 19. The outer end of lever 19 lies behind a toothed guard 22 and has a knife edge 23 for cooperation with the latter, so that the lever will be retained in elevated position until released. A handle 24 is formed at the free extremity of the lever.

While it is immaterial to the present invention in what manner the cable lengths 20 and 21 are engaged with drum 18, the drum has been shown as having the general form and cable engaging arrangement described in my above mentioned application, so that specific description is unnecessary here. As shown in Figure 3, however, cable lengths 20 and 21 constitute portions of a single cable whose central portion is reeved through the drum in such a manner as to be self-equalizing, the cable length being simultaneously tensioned upon rotation of the drum in a clockwise direction.

The cable lengths may be trained to suitable brake mechanism in the manner fully described in my prior application.

As most clearly shown in Figures 2 and 4, drum 18 comprises a main web or flange 25 and a parallel flange portion 26 connected to web 25 through an integral cylindrical portion 27 concentric with the drum axis. Portion 27 forms the bottom of a channel whose side walls are formed by elements 25 and 26, the cable being receivable in this channel or a portion thereof as shown in Figure 3. Web 25 has a central boss 28 within the cylindrical portion 27 but terminating short of the outer plane of flange 26. The drum is spaced from wall 11 by a washer 29 of substantially the same thickness as strip 12 and from Figure 2, it will be noted that the free end of tongue 16 lies substantially entirely behind the outer plane of flange 26, so that lever 19 extends in close proximity to the said plane. The tongue 16 is provided with a bowed portion clearing flange 26.

Flange 26 is notched to form radially extending teeth 30, the adjacent edges of adjacent teeth being substantially parallel to a radial line bisecting the intervening notch or space so that the teeth present an undercut effect. Also, as indicated in Figure 3 and clearly shown in Figure 5, the side walls of each tooth 30 converge away from lever 19.

A block or latch plate 31 has a plurality of teeth 32 defining between them a recess in which a tooth 30 is engageable, the sides of the recess conforming to and mating with the sides of the tooth. Since the teeth 30 are all of equal size any one of them may be engaged in the recess of the block 31. In view of the shape of the engaged tooth 30 and the complementary recess, it will be evident that engagement must be effected by movement of the block toward flange 26 in the direction indicated by the arrows in Figure 5, this direction being toward lever 19. Disengagement must be effected by a reverse movement of the block, since it is locked by the engaged tooth against direct radial movement and since the convergent relation of the side walls of the tooth prevents movement of the block toward the lever beyond the outer plane of flange 26.

Lever 19 is provided with seating means for block 31 adapted to receive the block when it is in engagement with the toothed flange 26. The seating means comprises preferably integral lateral ribs 33 on lever 19, which engage the sides of the block and a transverse rib 34, which engages the end of the block remote from the drum. A bolt 35 has a square shank portion adjacent its head adapted to fit in a square aperture 31' of block 31, the free end of the bolt passing through a longitudinally extending slot 19' disposed within the seating means of lever 19. The block is secured in seated position by means of a nut 36 threaded on the bolt extremity and having a loosening movement limited by a cotter pin 37 passed through a transverse aperture in the bolt end. Nut 36 may be loosened sufficiently to permit block 31 to be pushed away from lever 19 a sufficient distance to disengage it from flange 26 and to free it from the seating means. Hereupon the block may be moved toward the end of lever 19 with bolt 35 moving in slot 19'. The drum may now be rotated relative to the lever to take up the cable slack without interference of the cable with the ends of teeth 32. When the proper adjustment has been secured, the block is engaged with the registering tooth 30 by a movement the reverse of the disengaging movement above described.

By the described arrangement, lever 19 has a pivoting action about the axis of the drum and due to the shape of the inter-engaged teeth, movement of the lever away from the drum is effectively prevented. Also, the inter-engaged teeth, together with the seating means, serve to prevent any disengaging movement of block 31 toward the free end of lever 19. The lateral ribs 33 also serve to relieve bolt 35 of shearing stresses.

It will be understood that while teeth 30 have been referred to as having substantially radial faces, a true radial disposition may be departed from more or less, so long as the described locking effect is retained and it is to be understood that the term "radial" is used in the claims with this reservation. While this interlocking arrangement of teeth is desirable, it is not necessarily essential under the broad aspects of the invention.

According to Figure 9, a drum 38 generally similar to drum 18 and similarly mounted, is provided with a concentric series of tapped axially extending bores 39 adjacent its outer edge and a lever 40 pivoted on the drum supporting pin 41 has an aperture registrable with a selected one of the bores 39, a cap screw being insertable through the lever aperture and engaged in the registering bore to secure the lever to the drum in the desired angular relation.

It will be understood that I do not necessarily limit myself to the details of construction specifically shown and described, since the invention is susceptible of varied embodiment without departure from the scope of the following claims.

What I claim is:

1. Mechanism of the class described comprising a rotatable drum provided with peripheral teeth, the adjacent edges of adjacent teeth being substantially parallel to a radial line bisecting the intervening space, a block having a recess in which said teeth are selectively engageable, the shape of the recess conforming to that of the teeth so as to lock with the latter, a lever, and means for securing said block to said lever to connect the latter with the drum.

2. Mechanism of the class described comprising a rotatable drum provided with radial teeth, a lever adjacent said teeth in radial relation to the drum, the side walls of each tooth converging away from the lever, a block having a recess in which said teeth are selectively engageable, the recess conforming to the shape of the teeth, and means for securing said block to said lever to connect the latter with the drum.

3. Mechanism of the class described comprising a rotatable drum provided with peripheral teeth, the adjacent edges of adjacent teeth being substantially parallel to a radial line bisecting the intervening space, a lever adjacent said teeth in radial relation to the drum, the side walls of each tooth being convergent away from the lever, a block having a recess in which said teeth are selectively engageable, said recess conforming to the shape of the teeth, and means for securing said block to said lever to connect the latter with the drum.

4. Mechanism of the class described comprising a rotatable drum provided with radially projecting teeth, a block having a tooth selectively engageable in the spaces between the teeth, a lever having an end pivotally mounted on an axis coincident with that of the teeth, seating means on the lever receiving the block when the latter is engaged with the drum, said seating means comprising lateral ribs engaging the sides of the block and a transverse rib normally engaging the end of the block remote from the pivoted end of the lever, said bolt being passed through a longitudinally extending slot in the lever whereby, the bolt being loosened, the block may be moved out of engagement with said seating means and longitudinally of the lever.

GLENN E. EDMUNDS.