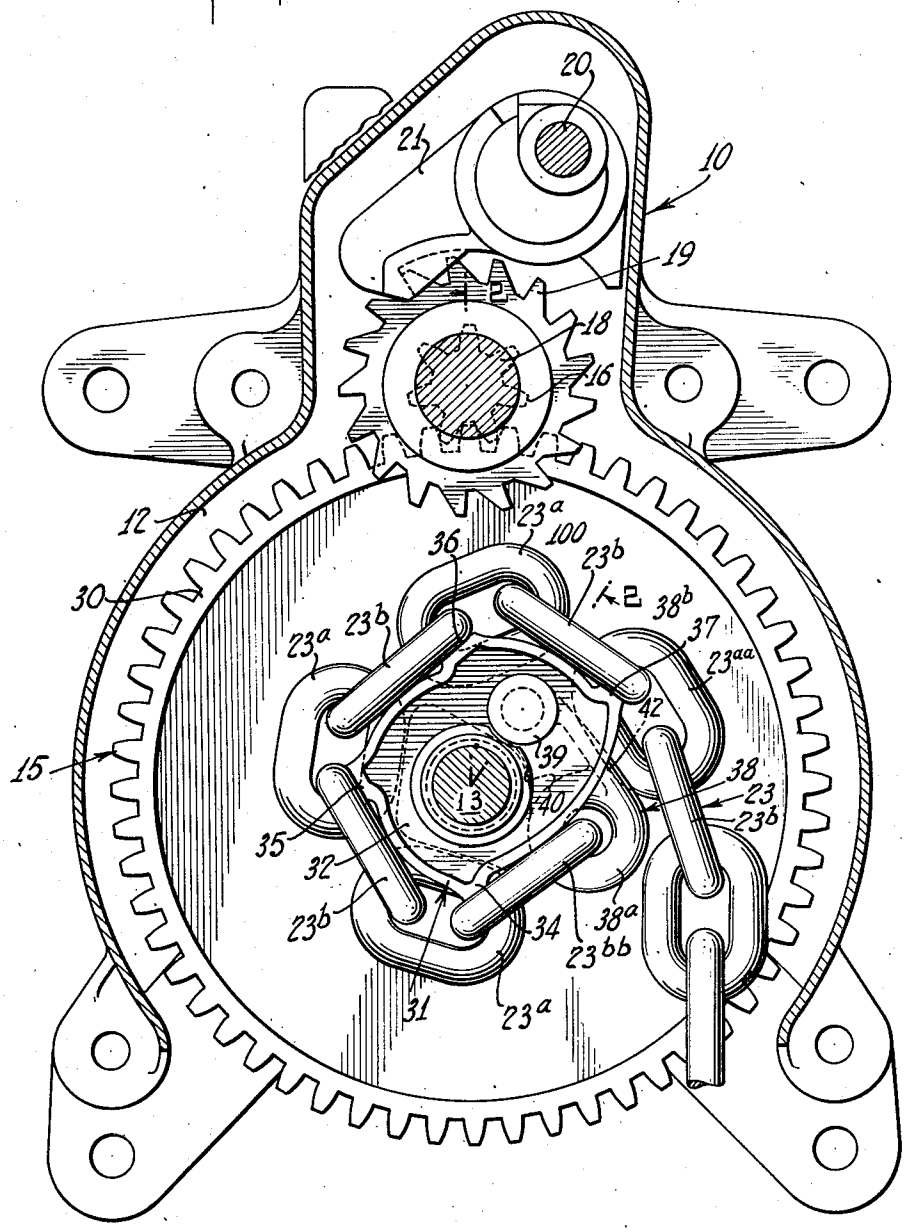
Nov. 21, 1944. R. W. BURNETT 2,363,393

RAILROAD CAR HAND BRAKE

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Fig. 1.



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Fig. 3.

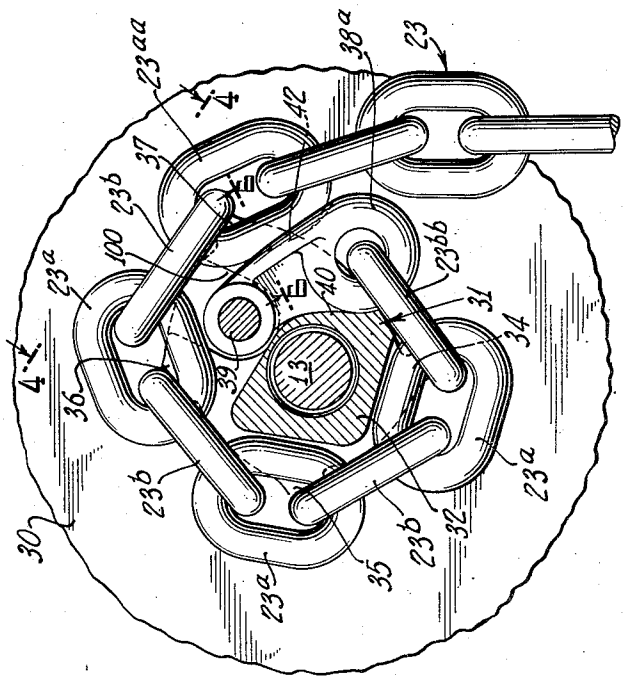
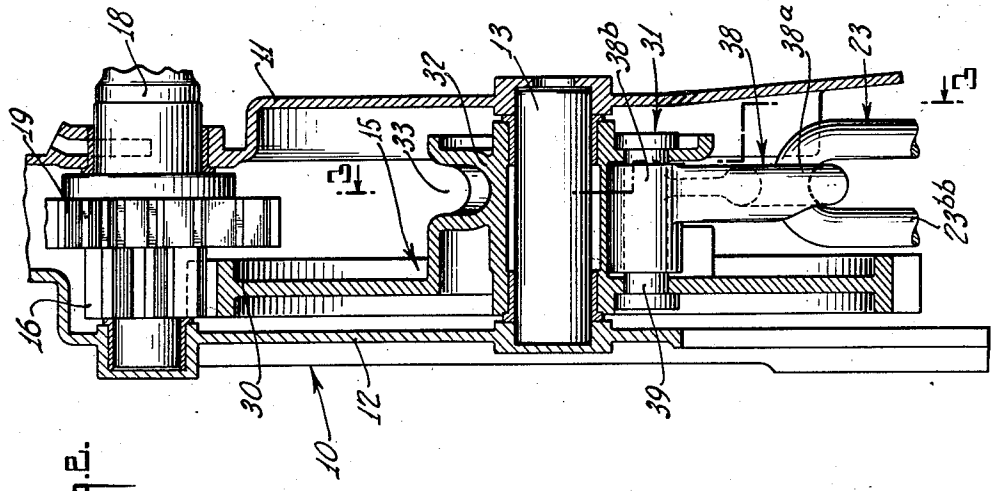


Fig. 2.



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Fig. 4.

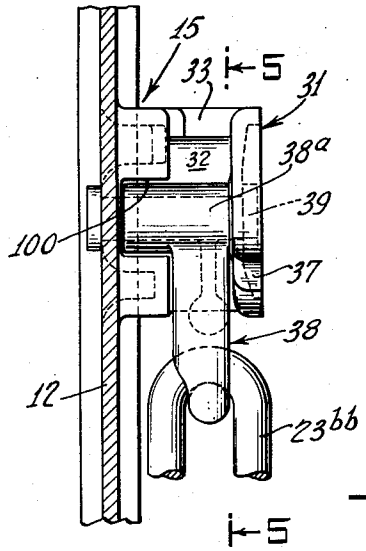


Fig. 6.

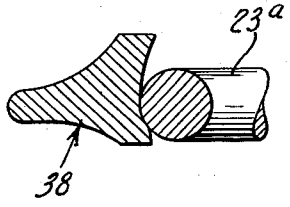
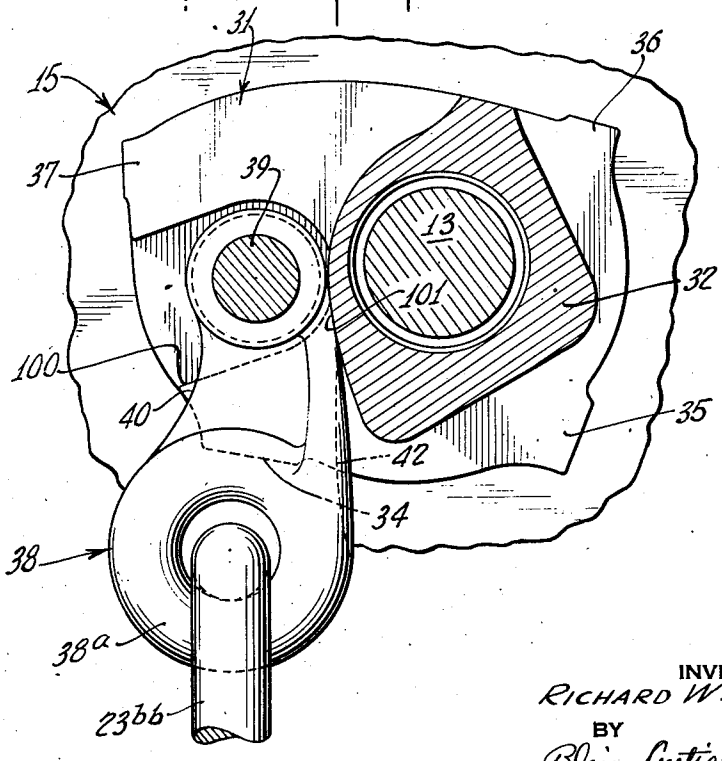


Fig. 5.



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2,363,393

UNITED STATES PATENT OFFICE

2,363,393

RAILROAD CAR HAND BRAKE

Richard W. Burnett, Chicago, Ill.; Marie C. Burnett, executrix of said Richard W. Burnett, deceased, assignor to Marie C. Burnett

Application November 14, 1941, Serial No. 419,081

4 Claims. (Cl. 254—149)

This invention relates to a railroad car hand brake and more particularly to the drum thereof.

One of the objects of this invention is to provide a railroad car hand brake drum which is simple, thoroughly practical, and durable throughout an extended period of operation. Another object is to provide a brake drum of the above character which is operable to efficiently take up a maximum of chain with a maximum of power. Another object is to provide a brake drum of the above character in which the structural elements are so disposed as to attain a high degree of strength without heavy construction. A further object is to provide a brake drum of the above character which may be safely used in conjunction with a hand brake by brakemen to control with a minimum of effort the movement of a freight car. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts as will be exemplified in the structure to be hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the drawings in which is shown one of the various embodiments of my invention,

Figure 1 is a sectional elevation of a railroad car hand brake showing the brake chain wound upon my drum;

Figure 2 is a sectional elevation taken along the line 2—2 of Figure 1, showing portions of the brake shown in Figure 1 and having the drum positioned in release or "off" position;

Figure 3 is a vertical sectional view of the drum taken on the line 3—3 of Figure 2;

Figure 4 is a vertical sectional elevation of the drum gear wheel showing the anchor member which connects the chain to the drum taken from the line 4—4 of Figure 3;

Figure 5 is a vertical sectional view, on an enlarged scale, taken on the line 5—5 of Figure 4; and,

Figure 6 is a sectional view taken on the line 6—6 of Figure 3.

Similar reference characters refer to similar parts throughout the several views of the drawings.

As conducive to a clearer understanding of certain features of this invention, it might here be pointed out that railroad car hand brakes should be sturdy and well able to withstand hard usage, while at the same time they must be compact as the space between connected cars is limited. In achieving compactness of construction, however, difficulties are encountered in providing a chain winding drum having ample capacity without reducing the efficiency of the winding mechanism. Spiral drums and other expedients have been resorted to but with indifferent success because of resulting bulkiness of the brake and power loss through excessive friction. Accordingly, it is another object of this invention to provide a hand brake for a railroad car which obviates the above difficulties in a thoroughly practical and efficient manner.

Referring now to Figure 2, the hand brake, generally indicated at 10, includes a housing comprising front and back plates 11 and 12 between which is mounted hand brake mechanism similar to that shown in Burnett Patent No. 2,236,563. This mechanism includes a shaft 13 upon which a combined gear and winding drum, generally indicated at 15 (Figures 1 and 2), is mounted, and a gear 16 meshing with the winding drum gear and mounted on a shaft 18 which has a vertical hand wheel (not shown) connected to its outer end. A ratchet wheel 19 is mounted on and connected to shaft 18, and a trip shaft 20 turned by a lever (not shown) moves a pawl 21 (Figure 1) into and out of engagement with ratchet wheel 19. In operation, the hand wheel turns shaft 18 which drives the gear and winding drum 15 through gear 16, resulting in the take-up of the chain, generally indicated at 23. During winding, as described in Burnett Patent No. 2,236,563, pawl 21 prevents reverse movement of the drum by coacting with the ratchet wheel which is positively connected to the winding drum through shaft 18, gear 16, and the winding drum gear. The brake is released by moving the pawl out of engagement with the ratchet wheel which permits the drum to turn to release or "off" position.

Combined gear and winding drum 15 (Figures 1 and 2) comprises a gear 30 integrally or otherwise connected with a winding drum generally indicated at 31. Preferably winding drum 31 (Figures 2 and 3) is integrally formed with the web of gear 30 and extends axially therefrom to provide a hub portion 32 which is rotatably borne by stud or shaft 13. Preferably drum 31 is eccentric in form, the eccentricity being designed in accordance with power requisites, and it is provided with a channel 33 extending therearound formed to receive the alternate vertical links 23a of chain 23 (Figures 1, 3 and 4). The outer surface of the drum comprises a series of pairs of substantially flat link supporting surfaces separated by channel 33, the supporting portions of each pair of surfaces being substantially parallel to each other and being angularly disposed with respect to the preceding and following pairs of

surfaces. The central portions of each pair of surfaces are convexly curved (Figures 1, 3 and 4), and the ends of these surfaces which contact the leading ends of links **23***b* have pairs of bosses **34**, **35**, **36**, and **37** formed on them which contact opposite sides of links **23***b*. Referring to Figure 1, it will now be clear that horizontal links **23***b* are supported by the centers of the convex portions and the bosses of each pair of link supporting surfaces, and that the alternate vertical links extend into channel **33**. Thus, links **23***a* all lie in substantially the same plane which precludes the necessity of providing a spiral or helical winding drum and accordingly makes possible a compact structure, and each horizontal link is supported at four spaced points which results in a minimum of friction.

Referring to Figures 2 and 3, it may be seen that the winding drum includes two sections, one connected to gear **30** and the other pivotally connected to the first-mentioned section. The second section forms both an anchor member **38** connecting end link **23***bb* to the drum and a continuation of the winding surface of the drum when the chain is wound thereon (Figure 3). Anchor member **38** has an outer end **38***a* to which the chain is attached and an enlarged inner end **38***b* which is pivotally connected to the drum between the section of the drum to the right of groove **33**, as viewed in Figure 2, and gear wheel **15**. The left-hand section of the drum, as viewed in Figure 2, has a channel **100** formed therein extending outwardly radially from the axis thereof (Figures 2, 3, and 4) which is adapted to receive the left-hand portion of the inner end of anchor member **38**. A rivet **39** extends through gear wheel **15**, anchor member **38**, and the outer portion of the drum pivotally mounting the anchor member on the drum. Anchor member **38** is of slightly less thickness than the width of groove **33** (Figures 2 and 4), and thus, when the chain is wound on the drum as shown in Figure 3, the anchor member pivots down into the groove.

Referring to Figure 5, it may be seen that anchor member **38** and the drum are so constructed that the anchor member is effectively braced if the brake accidentally winds in the wrong direction. If the drum is turned in the wrong direction, the anchor member pivots backwardly into groove **33** (Figure 4) until it abuts against the surface **101** (Figure 5) at the bottom of groove **33** which is shaped to form an effective support for the back of anchor member **38**.

Preferably the axis of rivet **39** is as close as possible to the axis of the winding drum in order to provide a short initial power arm, and anchor member **38** has a curved inner side **40** which conforms substantially to hub **32** of drum **31** (Figure 3). The outer side **42** (Figure 1) of anchor member **38** is preferably curved to receive the edge of vertical link **23***aa* when the chain is wound on the drum and thus coacts with winding drum bosses **37** and winding drum channel **33** in forming an extension of the channel to support link **23***aa*. Accordingly, winding drum **31**, when in a position of complete release, may be rotated in excess of 360°, and the chain may be wound thereon through such rotation without one chain link engaging any other chain link. In practice, it is possible to attain a drum rotation in excess of 500° without any two portions of the chain interengaging. Thus, by providing the coacting anchor member, channel and bosses, the capacity of the winding drum is substantially increased, and maximum take-up of the chain and the brake rigging to which it is attached is accordingly possible without loss of power.

Furthermore, by utilizing anchor member **38** to attach chain **23** to winding drum **31** and by utilizing a winding drum of the nature described, the center line of the winding surface for the chain is in a single vertical plane, all of which adds to the strength, rigidity and compactness of the brake mechanism and its housing.

The vertical links **23***a* of chain **23** are shown as being held in spaced relationship to the hub portion **32** of the drum and the end of anchor member **38** by the bosses and convexly curved portions of the link supporting surfaces. If desired, the bosses and convexly curved portions may be disposed nearer the axis of the winding drum, which would permit the edges of links **23***a* to rest against hub portion **32**. This modification would have the effect of increasing the strength of the construction and only slightly increases the friction, as hub portion **32** and the anchor member **38** are arranged and particularly adapted to support directly the chain links which would engage it.

Thus, through the structure disclosed and also by positioning the pivot of anchor member **38** as close as possible to shaft **13**, winding of the chain in excess of 360° is made possible, with the center line of the chain kept sufficiently close to the drum axis that relatively short resistance arms and adequate power are maintained while the chain is wound through a substantially extended arc. Furthermore, the drum is so constructed that it is adapted to support the chain with a minimum of friction.

It may now be seen that I have provided a hand brake drum for a railroad car or the like which attains the several objects above set forth in a thoroughly practical and efficient manner.

As many possible embodiments may be made of the above invention and as many changes might be made in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. In apparatus for manually setting railroad car brakes including, in combination, a rotatable winding drum having a channel extending around its outer edge in the central portion thereof, a chain, an anchor member connecting said chain to said drum, said drum having a series of pairs of link supporting surfaces, each pair of surfaces having the central portions thereof convexly curved and being angularly disposed with respect to the preceding and following pairs of surfaces, said channel being adapted to receive the alternate vertical links of said chain and said link supporting surfaces being adapted to receive the alternate transverse links of said chain, and a pair of bosses formed on each pair of link supporting surfaces and adapted to contact the leading ends of said transverse links when said chain is wound on said drum, whereby major portions of said links are held in spaced relationship to said drum when said chain is wound thereon.

2. In apparatus for manually setting railroad car brakes including, in combination, a rotatable winding drum having a channel extending around its outer edge in the central portion thereof, a chain, an anchor member connecting said chain to said drum, said drum having a series of pairs of link supporting surfaces, each pair of surfaces having the central portions thereof convexly curved and being angularly disposed with respect

to the preceding and following pairs of surfaces, said channel being adapted to receive the alternate vertical links of said chain and said link supporting surfaces being adapted to receive the alternate transverse links of said chain, and a pair of bosses formed at one end of each pair of link supporting surfaces, said bosses being adapted to support the leading ends of said transverse links and said convexly curved portions being adapted to support the central portions of said transverse links, whereby major portions of said transverse links are held in spaced relationship to said drum.

3. In apparatus for manually setting railroad car brakes including, in combination, a rotatable winding drum having a channel extending around its outer edge in the central portion thereof, a chain, an anchor member pivotally connected to said drum adjacent the axis thereof, said chain being connected to said anchor member, said drum having a series of pairs of link supporting surfaces, each pair of surfaces being angularly disposed with respect to the preceding and following pairs of surfaces, said channel being adapted to receive the alternate vertical links of said chain and said link supporting surfaces being adapted to receive the alternate transverse links of said chain, said link supporting surfaces being irregular whereby when said transverse links are in contact with the surfaces, said links contact these surfaces at a plurality of spaced points.

4. In apparatus for manually setting railroad car brakes including, in combination, a rotatable winding drum having a channel extending around its outer edge in the central portion thereof, a chain, an anchor member pivotally connected to said drum adjacent the axis thereof, said chain being connected to said anchor member, said drum having a series of pairs of link supporting surfaces, each pair of surfaces having the central portions thereof convexly curved and being angularly disposed with respect to the preceding and following pairs of surfaces, the channel being adapted to receive the alternate vertical links of said chain and the link supporting surfaces being adapted to receive the alternate transverse links of said chain, bosses formed on each pair of link supporting surfaces for supporting each of said transverse links at a plurality of spaced points, and means on said anchor member to hold a link of said chain in surmounted relationship over said anchor member in the same plane as the other links of said chain when said chain is wound on said drum.

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