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1,698,730

J. F. O'CONNOR

HAND BRAKE

Filed Nov. 8, 1926

Fig. 1

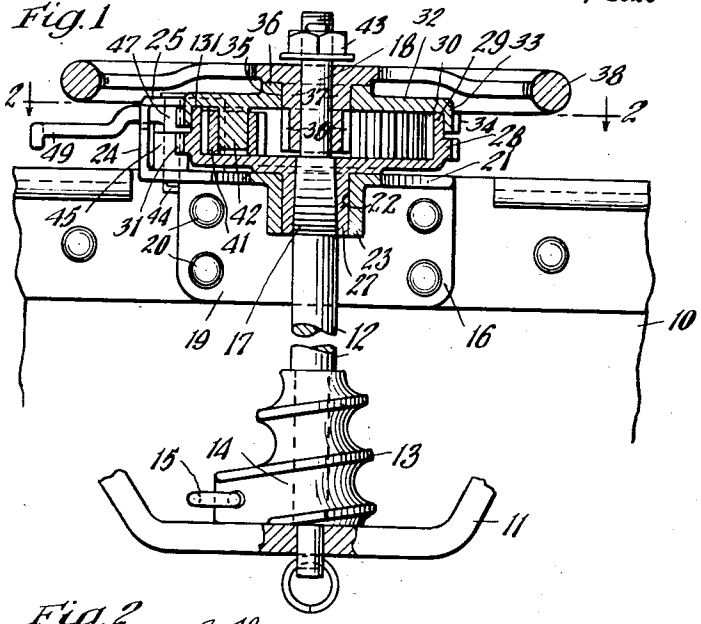


Fig. 2

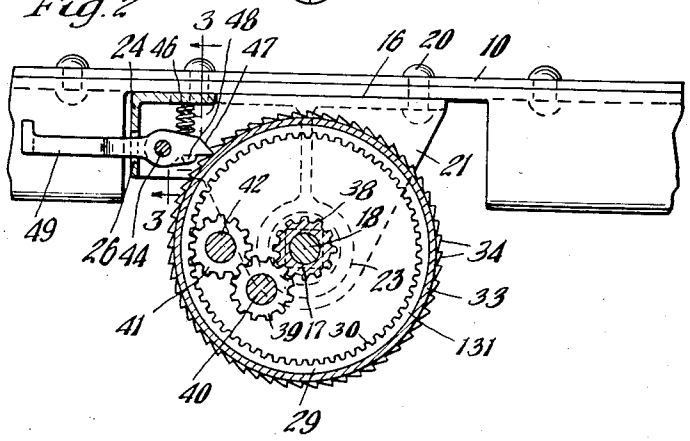
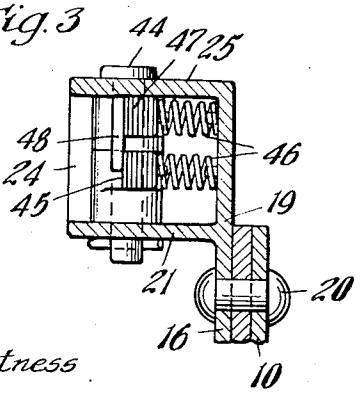


Fig. 3



Witness

Wm. Geiger

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By George D. Haight

His Atty.

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UNITED STATES PATENT OFFICE.

JOHN F. O'CONNOR, OF CHICAGO, ILLINOIS, ASSIGNOR TO W. H. MINER, INC., OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE.

HAND BRAKE.

Application filed November 8, 1926. Serial No. 146,864.

This invention relates to hand brakes.

An object of the invention is to provide a hand brake, wherein mechanism is utilized for rapidly taking up the slack in the brake rigging, and thereafter, upon encountering a predetermined resistance, effecting a much slower take-up of said rigging with increased application of power.

A more specific object of the invention is to provide a hand brake, including a winding staff having a drum attached thereto to which the brake rigging is secured, and in connection with the staff to provide a ring gear non-rotatably affixed to the staff, together with mechanism having frictional engagement with said ring gear to effect movement of the ring gear and mechanism in unison during one phase of operation of the device to take up the slack, said mechanism having driving means associated therewith which become operative to drive the ring gear with reference to said mechanism after the frictional engagement therebetween has been overcome, detachable means being provided for preventing retrograde rotation of the ring gear and of said mechanism.

Other and further objects of the invention will more clearly appear from the description and claims hereinafter following.

In the drawing, forming part of this specification, Figure 1 is a part vertical sectional, and part elevational view, showing the invention applied to a car structure, fragments of the latter of which are shown in elevation. Figure 2 is a horizontal sectional view corresponding substantially to line 2—2 of Figure 1. And Figure 3 is a vertical transverse sectional view of a portion of the invention taken substantially on the line 3—3 of Figure 2.

As shown in the drawings, 10 represents a portion of an end wall of a railway car to which the brake is secured, and 11 denotes a fragment of a brake step of a character usually provided for the reception of a brake staff in the usual manner. A brake staff 12 is utilized, and has its lower end rotatably mounted in the brake step 11, as shown in Figure 1. The lower end of the staff 12 is provided with a drum 13, substantially conical in form, the drum being provided with a helical groove 14 adapted for the reception of a brake chain indicated at 15, which latter leads to the brake shoes proper not shown. The upper portion of the brake staff 12 extends through a bracket 16, and is provided with a tapered squared portion 17, and beyond the squared portion 17 is a cylindrical portion 18, the parts 17 and 18 being operatively connected to the driving mechanism associated with the bracket 16 in a manner hereinafter more particularly referred to.

The bracket 16 includes a vertically disposed plate 19 which is riveted to the structure of the end wall 10 of the car by means of rivets 30, and integrally formed with said vertically disposed plate is a projecting horizontally extending flange 21 providing a supporting shelf, the outer end of which is provided with an aperature 22 surrounded by downwardly extending annular rib 23 to provide a bearing. At one side of the shelf 21 there is provided an upstanding flange 24, at the upper extremity of which is an overhanging flange 25, the flange 24 being provided with a slot 26.

Mounted in the bearing 22 is a sleeve 27 which is integrally formed with a ring gear or driven member 28. The gear 28 is provided with a vertical annular wall 29, the inner surface of which has formed thereon vertically disposed teeth 30. The outer surface of the annular wall 29, at its lower portion, is provided with ratchet teeth 31 adapted to engage with a suitable pawl hereinafter referred to. The upper outer annular portion of the wall 29 is smooth so as to provide a friction surface indicated at 131 which co-operates with a cap 32 or transmitting member forming a part of the actuating mechanism of the invention. The cap 32 is cup-shaped in form, and has an annular wall 33, the inner surfaces of which fit nicely about the friction surfaces 131 of the ring gear. The outer surface of the annular wall 33 is provided with ratchet teeth 34 adapted to co-act with a holding pawl hereinafter described. The cap 32 has a central opening 35, surrounded by an upstanding boss 36. Rotatably disposed in the opening 35 is a cylindrical portion 37 forming part of a hand wheel 38, the undersurface of the latter resting upon the top surface of the boss 36. The lower part of the cylindrical portion 37 is provided with gear teeth 38. The teeth 38 of the cylindrical portion 37 mesh with a gear 39 rotatably mounted upon a downwardly projecting eccentrically

disposed stud 40, integrally formed with the under-surface of the cap 32, and the gear 39 meshes with a gear 41 rotatably mounted upon a stud 42, also integrally formed with the cap 32, and arranged in such position that the gear 41 meshes with the teeth 30 of the ring gear 32. The end of the cylindrical portion of the shaft 12 is provided with a nut 43 which maintains the parts in position.

Extending through the flange 25, and horizontal shelf 21 of the bracket, somewhat inwardly of the vertical wall 24, is a pivot pin 44 upon which is pivotally mounted a pawl 45 normally urged into engagement with the teeth 31 on the outer side of the ring gear by means of a coil spring 46, and immediately above the pawl 45 is a second pawl 47 urged into engagement with the teeth 34 of the cap 32, the pawl being provided with an extension 48 which fits behind the pawl 45 and is adapted to move the same against the resistance afforded by the spring 46, when the pawl 47 is operated to release the latter, the pawl 47 being provided with a handle 49 which projects outwardly through the slot 26 in the wall 24 of the bracket so as to be in convenient position to be grasped by the hand of the operator to release both pawls 45 and 47 simultaneously.

In operation, when it is desired to set the brake rotation of the hand-wheel 38 in a clockwise direction, tends to move the cap 32 in unison therewith due to the frictional engagement of the cylindrical portion 37 with the adjacent portions of the cap, and this movement of the hand-wheel also tends to bring about rotation of the gear 38, the gear 39 and the gear 41, rotation of the gears being resisted due to the frictional engagement of the annular wall 33 of the cap with the annular wall 29 of the gear; consequently, during the initial movement of the hand-wheel, the hand-wheel, the cap, the ring gear, and the drum 13, will be rotated in unison and due to the peculiar conical formation of the drum 13, a relatively small movement thereof will take up all the slack in the brake rigging. When the slack has been taken up, the tension will have increased on the brake rigging to such extent as to overcome the frictional engagement between the ring gear and the cap 32. Assuming continued rotation of the hand-wheel 38, and cessation of movement of the cap 32 due to slippage on the ring gear, the gears 39 and 42 will begin to rotate, thereby driving the ring gear in a clockwise direction at a much slower rate of speed and with a great increase in effective power. Retrograde rotation of both the cap 32 and the ring gear, is prevented by the pawls 45 and 47.

When it is desired to release the brake, the handle 49 of the pawl 47 is pulled away from the car wall, which action also releases the pawl 45 due to the engagement of the latter by means of the extension 48 on the pawl 47, and so long as the pawls are held free, the ring gear will be rotated in a counter-clockwise direction to fully released position, the cap 32 being carried therewith due to the frictional engagement with the ring gear.

While I have herein shown and described what I consider the preferred manner of carrying out the invention, the same is merely illustrative, and I contemplate all changes and modifications which come within the scope of the claims appended hereto.

I claim:

1. In a device of the character described, the combination with a winding staff provided with a squared portion, and a cylindrical end portion; of a supporting bracket; of an internal ring gear rotatably mounted in said bracket and having a squared portion engageable with the squared portion of said staff, said ring gear being provided with ratchet teeth on its exterior surface; of a cap fitting over said ring gear, said cap being provided with ratchet teeth on its exterior surface, said cap being provided with a central bearing opening; a hand wheel provided with a central projection rotatably mounted in said bearing opening and provided with a gear on its inner end; studs on said cap, each of which carries gears meshing with each other, with said ring gear, and with the gear on said hand wheel; means for maintaining the parts in assembled relation; and pawls for preventing retrograde rotation of said cap and ring gear.

2. In a hand brake, the combination with a winding staff; of a ring gear fixed to said staff; a cap member telescoped with said ring gear and having direct frictional engagement therewith; an operating member having direct frictional engagement with said cap member; a gear fixed to said operating member and rotatable therewith; a driving gear interposed between said gear and said ring gear; and means for preventing retrograde movement of said cap and ring gear.

In witness that I claim the foregoing I have hereunto subscribed my name this 2nd day of November 1926.

JOHN F. O'CONNOR.