July 21, 1953 G. B. DOREY 2,646,141

SPRING MECHANISM FOR SLACK ADJUSTERS

Filed Feb. 13, 1951 3 Sheets-Sheet 1

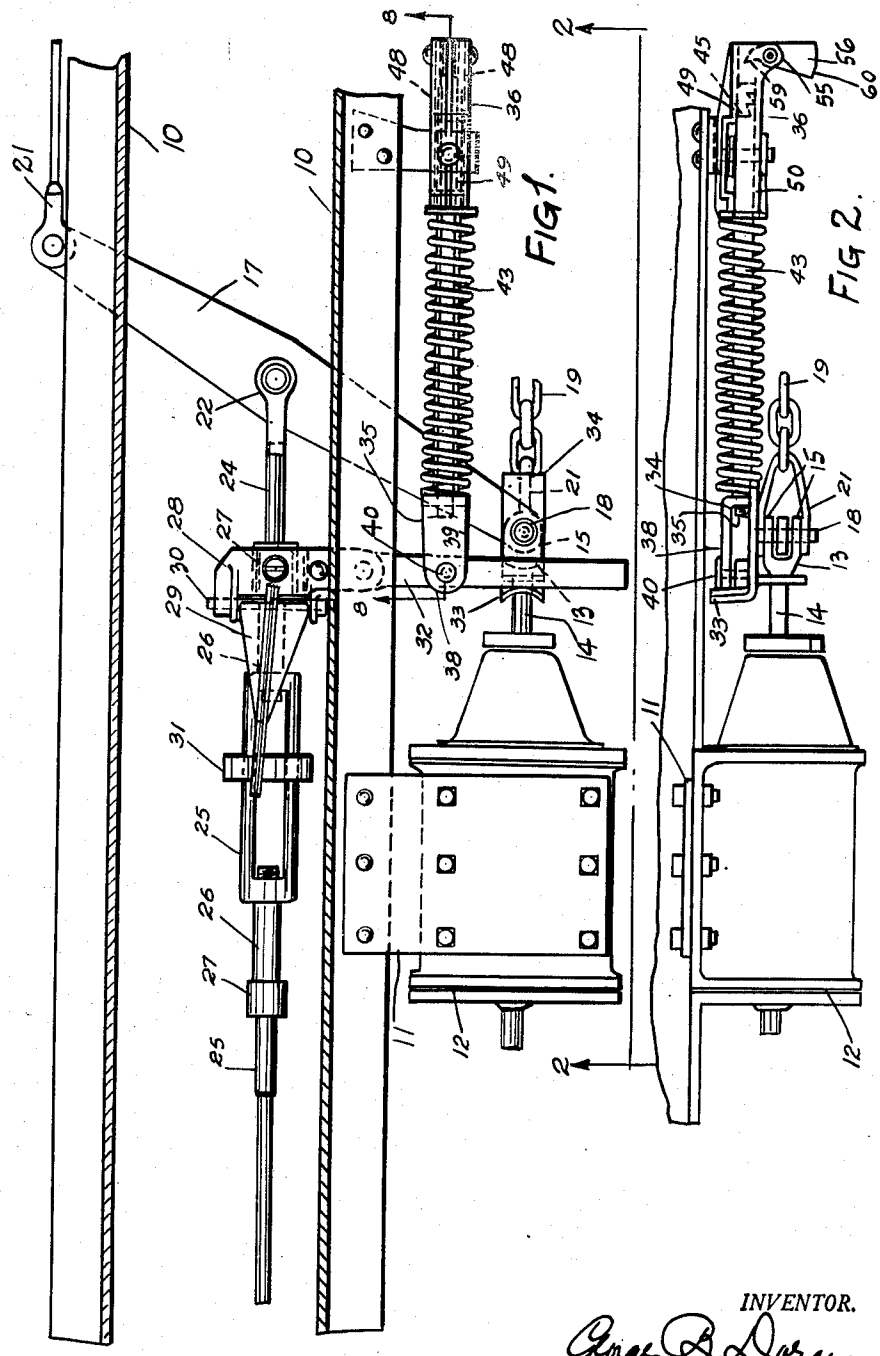


FIG 1.

FIG 2.

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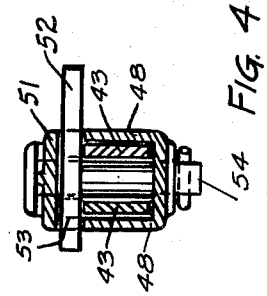


FIG. 4

FIG 6

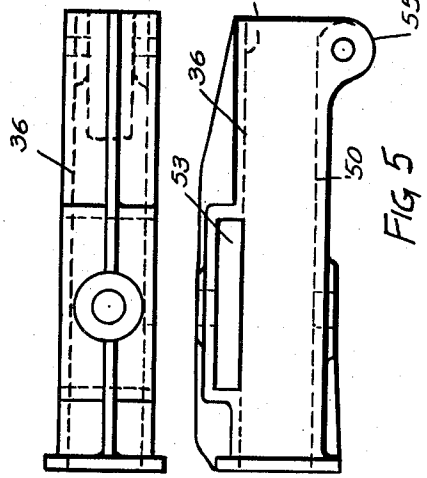


FIG 5

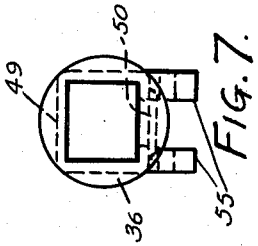


FIG. 7.

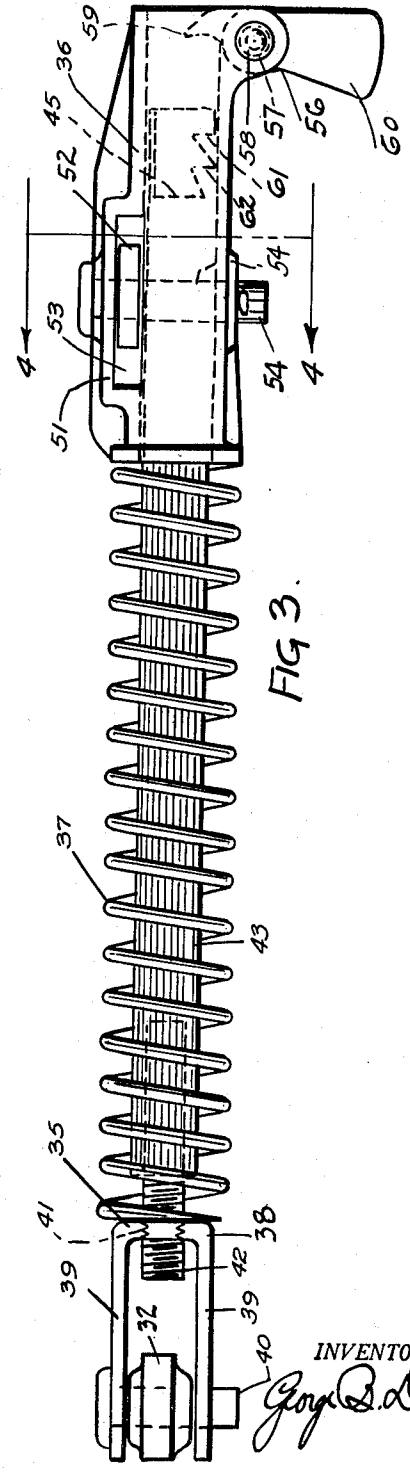


FIG 3.

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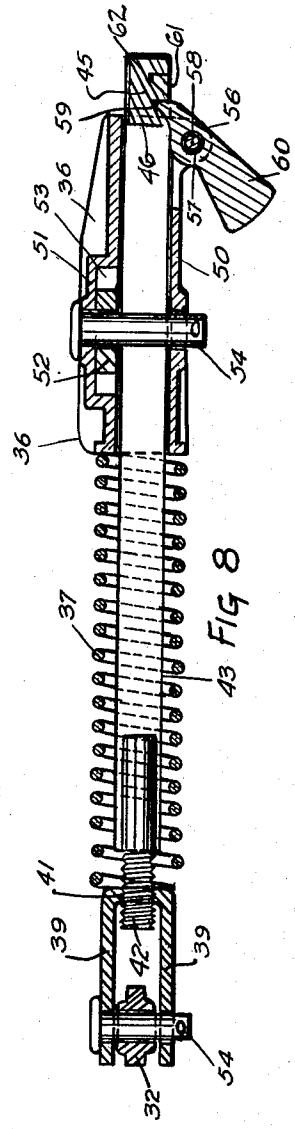


FIG 8

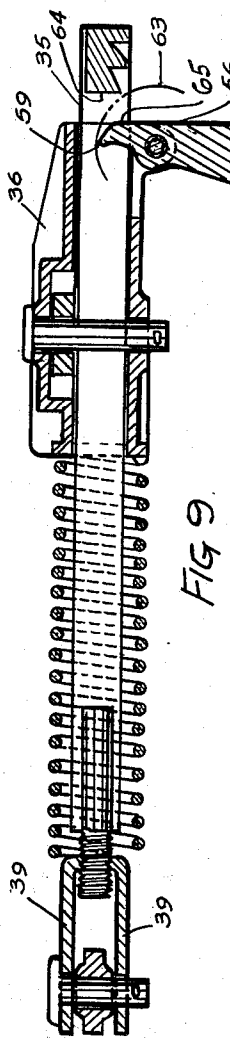


FIG 9

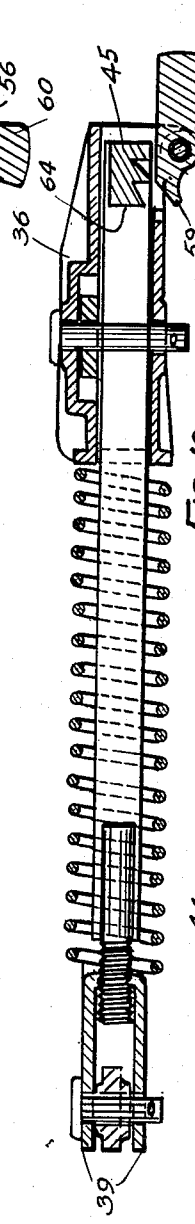


FIG 10

FIG 11.

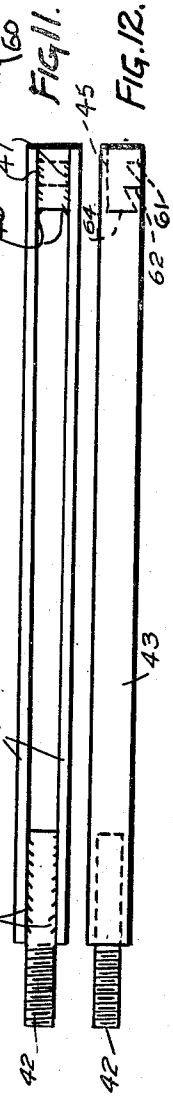


FIG. 12.

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SPRING MECHANISM FOR SLACK ADJUSTERS

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Application February 13, 1951, Serial No. 210,747

1 Claim. (Cl. 188—202)

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This invention relates to an improved spring mechanism for a slack adjuster for the brake leverage system of a railway car and is by way of an improvement on my pending United States application Serial No. 191,625, filed October 23, 1950.

The improvement is for use in connection with a slack adjuster wherein adjustment in the relation of certain parts is effected by means responsive to excessive travel of the brake applying push rod in order to maintain piston travel within the required limits of 7 to 9 inches and compensate for wear in the brake shoes, pins, connections and stretching of the rods in service.

The object of the invention is to provide an improved spring mechanism for retaining a spring energized and releasing said energy at a predetermined extent of push rod travel. The invention further resides in details of construction concerned with the mounting of the mechanism on the car structure whereby the mechanism may be readily mounted and dismounted for giving access to the brake cylinder.

A specific object of the invention is to provide telescopically related shouldered members having a spring interposed therebetween and having a pivoted pawl carried by the outer member for co-operating engagement with a block having ratchet teeth thereon and mounted on the inner member.

For further comprehension of my invention reference may be had to the accompanying drawings wherein:

Figure 1 is a plan view showing a portion of a railway car structure showing so much of the brake leverage system as necessary to illustrate the application of my improvement thereto, said view showing the parts with the brake in released position.

Figure 2 is a side elevational view of a portion of Figure 1 showing the push rod in relation to the brake cylinder and the resilient mechanism as viewed on a line 2—2 of said Figure 1.

Figure 3 is a side elevational view of the improved spring mechanism shown on an enlarged scale.

Figure 4 is a vertical sectional view taken through a line 4—4 of Figure 3.

Figure 5 is a detached side elevational view of the outer casing member.

Figure 6 is a plan view of the structure shown in Figure 5.

Figure 7 is an end elevational view of the casing shown in Figure 5 as viewed from left to right.

Figure 8 is a vertical longitudinal sectional

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view taken through the spring mechanism as seen on a line 8—8 of Figure 1 and showing the mechanism partially compressed with the spring energy retained in the first ratchet tooth.

Figure 9 is a view similar to Figure 8 except that the parts are shown with the spring compressed sufficiently to move the pawl to an overbalanced released position thus allowing free return of the parts to completely released position.

Figure 10 is a view similar to Figures 8 and 9 illustrating the position assumed by the locking pawl during the movement of the mechanism to released position.

Figure 11 is a plan view of the core of the inner member.

Figure 12 is an elevational side view of the core shown in Figure 11.

In said drawings the improvement is shown as applied to a railway car of conventional design and including the framing as indicated by the usual center sills 10—10 carrying a bracket 11 to which is bolted or otherwise secured a brake cylinder 12.

Associated with the brake cylinder is a longitudinally movable push rod 13 having a stem 14 and a pair of jaws 15—15, said rod being longitudinally movable in a forward direction on the admission of compressed air in the cylinder 12. Sandwiched between the pair of jaws 15—15 is a brake lever 17 and pivotally united therewith by means of a headed pin 18.

Leading from the outer end of the push rod is a hand brake chain connection 19 which is connected therewith by means of a clevis 20 which straddles the push rod jaws 15—15 and also receives the pin 18.

Pivotally connected to the end of the lever 17 remote from the push rod is a top rod 21 which leads to one of the trucks (not shown) and intermediate its ends said lever is connected to a center tie rod 22 which at its opposite end connects with the brake lever arrangement leading to the brake shoes at the opposite end of the car (not shown).

The center tie rod 22 is divided lengthwise into two sections 23 and 24 and the respective sections are screw-threaded to present right and left screw-threaded sections with which a complementary screw-threaded turnbuckle 25 co-operates. The said turnbuckle is formed with tubular extensions 26 each having a collar 27 one of which supports a bell crank lever assembly 28 mounted for horizontal swinging movement.

One of the arms 29 of the bell crank lever is

pivotally mounted at 30 for up and down swinging movement for intermittent engagement with a ratchet wheel 31 which latter is fixedly mounted on the turnbuckle. The opposite arm 32 of the bell crank lever is extended towards the push rod to engage with an auxiliary head 33 carried by the push rod, said head including a forwardly projecting runway 34.

The arm 32 of the bell crank lever is arranged to be moved in one direction in unison with the push rod in its forward movement during the brake applying operation and the spring mechanism forming the subject of this invention is provided for moving the lever in the opposite direction.

The spring mechanism includes telescopically related inner and outer members as indicated at 35 and 36 respectively between which a coil spring 37 is interposed. The inner member 35 includes an end clevis piece 38 having a pair of jaws 39—39 between which the arm 32 of the bell crank lever is extended and pivotally united therewith by means of a pintle 40.

The end wall of the clevis is screw-threaded at 41 to receive a correspondingly threaded rod section 42. The screw-threaded rod 42 is extended lengthwise between a pair of flat straps 43—43 and welded thereto as indicated at 44. At the outer end of the pair of straps there is disposed therebetween a toothed block section 45 which is welded in place as at 46 and 47 and effectively unites the pair of straps.

The straps being thus united at each end form a rigid well braced core structure having a substantially rectangular shaped contour which is extended within the outer member 36.

The outer member 36 is in the form of a housing or casing including spaced vertical walls 48—48 united at the top and bottom by upper and lower substantially horizontally disposed walls as indicated at 49 and 50 respectively. The contour of the casing as provided by walls 48, 49 and 50 closely follows the contour presented by the spaced straps 43—43 of the inner member and the latter is extended within the casing and guided thereby. An intermediate section 51 of the upper wall 49 of the casing is disposed above the level of the inner member a sufficient distance to accommodate a supporting bracket plate 52. In line with the said raised section 51 the side walls 48 of the casing are provided with aligned apertures 53—53 through which the bracket plate 52 extends.

A pivot 54 is extended through the bracket plate 52 and through the upper and lower walls 49 and 50 of the casing thus allowing for limited horizontal swinging movement of the spring mechanism assembly. When the pivot pin 54 is withdrawn from the outer member 36 and the bracket plate 52, the slack adjuster can be swung without dismantling away from the bracket plate 52 so as to permit inspection of the brake cylinder 12 and associated parts with a minimum of interference by the slack adjuster.

Adjacent the outer end of the casing the side walls 48—48 are extended downwardly vertically below the level of the lower wall 50 to present lugs 55 for pivotally supporting a pawl 56. The pawl 56 is pivotally mounted on a spacing ferrule 57 which in turn is secured in place by a rivet 58.

The pawl 56 includes an upper detent portion 59 and a weighted lower section 60 for biasing the pawl to a normally vertical position.

The operation of the device may be best understood by following out the sequence of operations involved in a brake setting operation with subsequent return of the brake parts to released position.

Assuming the brake in released position as shown in Figure 1 the push rod moves forwardly taking along the bell crank lever arm 32 by reason of the engagement between auxiliary head 33 of the push rod and the said arm. The forward movement of the arm 32 is accompanied by a sweeping movement of the pawl arm 29 over the ratchet wheel member 31 and moving freely over the same. During this forward movement of the push rod, the spring 37 is compressed between the shoulders of the inner and outer members 35 and 36 and such compression is held by reason of the engagement between the detent portion 59 of pawl 56 and the teeth of toothed section 45, the pawl first engaging with tooth 61 as shown in Figure 8 and upon further movement of the piston next engaging with the succeeding tooth 62. The spring compression is held by tooth 62 until such time as the push rod travel exceeds 7¼ inches whereupon the tooth 62 moves beyond the arc 63 of swinging movement of the detent and the pawl drops to overbalanced position as shown in Figure 9 allowing the release of the spring and resultant operation of the slack adjuster, as will be understood. During the returning movement of the inner member 35 under the influence of the spring the end wall 64 of the toothed section 45 contacts the wall 65 of the detent and swings the latter out of the path of movement of the said toothed section as shown in Figure 10 allowing the return of the pawl to normal locking position as shown in Figure 3 and in readiness for the next operation cycle.

While I have shown my improved mechanism with one specific type of slack adjuster, it will be understood that the same is applicable to any form of slack adjuster wherein a spring is energized during the brake applying operation and released upon a predetermined extent of piston travel.

What I claim as new is:

In a slack adjuster for the brake leverage system of a railway car including framing members and a brake cylinder mounted thereon and power applying means actuated by said cylinder for setting the brakes; a slack adjuster device for taking up slack in the leverage system, said adjusting device being operable in one direction by the power applying means and operable in the opposite direction to take up slack in the system, and spring mechanism for operating the device in the take up direction; the herein described improved spring mechanism in combination with a bracket member fixedly mounted on a framing member of the car, said mechanism including outer and inner shouldered members telescopically related and a spring interposed between said shoulders of the respective members, said outer member being of box shape with upper, lower and side walls, said side walls being apertured for the accommodation of the bracket member therethrough, a removable pivot pin extending through said bracket along the longitudinal axis thereof and through the upper and lower walls of the outer member to provide limited swinging movement of the outer member whereby on removal of said pivot pin said outer member can be removed from said bracket without further dismantling; said inner member including a pair of straps disposed in spaced relation on each side of the pivot and guided

thereby, and extending through the said outer member beneath the bracket; and spacing means at each end of the straps, said spacing means at the outer end of the inner member being in the form of a block having ratchet teeth on the underside thereof and a pawl pivotally mounted on the outer member below said block to engage with the ratchet teeth from underneath for holding the spring under compression, said ratchet block upon a predetermined extent of

spring compression being arranged to override the pawl and release the spring.

GEORGE B. DOREY.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
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