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RETAINING MEANS FOR SHOCK ABSORBING MECHANISM

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Fig. 1.

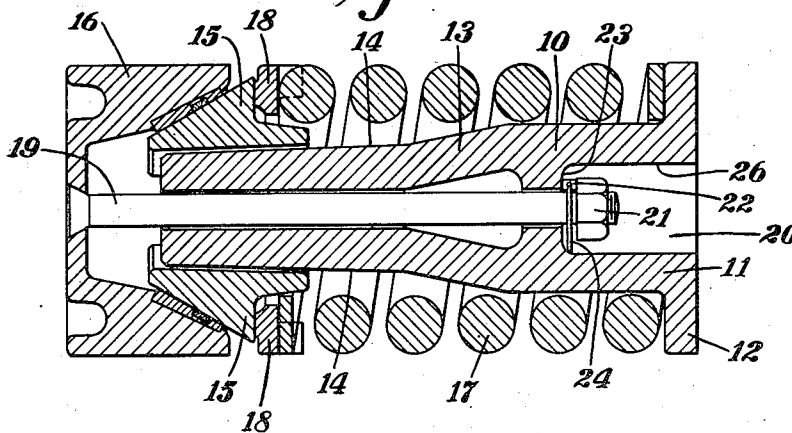


Fig. 2.

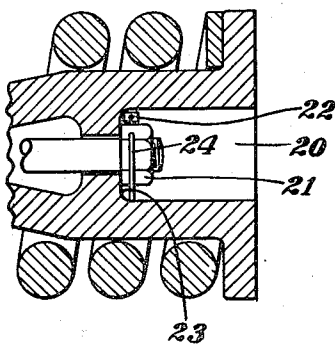


Fig. 3.

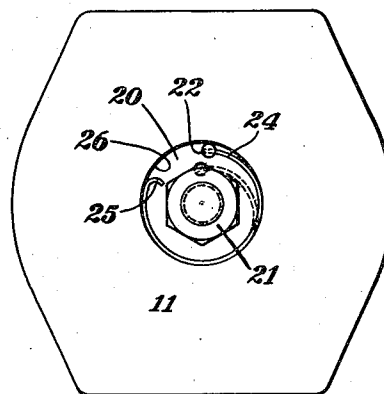
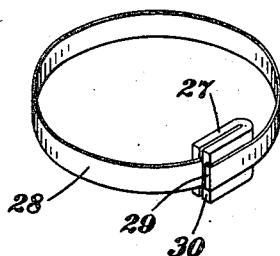


Fig. 4.



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RETAINING MEANS FOR SHOCK
ABSORBING MECHANISM

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13 Claims. (Cl. 213—22)

This invention relates to improvements in retaining means for shock absorbing mechanism and more particularly to novel retaining means for use in a railway draft gear.

One object of the invention is to provide retaining means simple in construction and positive in operation to effect a preliminary shortening of the shock absorbing mechanism sufficient to facilitate application thereof between the stop members of a conventional draft gear pocket, said means becoming inoperative after compression of the draft gear in service whereby the latter may then expand to its normal predetermined overall length to fit tightly between the stop members of the draft gear pocket. An important feature of our invention is the provision of means for positively holding the retaining means in its inoperative position once it has assumed such a position in service, so that there will be no danger of any part of the retaining means thereafter interfering with the operation of the gear.

Another object of our invention is a novel construction of retaining means as above described, of sufficient strength to withstand the initial compression of the draft gear spring and capable of easy and repeated application to the draft gear to reduce the normal overall length so as to facilitate insertion thereof between the stop lugs of the draft gear pocket.

Other objects and advantages will be pointed out in the following description and drawing, in which:

Figure 1 is a longitudinal vertical sectional view through a draft gear embodying our invention, the retaining means being in a position to effect a slight shortening of the gear.

Figure 2 is a partial view similar to Figure 1, showing the rear end portion only of the structure illustrated in Figure 1, but with the retaining means in inoperative position.

Figure 3 is an enlarged end view of the draft gear, showing the retaining means in its inoperative position in full lines and in its operative position in dotted lines, and

Figure 4 is an enlarged isometric view of a modified form of retaining means.

Although our retaining means may be employed in various well-known types of shock absorbing mechanisms in which relatively movable casings or followers are separated by spring means to cushion shocks, it is particularly adapted to those of the type illustrated in the drawing in which an end of the retaining bolt is positioned in a recess that would normally prevent an ordinary slug or block positioned beneath the bolt head or nut from dropping out in service, the open end of the recess being closed by the follower associated with the draft gear. The presence

of such a slug in this recess would thereby interfere with the action of the mechanism.

In the drawing the draft gear 10 comprises a friction member 11 formed with an enlarged base 12 and a stem 13 extending from said base. The stem is provided with friction surfaces 14 adapted to be engaged by friction shoes 15. A wedge 16 engages the shoes to force them against the stem. A spring 17 bears at one end against base 12 and at the other end against a spring follower 18 in engagement with the shoes. A retaining bolt 19 passes through openings in the wedge and in the friction member and into a recess 20 in the latter where it is secured by nut 21 to limit relative outward movement of the wedge and friction member. When the draft gear is first assembled the retaining nut 21 is adjusted so that the overall length of the gear plus the thickness of the followers, if any, will be equal to the distance between the end stops in the draft gear pocket. In order to facilitate insertion of the gear in the pocket we provide means to temporarily shorten the gear so that its overall length, plus the followers, will be less than the length of the pocket.

It will be appreciated that since practically all draft gears have an initial compression of from 5,000 to 7,000 pounds, any device positioned beneath the retaining nut must be capable of withstanding this load in order to effect the preliminary shortening desired. Furthermore, where there are space limitations, as when it is to be inserted in a recess in the draft gear, the shortening device must be compact and capable of insertion after the gear is assembled, even though provided with an attachment for positively throwing the device into non-operating position when the draft gear is first subjected to service blows.

Referring to the form of the invention shown in Figs. 1 to 3, our novel retaining means for temporarily holding the draft gear in a slightly shortened position comprises a spacer member 22 adapted to be positioned between nut 21 and the inner wall 23 of recess 20. As illustrated in Fig. 3 member 22 is in the form of a cylindrical slug and is of sufficient strength to withstand the initial compression of spring 17 without collapsing. Fastened at one end to member 22 is a light spring member or wire 24, preferably of brass because of its corrosion resistance. The other end of spring member 24 is formed with a half loop or hook 25. In applying the device to the draft gear the loop 25 is first hooked around the cylindrical portion of member 22, thereby maintaining said device in a contracted position for insertion in the recess 20. Although we prefer to form the free end of the spring member with a hook adapted to engage the spacer member for the purpose of locking the retaining means in a contracted position, it will be understood

that other means may be employed to perform this function. With the draft gear compressed, the retaining device is dropped over nut 21 and by the use of a forked tool the spacer member 22 is positioned beneath the nut 21 and held there while the gear is released. The expansive force of the gear then clamps the spacer member in this position beneath the nut. The spring member may be so formed that the positioning movement of the spacer member beneath the nut will automatically cause the hook of the spring member to be disengaged from the spacer member; or if desired, the spring member may be formed so that such disengagement will not occur automatically but can only be effected by a manual unlocking operation. With the hooked end portion of the spring member disengaged from the spacer member and sprung out against the wall 26 of the recess 20, and with the spacer member clamped beneath the nut 21, the retaining means is then in its operative position, as shown by the dotted lines in Fig. 3.

When the draft gear is so held in slightly compressed position by the spacer member 22, it may be readily inserted in the draft gear pocket. The moment the first service blow sufficient to further compress the gear is encountered, spacer member 22 will be released and sprung from beneath nut 21 by the action of the spring member 24 to the position illustrated by the solid lines in Fig. 3. When the draft gear is released from its load, it will then expand to its predetermined overall length.

Referring to the modification shown in Fig. 4, the retaining means there illustrated comprises a rectangular spacer member 27 secured to one end of a spring band 28. The member 27 is made from bar stock and, like member 22 in the previous form of the invention, is of sufficient strength to withstand the compression of spring 17 without collapsing. Member 27 is securely fastened to the spring band by bending the former into the shape of a U, inserting an end of the spring band between the arms of the U, and then pressing said arms tightly together. The free end of the spring band is bent at right angles to form a catch 29 adapted to be hooked around the end 30 of one of the arms of the member 27. With the free end of the spring band so hooked onto the spacer member, the retaining means is ready for application to the draft gear. The procedure followed in applying this modified form of retaining means to the gear is the same as that described above in connection with the first form, and the operation likewise is the same.

It will thus be seen from the preceding description that we have provided means simple in construction and positive in operation by which a preliminary shortening of a shock absorbing mechanism may be effected, whereby the latter may be readily assembled between the stop members of the draft gear pocket, said means automatically becoming inoperative in service upon compression of the shock absorbing mechanism to thereby permit full expansion of said mechanism to its predetermined overall length. In addition, our retaining means is so constructed and arranged that once it assumes its inoperative position in service, it is positively held in such position so that there will be no danger of any part thereof getting beneath the nut during the service life of the shock absorbing mechanism. Furthermore, our retaining means is of sufficient strength to withstand the initial com-

pression of the shock absorbing mechanism, yet capable of easy application thereto.

The terms and expressions which we have employed are used as terms of description and not of limitation, and we have no intention, in the use of such terms and expressions, of excluding any equivalents of the features shown and described or portions thereof, but recognize that various modifications are possible within the scope of the invention claimed.

What we claim is:

1. A retaining member for temporarily shortening the predetermined overall length of a shock absorbing mechanism comprising a spacer element of sufficient strength to withstand the expansive force of the mechanism, a spring element secured at one end thereof to said spacer element, and means on said elements adapted to lock the retaining member in a contracted position.

2. A retaining member for temporarily reducing the predetermined overall length of a shock absorbing mechanism comprising a spacer element adapted to transmit the expansive force of the mechanism and an arcuate spring element fastened to said spacer element, and means at opposite ends of said spring element adapted to lock the same in a contracted position.

3. Retaining means for temporarily reducing the predetermined overall length of a shock absorbing mechanism comprising a spacer element adapted to transmit the expansive force of the mechanism, and a spring element fastened at one end thereof to said spacer element, the free end of said spring element having a hook adapted to cooperate with said spacer element to maintain said retaining means in a contracted position.

4. Retaining means for temporarily reducing the predetermined overall length of a shock absorbing mechanism comprising a cylindrical spacer element adapted to transmit the expansive force of the mechanism, and a spring wire fastened at one end thereof to said spacer element, the free end of said spring wire having a hook adapted to cooperate with the cylindrical surface of said spacer element to maintain said retaining means in a contracted position.

5. Retaining means for temporarily reducing the predetermined overall length of a shock absorbing mechanism comprising a U-shaped spacer element adapted to transmit the expansive force of the mechanism, and a spring band secured at one end thereof to, and between the arms of said U-shaped spacer element, the free end of said spring band being formed with a hook adapted to cooperate with the end of one of the arms of said spacer element to thereby maintain said retaining means in a contracted position.

6. In a shock absorbing mechanism for railway draft riggings, the combination with yieldingly resisted, relatively movable members adapted to absorb shocks upon relative approach thereof, of means adapted to limit relative separation of said members and maintaining said mechanism of predetermined overall length, and retaining means for temporarily shortening said mechanism comprising a spacer element interposed between one of said members and said first named means, said spacer element being held in said operative position by the expansive force of the mechanism, and a spring element cooperating with said mechanism and said spacer element to throw the latter out of its operative position upon removal of said expansive force from said spacer

element to thereby permit said mechanism to expand to said predetermined overall length.

7. In a shock absorbing mechanism for railway draft riggings, the combination with yieldingly resisted, relatively movable members adapted to absorb shocks upon relative approach thereof, of means adapted to limit relative separation of said members and maintaining said mechanism of predetermined overall length, and retaining means interposed between one of said members and said first named means for temporarily holding said shock absorbing mechanism of lesser overall length than said predetermined length, said retaining means comprising a spacer element adapted to transmit the expansive force of the mechanism, and a spring element cooperating with said mechanism and said spacer element to throw the latter out of engagement from between said member and said first named means upon removal of the expansive force from said spacer element.

8. In a shock absorbing mechanism for railway draft riggings, the combination with yieldingly resisted, relatively movable members adapted to absorb shocks upon relative approach thereof, of means adapted to limit relative separation of said members and maintaining said mechanism of predetermined overall length, and retaining means for temporarily holding said shock absorbing mechanism slightly contracted when initially assembled, said retaining means comprising a spacer element interposed between one of said members and said first named means and adapted to transmit the expansive force of said mechanism, and a spring element cooperating with said mechanism and said spacer element to throw the latter out of engagement from between said member and said first named means upon compression of said mechanism in service.

9. In a shock absorbing mechanism for railway draft riggings, the combination with yieldingly resisted, relatively movable members adapted to absorb shocks upon relative approach thereof, of retaining means including cooperating shouldered abutments for limiting relative separation of said members and maintaining said mechanism of predetermined overall length, and a filler member interposed between said shouldered abutments for temporarily holding said shock absorbing mechanism slightly contracted when initially assembled, said filler member comprising a load transmitting element and a spring element associated therewith and cooperating with the mechanism to disengage said load transmitting element from between said shouldered abutments upon compression of said shock absorbing mechanism in service.

10. In a shock absorbing mechanism for railway draft riggings, the combination with yieldingly resisted, relatively movable members adapted to absorb shocks upon relative approach thereof, one of said members having a recess provided with a shouldered abutment therein, of means having a shouldered abutment for cooperation with said first named shouldered abutment to limit relative separation of said members and to maintain said mechanism of predetermined overall length, and retaining means for temporarily shortening the overall length of said shock absorbing mechanism, said retaining means comprising a spacer element interposed between said shouldered abutments and

adapted to transmit the expansive force of the mechanism, and a spring element associated with said spacer element and cooperating with the wall of said recess to disengage the spacer element from between said shouldered abutments upon compression of said shock absorbing mechanism in service.

11. In a shock absorbing mechanism for railway draft riggings, the combination with yieldingly resisted, relatively movable members adapted to transmit shocks upon relative approach thereof, one of said members having a recess provided with a shouldered abutment therein, of means having a shouldered abutment for cooperation with said first named shouldered abutment to limit relative separation of said members and to maintain said mechanism of predetermined overall length, and a retaining member for temporarily shortening said mechanism comprising a spacer element adapted to be interposed between said shouldered abutments and a spring element secured to said spacer element, said spring and spacer elements being provided with means for locking the retaining member in a contracted position to permit of ready insertion thereof in the said recess.

12. In a shock absorbing mechanism for railway draft riggings, the combination with yieldingly resisted, relatively movable members adapted to absorb shocks upon relative approach thereof, one of said members having a recess provided with a shouldered abutment therein, of means having a shouldered abutment for cooperation with said first named shouldered abutment to limit relative separation of said members and to maintain said mechanism of predetermined overall length, and retaining means for temporarily shortening the overall length of said shock absorbing mechanism, said retaining means comprising a resilient element adapted in cooperation with a wall of said recess to release said shouldered abutments upon compression of said shock absorbing mechanism in service.

13. In a shock absorbing mechanism for railway draft riggings, the combination with yieldingly resisted, relatively movable members adapted to absorb shocks upon relative approach thereof, one of said members having a recess provided with a shouldered abutment therein, of means having a shouldered abutment for cooperation with said first named shouldered abutment to limit relative separation of said members and to maintain said mechanism of predetermined overall length, and retaining means for temporarily shortening the overall length of said shock absorbing mechanism, said retaining means comprising a spacer element interposed between said shouldered abutments and adapted to transmit the expansive force of the mechanism, and a spring element associated with said spacer element and normally locked in contracted position, said spring element being adapted upon unlocking thereof to spring into engagement with a portion of the wall of said recess and being adapted further in cooperation with said wall to disengage the spacer element from between said shouldered abutments upon compression of said shock absorbing mechanism in service.

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