Jan. 4, 1944. R. M. NELSON 2,338,453

ASSEMBLY MAINTAINING AND SEALING MEANS FOR DRAFT GEARS

Filed Oct. 3, 1941

Fig. 1.

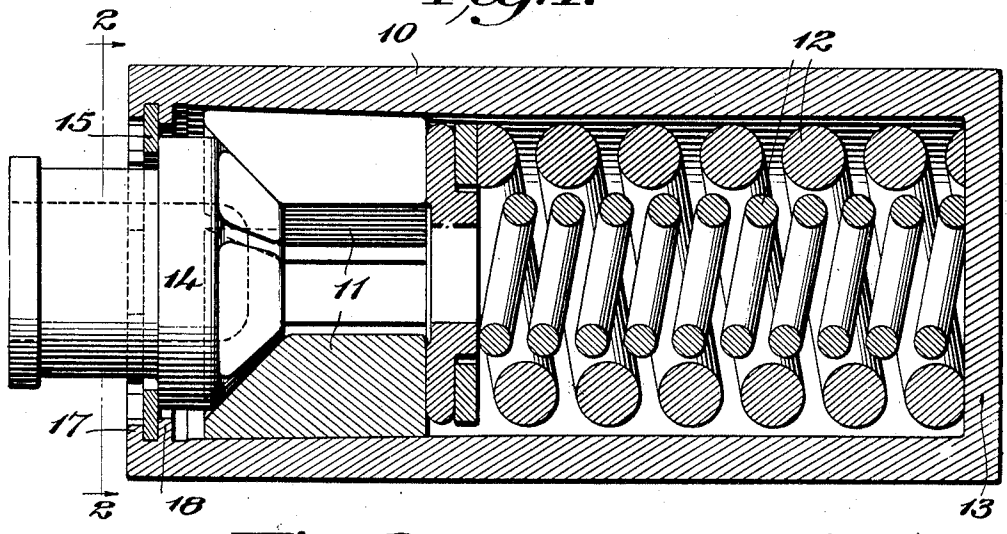


Fig. 2.

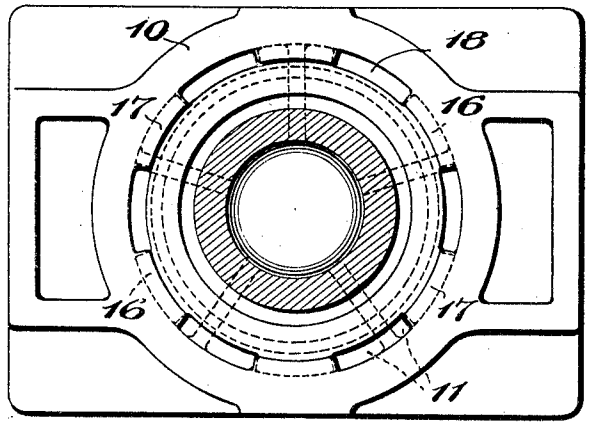


Fig. 3.

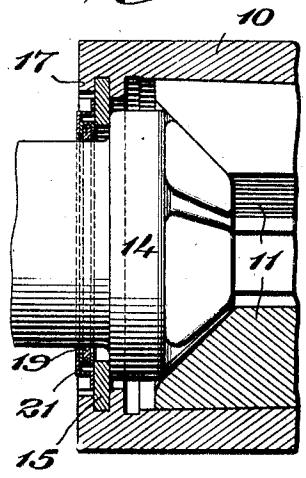
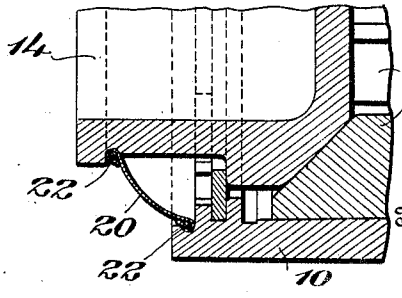


Fig. 4.



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ASSEMBLY MAINTAINING AND SEALING MEANS FOR DRAFT GEARS

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Application October 3, 1941, Serial No. 413,547

2 Claims. (Cl. 213—32)

This invention relates to railway draft gears, and has particular reference to improvements in railway draft gears of the general type comprising a casing, friction shoes therein, spring means reacting from the casing forwardly upon said shoes, and a wedge for exerting force rearwardly and outwardly upon said shoes in response to draft and buffing forces imposed on the gear to cause said shoes to frictionally cooperate with the casing to resist said forces.

In draft gears of the general type mentioned it is necessary to provide means to limit forward movement of the wedge and the friction shoes relative to the casing in order to maintain the wedge and the friction shoes in operative assembly with each other and with the casing, and heretofore this means usually has comprised a bolt connected at its rear end with the rear wall of the casing and extending forwardly through the casing and the wedge and having a nut thereon constituting a stop engageable by the wedge to limit forward movement thereof. Such bolts are, however, subject to bending or breakage by the severe forces imposed on the gears in service, and it has been found that in the case of failure of gears of the type mentioned the cause of the failure usually has been a broken or a badly bent bolt.

Accordingly, a special object of the present invention is to provide a simple, practical means to eliminate the usual bolt as an assembly maintaining means for gears of the type mentioned and to serve effectively in lieu of the eliminated bolt to maintain the gear parts in operative assembly with each other without the disadvantages incident to the use of a bolt for this purpose.

Another special object of the present invention is to provide simple, practical means of sealing the front, open ends of the casings of draft gears of the type mentioned against the entrance of foreign matter therethrough in the casings.

With the foregoing and other objects in view, which will become more fully apparent as the nature of the invention is better understood, the same consists in a draft gear of the type mentioned embodying the novel features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawing and defined in the appended claims.

In the accompanying drawing, wherein like characters of reference denote corresponding parts in related views:

Figure 1 is a central, vertical section through a draft gear of the type mentioned constructed in accordance with one practical embodiment of the invention.

Figure 2 is a cross section on the line 2—2 of Fig. 1.

Figure 3 is a fragmentary section similar to Fig. 1 illustrating one practical means of sealing the open front end of the casing against the entrance of foreign matter therethrough into the casing; and

Figure 4 is another fragmentary section similar to Fig. 1 illustrating another practical means of sealing the open front end of the casing against the entrance of foreign matter therethrough into the casing.

Referring to the drawing in detail, first with particular reference to Figs. 1 and 2, 10 designates a substantially cylindrical casing closed at its rear end and open at its front end and having its front end portion interiorly tapered rearwardly; 11 designates an annular series of friction shoes disposed in the said tapered front end portion of said casing; 12 designates spring means interposed between the rear ends of said friction shoes and the rear wall 13 of said casing and reacting from said rear wall upon said friction shoes to tend constantly to urge the latter forwardly relative to said casing, and 14 designates a wedge element acting rearwardly and outwardly upon the front ends of said friction shoes for urging them against the tapered front portion of the side wall of the casing 10 in response to draft or buffing forces imposed on the gear to frictionally resist such forces, all as is common and well known in the art and requires no further elucidation.

Heretofore, in order to maintain the wedge element 14 and the friction shoes 11 in assembly with the casing 10, the usual practice has been to provide an opening in the rear wall 13 of the casing; to extend a headed bolt forwardly through said opening and through the casing 10 and the wedge element 14 until the head on the rear end of the bolt engaged the rear wall of the casing, and then to apply a nut to said bolt in front of the wedge element 14 to be turned on said bolt to place the spring means 12 under desired normal compression and to serve as a stop to limit forward movement of the wedge element. However, in a gear such as described an assembly-maintaining bolt such as described is subjected to bending or breakage by the severe forces imposed on the gear in service, and in the case of gear failure the cause of the failure usually has been due to a broken

or badly bent bolt. Therefore, according to the present invention, the assembly retaining bolt heretofore generally used is eliminated and in lieu thereof a stop ring 15 is employed which is mounted in the front end of the casing 10 in the path of forward movement of a portion of the wedge element 14 so as to limit forward movement of said wedge element and thus maintain said wedge element and the friction shoes 11 in assembly with said casing.

According to the invention, the stop ring 15 is castellated. That is to say, said ring is provided peripherally with a series of annularly spaced apart projections 16. Similarly the casing 10 is provided at or adjacent to its front end with an annular series of spaced apart, inwardly extending flange elements 17. The width of the spaces between the flange elements 17 is such as to permit the ring projections 16 to pass between them, while the width of the spaces between the ring projections 16 is such as to accommodate the flange elements 17. Moreover, the distance from the center of the ring 15 to the outer edges of its projections 16 is greater than the distance from the center of the casing 10 to the inner edges of the flange elements 17 and suitably lesser than the internal diameter of the casing 10 rearwardly of the flange elements 17. Furthermore, the internal diameter of the stop ring 15 is greater than the diameter of the front end portion of the wedge element 14 and lesser than the diameter of the rear end portion of said wedge element. Accordingly, by engaging the stop ring 15 over the front end portion of the wedge element 14 and by alining the projections 16 of said stop ring with the spaces between the flange elements 17, the stop ring may be moved rearwardly to a position to the rear of said flange elements 17, assuming of course, that the wedge element 14 has been moved rearwardly sufficiently to permit such positioning of said stop ring. By then rotating said stop ring the projections 16 thereof may be engaged behind the flange elements 17 so that the stop ring will be held against forward movement relative to the casing 10 and thus will serve as a stop engageable by the shoulder at the front of the larger diameter, rear end portion of the wedge element 14 to limit forward movement of said wedge element and thus maintain the latter and the friction shoes 11 in assembly with the casing 10.

The spring means 12, the friction shoes 11 and the larger diameter rear end portion of the wedge element 14 are of lengths such that when the stop ring 15 is engaged behind the flange elements 17 the spring means 12 is maintained under a normal predetermined amount of compression. Thus, normally, the spring means 12 urges the friction shoes 11 forwardly against the wedge element 14 which is held against forward movement by the stop ring 15 and thereby the friction shoes are urged normally outward against the rearwardly tapered inner face of the front end portion of the casing 10.

It is understood, of course, that in accordance with common practice in the art, stop means are provided to limit rearward movement of the casing 10 and forward movement of the wedge element 14; that a yoke is associated with the casing 10 for transmitting draft forces forwardly thereto, and that a coupler butt cooperates with the wedge element 14 for transmitting buffing forces rearwardly thereto. Accordingly, either draft or buffing forces imposed on the gear are effective to produce movement of the wedge element 14 and the friction shoes 11 into the casing 10 against the force exerted forwardly by the spring means 12 and as a consequence the friction shoes 11 are urged outwardly against the rearwardly tapered inner face of the front end portion of the casing 10 to frictionally resist such forces.

Obviously, the stop ring 15 is very easy to apply and greatly facilitates initial assembly of the gear as compared with the use of the usual bolt for this purpose. Moreover, since the necessity of providing a casing-weakening bolt-accommodating opening in the rear wall 13 of the casing 10 is eliminated, the present casing is considerably stronger than the usual casing.

While it is not essential to provide means to hold the stop ring 15 against rearward movement into the casing 10, suitable means for this purpose preferably is provided and comprises in the present instance an annular flange 18 extending inwardly from the front end portion of the casing 10 in suitable, rearwardly spaced relationship to the flange elements 17. Preferably this flange 18 extends inwardly a distance such as to close the spaces between the stop ring projections 16 against the entrance of foreign matter through said spaces into the casing 10. Accordingly, since normally the wedge element 14 closes the central opening in the stop ring 15, the front end of the casing normally is completely closed against the entrance of foreign matter therethrough into the casing. In this connection and in order to provide for sealing the front end of the casing when the wedge element 14 is moved into the casing, the stop ring 15 may be equipped with a sealing ring 19 disposed in surrounding relationship to the smaller diameter, front end portion of the wedge element 14 as shown in Fig. 3 of the drawing, or, alternatively, the front end of the casing 10 and the wedge element 14 may be joined by a suitable boot 20 as illustrated in Fig. 4 of the drawing.

If the stop ring 15 is provided with a sealing ring such as the ring 19 for sealing cooperation with the wedge element 14 said sealing ring preferably is mounted on said stop ring for superficial movement relative thereto, as, for example, through the instrumentality of a retaining ring 21 carried by said stop ring 15 so that the seal is preserved despite any lateral shifting of the wedge element 14 relative to the stop ring 15. If, on the other hand, a boot such as the boot 10 is employed for sealing purposes, said boot may be provided at its ends with contracile ring 22 to snap into annular grooves in the wedge element 14 and in the front end portion of the casing 10 to connect it with said wedge element and said casing.

Should it be desirable to secure the stop ring 15 against rotation from its operative position, this may be done in any suitable manner as, for example, by spot welding the same to the casing 10. By means of a chisel or in any other suitable manner the spot welds may readily be broken to permit removal of the stop ring whenever removal thereof may be desired.

Without further description it is thought that the features and advantages of the invention will be readily apparent to those skilled in the art, and it will of course be understood that changes in the form, proportion and minor details of construction may be resorted to, without departing from the spirit of the invention and scope of the appended claims.

I claim:

1. A draft gear comprising a casing, friction shoes therein, spring means reacting from said casing forwardly upon said friction shoes, a wedge for exerting force rearwardly and outwardly upon said friction shoes to urge them into frictional cooperation with said casing, inwardly extending annularly spaced apart flange elements at the front end of said casing, a ring having peripheral annularly spaced apart projections to be passed rearwardly through the spaces between said flange elements and by rotation of said ring to be engaged behind said flange elements to hold said ring against forward movement relative to said casing, said ring when its projections are engaged behind said flange elements being disposed in the path of forward movement of a portion of said wedge and thereby constituting a stop directly engageable by said wedge to limit forward movement of said wedge and said friction shoes by said spring means, said ring having annularly spaced apart recesses between said projections through which said casing flange elements pass when the ring projections are passed rearwardly through the spaces between said casing flange elements, and an inwardly extending continuously annular flange on the front end of said casing rearwardly of said ring holding said ring against rearward movement relative to said casing, said continuously annular flange extending inwardly beyond the bottoms of the recesses of said ring and closing the spaces between said ring projections against the entrance of foreign matter through said spaces into the casing, the outer end portion of said wedge extending through the opening defined by said continuously annular flange into direct engagement with said stop ring.

2. A draft gear comprising a casing open at one end and including an annular side wall completely surrounding its said open end, friction shoes in said casing, spring means reacting from said casing forwardly upon said friction shoes, a wedge for exerting force rearwardly and outwardly upon said friction shoes to urge them into frictional cooperation with said casing, inwardly extending annularly spaced apart flange elements at the front end of said casing, a ring having peripheral annularly spaced apart projections to be passed rearwardly through the spaces between said flange elements and by rotation of said ring to be engaged behind said flange elements to hold said ring against forward movement relative to said casing, said ring when its projections are engaged behind said flange elements being disposed in the path of forward movement of a portion of said wedge and thereby constituting a stop directly engageable by said wedge to limit forward movement of said wedge and said friction shoes by said spring means, said ring having annularly spaced apart recesses between said projections through which said casing flange elements pass when the ring projections are passed rearwardly throught the spaces between said casing flange elements, and inwardly extending flange means on the front end of said casing rearwardly of said ring holding said ring against rearward movement relative to said casing and closing the spaces between said ring projections against the entrance of foreign matter through said spaces into the casing.

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