Feb. 9, 1932. G. W. WILDIN 1,844,234

FRICTION DRAFT GEAR

Filed May 15, 1930

Fig. 1.

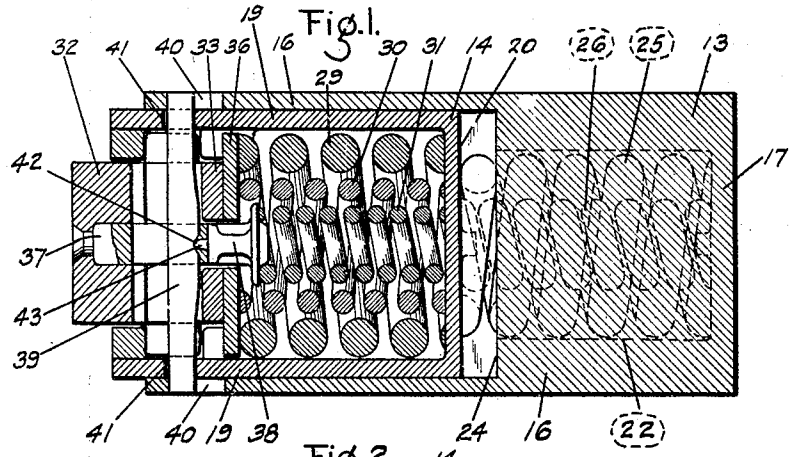


Fig. 2.

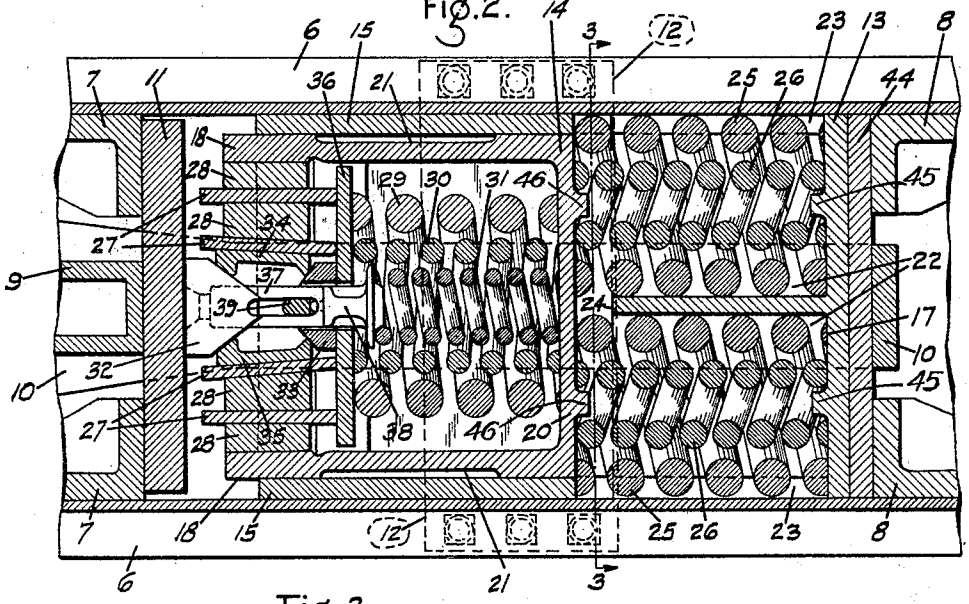
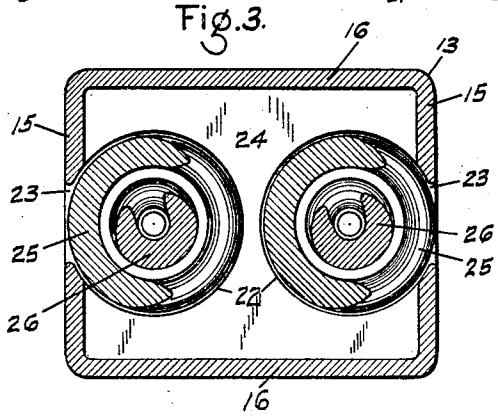


Fig. 3.



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UNITED STATES PATENT OFFICE

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FRICTION DRAFT GEAR

Application filed May 15, 1930. Serial No. 452,761.

The object of the invention is to provide an improved draft gear especially adapted for installation in passenger coaches, in which minor shocks will be absorbed by spring buffer action and the more severe shocks absorbed by friction shock-absorbing means.

It is an object to provide a unitary assembly of a friction draft gear and buffer springs which will occupy the standard space provided in the usual "yoke", and which can be handled and installed as an ordinary draft gear.

Other objects of the invention are to provide a draft gear which is composed of inner and outer telescoping casings, the outer casing containing buffer springs and the inner casing containing the friction elements; to provide for a detachable assembly of the friction casing and the buffer casing; and to provide a simple, reliable and rugged construction which will function regularly under all conditions of service.

These and other objects of the invention will become apparent from the following description and the accompanying figures attached.

In the accompanying drawings:

Fig. 1 is a vertical longitudinal section of a draft gear embodying the invention;

Fig. 2 is a horizontal longitudinal section of the same gear as installed in a railway passenger or freight car, showing in addition the portions of the draft or center sills of the car, stop plates, yoke and coupler butt; and

Fig. 3 is a vertical transverse section of the draft gear shown in Fig. 2, on the line 3—3 marked thereon.

With reference to the drawings, the draft rigging comprises the center or draft sills 6 of a car underframe, to which are secured, by proper means, the front stop lugs 7, 7, and the rear stop lugs 8, 8. The inner end of the draw-bar 9 is connected by conventional means (not shown) to the yoke 10, which is of the usual standard form. A follower plate 11 is placed within the yoke and supported thereby. The yoke itself is supported in the conventional manner by a detachable saddle plate 12, bolted to the draft sills as shown.

The draft gear mechanism itself comprises two telescoping casings, an outer casing 13 and an inner casing 14. The outer casing 13 is substantially rectangular in form, and is provided with side walls 15, 15, top and bottom walls 16, and the rear end wall 17. The side walls 15 fit snugly within the draft sills 6, as shown in Fig. 2. The inner casing 14 comprises a hollow rectangular shell provided with side walls 18, top and bottom walls 19, and the rear end wall 20. The side walls may be recessed for a portion of their length, as indicated at 21, or the structure may be otherwise lightened within the required limits of its strength.

The length of the inner casing 14 is much less than that of the casing 13, so that upon assembly (as shown in Fig. 2) it is substantially enclosed thereby and space is provided between the end walls of the two for the spring unit of the gear. The outer casing 13 is shown as comprising a substantially rectangular block of metal, provided with a very thick rear wall 17 the face of which is shown at 24. The wall 17 is provided with two parallel cylindrical pockets 22. The side walls 15 of the casing 13 may be cut away, as indicated at 23, 23 (Figs. 2 and 3), to afford clearance for the springs.

The pockets 22 are located at each side of the longitudinal center line of the outer casing 13. The inner face of the rear wall 17 comprises a vertical face 24, coextensive in area with the rear face of the casing 14. The face 24, therefore, provides a stop which limits the inward movement of the casing 14. As indicated in Figs. 2 and 3, heavy coil springs 25 and 26 are mounted in each of the pockets provided. The outer springs 25 are much heavier than the inner springs 26. Studs 45, facing inwardly from the bottom of the pockets 22, and studs 46, extending outwardly from the rear wall 20 of the inner casing 14, center the springs 26 with respect to the pockets.

The springs 25 and 26 bear against the rear wall 17 of the outer casing 13, and on the opposite end bear against the rear wall 20 of the inner casing 14, and they thus normally maintain the inner casing 14 extended

relatively to the outer casing 13, so that the rear wall 20 of the inner casing is spaced from the face 24, as shown in Fig. 1.

This spacing represents the permissible compression to which the springs 25, 26, may be subjected without danger of set. It is, of course, obvious that the depth of the pockets 22 must be such that the springs 25, 26, may be compressed entirely within the compass of the pockets without damage to the spring.

The friction shock absorbing mechanism is housed in the inner casing 14, and is composed of the following elements: Adjacent the front end of the inner casing is disposed a group of alternate friction plates 27, 28, placed upon the opposite sides of a wedging mechanism. The plates 28 are anchored to the casing 14, and the plates 27 are movable and normally bear against the follower plate 36, which is held in position by the resistance springs 29 and 30.

The wedging mechanism comprises longitudinally placed wedge blocks 32, 33, having opposed wedging faces which engage corresponding faces upon wedge blocks 34, 35, located, respectively, on either side of the wedge block 32. As will be seen from the drawings, the wedge block 33 is also normally engaged by the follower plate 36.

A release spring 31 at one end pressed upon the inner rear face of the casing 14, and at its other end bears upon a spring follower 38, which transmits the pressure through the stem 37 of the wedge-block 32. The key 39, driven through slots 40 provided in the outer casing and through cooperating slots 41 provided in the inner casing, passes through an opening in the stem 37, and thus securely locks the buffer and friction gear in an assembled position.

To prevent the key 39 from being dislodged, a depression 42 is formed in its rear face into which a projection or detent 43 extends from the follower 38. The key 39 fits the apertures 41 closely, and hence has no movement longitudinally of the casing 14, while the slots 40 are elongated at least to the extent of the normal clearance provided between the face 24 and the rear wall 20 of the casing 14.

The friction unit of the gear has a much greater capacity than that of the spring unit, the ratio being in practice about three to one. In consequence compressive forces will first affect only the spring unit, but when the force exceeds the capacity of the springs 25, 26, it will be completely transferred to the friction unit as soon as the face 24 and the wall 20 make contact. With the further relative approach of the follower 11 and the casing 14, the resistance is primarily by the springs housed within the casing 14, plus the friction which is developed between the wedge shoes 34, 35, and the plates 27 against which they bear.

Because of the slight taper of a pair of the anchored plates 28, both of the resisting agents are rapidly augmented. The inward lateral movement of the shoes, caused by this tapered form, urges the wedge 33 forward. As soon as the follower 11 comes into contact with the plates 27, the latter are moved longitudinally relatively to the plates 28, thereby developing greatly increased friction, which continues to be augmented by the action of the tapered plates until the gear is completely closed by the engagement of the follower 11 with the end of the casing 14.

Modifications and rearrangements may be made within the scope of the invention, in which the action is in full accord with the principles herein set forth.

I claim as my invention:—

1. In a draft gear, in combination, a housing containing friction shock absorbing means including intercalated friction plates, wedge means compressing the plates together and resistance springs opposing the movement of said plates, a second open ended housing surrounding the housing first named and in which the said friction housing is slidable longitudinally, buffing springs interposed between said first and second housings, and a bar extending transversely through both housings and having lateral lost motion with respect to one of them for limiting the movement of one housing with respect to the other.

2. In a draft gear, an open ended housing, a second housing closing the opening and slidable in said first-named housing, a buffing spring in the closed space between the two housings, a projection on one of the housings limiting the relative approach beyond the capacity of the spring, frictional shock absorbing means including intercalated plates and resistance springs therefor contained in said second housing, and a bar extending transversely through both housings and having lateral lost motion with respect to one of them for limiting the outward movement of the second housing with respect to the first and serving to maintain an initial compression upon all springs in both housings.

3. In a draft gear, in combination, a casing having a closed end adapted to cooperate with a pair of stop lugs, the opposite end of the casing being open, a second casing of like form freely slidable within the first-named casing having its open end similarly directed, expansion springs reacting between the closed ends of the two casings, a column limiting the relative approach of the closed ends of the casings, a stop-engaging follower facing the open ends of the casings, a shock absorbing unit housed within the second-named casing and comprising friction plates and wedges, one of the latter bearing upon the follower, spring means reacting between

the plates and wedges and the closed end of the casing and a bar extending transversely through both casings and having lateral lost motion with respect to one of them for limiting the relative movement of the two casings, such bar also passing through the follower-engaging wedge whereby the friction elements are held within the second-named casing.

In testimony whereof I affix my signature.

GEORGE W. WILDIN.