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FRICTION DRAFT GEAR

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Fig. 1.

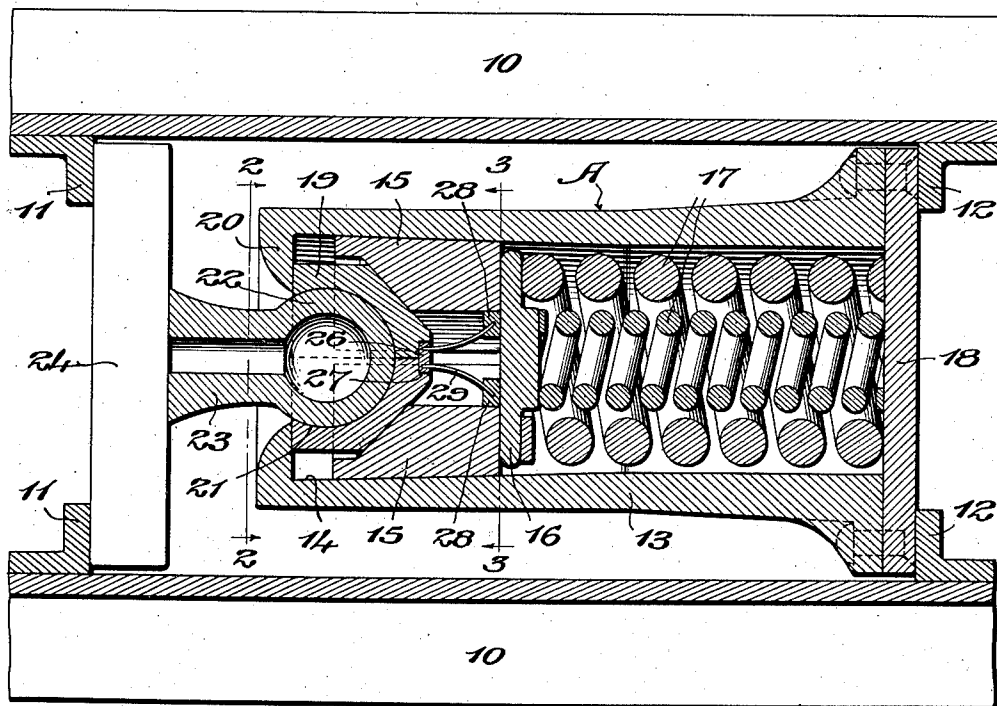


Fig. 2.

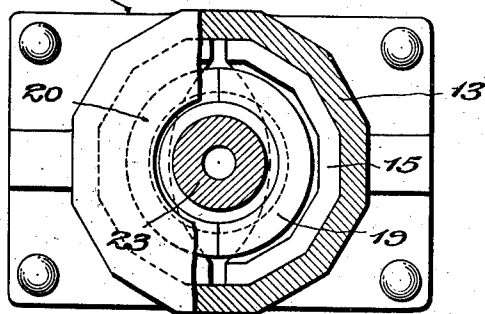


Fig. 3.

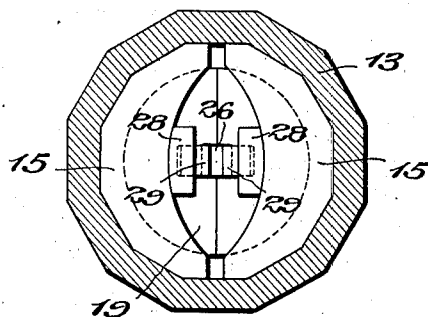
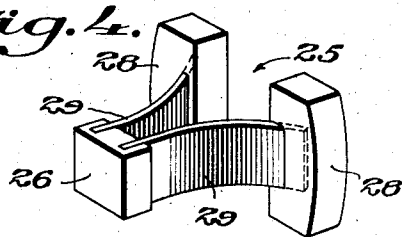


Fig. 4.



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FRICTION DRAFT GEAR

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10 Claims. (Cl. 213—34)

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, resilient means reacting from the rear end of the casing forwardly upon said friction shoes, and a wedge element for exerting force rearwardly and outwardly upon said friction shoes in response to draft and buffing forces imposed upon the gear, whereby the shoes are caused to cooperate frictionally with the casing to resist said forces.

One special and important object of the invention is to provide a draft gear of the general type mentioned embodying a simple, practical construction whereby it may accept impact blows delivered angularly thereto, without distortion, breakage or disalignment of the parts thereof.

Another special and important object of the invention is to provide a draft gear of the general type mentioned embodying novel and improved spring means to release the wedge element from the friction shoes following any given operation of the gear to absorb the shock of a draft or buffing force imposed thereon, thereby to avoid any sticking of the parts of the gear in positions in which they are ineffective properly to perform their shock absorbing functions.

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 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 the different views:

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

Figure 2 is a cross section on the line 2—2 of Fig. 1 with parts broken away.

Figure 3 is a cross section on the line 3—3 of Fig. 1; and

Figure 4 is a perspective view of the release spring unit.

Referring to the drawing in detail, 10, 10 designate the side sills of a car under-frame structure; 11 and 12 designate front and rear pairs of stop lugs fixed to and extending inwardly from said side sills 10, 10, and A designates, generally, a draft gear constructed in accordance with one practical embodiment of the invention and operatively disposed between the side sills 10, 10 and between said pairs of stop lugs 11 and 12, all in accordance with usual and well known practice.

The draft gear A comprises, as usual, a substantially cylindrical casing 13 the front end

portion of which is interiorly tapered inwardly as indicated at 14; any desired number of friction shoes 15 disposed in the said front end portion of said casing with their outer faces in frictional sliding engagement with the inwardly tapered inner surface 14 thereof; a spring cap 16 disposed against the rear ends of said friction shoes; one or more coil springs 17 or other suitable resilient means interposed between the rear wall 18 of the casing 13 and said spring cap and tending constantly to urge said friction shoes forwardly relative to said casing, and a wedge element 19 in front of the friction shoes 15 and having wedging cooperation therewith whereby it is effective, by rearward movement thereof, to move said friction shoes rearwardly and also to urge them outwardly against the said inwardly tapered surface 14, all as is likewise, generally speaking, well known in the art.

At the front end of the casing 13 is an inwardly extending stop flange 20 or other suitable stop means to be engaged by the front end of the wedge element 19 to limit forward movement thereof, while in accordance with the invention the rear wall 18 of the casing 13 is comprised by a plate or the like separate from said casing so that prior to riveting or otherwise fastening the same to said casing, the parts of the gear which are contained in said casing may be inserted into the same through the open rear end thereof.

In the wedge element 19 is a recess 21 of spherical form which opens through the front end of said wedge element, while neatly fitted in said recess is a substantially spherical head 22 at the rear end of a wedge follower 23 which extends through the central opening in the front end of the casing 13 defined by the stop flange 20 and at its front end is seated against the rear face of a main front follower 24.

The recess 21 is in excess of a hemisphere so as to insure retention of the head 22 therein, and in this connection, in order to permit ready assembly and disassembly of said head 22 with and from the wedge element 19, the latter may be composed, as shown, of two mating half-sections which constantly are urged and maintained together by their wedging engagement with the front ends of the friction shoes 15.

Normally the rear end of the casing 13 is engaged against the rear pair of stop lugs 12 and the spring, or springs, 17, is or are, under a certain amount of compression urging the friction shoes 15 and the wedge follower 23 forwardly relative to said casing and maintaining the main front follower 24 engaged against the front pair of stop lugs 11. In this connection it will be understood, of course, that a draw-bar (not shown) is engaged with the rear end of the casing 13 and with the front face of the main front follower 24. Accordingly, assuming that, through

the draw-bar, either a draft force is imposed forwardly upon the casing 13 or that a buffing force is imposed rearwardly upon the main front follower 24, it is manifest that the wedge element 19 will be forced rearwardly relative to the casing 13, that the friction shoes 15 likewise will be forced rearwardly relative to said casing, and that due to the resistance offered by the spring, or springs, 17 to rearward movement of said friction shoes, the same will be forced outwardly by the wedge element 19 tightly against the inwardly tapered inner surface 14 of the casing 13 and thereby the shock or impact of the draft or buffing force, as the case may be, will be absorbed by the frictional sliding engagement of the friction shoes 15 with the casing surface 14.

It will further be manifest that in the event of either the draft or buffing force being delivered at an angle to the gear; that is, in a direction other than directly longitudinally of the gear, the ball and socket universal joint connection between the wedge element 19 and the wedge follower 23 will permit said wedge follower to assume a position in line with the direction of delivery of the impact force without tendency to cock the wedge element 19 and, consequently, without distortion, breakage or disalignment of any other of the different parts of the gear.

Following relief of a draft or buffing force imposed upon the gear, expansion of the spring, or springs, 17 ordinarily effects release of the gear by forcing the friction shoes 15 and the wedge 19 forwardly until the same assume their normal forwardmost positions as determined by engagement of the wedge element 19 with the stop flange 20. In this connection and to insure initial forward release movement of the wedge element 19 relative to the friction shoes 15 in the event said wedge element should tend to stick against said friction shoes and prevent their forward release movement, a novel release spring unit 25 is provided. This unit comprises a block 26 to fit into a central recess 27 in the rear end of the wedge element 19; a plurality of other blocks 28, one for each of the friction shoes 15, seated at its outer side against its related friction shoe and at its rear end against the front face of the spring cap 16, and a bowed leaf spring 29 connecting each block 28 with the block 26.

Due to the blocks 28 being held by the spring cap 16 against rearward movement relative to the friction shoes 15, it is apparent that as the wedge element 19 moves rearwardly relative to said friction shoes under an impact force imparted to the gear, the leaf springs 29 will be abnormally bowed or flexed with consequent storing of spring energy therein. Accordingly, upon relief of the impact force, the tendency of said leaf springs to straighten or to return to their normal bowed form, thereby to release the energy stored therein, will effect forward movement of the wedge element 19 relative to the friction shoes 15 and thus overcome any sticking of said wedge element against said friction shoes, insuring return of said friction shoes and said wedge element to their forwardmost or released positions by the spring, or springs, 17.

In the drawing, only two friction shoes 15 have been illustrated and these have been shown as having a plurality of flat outer faces cooperating with corresponding flat inner faces of the casing 13. Obviously, however, any other number of friction shoes may be provided if desired and, regardless of their number, their outer faces

and the rearwardly tapered inner surface of the casing 13 may be of any other desired form.

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 friction draft gear comprising a casing having an inwardly tapered inner surface, friction shoes having their outer faces disposed against said surface, a wedge element having wedging cooperation with the outer ends of said friction shoes so that by inward movement thereof it is effective to urge said shoes inwardly longitudinally of the casing and also laterally outward against said tapered surface, resilient means tending constantly to urge said friction shoes and said wedge element longitudinally outwardly relative to said casing, stop means to limit longitudinal outward movement of said wedge element and said friction shoes by said spring, a main front follower, a wedge follower interposed between said main front follower and said wedge element and through which impact forces imposed upon the gear are transmitted to said wedge element, and a universal joint connection between said wedge follower and said wedge element.

2. A friction draft gear comprising a casing having an inwardly tapered inner surface, friction shoes having their outer faces disposed against said surface, a wedge element having wedging cooperation with the outer ends of said friction shoes so that by inward movement thereof it is effective to urge said shoes inwardly longitudinally of the casing and also laterally outward against said tapered surface, resilient means tending constantly to urge said friction shoes and said wedge element longitudinally outwardly relative to said casing, stop means to limit longitudinal outward movement of said wedge element and said friction shoes by said spring, a main front follower, a wedge follower interposed between said main front follower and said wedge element and through which impact forces imposed upon the gear are transmitted to said wedge element, and a universal joint ball and socket connection between said wedge follower and said wedge element.

3. A friction draft gear comprising a casing closed at its rear end and centrally open at its front end and having inwardly extending stop means at its front end, the inner surface of the front end portion of said casing being tapered inwardly, a plurality of friction shoes in the front end portion of said casing with their outer faces engaged with said tapered surface, resilient means between the rear end wall of said casing and said friction shoes tending constantly to urge said shoes forwardly relative to said casing, a wedge element having wedging cooperation with the front ends of said friction shoes so that by rearward movement thereof it is effective to move said shoes rearwardly and also outwardly against said tapered surface, said stop means being disposed to be engaged by said wedge element to limit forward movement thereof and thereby limit forward movement of said shoes, a main front follower, a wedge follower interposed between said main front follower and said wedge element and extending through the central open-

ing in the front end of said casing and through which impact blows delivered to the gear are transmitted to said wedge element, and a universal joint connection between said wedge follower and said wedge element.

4. A friction draft gear comprising a casing closed at its rear end and centrally open at its front end and having inwardly extending stop means at its front end, the inner surface of the front end portion of said casing being tapered inwardly, a plurality of friction shoes in the front end portion of said casing with their outer faces engaged with said tapered surface, resilient means between the rear end wall of said casing and said friction shoes tending constantly to urge said shoes forwardly relative to said casing, a wedge element having wedging cooperation with the front ends of said friction shoes so that by rearward movement thereof it is effective to move said shoes rearwardly and also outwardly against said tapered surface, said stop means being disposed to be engaged by said wedge element to limit forward movement thereof and thereby limit forward movement of said shoes, a main front follower, a wedge follower interposed between said main front follower and said wedge element and extending through the central opening in the front end of said casing and through which impact blows delivered to the gear are transmitted to said wedge element, and a universal joint ball and socket connection between said wedge follower and said wedge element.

5. A friction draft gear comprising a casing having an inwardly tapered inner surface, friction shoes having their outer faces disposed against said surface, a wedge element having wedging cooperation with the outer ends of said friction shoes so that by inward movement thereof it is effective to urge said shoes inwardly longitudinally of the casing and also laterally outward against said tapered surface, resilient means tending constantly to urge said friction shoes and said wedge element longitudinally outwardly relative to said casing, stop means to limit longitudinal outward movement of said wedge element and said friction shoes by said spring, a main front follower, a wedge follower interposed between said main front follower and said wedge element and through which impact forces imposed upon the gear are transmitted to said wedge element, said wedge element having a recess of spherical form therein and said wedge follower having a head of spherical form disposed in and neatly fitting said recess to provide a universal joint connection between the same and said wedge element.

6. A friction draft gear as set forth in claim 5 in which the wedge element is composed of separate mating sections to permit disposition of the head of the wedge follower in the recess of said wedge element.

7. A friction draft gear comprising a casing having an inwardly tapered inner surface, friction shoes having their outer faces disposed against said surface, a wedge element having wedging cooperation with the outer ends of said friction shoes so that by inward movement thereof it is effective to urge said shoes inwardly longitudinally of the casing and also laterally outward against said tapered surface, resilient means tending constantly to urge said friction shoes and said wedge element longitudinally outwardly rela-

tive to said casing, and leaf spring means between the inner end of said wedge element and said resilient means held against inward longitudinal movement relative to said friction shoes by said resilient means and against lateral outward movement by the inner end portions of said shoes, whereby it holds the inner end portions of said shoes urged outwardly against said casing and is energized by longitudinal inward movement of said wedge element relative to said shoes and exerts a releasing force longitudinally outward upon said wedge element.

8. A friction draft gear comprising a casing, the inner surface of the front end portion of which is tapered inwardly, a plurality of friction shoes in the front end portion of said casing with their outer faces engaged with said tapered surface, a spring cap disposed against the rear ends of said shoes, resilient means exerting force constantly forwardly upon said spring cap and through the same upon said shoes, a wedge element having wedging cooperation with the front end portions of said shoes so that by rearward movement thereof it is effective to move said shoes rearwardly and also outwardly against said tapered surface, and a release spring unit interposed between said spring cap and the rear end of said wedge element and said friction shoes, said release spring unit comprising a plurality of leaf springs extending between said wedge element and said spring cap and held at their rear ends by the inner end portions of said shoes against outward movement and by said spring cap against rearward movement relative to said shoes, whereby they hold the inner end portions of said shoes urged outwardly against said casing and are energized by rearward movement of said wedge element relative to said shoes to subsequently effect releasing forward movement of said wedge element relative to said shoes.

9. A friction draft gear comprising a casing the inner surface of the front end portion of which is tapered inwardly, a plurality of friction shoes in the front end portion of said casing with their outer faces engaged with said tapered surfaces, a spring cap disposed against the rear ends of said shoes, resilient means exerting force constantly forwardly upon said spring cap and through the same upon said shoes, a wedge element having wedging cooperation with the front end portions of said shoes so that by rearward movement thereof it is effective to move said shoes rearwardly and also outwardly against said tapered surface, and a release spring unit interposed between said spring cap and the rear end of said wedge element and said friction shoes, said release spring unit comprising a block disposed against the rear end of said wedge element, a plurality of other blocks disposed against the inner faces of said friction shoes, respectively, and against the front face of said spring cap, and bowed leaf springs connecting said first mentioned block with said second mentioned blocks, respectively.

10. A friction draft gear as set forth in claim 9 in which the wedge element is provided in its inner end with a centrally located recess, and in which the first mentioned block is disposed in said recess and thereby is held centrally located relative to said wedge element.

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