June 11, 1946. A. A. BUREAU 2,401,905

FRICTION SHOCK ABSORBING MECHANISM

Filed Feb. 17, 1945

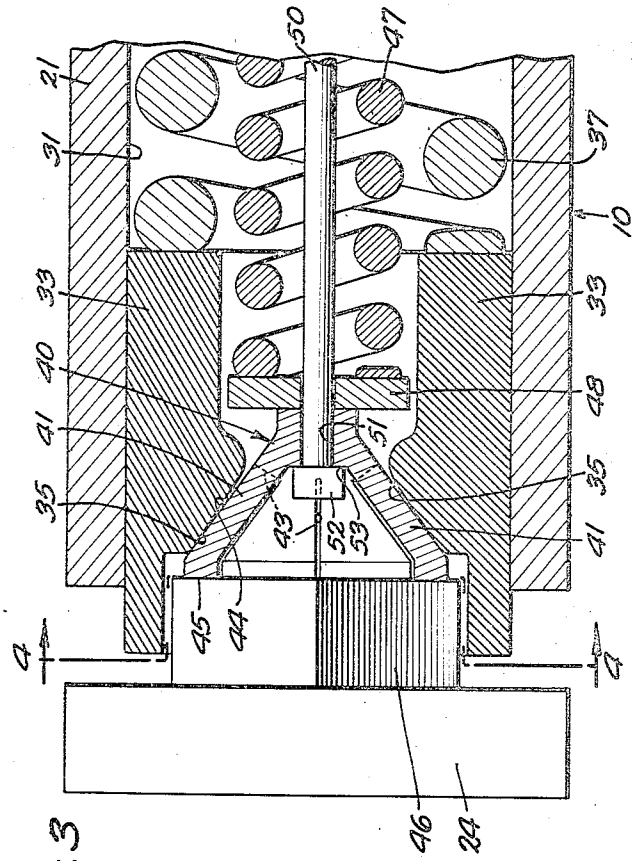


FIG. 3

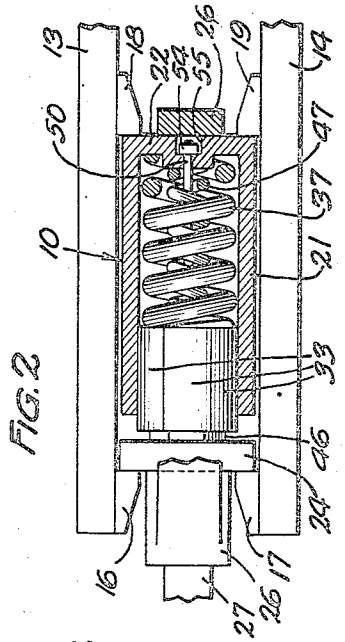


FIG. 2

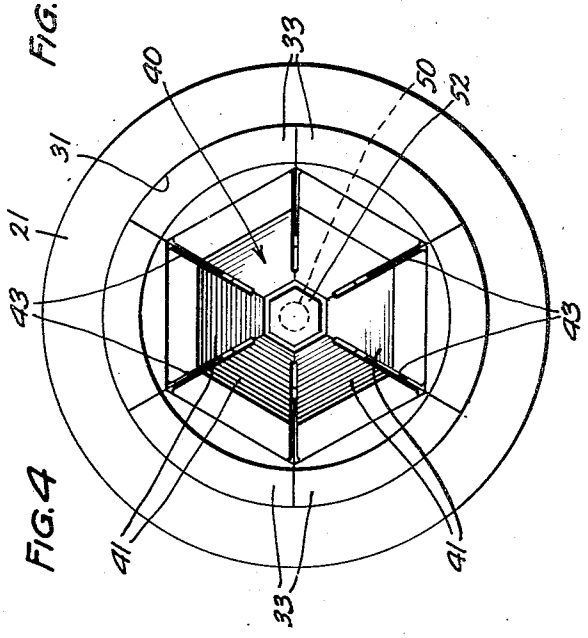


FIG. 4

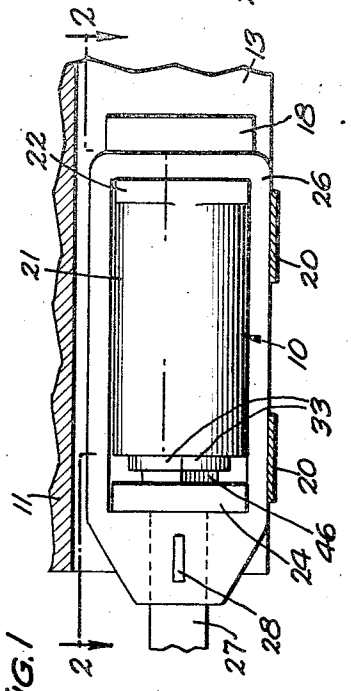


FIG. 1

INVENTOR
A. A. BUREAU
BY Harry C. Dufft
ATTORNEY

Patented June 11, 1946 2,401,905

UNITED STATES PATENT OFFICE

2,401,905

FRICTION SHOCK ABSORBING MECHANISM

Arthur A. Bureau, Chicago, Ill., assignor to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York

Application February 17, 1945, Serial No. 578,457

6 Claims. (Cl. 213—34)

1

This invention relates to a friction shock absorbing mechanism and more particularly to a draft gear for use in connecting a plurality of vehicles or railway cars.

In fraction draft gears of the type where friction shoes are used and are forced against a friction surface of a casing and moved therealong by a wedge member, the capacity of the draft gear may be increased by reducing the wedging angle of the wedge member to increase the transverse outward thrust of the shoes against the casing thereby increasing the frictional resistance to sliding movement between the shoes and the casing. However, difficulties arise in trying to increase the capacity of draft gears by this means beyond a certain point in that the wedge member becomes locked and will not release when the draft gear has been compressed and the pressure released.

An object of this invention is to provide an effective and freely releasable draft gear.

In one embodiment of the invention there is provided a draft gear comprising a cylindrical housing with inner frictional surfaces against which a plurality of segmental friction shoes are adapted to be moved longitudinally outward by a spring and moved longitudinally inward and radially outward by a hollow, slotted, pyramidal wedge member having flexible diverging wedge faces engaging cooperating inclined faces on the friction shoes. The wedge member is urged longitudinally outward by a spring and engages a follower which is movable relative to the housing.

The invention will be more fully understood from the following description taken in connection with the accompanying drawing illustrating a preferred embodiment, in which

Fig. 1 is a vertical longitudinal section through a portion of a car body showing the draft gear in place thereon;

Fig. 2 is a horizontal section taken on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged, fragmentary, vertical, sectional view showing a portion of the draft gear, and

Fig. 4 is an end view of the draft gear indicated by the line 4—4 of Fig. 3.

Referring to the drawing, there is shown in Fig. 1 a draft gear 10 mounted on the underneath side of a vehicle body or railway car 11. The car 11 is provided with a pair of spaced, centrally located frame members 13 and 14 having secured thereto a pair of draft lugs 16 and 17 and a pair of buffer lugs 18 and 19. The draft gear 10, located between the frame members 13 and 14, is

2

positioned between and engages the draft lugs 16 and 17 and the buffer lugs 18 and 19 and is supported by plates 20—20 attached to the frame members 13 and 14.

The draft gear 10 comprises a cylindrical housing or casing 21 open at the forward end and closed at the rear end by an integral wall 22 which extends outwardly therefrom to form a rectangular follower engaging the buffer lugs 18 and 19. The shock absorbing mechanism is enclosed within the housing 21 and projects forward therefrom and abuts a follower block 24 which engages the draft lugs 16 and 17. A yoke 26 surrounds the draft gear and is connected to a coupler 27 by a key 28.

The housing 21 is provided with an inner cylindrical friction surface 31 against which a plurality of segmental friction shoes or members 33 slidably engage. Each of the shoes 33 is provided with an outer cylindrical friction surface for engaging the cylindrical surface 31 of the housing and is provided with an inclined wedge face 35. The segmental shoes 33 are arranged adjacent each other so as to form an expansible cylindrical friction drum for frictionally engaging the housing, and with the flat inclined wedge faces 35 directed longitudinally outward and radially inward, as seen in Fig. 3. A helical compression spring 37, enclosed within the housing and engaging the end wall 22 thereof, engages the ends of the shoes 33, urging them outward and opposing inward movement thereof.

A hollow pyramidal wedge member 40 engages the wedge faces 35 of the shoes 33 and moves the shoes longitudinally inward and simultaneously force them radially outward when a force is applied thereto as will appear hereinafter. The wedge member 40 is provided with a plurality of flat, converging, wall portions 41 which are separated from adjacent wall portions 41 by slots 43 extending inwardly from the diverging ends thereof so as to provide a slight flexibility to each of the inclined wall portions 41. The walls 41 have flat wedge faces 44 thereon which may be disposed at an angle parallel to the faces 35 of the shoes 33 or they may be disposed at a slightly greater or lesser angle so as to initially engage the faces 35 at one end thereof. As shown in Fig. 3 the faces 44 of the wedge member 40 are disposed at a slightly greater angle from the axis of the draft gear than the faces 35 so that they engage the faces 35 at the outer end thereof. One end of the wedge member 40 is provided with a seat 45 which engages an extension 46 of the follower block 24.

The other end of the wedge member is engaged by one end of a compression spring 47, a washer 48 being interposed therebetween and the other end of the spring engaging the end wall 22 of the housing 21. A rod 50 for retaining the wedge member, shoes and springs in assembled relation is provided and passes through an aperture 51 in the wedge member 40 with the head 52 of the rod engaging a shoulder 53 on the wedge member 40. The other end of the rod passes through an aperture in the end wall 22 and has a nut 54 threaded on it which fits within a recess 55 provided in the wall 22.

In the operation of the friction draft gear, upon application of a force thereto, either buff or draft, there is relative movement between the follower 24 and the housing 21 which in effect moves the wedge member 40 longitudinally inward relative to the housing. The wedge member 40, engaging the shoes 33, forces them radially outward into tight engagement with the friction surface 31 of the housing and longitudinally inward along the surface 31. In moving longitudinally inward the flexible walls 41 flex until they are parallel to and fully engage the wedge faces 35. Upon release of the applied force to the draft gear, the spring 47 will move the wedge member 40 outward and release the wedging pressure to the shoes 33 which will be moved longitudinally outward by the spring 37 simultaneously with the outward movement of the wedge 40. When the pressure applied by the follower 24 to the wedge 40 is removed the flexible wall portions 41 of the wedge yieldingly engage the wedge faces 35 of the shoes 33 and may be readily released therefrom by the pressure of the spring 47 applied thereto. The spring action of the flexible wall portions 41 in tending to assume its normal position aids in the releasing of the wedge from the shoes 33 in the compressed position of the draft gear.

What is claimed is:

1. In a draft gear, a housing having inner friction surfaces, a plurality of friction shoes slidably engaging the friction surfaces of said housing, each of said shoes having a wedge face, a wedge member having a plurality of flexible, inclined wedge faces for engaging said wedge faces of said shoes, a pressure transmitting member engaging said wedge member and movable relative to said housing, means for yieldingly opposing the longitudinal inward movement of the shoes, and means for urging said wedge member longitudinally outward.

2. In a draft gear, a cylindrical housing having inner friction surfaces, a plurality of segmental shoes engaging said friction surfaces of said housing, each of said shoes having an inclined wedge face, a hollow pyramidal wedge member having a plurality of flat flexible inclined wall portions for engaging said inclined wedge faces of said friction shoes, a follower member engaging said wedge member, resilient means for urging the shoes longitudinally outward, and resilient means for urging said wedge longitudinally outward.

3. In a friction shock absorbing mechanism, a follower member, a relatively movable housing having inner friction surfaces, a hollow pyramidal wedge member engaging said follower

member, said wedge member being slotted to form a plurality of flexible diverging wall portions having wedge faces, a plurality of friction shoes engageable with said wedge members and said housing, each of said shoes having an inclined face engaging said flexible diverging wedge faces of said wedge member and having a friction surface for slidably engaging said friction surfaces of said housing, spring means for urging said shoes in a longitudinally outward direction and for opposing the movement of said shoes in the opposite direction, and spring means for urging said wedge member longitudinally outward.

4. In a friction shock absorbing mechanism, a cylindrical housing and a cylindrical inner friction surface, a plurality of segmental friction shoes, each shoe having a cylindrical friction surface slidably engaging the cylindrical friction surface of said housing and having a wedge face, a hollow pyramidal wedge member having flexible diverging wall portions separated from adjacent wall portions and joined together at the apex of said wedge member, said wall portions being provided with wedge faces engaging the wedge faces of said shoes, said wedge faces on said wedge member being disposed at a slightly greater angle than said wedge faces on said shoes so that in the normal expanded position of said shock absorbing mechanism the wedge faces on said wedge member contact the wedge faces of the shoes at one end thereof, spring means for urging said shoes longitudinally outward, spring means for urging said wedge member longitudinally outward, and a pressure transmitting member engaging said wedge member.

5. In a draft gear, a housing having inner friction surfaces, a plurality of friction shoes slidably engaging the friction surfaces of said housing, each of said shoes having a wedge face, a wedge member having a plurality of flexible inclined wedge faces for engaging the wedge faces of said shoes, said wedge faces on said wedge member being disposed at a slightly greater angle than said wedge faces on said shoes so that in the normal expanded position of said draft gear the wedge faces on said wedge member contact the wedge faces of the shoes at one end thereof, a follower engaging said wedge member, means for urging said shoes longitudinally outward, and means for urging said wedge member longitudinally outward.

6. In a friction shock absorber mechanism, a housing having inner friction surfaces, a plurality of friction shoes slidably engaging the friction surfaces of said housing, each of said shoes having a wedge face, a wedge member having a plurality of flexible converging wedge faces for engaging the wedge faces of said shoes, said wedge faces on the wedge member being disposed at a slightly different angle than the wedge faces on said shoes so that in the normal expanded position of the shock absorber mechanism the wedge faces on said wedge member contact the wedge face on said shoes at one end thereof, a pressure transmitting member engaging said wedge member, means for urging said shoes longitudinally outward, and means for urging said wedge member longitudinally outward.

ARTHUR A. BUREAU.