Jan. 29, 1935. E. H. SCHMIDT 1,989,157

DRAFT GEAR

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Fig. 1.

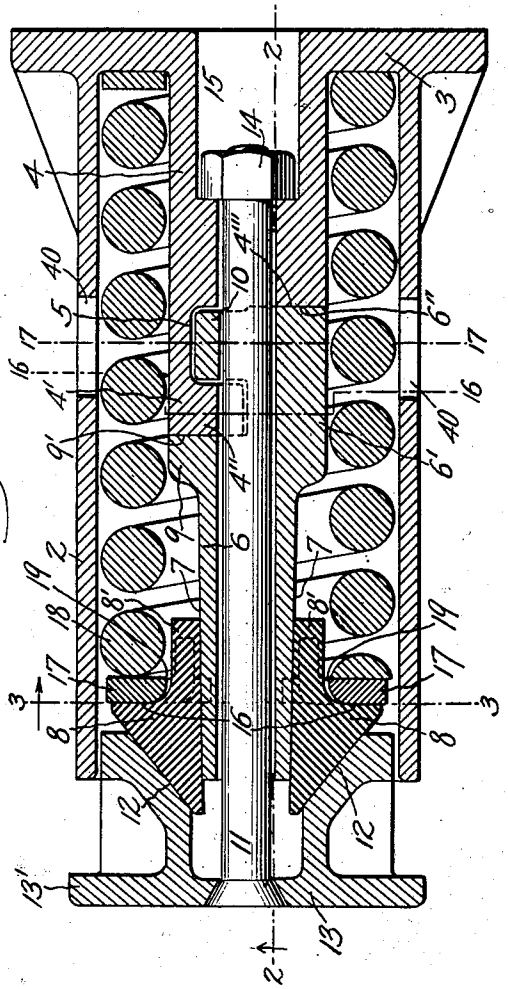


Fig. 2.

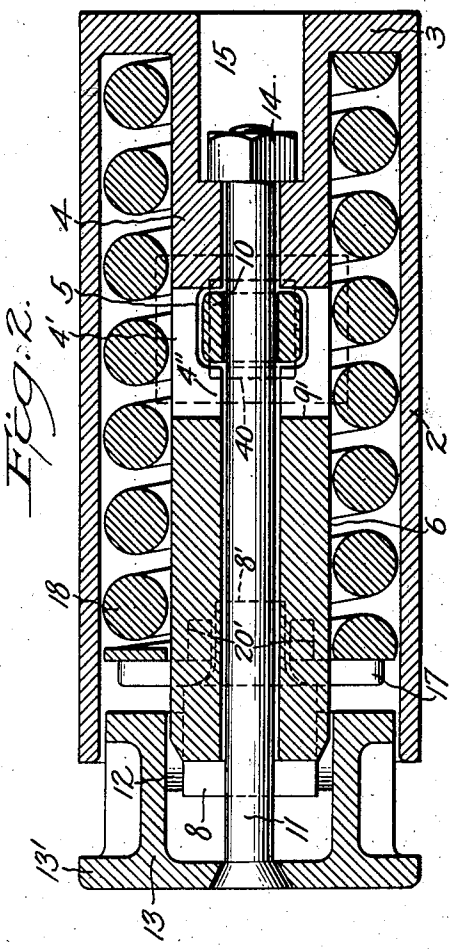


Fig. 3.

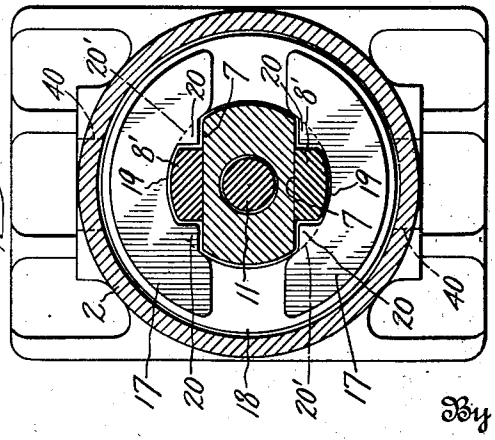
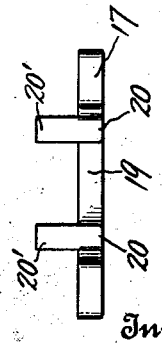


Fig. 4.



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Fig. 5.

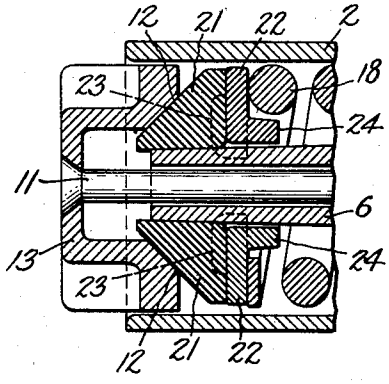


Fig. 6.

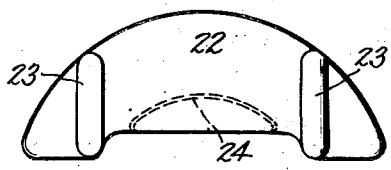


Fig. 7.

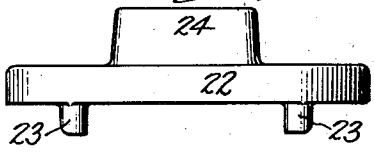


Fig. 8.

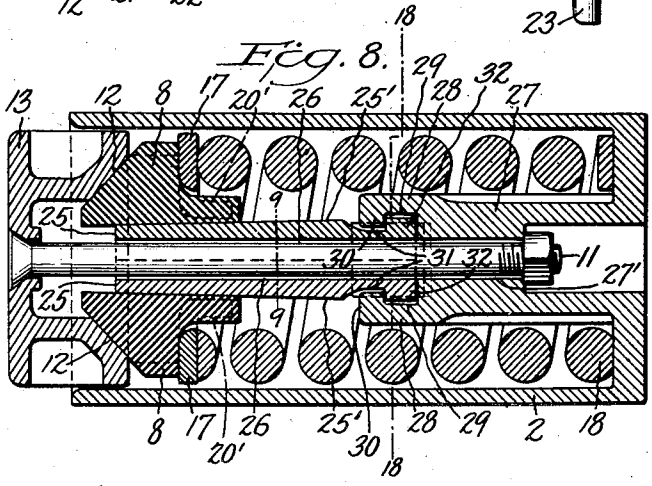


Fig. 9.

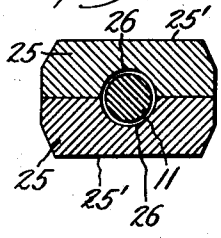


Fig. 10.

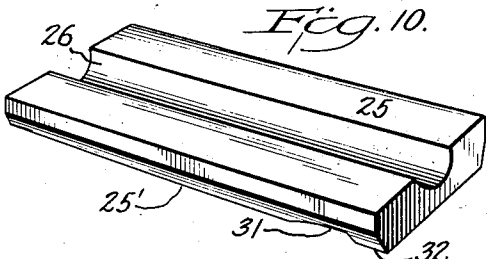


Fig. 12.

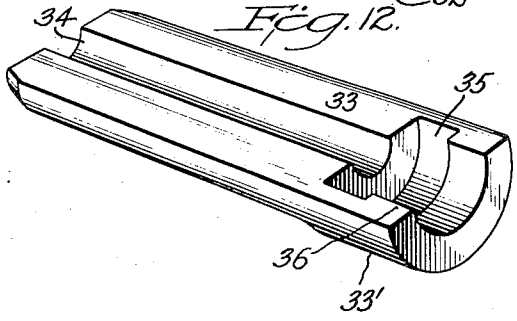
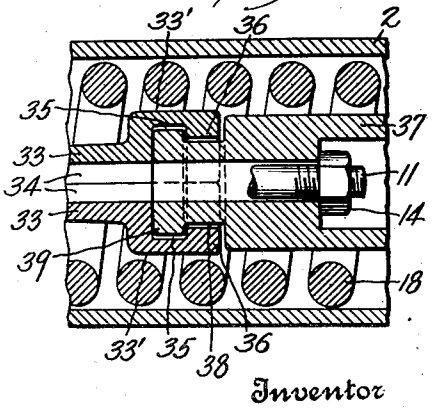


Fig. 11.



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Fig. 13.

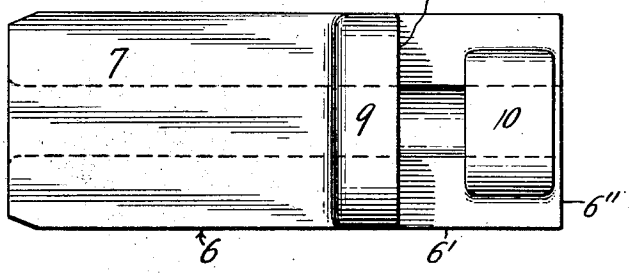


Fig. 14.

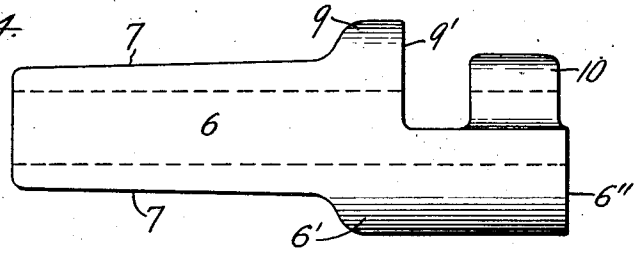


Fig. 15.

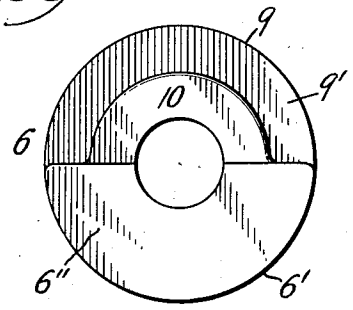


Fig. 17.

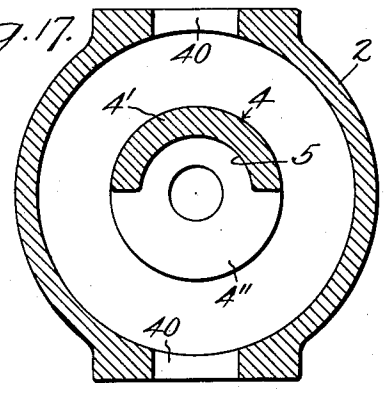


Fig. 16.

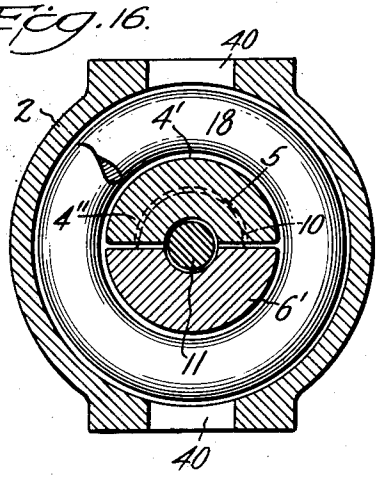
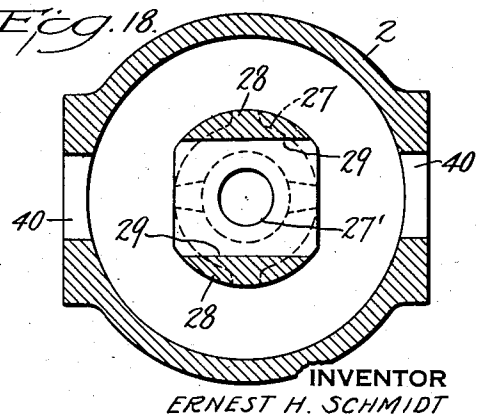


Fig. 18.



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UNITED STATES PATENT OFFICE

1,989,157

DRAFT GEAR

Ernest H. Schmidt, Cleveland Heights, Ohio, assignor to National Malleable and Steel Castings Company, Cleveland, Ohio, a corporation of Ohio

Application November 18, 1930, Serial No. 496,387

10 Claims. (Cl. 213—36)

This invention has for its object the provision of a novel and improved railway draft gear. One of the features of the invention resides in the provision of improved spring seating means for cooperation with the friction shoes of a draft gear whereby the spring seating means and shoes are maintained in proper relation to each other and full bearing of each shoe upon its associated spring seat is insured. The invention also provides effectively for preventing the spring seating means from engaging the case of the draft gear. A further feature comprises the provision of novel and efficient means whereby a central friction member separable from the gear case may be interengaged with said case and retained in engagement therewith. Other features of the invention will be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a longitudinal sectional view of one form of draft gear embodying my invention.

Fig. 2 is a sectional view on line 2—2 of Fig. 1.

Fig. 3 is a transverse sectional view on line 3—3 of Fig. 1.

Fig. 4 is a detail end elevational view of one of the spring seats shown in Figs. 1, 2, and 3.

Fig. 5 is a detail longitudinal sectional view showing a modified form of spring seat and friction shoes substituted for the shoes and spring seat of the draft gear in Figs. 1 to 3.

Fig. 6 is a detail front elevation of one of the spring seats on Fig. 5.

Fig. 7 is a detail plan view of said spring seat.

Fig. 8 is a longitudinal sectional view showing a draft gear embodying further modifications of my invention.

Fig. 9 is a detail transverse sectional view on line 9—9 of Fig. 8.

Fig. 10 is a perspective view showing one of the components of the central friction member of Fig. 8.

Fig. 11 is a detail longitudinal sectional view showing a further modified form of central friction member interengaged with the draft gear case.

Fig. 12 is a perspective view of one of the components of the central friction member of Fig. 11.

Fig. 13 is a plan view of the central friction member of Figs. 1 to 3.

Fig. 14 is a side elevation of said central friction member of Figs. 1 to 3.

Fig. 15 is a front end elevation of said central friction member.

Fig. 16 is a transverse sectional view on line 16—16 of Fig. 1.

Fig. 17 is a transverse sectional view on line 17—17 of Fig. 1, with the central friction member, spring, and retaining bolt omitted.

Fig. 18 is a transverse sectional view on line 18—18 of Fig. 8, with the central friction member and retaining bolt omitted.

Similar reference numerals designate similar parts throughout the several views.

Referring to the form of my invention shown in Figs. 1, 2, and 3 of the drawings, there is shown a draft gear including a case 2, which has extending inwardly from its rear end wall 3 a central projection 4. Said projection includes a forward extension 4' shown as semi-cylindrical in shape, and provided with a semi-circular recess 5. Interengaged with projection 4 is a central friction member 6 having upper and lower friction surfaces 7, 7, engaged by the respective friction shoes 8, 8. Said central friction member is provided with an upwardly extending projection 9, the rear face 9' of which is adapted to abut the front end of the extension 4'. Also, said central friction member has a rear portion 6' complemental to the forward portion 4' of projection 4; said rear portion 6' having an upward projection 10 which fits into the recess 5 while the flange or shouldered portion 4'' of extension 4' forward of said recess fits between the lugs or projections 9, 10 aforesaid. The forward end 6'' of said portion 6' of the central friction member abuts the face 4''' of projection 4. The projection 4, together with its extension 4', and the central friction member 6, together with its extension 6' and lug 10, are recessed to receive a retaining bolt 11 which extends longitudinally through said elements as shown.

The inclined faces of the friction shoes 8, 8, are engaged by the correspondingly inclined surfaces 12, 12, of a wedge 13. The bolt 11 serves not only to retain the central friction member and projection 4 in interengaged relation but also extends through the wedge 13, as shown, and thus maintains the latter, together with the shoes 8, 8, in assembled relation to the case 2. A nut 14 is applied to the rear end of bolt 11 and is received within a counterbored portion 15 of the projection 4.

The rear face 16 of each of the friction shoes is engaged by a corresponding one of a pair of spring seat members 17, 17. Both of said spring seat members are engaged by the forward end of the spring 18, which is located within the case 2 and surrounds the friction member 6 and projection 4 aforesaid, said spring bearing at its rear end against the wall 3 of the case. Each

of the spring seats 17, 17 is provided with a notched portion 19, through which projects a rearward extension 8' of the associated friction shoe. Shoulders 20, 20 in said notched portion cooperate with the sides of the extensions 8' of the associated shoe for preventing angular movement of the spring seat with respect to said shoe, a full bearing of each shoe upon the associated spring seat being thus assured. The shoulders 20, 20 of each spring seat are extended beyond the rear face of the seat to form extensions or lugs 20', 20', and the latter, as shown, extend inside the coils of the spring 18. The distance from each lug 20' to the inner surface of the adjacent coil of said spring is less than the distance from the outer surface of the spring seat to the inner wall or surface of the case 2. Movement of each spring seat transversely of the case a sufficient extent to engage the side of the case is thus prevented by the engagement of lugs 20' with the spring 18. It will be further noted that through the projections 8' of the shoes 8 the latter are afforded an extended bearing on the friction member 6.

It will be apparent that compression of the gear in either buff or pull produces relative movement between the shoes 8, 8 and the central friction member and that compression of said gear is resisted both by the spring 18 and by the friction generated between said shoes and friction member. The surfaces 7, 7 of said friction member are shown flat for engagement by the corresponding flat surfaces of the shoes, and, in addition, said surfaces 7, 7 are shown inclined or tapered upwardly from front to rear with respect to the longitudinal axis of the gear; such taper of the friction member increasing the friction developed during compression of the gear. The amount of taper may, of course, be varied as desired, or the faces 7, 7 may be parallel to the longitudinal axis of the gear. The distance between the flange 13' of the wedge and the front end of the case is such that said flange will engage said end of the case just before the spring 18 is driven solid, thereby protecting said spring against oversolid blows.

It will be noted that while a single spring 18, common to both friction shoes, is provided, separate spring seats are provided for the respective shoes. With this arrangement, if any sticking of one of the shoes should occur, a substantial portion of the power of the spring is nevertheless available for action upon the other shoe.

In Figs. 5 and 6 there are shown modified forms of spring seat and friction shoes which may be substituted for the spring seats and shoes of Figs. 1, 2, and 3. The friction shoes 21, 21 of Figs. 5 and 6 are engaged by the respective spring seat members 22, 22. Each of said spring seats has on its forward face a pair of lugs 23, 23, which extend on opposite sides of the associated shoe 21 for preventing angular movement between said shoe and spring seat. Extending from the rear face of each spring seat is a flange 24 which projects inside the spring 18 and is engageable with said spring, to prevent the spring seat from moving a sufficient distance transversely of the case to engage the latter.

In Fig. 8 there is shown a draft gear employing a modified form of central friction member and a correspondingly modified means for interengaging the latter with the case 2. Otherwise, the elements in Fig. 8 are the same as those in Fig. 1. The central friction member shown in Fig. 8, and also in Figs. 9 and 10, consists of two component elements 25, 25, each having a slightly inclined or tapered plane surface 25' for engagement with the corresponding shoe 8. The opposite surface of each of said friction elements 25, 25 is recessed at 26 for the reception of the retaining bolt 11. The case 2 has an inwardly extending central projection 27 having an opening 27' for the retaining bolt 11. Said extension 27 is provided with forward extensions 28, 28 (Figs. 8 and 18) which are undercut or recessed at 29, 29, to provide lugs 30, 30, respectively. The respective central friction member sections 25, 25 are notched at 31, 31 to provide lugs 32, 32, which lugs are inserted into the respective recesses 29, 29, as shown. The lugs 30, 30 are at the same time adapted to enter into the notched portions 31, 31 of said sections, and to engage the respective lugs 32, 32. The sections 25, 25 of the friction member may be conveniently assembled into proper relation to each other and to the case 2 by inserting the upper section into one side of the case and engaging its lug 32 with the adjacent side portion of the upper recess 29, and inserting the lower section into the opposite side of the case and engaging its lug 32 with the adjacent portion of the lower recess 29, and then shifting the respective sections 25, 25 laterally in opposite directions until the upper section overlies the lower and their recesses 26 are in registry with each other and with the opening 27' of extensions 27.

A further alternative construction of friction member is shown in Figs. 11 and 12. The friction member there shown consists of two sections 33, 33, each of which has a friction face for engagement by the associated friction shoe and is recessed on its opposite surface at 34 for the reception of the retaining bolt 11. At its rear end each section 33 has a curved portion 33' in the interior of which is a counter-sunk semi-annular recess 35 and a semi-annular lip or flange 36. The extension 37 from the rear wall of the case 2 has a projection comprising an annular recessed portion 38 and an annular flange 39. The sections 33, 33 may be readily fitted into engagement with said projection by engaging the flanges 36 of the respective sections with the annular recess 38, at which time the flange 39 engages the recesses 35 of said sections as shown in Fig. 11.

The case 2 may be provided with openings 40, 40, in the opposite sides, as shown in Figs. 17 and 18, said holes being positioned opposite the forward portion of the central inwardly extending projection of the case so that the surfaces thereof may be readily cleaned and smoothed prior to the engagement of the central friction member therewith.

The terms and expressions which I have employed are used as terms of description and not of limitation, and I 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.

I claim:

1. In a draft gear, a case, a friction member in said case, a friction shoe engaging said friction member, a spring seat engaging said friction shoe, a spring engaging said spring seat, said friction shoe having an extension engaging said friction member and projecting through said spring seat, means on said spring seat cooperating with the sides of said shoe for preventing angular movement between said shoe and said seat,

and means on said spring seat extending inside said spring for preventing movement of said seat into engagement with said case.

2. In a draft gear, a central friction member, friction shoes engaged with said member, on opposite sides thereof, spring seat members engaging the respective shoes, interengageable means on said spring seat members and their respective shoes for preventing angular movement therebetween, and a spring common to said spring seat members and engaging the same.

3. In a draft gear, friction shoe members, spring seat members engaging the respective shoe members, means carried by one of said members for engagement with opposite sides of the other respective member for preventing angular movement between each shoe member and its associated spring seat member, a friction member engaged by said friction shoe members, spring means engaging said spring seat members for resisting movement of said shoe members in one direction, and wedge means engaging said shoe members and adapted to move the latter against the action of said spring means.

4. In a draft gear, friction shoe members, spring seat members engaging the respective shoe members, means carried by one of said members to engage the other respective member for preventing angular movement between each shoe member and its associated spring seat member, a spring common to said spring seat members, one end of said spring engaging said spring seat members for opposing movement of said shoes, abutment means for the opposite end of said spring, and means cooperating with said shoes for moving the same against the action of said spring and for causing friction to be developed during said movement.

5. In a draft gear, a case circular in cross section, friction shoe members in said case, spring seat members engaging the respective shoe members, spring means bearing against an end of said case and engaging said spring seat members, interengageable means on each spring seat member and the respective friction shoe member for preventing angular movement therebetween, and means cooperating with said shoe members for moving the same against the action of said spring means and for causing friction to be developed during said movement.

6. In a draft gear, a case circular in cross section, friction shoe members in said case, spring seat members engaging the respective shoe members, a spring bearing at one end against an end of said case and engaging said spring seat members at its opposite end, interengageable means on each spring seat member and the respective friction shoe member for preventing angular movement therebetween, and means cooperating with said shoe members for moving the same against the action of said spring and for causing friction to be developed during said movement.

7. In a draft gear, a case circular in cross section, friction shoe members in said case, spring seat members engaging the respective shoe members, a spring bearing at one end against an end of said case and engaging said spring seat members at its opposite end, interengageable means on each spring seat member and the respective friction shoe member for preventing angular movement therebetween, said spring seat members having means cooperating with said spring means for preventing engagement between said spring seat members and said case, and means cooperating with said friction shoe members for moving the same against the action of said spring and for causing friction to be developed during said movement.

8. In a draft gear, a case, a central friction member in said case, friction shoes engaged with said member on opposite sides thereof, spring seat members engaging the respective shoes, interengageable means on said spring seat members and their respective shoes for preventing angular movement therebetween, a spring surrounding said central friction member and bearing at one end against said case, said spring at its other end engaging said spring seat members.

9. In a draft gear, a case, a friction shoe in said case, a friction element engaged by said shoe, a spring seat member engaging said shoe, a spring surrounding said friction element and engaging said spring seat, an extension on said member projecting inside said spring for cooperating with the latter to prevent engagement of said member with said case, and interengageable means on said shoe and said member preventing angular movement therebetween.

10. In a draft gear, a case, a friction member in said case, friction shoes engaging said friction member, spring seat members engaging the respective shoes and each extending as close to the case as does the associated shoe, a spring engaging said spring seat members, an extension on each said spring seat member projecting inside said spring for cooperating with the latter to prevent engagement of said member with said case, and interengageable means between each shoe and its associated spring seat member preventing angular movement therebetween, and wedge means for moving said shoes along said friction member against the resistance of said spring.

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