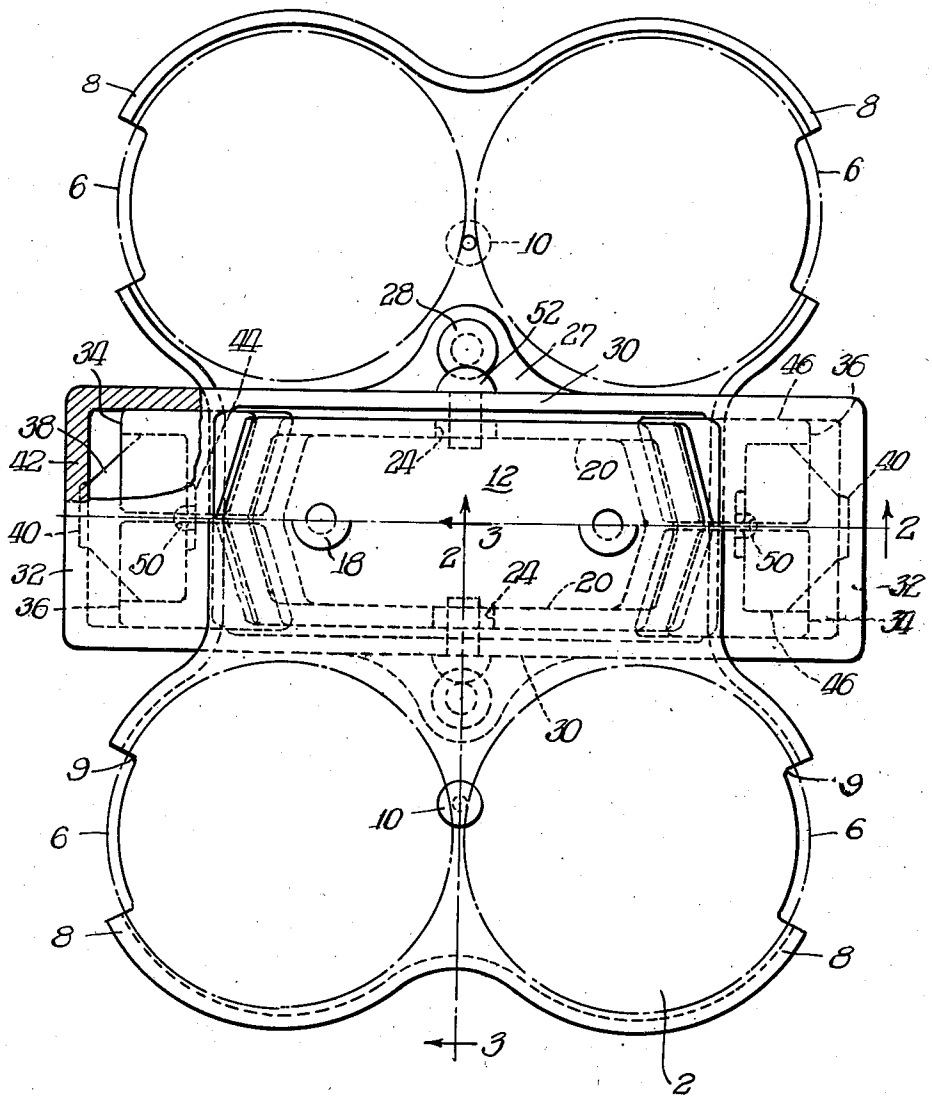
Aug. 29, 1944. D. M. LIGHT 2,357,264

SPRING GROUP

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Fig. 1.



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Fig. 2.

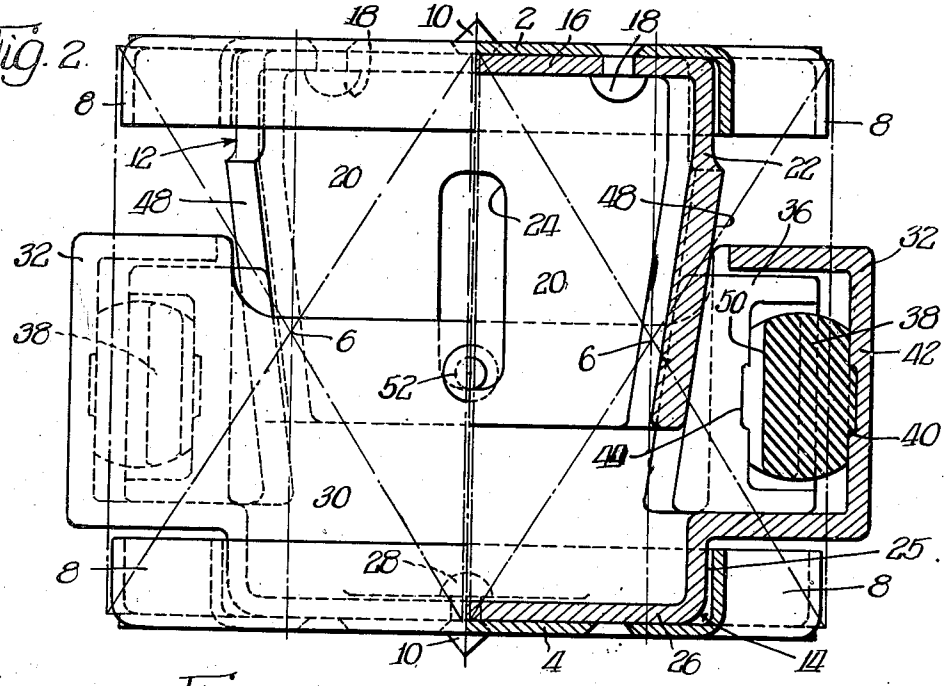
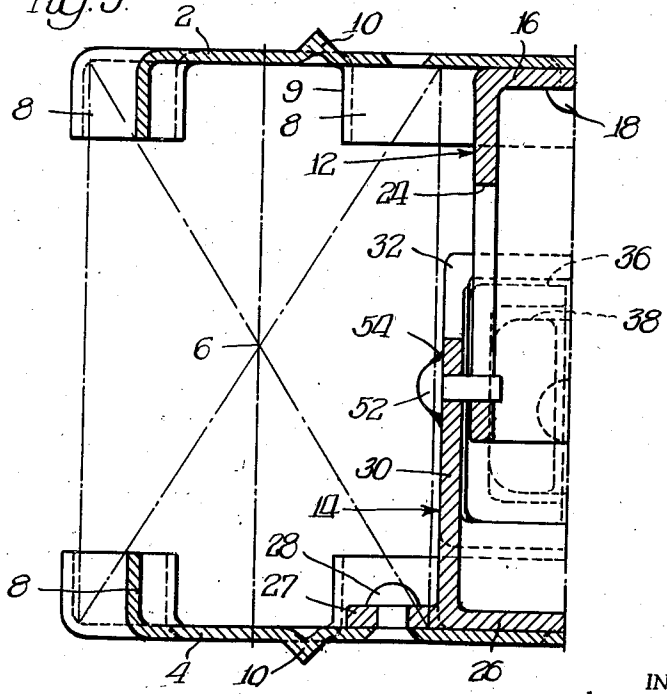


Fig. 3.



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Patented Aug. 29, 1944 2,357,264

UNITED STATES PATENT OFFICE

2,357,264

SPRING GROUP

David M. Light, Chicago, Ill., assignor to American Steel Foundries, Chicago, Ill., a corporation of New Jersey

Application October 13, 1941, Serial No. 414,751

31 Claims. (Cl. 267—9)

My invention relates to spring groups as usually utilized in railway car trucks and more particularly to such a structure wherein a plurality of coil springs may be utilized in conjunction with a snubbing means or friction absorbing device, such a combination sometimes being designated a ride control group.

The general object of my invention is to devise such a spring group capable of convenient assembling or dismantling and suitable for ready adaption to various loading devices while at the same time meeting the normal requirements of the manufacturing practice.

A specific object of my invention is to devise such a spring group comprising top and bottom spring plates between which may be secured coil springs and to which may be fixed the opposite followers of a friction device so constructed as to afford maximum wearing surfaces and long life in service.

Another object of my invention is to devise such a structure as that described wherein the bottom follower may house friction shoes and resilient means for urging said friction shoes into engagement with the side walls of the top follower.

My invention contemplates that a plurality of friction shoes may be utilized at each end of the followers, said friction shoes having reversely arranged diagonal frictional engagement with one follower, and my invention further comprehends such a structure wherein the friction shoes may be urged into engagement with friction surfaces on both followers by a single resilient means under compression between said shoes and one of said followers.

In the drawings,

Figure 1 is a top plan view of a spring group embodying my invention, one-half of the top spring plate and a portion of the top wall of the top follower being cut away in order more clearly to illustrate the structure therebeneath.

Figure 2 is an end view, partly in section, of the structure shown in Figure 1, the section being taken substantially in the transverse vertical plane bisecting the group and as indicated by the line 2—2 of Figure 1, and Figure 3 is a further sectional view taken substantially in the vertical plane bisecting the group longitudinally and as indicated by the line 3—3 of Figure 1.

My novel spring group may comprise a top spring plate 2 and a bottom spring plate 4, the end portions of each of which may have a scallop-like contour in order conveniently to conform to the coil springs confined therebetween and diagrammatically indicated at 6, 6. Each of said plates may have flanges inturned as at 8, 8, said flanges being discontinuous as at 9, 9 in order to facilitate drainage or permit escape of any other included extraneous matter. Each of the plates 2 and 4 may have formed thereon a plurality of outwardly projecting lugs, 10, 10 which may conveniently serve as positioning means therefor with respect to the supporting and supported frame members between which the group may normally be positioned. Centrally of the group and between the coils at opposite ends thereof may be positioned my novel form of friction device having the top follower 12 and the bottom follower 14, said top follower being a box-like structure open at the lower end and having a rectangular top wall 16 which may be secured as at 18, 18 by rivets or other convenient means to the top spring plate 2. Said top follower 12 may have depending side walls 20, 20 tapering slightly toward their lower ends to merge conveniently with the V-shaped tapering end walls 22, 22, said side walls 20, 20 being afforded central vertical elongated slots 24, 24 for a purpose to be mentioned.

The bottom follower 14 may also be a rectangular box-like structure, the lower portion of which may be of somewhat reduced size, as best seen in the view of Figure 2, to accommodate its convenient reception between the relatively narrow portions of the top and bottom spring plates as may be seen at 25 (Figure 2). Said bottom follower may comprise a rectangular bottom wall 26 with securing lugs 27, 27 at opposite sides thereof which may be fixed as at 28, 28 by means of rivets or other convenient means to the bottom spring plate 4. Said bottom follower 14 also may comprise side walls 30, 30 which may be continuous from end to end of the follower, said side walls thus forming parts of the rectangular cup-like end portions 32, 32 at opposite ends of said bottom follower, each of which may serve as a housing for a plurality of friction shoes 34 and 36 together with the rubber compression spring 38, one end of which may seat and be positioned as at 40 against the end wall 42 of the housing 32, and the opposite end of which may seat as at 44 against the friction shoes 34 and 36, said resilient means being normally under compression between said shoes and end wall and being effective to urge said shoes apart into engagement with friction surfaces on the side walls of the end portion 32 as at 46, 46 (Figure 1) and also operative to urge said friction shoes into engagement with the opposite faces of the V-

shaped friction surfaces **48**, **48** formed on each end wall **22** of the top follower **12**. The shoe abutting face of the rubber block or compression spring **38** may be cored away centrally thereof to form the vertical slot **50** which may afford clearance of said rubber block from the adjacent vertical edges of the shoes **34** and **36** and prevent the extrusion of the rubber thereof between said shoes under pressures which may be developed in operation.

After the parts are assembled, they may be retained in normal position by means of lugs **52** which may be centrally secured in the opposite side walls **30**, **30** of the bottom follower adjacent the upper edges thereof in any convenient manner, as by welding, as at **54**, and the inner ends of said lugs may project into the before-mentioned slots **24** in the side walls of the top follower, the engagement of said lugs in said slots thus permitting reciprocating movement between said followers but preventing accidental disengagement thereof. In dismantling the device, said lugs may readily be removed.

In my novel arrangement it will be seen that the friction shoes housed in the respective end portions of the bottom follower will be urged into engagement with the V-shaped tapering friction faces formed on the end walls of the top follower by means of the compression spring or rubber pad **38**, said rubber pad also being effective to urge said friction shoes laterally into engagement with the side walls **30**, **30** of the bottom follower. In other words, the compression spring **38** will afford a direct force path from the end wall **42** to each friction shoe and likewise from each friction shoe to the opposite friction shoe, the single resilient member thus being effective to cause frictional engagement of each shoe with both followers.

It is to be understood that I do not wish to be limited by the exact embodiment of the device shown which is merely by way of illustration and not limitation as various and other forms of the device will, of course, be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

I claim:

1. In a spring group, top and bottom plates, a coil spring and a friction device confined therebetween, said friction device comprising a top follower with V-shaped tapering friction walls, a bottom follower carrying means at opposite ends thereof for engagement with said walls, said means comprising a housing and spaced friction shoes engaging respective faces of the adjacent V-shaped wall, and resilient means under compression between said shoes and housing, said resilient means being operative to urge said shoes into engagement with said walls and also operative to urge said shoes into engagement with spaced surfaces on said housing.

2. A friction device comprising top and bottom followers, said top follower presenting spaced tapering V-shaped friction surfaces and said bottom follower housing a plurality of friction shoes for complementary engagement with each of said surfaces, said bottom follower comprising a housing at each end thereof for the adjacent friction shoes, and resilient means under compression within each housing in abutment with the adjacent shoes, said resilient means urging said shoes into engagement with the respective faces of the adjacent surface and urging said shoes laterally into engagement with spaced portions of the adjacent housing.

3. In a spring group, top and bottom plates, coil springs between said plates adjacent opposite ends thereof, and a friction device intermediate said coils and comprising top and bottom followers, said top follower presenting spaced V-shaped friction walls, and said bottom follower supporting a plurality of friction shoes for engagement with respective faces of each of said walls, said bottom follower having at each end thereof means carrying the adjacent shoes, and resilient means under compression between said shoes and carrying means and affording a direct force path between adjacent shoes and between each shoe and the adjacent carrying means.

4. In a spring group, top and bottom plates, a coil spring and a friction device confined between said plates, said friction device comprising a bottom follower, a top follower in reciprocative relation therewith, said top follower having friction end walls, and said bottom follower having end portions each affording housing for a plurality of friction shoes engaging said end walls, and resilient means urging said friction shoes into engagement with said end walls and respectively into engagement with lateral walls of the adjacent housing.

5. A friction device comprising top and bottom followers, said top follower presenting spaced tapering V-shaped friction surfaces and said bottom follower housing a plurality of friction shoes for complementary engagement with each of said surfaces, said bottom follower comprising a housing at each end thereof for the adjacent friction shoes, and resilient means under compression within each housing in abutment with the adjacent shoes, said resilient means urging said shoes into engagement with the respective faces of the adjacent surface and urging said shoes apart.

6. In a spring group, top and bottom plates, coil springs between said plates adjacent opposite ends thereof, a friction device intermediate said springs and comprising top and bottom followers, said top follower presenting spaced V-shaped friction walls, and said bottom follower supporting a plurality of friction shoes for engagement with respective faces of each of said walls, said bottom follower having at each end thereof means carrying the adjacent shoes, and resilient means under compression between said shoes and carrying means and affording a direct force path between adjacent shoes.

7. In a spring group, top and bottom plates, a coil spring and a friction device confined therebetween, said friction device comprising a top follower with V-shaped tapering friction walls, a bottom follower carrying means at opposite ends thereof for engagement with said walls, said means comprising a housing and spaced friction shoes engaging respective faces of the adjacent V-shaped wall, and resilient means under compression between said shoes and housing.

8. In a friction device, a top follower presenting spaced V-shaped friction surfaces, a bottom follower supporting a plurality of friction shoes in engagement with the respective faces of each of said surfaces, said bottom follower comprising a housing at each end thereof, and resilient means under compression between the adjacent shoes and a wall of said housing, said resilient means being operative to urge said shoes laterally into engagement with said housing and into abutment with the adjacent faces.

9. In a friction device, a top follower presenting spaced V-shaped friction surfaces, and a bot-

tom follower supporting a plurality of friction shoes in engagement with the respective faces of each of said surfaces, said bottom follower having at each end thereof a housing for the adjacent shoes, and a resilient member under compression between said shoes and a wall of said housing and affording a direct force path between respective shoes, and affording a direct force path from said wall to each of said shoes.

10. In a friction device, a top follower presenting spaced V-shaped friction surfaces, and a bottom follower supporting a plurality of friction shoes in engagement with the respective faces of each of said surfaces, said bottom follower having at each end thereof a housing for the adjacent shoes, and a resilient member under compression between said shoes and a wall of said housing and affording a direct force path between respective shoes.

11. In a spring group, top and bottom plates, a coil spring and a friction device confined therebetween, said friction device comprising a top follower with V-shaped tapering friction walls, and a bottom follower carrying means at opposite ends thereof for engagement with said walls, said means comprising a housing and spaced friction shoes engaging respective faces of the adjacent V-shaped wall.

12. A friction device comprising top and bottom followers, said top follower presenting spaced tapering V-shaped friction surfaces and said bottom follower housing a plurality of friction shoes for complementary engagement with each of said surfaces, said bottom follower comprising a housing at each end thereof for the adjacent friction shoes, and resilient means under compression within each housing in abutment with the adjacent shoes.

13. In a spring group, top and bottom plates, a coil spring and a friction device confined between said plates, said friction device comprising a bottom follower, a top follower in reciprocative relation therewith, said top follower having friction end walls, and said bottom follower housing portions of said walls and supporting friction shoes resiliently urged into engagement with said end walls.

14. In a spring group, top and bottom plates, a coil spring and a friction device confined between said plates, said friction device comprising a bottom follower, a top follower in reciprocative relation therewith, said top follower having friction end walls, and said bottom follower having end portions overlying said walls and each resiliently housing a plurality of friction shoes engaging the adjacent wall.

15. In a friction device, a top follower presenting spaced V-shaped friction surfaces, a bottom follower supporting a plurality of friction shoes in engagement with the respective faces of each of said surfaces, said bottom follower comprising a housing at each end thereof, and resilient means under compression between the adjacent shoes and a wall of said housing.

16. In a spring group, top and bottom plates, a coil spring and a friction device confined therebetween, said friction device comprising a top follower with V-shaped tapering friction walls, and a bottom follower resiliently housing friction means at opposite ends thereof for engagement with said walls, each of said means comprising a pair of shoes each in frictional engagement with both of said followers.

17. A friction device comprising top and bottom followers, said top follower presenting spaced tapering V-shaped friction surfaces, and said bottom follower resiliently housing pairs of friction shoes for complementary engagement with each of said surfaces, each of said shoes having frictional engagement with both of said followers.

18. In a friction device, a top follower presenting spaced V-shaped friction surfaces, and a bottom follower housing pairs of friction shoes in engagement with the respective faces of each of said surfaces, and a resilient member compressed between each pair of shoes and one of said followers.

19. In a friction device, a hollow top follower of wedge-like form, a bottom follower with a yoke portion partially enclosing said top follower, pairs of friction shoes housed in respective ends of said yoke-like portion in frictional engagement with said top follower, and resilient means associated with each pair of shoes.

20. In a friction device, a hollow top follower of wedge-like form, a bottom follower with a yoke portion partially enclosing said top follower, pairs of friction shoes housed in respective ends of said yoke-like portion in frictional engagement with said top follower, and resilient means associated with each pair of shoes, each of said resilient means being operative to urge the shoes of each pair into frictional engagement with both of said followers.

21. In a friction device, a hollow top follower of wedge-like form, a bottom follower with a yoke portion partially enclosing said top follower, pairs of friction shoes housed in respective ends of said yoke-like portion in frictional engagement with said top follower, and resilient means associated with each pair of shoes, each of said resilient means being compressed by the respective shoes of each pair and an adjacent wall of one of said followers.

22. In a friction device, a hollow top follower of wedge-like form, a bottom follower with a yoke portion partially enclosing said top follower, pairs of friction shoes housed in respective ends of said yoke-like portion in frictional engagement with said top follower, and resilient means associated with each pair of shoes, each of said resilient means being compressed by the respective shoes of each pair and an adjacent wall of said bottom follower.

23. In a friction device, a top follower having parallel side walls and V-shaped tapering end walls defining a wedge-like structure, a bottom follower having a yoke portion partially surrounding said walls, and pairs of friction shoes resiliently housed in the ends of said yoke portion in frictional engagement with said V-shaped tapering end walls.

24. In a friction device, a top follower having parallel side walls and V-shaped tapering end walls defining a wedge-like structure, a bottom follower having a yoke portion partially surrounding said walls, pairs of friction shoes housed in the ends of said yoke portion in frictional engagement with said V-shaped tapering end walls, and a resilient member associated with each pair of shoes and operative to urge each shoe into frictional engagement with both of said followers.

25. In a friction device, a top follower having parallel side walls and V-shaped tapering end walls defining a wedge-like structure, a bottom follower having a yoke portion partially surrounding said walls, pairs of friction shoes housed in the ends of said yoke portion in frictional engagement with said V-shaped tapering end walls, and a resilient member compressed between each

pair of shoes and an adjacent wall of one of said followers.

26. In a friction device, a top follower having parallel side walls and V-shaped tapering end walls defining a wedge-like structure, a bottom follower having a yoke portion partially surrounding said walls, pairs of friction shoes housed in the ends of said yoke portion in frictional engagement with said V-shaped tapering end walls, and a resilient member compressed between each pair of friction shoes and a wall of the adjacent yoke end.

27. In a friction device, a top follower having wedge-like form with friction walls at opposite extremities thereof, a bottom follower with a yoke portion in telescoping relationship with said top follower, and pairs of friction shoes resiliently housed in respective ends of said yoke portion in frictional engagement with said friction walls.

28. In a friction device, a top follower having wedge-like form with friction surfaces at opposite extremities thereof, a bottom follower with a yoke portion in telescoping relationship with said top follower, pairs of friction shoes housed in respective ends of said yoke portion in frictional engagement with said surfaces, and a resilient member associated with each pair of friction shoes and operative to urge each shoe into frictional engagement with both followers.

29. In a friction device, a top follower having wedge-like form with friction walls at opposite extremities thereof a bottom follower with a yoke portion in telescoping relationship with said top follower, pairs of friction shoes housed in respective ends of said yoke portion in frictional engagement with said walls, and a resilient pad compressed between the shoes of each pair and an adjacent wall of said yoke portion.

30. In a friction device, a top follower having wedge-like form with friction walls at opposite extremities thereof, a bottom follower with a yoke portion in telescoping relationship with said top follower, pairs of friction shoes housed in respective ends of said yoke portion in frictional engagement with said walls, and a resilient pad compressed between the shoes of each pair and an adjacent wall of said yoke portion and operative to urge the shoes of each pair apart and into frictional engagement with both followers.

31. In a friction device, top and bottom followers, one of said followers presenting at opposite ends of said device V-shaped diverging friction walls, the other of said followers supporting pairs of friction shoes for engagement with said walls respectively, each end of said device having a single resilient pad affording a direct force path between the shoes of the adjacent pair and between each shoe and a wall of the supporting follower.

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