Aug. 6, 1940. A. H. OELKERS 2,210,840

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Filed Sept. 12, 1939 3 Sheets-Sheet 1

Fig. 1.

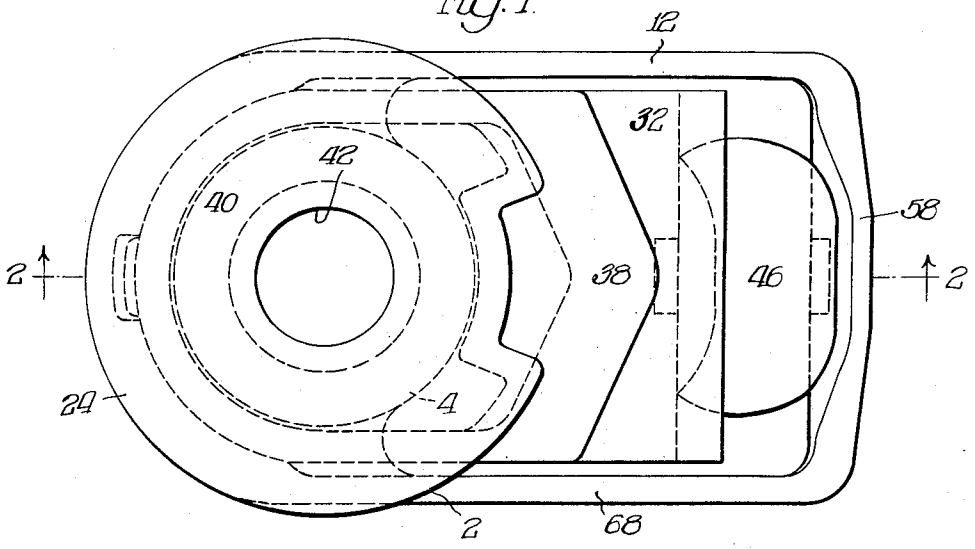
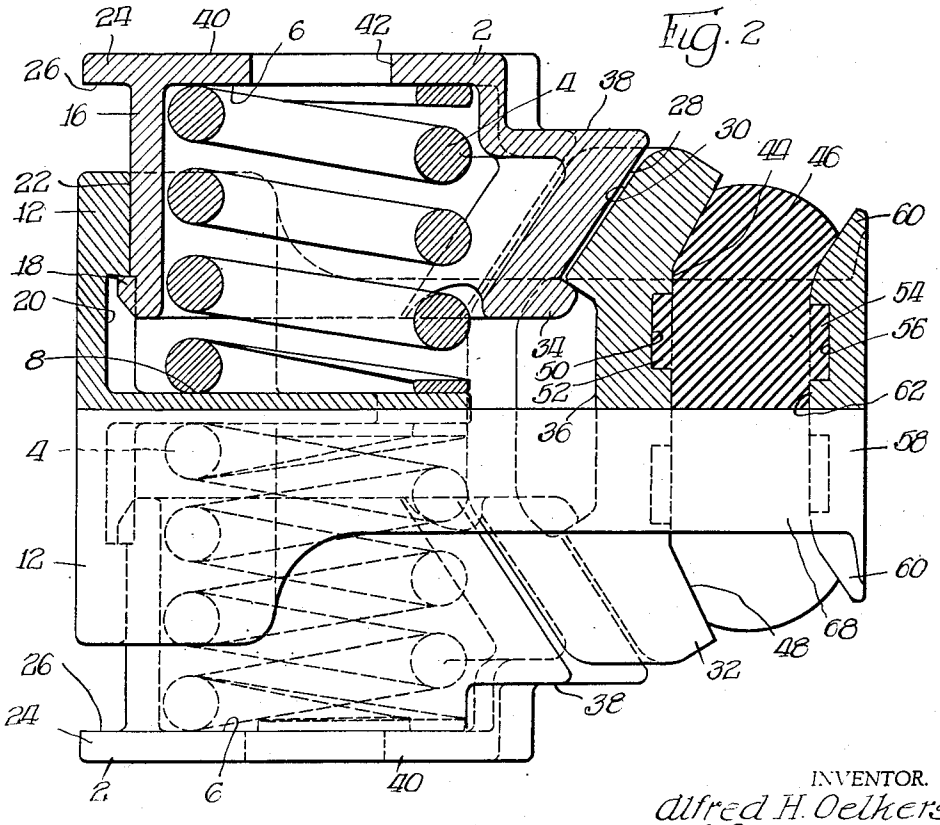


Fig. 2.



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Filed Sept. 12, 1938 3 Sheets-Sheet 2

Fig. 3.

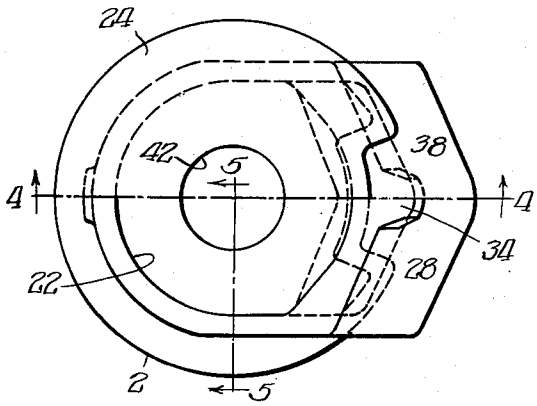


Fig. 5.

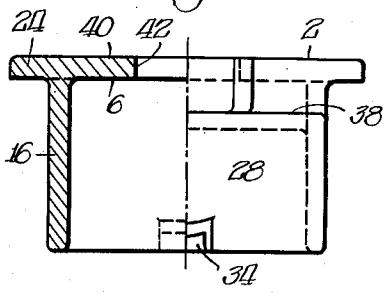


Fig. 6.

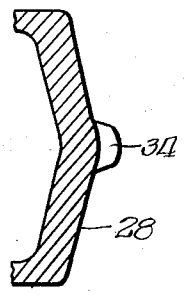


Fig. 4

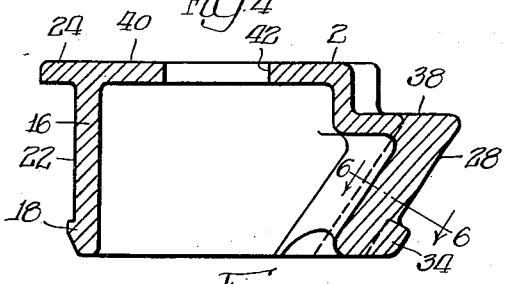


Fig. 7.

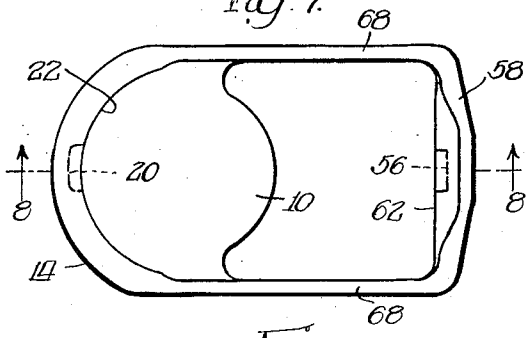


Fig. 9

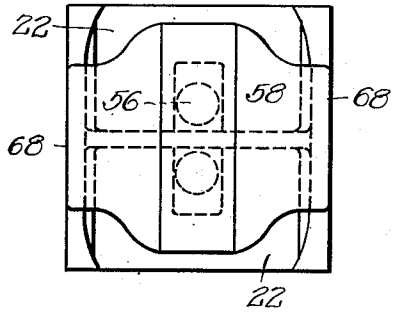
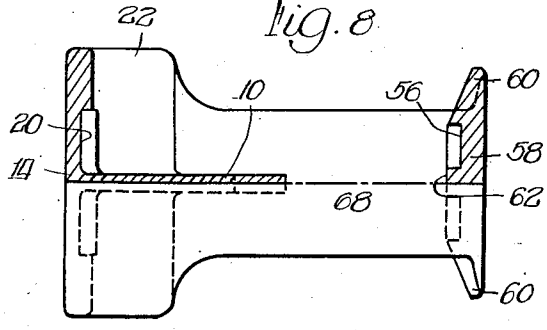


Fig. 8.



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Filed Sept. 12, 1938 3 Sheets-Sheet 3

Fig. 10

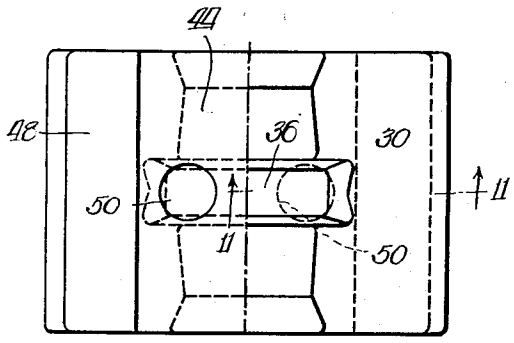


Fig. 12

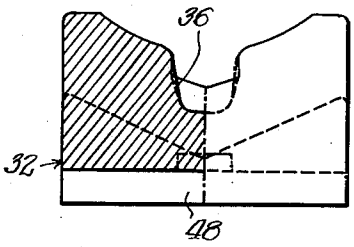


Fig. 11

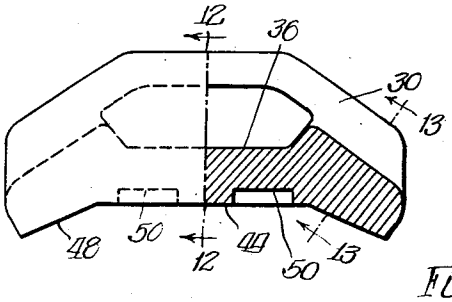


Fig. 13

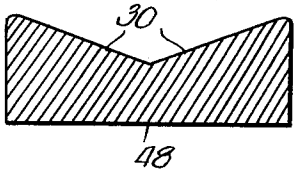


Fig. 14

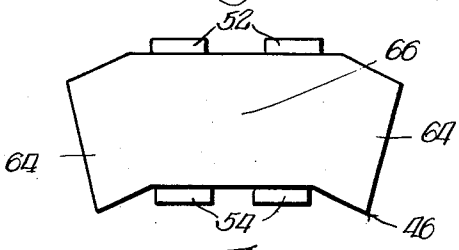
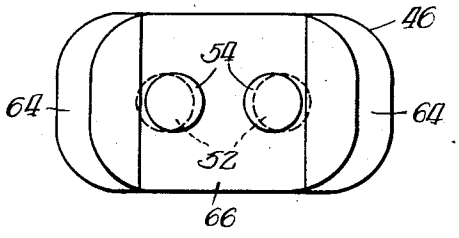


Fig. 15



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Patented Aug. 6, 1940 2,210,840

UNITED STATES PATENT OFFICE

2,210,840

SNUBBER

Alfred H. Oelkers, Chicago, Ill., assignor to American Steel Foundries, Chicago, Ill., a corporation of New Jersey

Application September 12, 1938, Serial No. 229,545

28 Claims. (Cl. 267—9)

My invention relates to a friction absorbing device particularly suitable for use on railway rolling stock.

It is frequently desirable to substitute a snubber device or friction absorbing arrangement in a railway freight car to take the place of a single coil spring. Experience has shown that it is exceedingly difficult, if not impossible, to design an adequate friction absorbing mechanism within the space which ordinarily accommodates such a single coil. A multitude of such devices have been tried out and discarded and certain designs are at present in use. In most cases the life for such a mechanism is relatively short because of the impossibility of placing within so restricted a space the amount of metal required in order that it may be over a period of time frictionally worn away and yet continue to function efficiently over such a period as will make the device economically practicable. Under such circumstances I have devised a novel form of friction absorbing device which in most cases may be substituted for such a single coil but which, at the same time, requires somewhat greater space than such a coil. That portion of my mechanism which can not be included within the space ordinarily occupied by the coil spring is so positioned and arranged with respect to the remaining parts thereof that it may usually be substituted for the coil spring without interfering with the other parts embodied in the standard truck arrangements.

Generally stated, the object of my invention is to design an efficient shock absorbing mechanism suitable for replacement of the single coil spring in railway equipment and having a relatively long life as compared with the usual such mechanism.

My invention comprises a novel arrangement of top and bottom followers housing a compression spring and having frictional engagement with a side wedge, all of said parts being held in assembled relationship by a novel yoke arrangement in combination with a rubber spring.

Figure 1 is a top plan view of a friction absorbing device embodying my invention;

Figure 2 is a side elevation thereof, partly in section, the section being taken substantially in the vertical plane bisecting the device and as indicated by the line 2—2 of Figure 1;

Figures 3, 4, 5 and 6 show the follower wedge, Figure 3 being a plan view thereof, one half showing the top plan and the other half the bottom plan view; Figure 4 is a sectional view bisecting the follower wedge on its long axis and substantially in the plane indicated by the line 4—4 of Figure 3; Figure 5 is an end elevation taken from the right as seen in Figures 3 and 4 and half in section, the section being taken substantially in the plane indicated by the line 5—5 of Figure 3; and Figure 6 is a sectional view through the friction surface of the follower wedge, the section being taken substantially in the plane indicated by the line 6—6 of Figure 4.

Figures 7, 8 and 9 show the retaining yoke associated with my snubbing device, Figure 7 being a top plan view thereof; Figure 8 is a side elevation, half in section, the section being taken in the plane bisecting the yoke and substantially as indicated by the line 8—8 of Figure 7; and Figure 9 is an end elevation of said yoke, the view being taken from the right as seen in Figures 7 and 8;

Figures 10 to 13, inclusive, show the side wedge for my novel friction absorbing device, Figure 10 being a plan view, the left half showing the plan of the outer face thereof and the right half showing the plan of the inner face thereof; Figure 11 is a side elevation, half in section, the section being taken substantially in the plane bisecting the wedge and as indicated by the line 11—11 of Figure 10; Figure 12 is an end view, half in section, the section being taken in a plane bisecting the wedge and substantially as indicated by the line 12—12 of Figure 11; and Figure 13 is a sectional view through the friction surface of the wedge and substantially as indicated by the line 13—13 of Figure 11;

Figure 14 is a side elevation of the rubber spring used in my device; and Figure 15 is a plan view thereof.

Describing my novel friction absorbing device in more detail and with particular reference to the assembly drawing (Figures 1 and 2), it will be seen that the snubber comprises the top and bottom follower wedges 2, 2, identical in form, and comprising cup-like structures within each of which may be housed a compression spring 4, one end of said spring being positioned against the spring seat 6 formed by the outer wall of said housing, the opposite end of the spring being positioned as at 8 against the horizontal wall or spring seat 10 (Fig. 8) which serves also as a reinforcement of the yoke structure generally indicated at 12. The yoke 12 comprises an end portion 14 of generally cylindrical form as best seen from a consideration of Figures 7 and 8, said cylindrical end portion being divided into top and bottom halves by the before mentioned horizontal wall 10. Against the

inner face of said cylindrical wall portion 14 may be seated the follower wedge cylindrical wall 16 of complementary form, the inner edge of said follower wedge wall having the central lug 18 which is received within the vertical channel 20 formed on the inner face of the yoke wall 12. Thus, the wall 16 of the follower wedge and the complementary wall 12 of the yoke have sliding frictional engagement along the cylindrical surface indicated at 22. The follower wedges are formed with the outer annular flanges 24, 24 overhanging as at 26 the cylindrical end wall of the yoke.

Each of the follower wedges has the diagonally arranged wedge-shaped friction surface 28 formed on the wall opposite the cylindrical portion 16, the form of which friction surface is best seen from a consideration of Figures 3 and 4. The friction surface 28 against which may be seated the friction surface 30 formed on the side wedge 32 has a shallow V-shaped groove at one end thereof. At the opposite end of said side wedge is an identical shallow V-shaped friction surface for engagement with the follower wedge at the other end of the device. At the inner edge of the sloping wall of each follower and centrally thereon is formed the retaining lug 34, said lugs being received in and cooperating with the vertical channel 36 on the side wedge 32, thus retaining the various parts in assembly.

It may be noted that the sloping wall of each follower is formed only on the central portion of the follower, the said wall thus having the offset or shelf indicated at 38 and permitting the outer face of the follower 2 to have the generally circular configuration indicated at 40 and serving as seating means for the device, said seating means being suitable for positioning where an ordinary coil spring might otherwise be used. Centrally formed on the seat 40 is the circular aperture 42 which permits drainage as well as escape of any other extraneous matter which might enter.

The outer face of the side wedge 32 is of a form best seen from a consideration of Figures 10 and 11 with a shallow seat 44 for the rubber spring 46, said seat comprising the low flaring walls indicated at 48, 48 of a form to retain the rubber spring 46 in position. In addition, centrally formed on the seat 44 are the recesses 50 within which may be received the projections 52 formed on the inner face of the rubber spring 46, thus serving as additional positioning means. On the opposite or outer face of the rubber spring 46 are formed also positioning lugs 54 which may be received in recesses 56 on the inner face of the end wall 58 of the yoke 12. The end wall 58 is widened forming top and bottom flanges 60, 60 serving to form a seat 62 for the rubber spring 46.

The detail of the rubber spring 46 is shown in Figures 14 and 15 wherein it may be seen that it is a solid block of rubber having diagonally arranged end portions of generally oval form as indicated at 64, 64, thus conforming to the general configuration of the seats 44 and 62 on the side wedge and the yoke end wall respectively. The rubber spring has also the positioning means 52, 52 and 54, 54 on the opposite faces thereof as already described.

The detail of the yoke is shown in Figures 7, 8 and 9 wherein it may be seen that it comprises the generally cylindrical end wall 14 already described and likewise the opposite end wall 58, said end walls being joined by the integral side walls 68, 68 with the horizontal spring seat 10 integrally formed with the side walls and said cylindrical end wall 14.

In opposition, assuming the parts to be in released position, application of a load to the device causes the follower wedges 2, 2 to move toward each other compressing the springs 4, 4 while the follower wedges have sliding frictional engagement with the cylindrical end wall 12 of yoke and at their opposite sides have sliding frictional engagement along diagonal surfaces with the friction faces of the side wedge 32. Movement of the follower wedges 2, 2 toward each other forces the side wedge 32 outwardly, thus compressing the rubber spring 46 and offering increased resistance as the compressing progresses. To those skilled in the art it will be apparent that I have provided unusually large friction absorbing areas and that I have availed of the rubber springs 46 in a manner most suitable for such material. It will be apparent also that I have devised a relatively simple structure having only five parts, two of which are duplicated, thus reducing to a minimum the cost of manufacture. The parts also are of such form and structural arrangement as to permit the use of adequate metal, portions of which may be worn away in frictional absorption without unduly shortening the useful life of the device.

It is to be understood that I do not wish to be limited by the exact embodiments of the device shown which are 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 friction absorbing device, top and bottom followers in the form of housings each having opposed friction walls, one of said walls being of cylindrical form and the other diagonal wedge shaped, a side wedge having engagement at opposite ends with said diagonal walls respectively and comprising top and bottom outwardly flaring walls forming a seat for resilient means, resilient means positioned there-against, a retaining yoke having an end wall abutting said resilient means and an opposed end wall having cylindrical friction surfaces complementary in form to said before mentioned cylindrical walls, said yoke having a plate projecting between said followers, a coil spring housed within each of said followers and seated against opposite faces of said plate, and means at the inner edges of said follower walls having abutment with means on said yoke and said side wedge respectively to retain said parts in assembled relationship.

2. In a friction absorbing device, top and bottom followers in the form of housings each having opposed friction walls, one of said walls being of cylindrical form and the other diagonal wedge shaped, a side wedge having engagement at opposite ends with said diagonal walls respectively and comprising top and bottom outwardly flaring walls forming a seat for resilient means, resilient means positioned there-against, a retaining yoke having an end wall abutting said resilient means and an opposed end wall with cylindrical friction surfaces complementary in form to said before mentioned cylindrical walls, said yoke having means projecting between said followers, a

coil spring housed within each of said followers and seated against opposite faces of said projecting means, and means on said follower cylindrical walls abutting shoulders on said yoke cylindrical walls to retain said parts in assembled relationship.

3. In a friction absorbing device, top and bottom followers in the form of housings each having opposed friction walls, one of said walls being of cylindrical form and the other diagonal wedge shaped, a side wedge having engagement at opposite ends with said diagonal walls respectively and comprising top and bottom outwardly flaring walls forming a seat for resilient means, resilient means positioned thereagainst, a retaining yoke having an end wall abutting said resilient means and an opposed end wall having cylindrical friction surfaces complementary in form to said before mentioned cylindrical walls, said yoke having means projecting between said followers, a coil spring housed within each of said followers and seated against opposite faces of said projecting means, and means on said followers abutting means on said side wedge to retain said parts in assembly.

4. In a friction absorbing device, top and bottom followers in the form of housings each having opposed friction walls, one of said walls being of cylindrical form and the other diagonal wedge shaped, a side wedge having engagement at opposite ends with said diagonal walls respectively and comprising top and bottom outwardly flaring walls forming a seat for resilient means, resilient means positioned thereagainst, a retaining yoke having an end wall abutting said resilient means and an opposed end wall with cylindrical friction surfaces complementary in form to said before mentioned cylindrical walls, said yoke having means projecting between said followers, and a coil spring housed within each of said followers and seated against opposite faces of said projecting means.

5. In a friction absorbing device, top and bottom followers in the form of housings each having cylindrical and wedge-shaped friction surfaces, a retaining yoke having a cylindrical end wall with friction faces complementary in form to said before mentioned cylindrical surfaces and in engagement therewith, said yoke comprising a plate extending between said followers, resilient means housed within said followers and in abutment with opposite sides of said plate, a side wedge having channels complementary in form to said wedge shaped friction surfaces and in engagement therewith respectively, and a rubber spring between said side wedge and said yoke, said rubber spring comprising positioning means on its opposite faces having engagement respectively with said side wedge and said yoke.

6. In a friction absorbing device, end followers each comprising outwardly directed opposed friction surfaces, lugs on said followers, a retaining yoke having a spring seat extending between said followers and comprising an end wall having engagement with certain of said surfaces on said followers, spring means housed within said followers, a side wedge having top and bottom engagement with other of said surfaces respectively, resilient means between said side wedge and the opposite end of said yoke, and retaining means centrally formed on the inner edges of said follower walls, certain of said lugs being received in slots in said end wall and other of said lugs being received in opposite ends of a slot on said side wedge.

7. In a friction absorbing device, top and bottom followers in the form of housings each having cylindrical and wedge-shaped friction faces, a retaining yoke having a cylindrical end wall with friction surfaces complementary in form to said before mentioned cylindrical faces and having engagement therewith, said yoke comprising a plate extending between said followers, resilient means housed within said followers and in abutment with opposite sides of said plate, a side wedge having channels complementary in form to said wedge-shaped friction faces and in engagement therewith respectively, and resilient means between said side wedge and said yoke.

8. In a friction absorbing device, top and bottom followers in the form of housings each having cylindrical and wedge-shaped friction faces, a retaining yoke having a cylindrical end wall with friction surfaces complementary in form to said before mentioned cylindrical faces and having abutment therewith, said yoke comprising a plate extending between said followers, resilient means housed within said followers and in abutment with opposite sides of said plate, a side wedge having channels complementary in form to said wedge-shaped friction surfaces and in engagement therewith respectively, and a rubber spring between the said side wedge and said yoke.

9. In a friction absorbing device, end followers each comprising outwardly directed opposed friction surfaces, a retaining yoke having a spring seat extending between said followers and comprising an end wall having engagement with certain of said surfaces on said followers, spring means housed within said followers, a side wedge having top and bottom engagement with other of said surfaces respectively, resilient means between said side wedge and the opposite end of said yoke, and retaining lugs on the inner edges of said follower walls, certain of said lugs engaging shoulders on said yoke and other of said lugs engaging shoulders on said side wedge.

10. In a friction absorbing device, top and bottom followers each comprising a cylindrical end wall and an opposed wedge-shaped end wall, spring means housed within said followers, a side wedge having top and bottom channels complementary in form to said opposed wedge surfaces, resilient means seated against the outer face of said side wedge, and a retaining yoke having an end wall in abutment with said resilient means and an opposed end wall having frictional engagement with the cylindrical walls of said followers.

11. In a friction absorbing device, end followers each comprising outwardly directed opposed friction surfaces, a retaining yoke having a spring seat extending between said followers and comprising an end wall having engagement with certain of said surfaces on said followers, spring means housed within said followers, a side wedge having top and bottom engagement with other of said surfaces respectively, and resilient means between said side wedge and the opposite end of said yoke.

12. In a friction absorbing device, top and bottom followers each comprising a cylindrical end wall and an opposed wedge-shaped end wall, spring means housed within said followers, a side wedge having top and bottom channels complementary in form to said opposed wedge surfaces, resilient means seated against the outer face of said side wedge, and a retaining yoke having engagement with said resilient means and with said cylindrical walls.

13. In a friction absorbing device, a retaining yoke comprising opposing end walls and lateral straps joining said walls, one of said end walls having top and bottom cylindrical friction surfaces and centrally arranged vertical slots, the other of said walls having recesses forming spring positioning means, and a horizontal integral plate centrally formed adjacent one of said end walls and forming a spring seat.

14. In a friction absorbing device, a retaining yoke comprising opposing end walls, side straps and a centrally formed horizontal spring seat adjacent one of said walls, each of said walls having on its inner face recesses forming interlocking means with other parts of said device, and one of said walls having vertically arranged cylindrical friction faces.

15. In a friction absorbing device, a side wedge of generally shallow V-shaped form and comprising top and bottom V-shaped friction channels and a vertical channel centrally formed on said wedge between said friction surfaces, said wedge having an outer face comprising recesses and flaring top and bottom walls forming seating means for a rubber spring.

16. A friction follower wedge in the form of a housing having an open end, friction surfaces on the outer faces of opposed walls thereof, one of said friction surfaces being perpendicularly arranged and cylindrical in form and the other thereof being diagonally arranged and wedge shaped, each of said walls having a retaining lug thereon.

17. In a friction absorbing device, a retaining yoke comprising opposing end walls and lateral straps joining said walls, one of said end walls having top and bottom cylindrical friction surfaces and centrally arranged vertical slots, the other of said walls having recesses forming spring positioning means.

18. A friction follower wedge in the form of a housing having an open end, friction surfaces on the outer faces of opposed walls thereof, one of said friction surfaces being perpendicularly arranged and cylindrical in form and the other thereof being diagonally arranged and wedge-shaped.

19. In a friction absorbing device, a retaining yoke comprising opposing end walls, side straps and a centrally formed horizontal spring seat adjacent one of said walls, each of said walls having on its inner face recesses forming interlocking means with other parts of said device.

20. A rubber spring in the form of a solid block having oval end portions diagonally arranged and projecting means on the opposite faces of said spring forming positioning means therefor.

21. In a friction absorbing device, a retaining yoke comprising end walls, side straps, and a centrally formed horizontal spring seat adjacent one end, each of said walls having inwardly directed recesses forming interlocking means with associated parts retained within said yoke, and one of said walls having a cylindrical friction face.

22. A friction follower wedge in the form of a housing having an open end, friction surfaces on the outer faces of opposed walls thereof, one of said surfaces having cylindrical form and the other thereof being wedge-shaped.

23. A friction follower wedge formed as a housing with an open end, friction surfaces on the outer faces of opposed walls thereof, one of said surfaces being perpendicularly arranged and the other thereof being diagonally arranged, and retaining lugs on each of said walls.

24. In a friction absorbing device, a retaining yoke comprising lateral straps joining end walls thereof, one of said end walls having a cylindrical friction surface and the other of said walls forming a spring seat.

25. A friction follower wedge formed as a housing with an open end, friction surfaces on the outer faces of opposite walls thereof, one of said friction surfaces having a cylindrical form and the other having a diagonally arranged wedge shape.

26. In a friction absorbing device, end followers housing compression springs, a side wedge, a retaining yoke, and a side spring between said wedge and yoke, said housings having retaining means interlocked with said yoke and said wedge to retain said parts in assembly.

27. A friction absorbing device comprising end followers housing compression springs, a yoke, a side wedge, resilient means between said wedge and yoke, and interlocking means on said followers engaging said yoke and side wedge to retain said parts in assembly.

28. A friction absorbing device comprising end followers, compression springs in abutment with said followers respectively, a yoke having a shelf interposed between said springs, a side wedge, resilient means between said wedge and yoke, and retaining means on said followers engaging said yoke and said wedge.

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