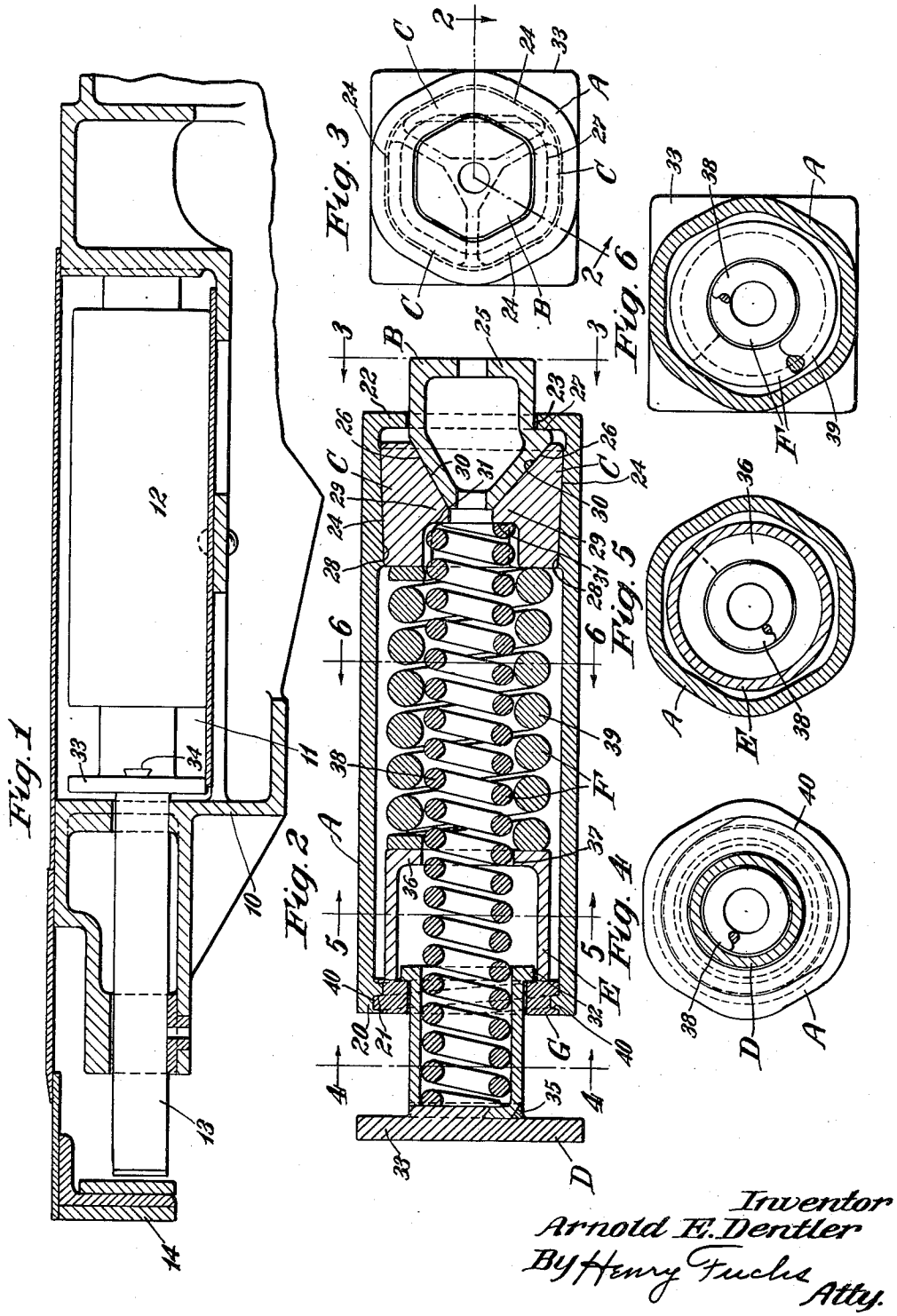
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BUFFING MECHANISM

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BUFFING MECHANISM

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Fig. 7

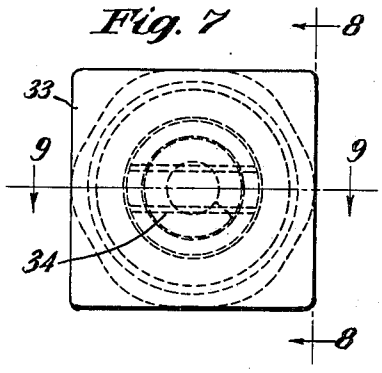


Fig. 8

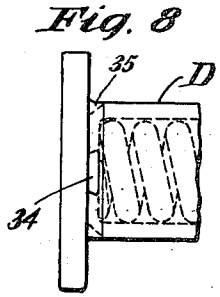


Fig. 9

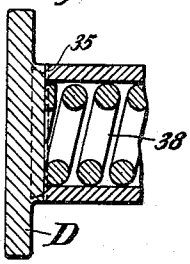


Fig. 10

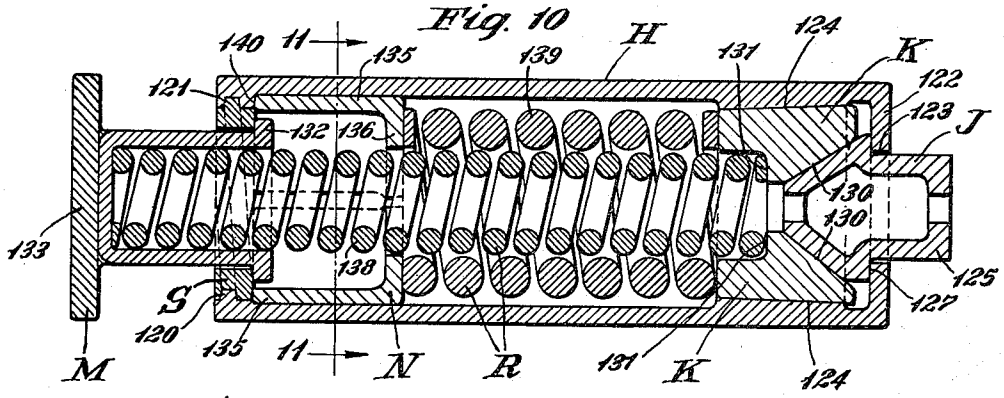
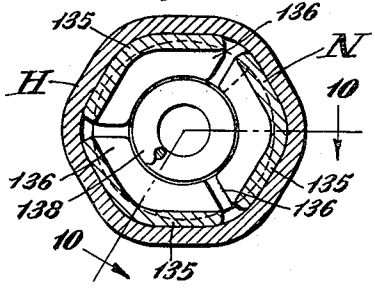


Fig. 11



Inventor
Arnold E. Dentler
By Henry Fuchs
Atty.

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BUFFING MECHANISM

Arnold E. Dentler, Hinsdale, Ill., assignor to W. H. Miner, Inc., Chicago, Ill., a corporation of Delaware

Application November 29, 1935, Serial No. 52,215

11 Claims. (Cl. 213—24)

This invention relates to improvements in buffing mechanisms.

This application is a continuation in part of my copending application, Serial Number 42,729, filed September 30, 1935.

An object of the invention is to provide a buffing mechanism having preliminary free spring action to absorb the lighter shocks, followed by relatively high frictional resistance to take care of the heavier shocks.

Another object of the invention is to provide a friction buffer having preliminary free spring action and limited free spring capacity combined with means for producing high frictional resistance to absorb the heavier shocks, wherein the high frictional resistance is produced by spring resisted wedge friction means cooperating with a friction shell or casing, wherein the preliminary free spring action is produced by the spring resistance means only of the friction mechanism by the action of the pressure transmitting means cooperating with part only of the spring resistance, and wherein the free spring capacity is limited by bringing the pressure transmitting means into direct actuating relation with the friction shock absorbing means.

Other objects of the invention will more clearly appear from the description and claims hereinafter following.

In the drawings forming a part of this specification, Figure 1 is a fragmentary, vertical, longitudinal sectional view of the end platform of a railway car, illustrating my improvements in buffing mechanisms in connection therewith. Figure 2 is a longitudinal, sectional view through the buffing mechanism of Figure 1, said section being taken on two intersecting planes at an angle to each other and corresponding substantially to the angular line 2—2 of Figure 3. Figure 3 is a rear elevational view of the mechanism shown in Figure 2, said view being on the line 3—3 of Figure 2. Figures 4, 5, and 6 are vertical sectional views, corresponding respectively to the lines 4—4, 5—5, and 6—6 of Figure 2. Figure 7 is a front, elevational view of the mechanism shown in Figure 2. Figure 8 is a broken, side elevational view of the mechanism shown in Figure 7, corresponding substantially to the line 8—8 of said figure. Figure 9 is a horizontal, sectional view, corresponding substantially to the line 9—9 of Figure 8. Figure 10 is a view similar to Figure 2, illustrating another embodiment of the invention, the section in Figure 10 corresponding substantially to the line 10—10 of Figure 11. Figure 11 is a vertical, sectional view, corresponding substantially to the line 11—11 of Figure 10.

In said drawings, 10 indicates a portion of the underframing of a passenger car end platform, having a pocket 11 adapted to receive the buffing mechanism, which is indicated by 12. The buffing mechanism 12 is actuated by the usual longitudinally slidable center stem 13, which is guided in suitable openings of the underframe structure and cooperates with the usual movable end platform member 14. As is well understood by those skilled in this art, the end platform member 14 is moved inwardly upon receiving buffing shocks, thereby forcing the stem 13 inwardly also, and compressing the buffing mechanism 12 against the rear wall of the pocket 11.

Referring first to the embodiment of the invention illustrated in Figures 1 to 9 inclusive, my improved buffing mechanism proper comprises broadly a housing or friction casing A; a wedge B; three friction shoes C, C, and C; a pressure transmitting member D; a spring abutment E; spring resistance means F; and a retaining member G for holding the parts assembled.

The casing A is in the form of a cylinder of substantially hexagonal cross-section, as clearly shown in Figures 3 to 6 inclusive. The front end of the casing A, or the left hand end, as viewed in Figure 2, has the walls thereof thickened, as indicated at 20, said thickened wall sections being interiorly screw threaded, as indicated at 21, to detachably and adjustably receive the retaining member G. The opposite or rear end of the casing A has a laterally, inwardly projecting, annular flange which forms a rear wall 22 having a central opening 23. The friction shell section of the casing A is formed at the rear end thereof and comprises symmetrically disposed, interior friction surfaces 24—24—24, which are inclined forwardly of the casing and are located adjacent to said rear wall 22.

The wedge B is in the form of a hollow block having a reduced stem portion 25 which extends through the opening 23 of the rear wall 22 of the casing A and projects beyond the rear end of said casing. The wedge block B is provided with three wedge faces 26—26—26, which cooperate with the friction shoes C, C, and C. The outer end of the stem 25 of the wedge is adapted to bear on the vertical rear wall of the pocket 11 of the underframing 10 of the car. The reduced stem 25 of the wedge B provides a stop shoulder 27 at the inner end thereof, which is substantially continuous around the wedge and adapted to engage the rear wall 22 of the casing A to limit

movement of the wedge outwardly with respect to said casing.

The friction shoes C, which are three in number, have V-shaped exterior friction surfaces 28, which cooperate with the friction surfaces 24 of the casing. Each shoe is laterally, inwardly enlarged, as indicated at 29, said enlarged portion being provided with a wedge face 30, which cooperates with the corresponding wedge face 26 of the wedge block B. The enlarged portions of the friction shoes present spring abutment shoulders 31—31—31, which are adapted to cooperate with one of the members of the spring resistance F.

The pressure transmitting member D is in the form of a thimble having an annular stop flange 32 at the inner end thereof, which cooperates with the retaining member G, as hereinafter pointed out. At the outer end, the thimble of the pressure transmitting member D is provided with a platelike follower section 33 which is fixed to the closed end of the thimble by a dovetail joint 34 and is further welded to said thimble, as indicated at 35. The follower plate 33 of the pressure transmitting member is adapted to be engaged by the sliding stem 13 of the buffing mechanism during the operation of the device.

The spring abutment E is in the form of a substantially cylindrical sleeve having an inturned flange at the right hand end, as viewed in Figure 2, said flange forming an end wall 36, provided with a central opening 37. The wall 36 of said sleeve forms an abutment for the outer coil of the spring resistance F. As most clearly shown in Figure 2, the spring abutment E is held against outward movement by the retaining member G on which it is seated.

The spring resistance F comprises an inner, relatively light coil 38 and a heavier outer coil 39. The inner coil 38 is of greater length than the outer coil and extends through the opening 37 of the abutment sleeve E and into the thimble of the pressure transmitting member D. The opposite ends of the coil 38 bear on the front wall of the thimble of the member D and on the shoulders 31—31—31 of the friction shoes C, C, and C. The coil 39 of the spring resistance F has its opposite ends bearing respectively on the friction shoes C, C, and C and the flange 36 of the spring abutment sleeve E. The parts are preferably so proportioned that in assembled relation, the spring 39 is held under initial compression between the shoes C, C, and C and the spring abutment E, and that the spring 38 is held under initial compression between said shoes and the pressure transmitting member D.

The retaining means G is in the form of a ring which surrounds the thimble portion of the pressure transmitting member D and has exterior screw threads 40, which are engaged with the threads 21 of the thickened wall section 20 of the casing A. The retaining ring G has shouldered engagement with the flange 32 of the pressure transmitting element D, thereby limiting outward movement of the latter and holding the same assembled with the casing A. The ring G also serves as an abutment or stop member for the sleeve E. In addition to holding the parts assembled, the screw ring G is also employed to maintain the parts of overall uniform length and hold the preliminary spring 38 and the heavier outer coil spring 39 under the desired initial compression. As will be clear upon reference to Figure 2, the parts of the mechanism are so proportioned that the platelike follower section 33 of the pressure transmitting member D will engage the front end of the casing A when the rear end of the thimble section of the pressure transmitting member comes into engagement with the flange 36 of the spring abutment E.

In assembling the mechanism, the parts are inserted through the open left hand end of the casing, as viewed in Figure 2, while the screw ring G is detached from said casing. The wedge B, the three friction shoes C, C, and C, together with the springs 38 and 39 and the abutment sleeve E are first inserted through the left hand end of the casing. The pressure transmitting member is then telescoped over the outer end of the coil spring 38 and the screw ring threaded into the opening of the casing A and adjusted to the proper position to hold the parts assembled and provide the required overall length of the gear. The platelike follower section 33 of the pressure transmitting member D is then secured to the thimble by engaging the cooperating parts of the dovetail joint 34 with each other and welding the plate 33 to the thimble, as indicated at 35 in Figures 8 and 9. The parts of the gear may also be assembled by first placing the wedge B, the friction shoes C, C, and C, the springs 38 and 39, and the sleeve E within the casing A and then applying the pressure transmitting member D with the screw ring G assembled therewith. In other words, the screw ring may be telescoped over the thimble of the pressure transmitting member D before the plate 33 is fixed to said thimble.

The operation of the improved buffer as shown in Figures 1 to 9 inclusive is as follows: Upon inward movement of the buffing stem 13, the pressure transmitting member D is forced inwardly of the casing A while the wedge is held against rearward movement by engagement of the vertical rear wall of the pocket 11 of the underframe structure 10. The spring 38 will thus alone be compressed between the pressure transmitting member and the friction shoes, the friction shoes at this time remaining stationary due to the high frictional resistance existing between the friction surfaces thereof and the casing. The compression of the spring 38 continues until the pressure transmitting member D has been moved inwardly a sufficient distance to engage the plate section 33 thereof with the corresponding end portion of the casing A, whereupon the casing will be forced rearwardly, thereby causing the wedge to move inwardly of the shell, wedging the friction shoes apart and effecting longitudinal movement of said shoes with respect to the friction surfaces of the casing. The inward movement of the friction system comprising the friction shoes C, C, and C and the wedge D is resisted by both the springs 38 and 39 of the spring resistance, thereby providing high shock absorbing capacity. As will be evident during the preliminary action of the mechanism, the spring 38 only is compressed, thereby providing easy cushioning action. The free spring capacity of the spring 38 is limited when the follower section 33 of the pressure transmitting member D engages the casing A, and during the remainder of the operation of the device combined spring and frictional resistance is provided.

Referring next to the embodiment of the invention illustrated in Figures 10 and 11, my improved buffing mechanism proper comprises broadly a housing or casing H; a wedge J; three friction shoes K, K, and K; a pressure transmitting member M; a sectional spring abutment N;

spring resistance means R; and a retaining member S for holding the parts assembled.

The casing H is of substantially the same design as the casing A, hereinbefore described, and has the right hand end portion thereof, as viewed in Figure 10, provided with interior friction surfaces 124—124, corresponding to the friction surfaces 24—24, hereinbefore described. The right hand end portion of the casing H is closed by a wall 122 having a central opening 123 through which the reduced end portion 125 of the wedge J is adapted to extend. At the other end, the casing is interiorly screw threaded, as indicated at 120, to receive the threads 121 of the retaining member S, which is in the form of a ring. The shoes K, K, and K, which are substantially the same as the shoes C, C, and C, hereinbefore described in connection with Figures 1 to 9, inclusive, have frictional engagement with the friction surfaces 124 of the casing and have wedge faces on their inner sides which have wedging engagement with the wedge faces 130—130—130 of the wedge J. The reduced section 125 of the wedge J provides a stop shoulder 127 which engages the wall 122 of the casing H and limits outward movement of the wedge. The friction shoes K, K, and K have shoulders 131—131—131, which correspond to the shoulders 31—31—31, hereinbefore described, and serve as abutment means for the corresponding end of the inner coil of the spring resistance R. The spring resistance R, which comprises a relatively light inner coil 138 and a heavier outer coil 139, corresponds to the spring resistance F, hereinbefore described, and has the outer coil thereof bearing respectively on the shoes K, K, and K and the sectional abutment member N. The inner coil 138 of the spring resistance R has its opposite ends bearing on the shoulders 131—131—131 of the friction shoes and the pressure transmitting member M. The pressure transmitting member M is of similar design to the pressure transmitting member D, hereinbefore described, and comprises a thimble portion to which the platelike member 133 is welded. The pressure transmitting member M differs from the pressure transmitting member D, hereinbefore described, in that it is merely welded to the thimble and does not have a dovetail joint therewith. At the inner end the thimble of the pressure transmitting member M is provided with an annular shoulder 132, which engages the retaining ring S and thereby limits outward movement of the pressure transmitting member M. The parts of the mechanism hereinbefore described are substantially the same as the corresponding parts of the mechanism illustrated in Figures 1 to 9 inclusive. However, the abutment member N differs from the abutment member E, hereinbefore described, in that the former is composed of three sections. These sections are indicated by 135—135—135. Each section 135 is in the form of a V-shaped plate member having a laterally, inwardly extending, flange 136 at the rear end thereof. The flanges 136—136—136 of said sectional sleeve form abutment means for the outer coil of the spring resistance R. As most clearly shown in Figure 10, the sectional spring abutment sleeve N is held against outward movement with respect to the casing H by having shouldered engagement with an annular shoulder 140 formed at the left hand end of the casing H, as shown in Figure 10. The sections of the spring abutment sleeve N are annularly spaced apart, as shown in Figure 11, to provide sufficient clearance therebetween to permit collapse of the sleeve so that the same may be inserted through the left hand end of the casing H, as shown in Figure 10.

In assembling the parts of the mechanism shown in Figures 10 and 11, the procedure is the same as that hereinbefore described in connection with Figures 1 to 9, inclusive, with the exception that the spring abutment N, which comprises the sections 135—135—135, is assembled with the casing by successively placing the sections thereof in position and then expanding the sleeve N to the position shown in Figure 10 where it has shouldered engagement with the shoulder 140 of said casing.

The operation of the device shown in Figures 10 and 11 is substantially the same as the operation of the device hereinbefore described.

I have herein shown and described what I now consider the preferred manner of carrying out my invention, but the same is merely illustrative and I contemplate all changes and modifications that come within the scope of the claims appended hereto.

I claim:

1. In a shock absorbing mechanism of the character described, the combination with a friction shell; of friction shoes cooperating with the friction shell; a wedge at one end of the shell having wedging engagement with said shoes and being movable lengthwise of the mechanism and normally projecting outwardly of said end of the shell; a pressure transmitting member at the other end of the shell extending into the shell and movable lengthwise thereof; removable spacing sleeve having shouldered engagement with abutment means on the interior of said shell at said last named end thereof; spring means opposing movement of said shoes inwardly of the shell and bearing on the inner end of said sleeve; and additional spring means opposing relative movement of said shoes and pressure transmitting member and extending through said sleeve.

2. In a shock absorbing mechanism of the character described, the combination with a casing having interior friction surfaces at one end thereof; of friction shoes cooperating with the friction surfaces of said casing; a wedge at said end of the casing movable lengthwise of the mechanism and normally projecting outwardly of the casing, said wedge having wedging engagement with said shoes; a movable pressure transmitting member telescoped within the other end of the casing; spring means opposing relative movement of said shoes and casing; a removable sleeve in said casing transmitting the pressure from said spring means to the casing and holding said spring spaced from the last named end of the casing; and spring means extending through said sleeve and opposing relative movement of said shoes and pressure transmitting member.

3. In a shock absorbing mechanism of the character described, the combination with a friction shell; of friction shoes cooperating with the friction shell; a wedge at one end of the shell having wedging engagement with said shoes and being movable lengthwise of the mechanism and normally projecting outwardly of said end of the shell; means for limiting outward movement of said wedge; a spacing sleeve within the shell at the other end thereof; a pressure transmitting member at said last named end of the shell telescoped within said sleeve and movable lengthwise thereof; detachable retaining means con-

nected to the shell having shouldered engagement with the pressure transmitting member to limit outward movement of said member; spring means opposing relative movement of said shoes and shell and bearing on said sleeve; and additional spring means extending through the sleeve and bearing on said pressure transmitting member and opposing relative movement of the latter and said shoes.

4. In a shock absorbing mechanism of the character described, the combination with a friction shell; of friction shoes cooperating with the friction shell; a wedge at one end of the shell having wedging engagement with said shoes and being movable lengthwise of the mechanism and normally projecting outwardly of said end of the shell; means for limiting outward movement of said wedge; a spacing sleeve telescoped within the other end of the shell; a pressure transmitting member at said last named end of the shell telescoped within said sleeve and movable lengthwise of the shell; means fixed to said shell at said second named end thereof for limiting outward movement of said sleeve and pressure transmitting member; spring means bearing on the inner end of said sleeve and opposing relative movement of said shoes and sleeve; and additional spring means extending through the sleeve and opposing relative movement of said shoes and pressure transmitting member.

5. In a shock absorbing mechanism of the character described, the combination with a casing having interior friction surfaces at one end thereof; of friction shoes cooperating with the friction surfaces of said casing; a wedge at said end of the casing movable lengthwise of the mechanism and normally projecting outwardly of the casing, said wedge having wedging engagement with said shoes; a movable pressure transmitting member telescoped within the other end of the casing and normally projecting from said end of the casing; a sectional collapsible spring abutment member within said casing at said last named end thereof having the spring abutment face thereof spaced inwardly from the corresponding end of said casing; spring means opposing relative movement of said shoes and spring abutment means; and spring means extending through said spring abutment means and opposing relative movement of said shoes and pressure transmitting member.

6. In a shock absorbing mechanism of the character described, the combination with a casing provided with an interior stop shoulder at one end and a laterally inwardly directed retaining flange at the other end, said casing having interior friction surfaces adjacent to said flange; of friction shoes having sliding frictional engagement with said friction surfaces; a block having wedging engagement with said shoes, said block having shouldered engagement with said flange for limiting outward movement of the wedge block, said wedge block also having a stem projecting outwardly of the casing; a hollow stop sleeve within the casing bearing on the shoulder of said shell and being held against outward movement by said shoulder; a pressure transmitting thimble telescoped within the end of the casing having said shoulder, said thimble having a stop flange thereof outwardly of the casing adapted to engage said casing after compression of the mechanism to a predetermined extent to move said casing and wedge relatively to each other; a spring extending through said hollow stop sleeve and into said thimble and opposing relative movement of the pressure transmitting member and shoes; and a spring surrounding said first named spring and bearing at opposite ends on said stop sleeve and shoes respectively.

7. In a shock absorbing mechanism of the character described, the combination with a friction shell; of friction shoes cooperating with the shell; a wedge at one end of the shell having wedging engagement with said shoes and being movable lengthwise of the mechanism and normally projecting outwardly of said end of the shell, said wedge having shouldered engagement with the shell for limiting outward movement of the wedge; a pressure transmitting member at the other end of the shell extending into the shell and movable lengthwise thereof; removable spring abutment means within the shell at said last named end thereof; means on said last named end of the shell, detachably connected thereto and having shouldered engagement with said spring abutment and pressure transmitting member for limiting outward movement thereof; spring means opposing relative movement of said shoes and spring abutment means; and additional spring means opposing relative movement of said shoes and pressure transmitting member.

8. In a shock absorbing mechanism of the character described, the combination with a friction shell; of friction shoes cooperating with the friction shell; a wedge at one end of the shell having wedging engagement with said shoes and being movable lengthwise of the mechanism and normally projecting outwardly of said end of the shell; means for limiting outward movement of said wedge; a pressure transmitting member at the other end of the shell extending into the shell and movable lengthwise thereof; removable spring abutment means within said shell at said last named end thereof; an adjustable retaining ring screw threaded into said second named end of the shell and abutting said spring abutment means to hold the same against movement outwardly of the shell, said pressure transmitting member extending through said ring and having shouldered engagement therewith to limit outward movement of said member; spring means opposing relative movement of said shoes and spring abutment means; and additional spring means opposing relative movement of said shoes and pressure transmitting member.

9. In a shock absorbing mechanism of the character described, the combination with a casing having interior friction surfaces at one end thereof; of friction shoes cooperating with the friction surfaces of said casing; a wedge at said end of the casing movable lengthwise of the mechanism and normally projecting outwardly of the casing, said wedge having wedging engagement with said shoes; a removable, longitudinally split, spring abutment sleeve telescoped within said casing at the other end thereof, said sleeve having a spring abutment face spaced from said last named end of the casing; a movable pressure transmitting member telescoped within said sleeve and normally projecting from said end of the casing; spring means bearing on said abutment face and opposing relative movement of said shoes and spring abutment sleeve; and spring means extending through said spring abutment means and opposing relative movement of said shoes and pressure transmitting member.

10. In a shock absorbing mechanism of the character described, the combination with a friction shell; of friction shoes cooperating with the friction shell; a wedge at one end of the shell

having wedging engagement with said shoes and being movable lengthwise of the mechanism and normally projecting outwardly of said end of the shell; means for limiting outward movement of said wedge; a pressure transmitting member at the other end of the shell extending into the shell and movable lengthwise thereof; a removable, sectional spring abutment sleeve telescoped within said shell at said last named end thereof and enclosing the inner end portion of said pressure transmitting member, said sleeve having a transverse spring abutment wall at the inner end thereof, said wall having an opening therethrough; means for limiting outward movement of said spring abutment sleeve; spring means bearing at one end on said transverse wall of said abutment sleeve opposing relative movement of said shoes and sleeve; and additional spring means extending through the opening of said sleeve and opposing relative movement of said shoes and pressure transmitting member.

11. In a shock absorbing mechanism of the character described, the combination with a casing having interior friction surfaces at one end thereof; of friction shoes cooperating with the friction surfaces of said casing; a wedge at said end of the casing movable lengthwise of the mechanism and normally projecting outwardly of the casing, said wedge having wedging engagement with said shoes; a removable sectional spring abutment sleeve seated within the other end of said casing and held against outward movement with respect to the casing, said sleeve having a spring abutment wall at the inner end thereof; a movable pressure transmitting member telescoped within said spring abutment sleeve and normally projecting from said last named end of the casing; a spring interposed between and bearing on the shoes and said wall of the spring abutment sleeve respectively; and a second spring enclosed within said first named spring, said second named spring extending through said spring abutment sleeve and being interposed between and having its opposite ends bearing respectively on said pressure transmitting member and shoes.

ARNOLD E. DENTLER.