Nov. 28, 1950 G. E. DATH 2,532,013

BUFFER

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Fig. 1

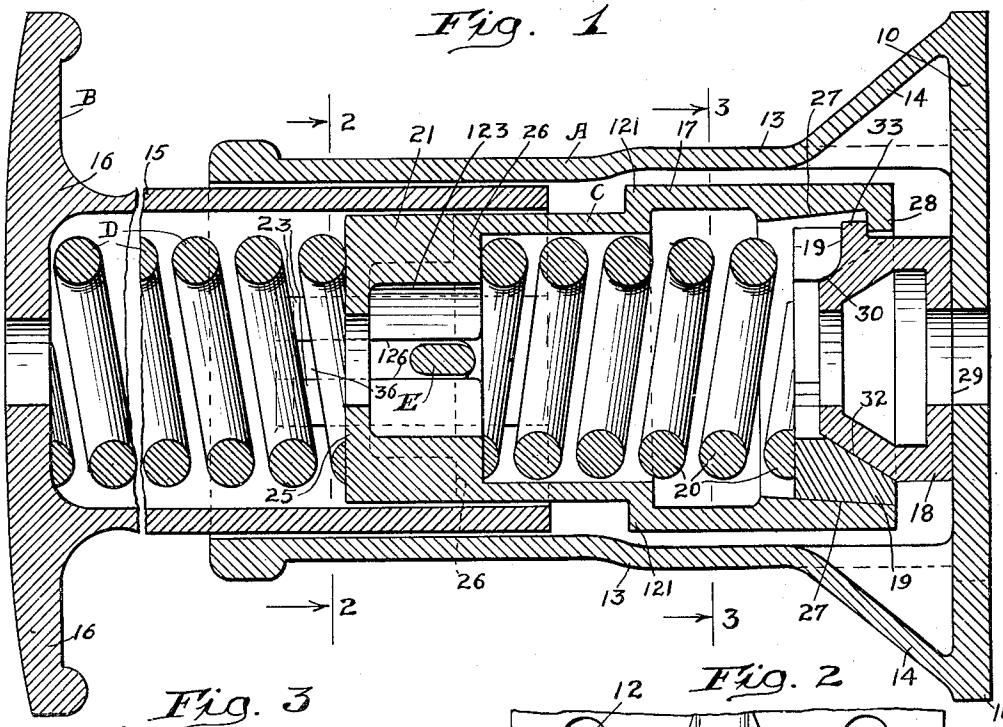



Fig. 3

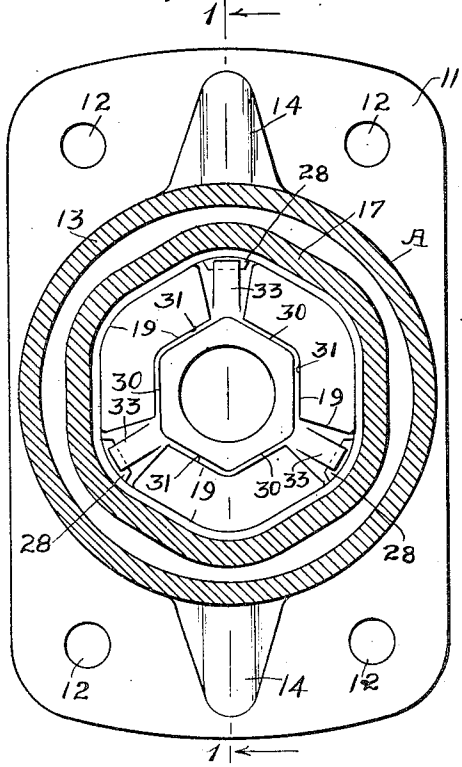
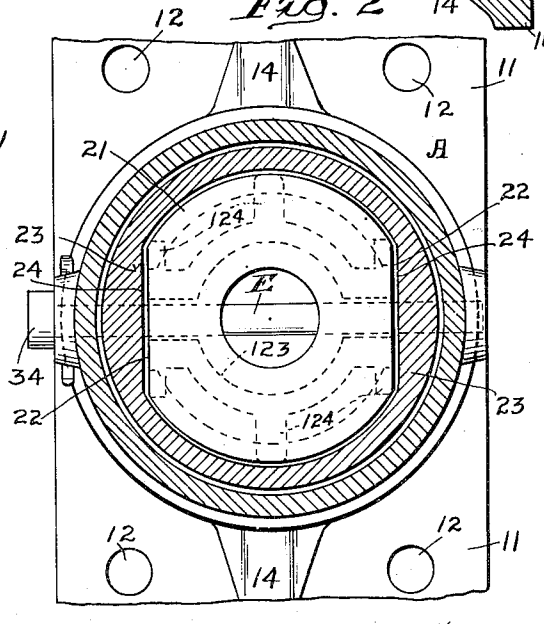



Fig. 2




Inventor:
George E. Dath

By Henry Fuchs Attys.

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Fig. 4

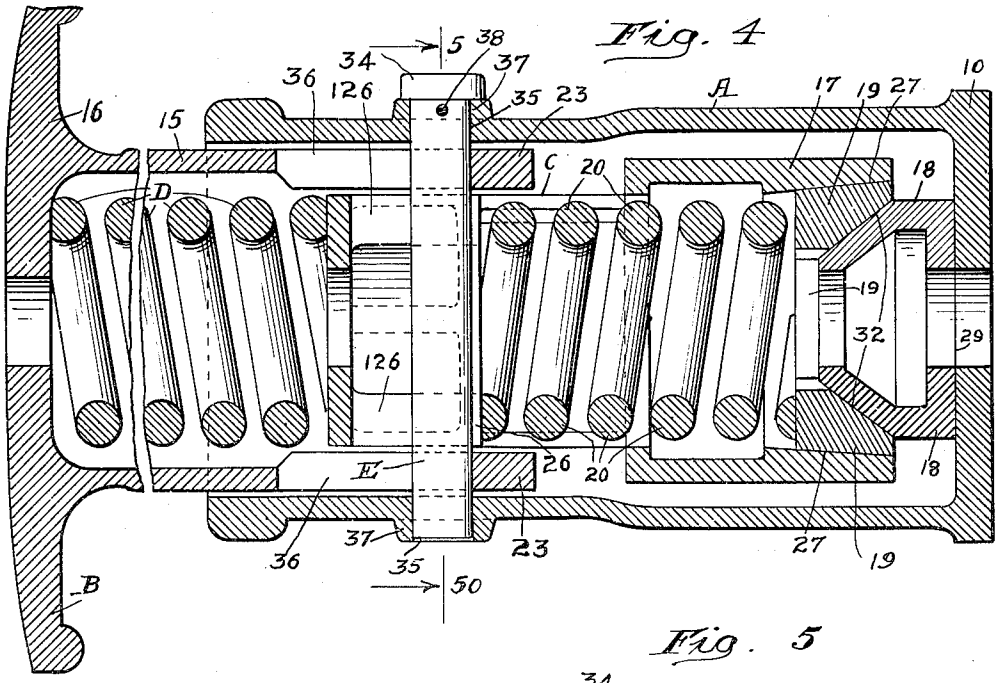
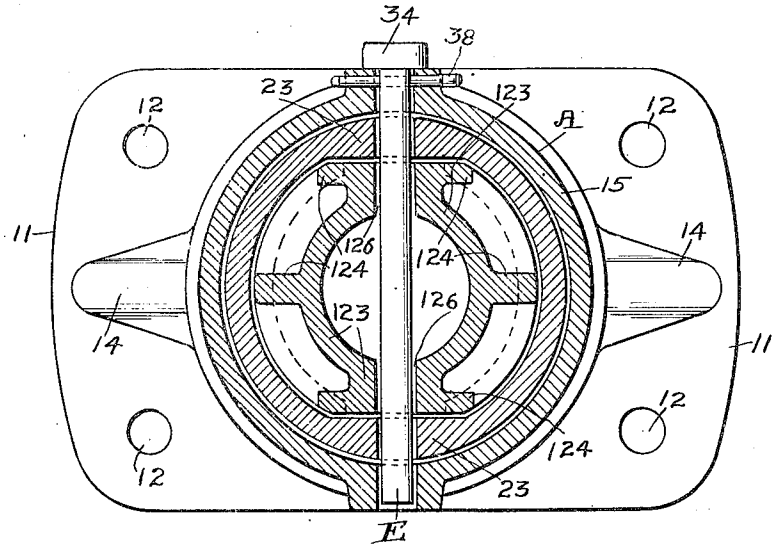



Fig. 5




Inventor:
George E. Dath

By Henry Fuchs
Atty.

Patented Nov. 28, 1950 2,532,013

# UNITED STATES PATENT OFFICE

2,532,013

## BUFFER

George E. Dath, Mokena, Ill., assignor to W. H. Miner, Inc., Chicago, Ill., a corporation of Delaware

Application June 4, 1945, Serial No. 597,527

2 Claims. (Cl. 213—221)

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This invention relates to improvements in buffers for railway cars.

One object of the invention is to provide a simple and efficient buffer mechanism for railway cars comprising a spring resistance and a friction shock absorber actuated successively to provide preliminary spring action to absorb the lighter shocks, followed by high frictional resistance to take care of the heavier shocks, wherein the preliminary spring is contained in a buffing head and is buttressed against the friction shock absorber which is contained within a housing within which the buffing head is slidingly telescoped, and wherein the buffing head has lost motion with respect to the shock absorber and engages and actuates the same after the spring resistance has been compressed to a predetermined extent.

A further object of the invention is to provide in a buffer mechanism as set forth in the preceding paragraph, simple and efficient means for anchoring the buffing head to the housing and limiting outward movement of the same with respect to the housing, comprising a retaining element extending transversely through the housing and buffing head.

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 vertical, longitudinal sectional view of my improved buffer mechanism, corresponding substantially to the line 1—1 of Figure 3. Figure 2 is a transverse, vertical sectional view, corresponding substantially to the line 2—2 of Figure 1. Figure 3 is a transverse, vertical sectional view, corresponding substantially to the line 3—3 of Figure 1. Figure 4 is a horizontal, longitudinal sectional view, that is, a view in a plane at right angles to the horizontal sectional view shown in Figure 1. Figure 5 is a transverse, vertical sectional view, corresponding substantially to the line 5—5 of Figure 4, the key of the mechanism being shown in elevation.

As shown in said drawings, my improved buffer mechanism comprises broadly a housing A; a buffer head B; a friction shock absorber C; a spring resistance D; and a retaining key E.

The housing A is in the form of a tubular, cylindrical shell, open at its front end and closed at its rear end by a vertical transverse wall 10. The wall 10 is extended laterally beyond the sides of the tubular shell portion of the housing, providing a pair of flanges 11—11 for securing

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the housing to the end of a railway car in the usual manner. The flanges 11—11 are provided with suitable bolt receiving openings 12—12 and 12—12 adapted to accommodate the shanks of the usual securing bolts for fastening the housing to the end wall of the railway car. The housing is of enlarged diameter at its rear end, as indicated at 13, and the flanges 11—11 of the housing are braced by suitable reenforcing webs 14—14 which are integral with said flanges and the side walls of the portion 13 of the housing.

The buffer head B includes a cylindrical shell or sleeve 15 which extends rearwardly from the buffer head proper 16, which closes the front end of the shell forming the end wall of the same. The wall forming the buffer head proper 16 projects laterally outwardly of the cylindrical shell 15, as clearly shown in Figures 1 and 4. The shell portion 15 of the buffer head B is slidingly telescoped within the housing.

The friction shock absorber C is disposed within the housing A and comprises a friction casing 17, a wedge block 18, three friction shoes 19—19—19, and a spring resistance 20.

The friction casing 17 is of cylindrical shape, open at its rear end. At the front end portion thereof, which is indicated by 21, the casing is of reduced diameter, thereby providing an annular abutment shoulder 121. The reduced portion 21 is of such a size as to telescopically fit within the cylindrical shell portion 15 of the buffer head B. At diametrically opposite sides thereof, the walls of the reduced portion 21 of the casing are cut away, as indicated at 22—22, to fit between inwardly thickened, interior, diametrically opposite wall portions 23—23 at the inner end of the shell 15 of the buffer head, said thickened wall portions presenting flat vertical faces 24—24. The purpose of the thickened wall portions 23—23 is to increase the strength of the walls of the shell 15 at the point where the key E extends through the shell of the buffer head. At the extreme forward end portion thereof, the reduced portion 21 of the casing 17 is suitably strengthened. This portion of the casing is made of smaller diameter than the reduced portion 21, as indicated at 123, and reenforced by laterally projecting, longitudinally extending webs 124 integral with the side wall of the portion 123 and transverse end walls 25 and 26, in effect, closing the front end of the casing 17 and connecting the portions 23 of said casing with the larger diameter section of the reduced portion 21. The transverse wall 26 serves as an abut-

ment for the front end of the spring resistance 20, as hereinafter pointed out. The portion 123 of the casing is provided with a longitudinally extending, transversely disposed slot 126 adapted to accommodate the locking key E. At the open rear end thereof, the casing 17 is provided with three interior friction surfaces 27—27—27 which are arranged symmetrically about the central longitudinal axis of the mechanism. The friction surfaces 27—27—27 are preferably of V-shaped, transverse cross section and converge forwardly of the mechanism. Rearwardly of the friction surfaces 27—27—27, the open end of the casing 17 has three laterally inwardly projecting retaining lugs 28—28—28 for limiting rearward movement of the wedge block 18 with respect to the casing and holding the former assembled with the latter.

The wedge block 18 is in the form of a hollow member having a flat, vertical, rear end face 29 bearing on the end wall 10 of the housing A. At the forward end thereof, the block 18 has three V-shaped wedge faces 30—30—30 converging toward the longitudinal axis of the mechanism in forward direction.

The friction shoes 19—19—19 surround the wedge and are provided with V-shaped friction surfaces 31—31—31 on their outer sides engaging respectively the V-shaped friction surfaces 27—27—27 of the casing. On the inner side, each shoe 19 has a V-shaped wedge face 32 engaging the corresponding V-shaped wedge face 30 of the wedge block 18.

The wedge block 18 is anchored to the casing by three radially extending lugs 33—33—33 engaging respectively between adjacent friction shoes and cooperating with the lugs 28—28—28 of the casing.

The spring resistance 20 is in the form of a heavy helical coil arranged within the casing 17 and interposed between the shoes 19—19—19 and the front end of the casing, having its front and rear ends bearing respectively on the transverse wall 26 of the casing and the front ends of the shoes 19—19—19.

The spring resistance D is disposed within the sleeve 15 of the buffer head B and comprises a single helical coil having its front and rear ends bearing respectively on the inner side of the front wall 16 of the sleeve 15 and the front end of the friction casing 17 of the shock absorber C.

The key E is in the form of a bar of substantially rectangular, transverse cross section and is headed at one end, as indicated at 34. This key serves to anchor the buffer head B to the housing A and is engaged within diametrically opposite openings 35—35 in the side wall of the housing A and extends through longitudinally extending, diametrically opposed, elongated slots 36—36 in the walls of the shell 15 of the buffer head B, and the slot 126 of the friction casing 17 of the shock absorber C. As shown, the openings 35—35 are preferably reenforced by outstanding bosses 37—37. The key E is preferably secured against removal by a cotter pin 38 extending through the shank of the key, at the headed end thereof, and through the corresponding boss 37. As shown most clearly in Figures 1 and 4, the slots 36—36 of the sleeve of the buffer head B are considerably longer than the slot 126 of the casing 17 of the shock absorber C, thereby permitting greater relative lengthwise movement between the buffer head and the key than between the friction casing 17 and said key.

The capacity of the friction shock absorber C is considerably greater than that of the spring D, and thus when the buffer head is forced inwardly of the housing, the spring D is compressed between the buffer head and the friction shock absorber, which is inert due to its high capacity frictional resistance. The spring D only will thus be compressed until the friction shock absorber is positively actuated by the buffer head through engagement of the inner end of the sleeve 15 of the buffer head with the shoulder 121 of the casing 17.

The operation of my improved buffer mechanism is as follows: Upon inward movement of the buffer head B, through pressure exerted thereon by any object, such as a buffer head of an adjacent car, the head B is forced inwardly of the housing A, compressing the spring D against the friction shock absorber C, thus absorbing the lighter shocks to which the mechanism is subjected. As the head B moves further inwardly of the housing A, the inner end of the shell 15 thereof engages the annular shoulder 121 of the casing 17 of the friction shock absorber, thereby compressing the latter and taking care of the heavier shocks. Upon the actauting force being reduced, the expansive action of the spring 20 of the shock absorber restores all of the parts thereof to the full release position shown in Figures 1 and 4, rearward movement of the wedge 18 being limited by shouldered engagement of the lugs 33 thereof with the lugs 28 of the casing 17, and the expansive action of the spring D restores the buffer head to the full release position shown in Figures 1 and 4, outward or forward movement of the buffer head with respect to the housing A being limited by the key E.

I claim:

1. In a buffer for railway cars, the combination with a housing open at the front end and closed at the rear end; of a buffer head including a sleeve slidingly telescoped within the housing, said sleeve having aligned, diametrically opposed, longitudinally extending slots in the side walls thereof; a key extending through the slots of said sleeve and having its opposite ends fixed in the housing walls, said slots being closed at the rear ends to limit outward movement of the buffer head by said key; a friction shock absorber within the housing including a friction casing open at the rear end, friction shoes slidable within the open end of the casing, a wedge block in wedging engagement with said shoes, said block being buttressed against the closed rear end of the housing, spring means opposing movement of said shoes inwardly of the casing, said casing being longitudinally slotted to accommodate the locking key; and a spring within the buffer head opposing relative movement of the friction casing and head.

2. In a friction shock absorber, the combination with a friction casing open at one end and closed at the other end, said casing being movable inwardly by an actuating force being applied at said closed end thereof; of friction shoes slidingly telescoped within the open end of the casing in sliding frictional engagement therewith; a central wedge block in wedging engagement with said shoes, said wedge block normally projecting from the casing and being engageable with a fixed stop; a spring within the casing yieldingly opposing movement of the shoes inwardly of the casing, said casing having a lengthwise extending slot at its closed end, the inner end wall of said slot providing a limiting shoulder; and a key fixed with respect to said stop for the wedge

and extending through the slot of the casing, said key limiting outward movement of the casing by engagement with said inner end wall of said slot.

GEORGE E. DATH.

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