Jan. 8, 1957 D. S. CAMPBELL 2,776,759

RUBBER DRAFT GEAR

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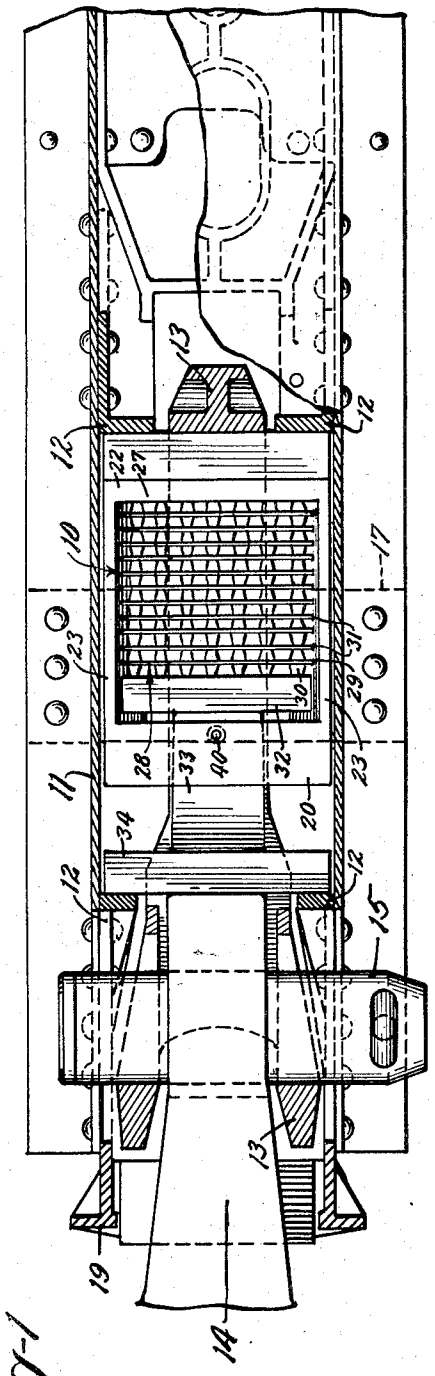


Fig-1

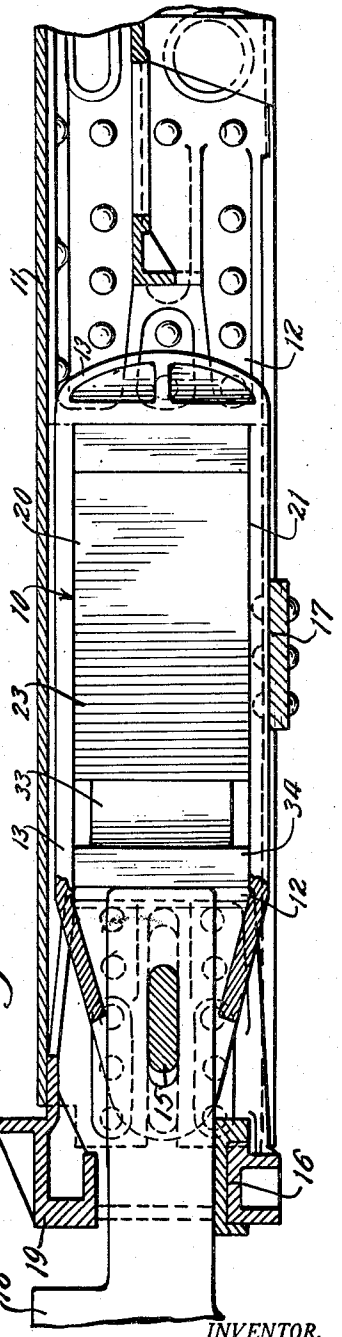


Fig-2

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Fig-3

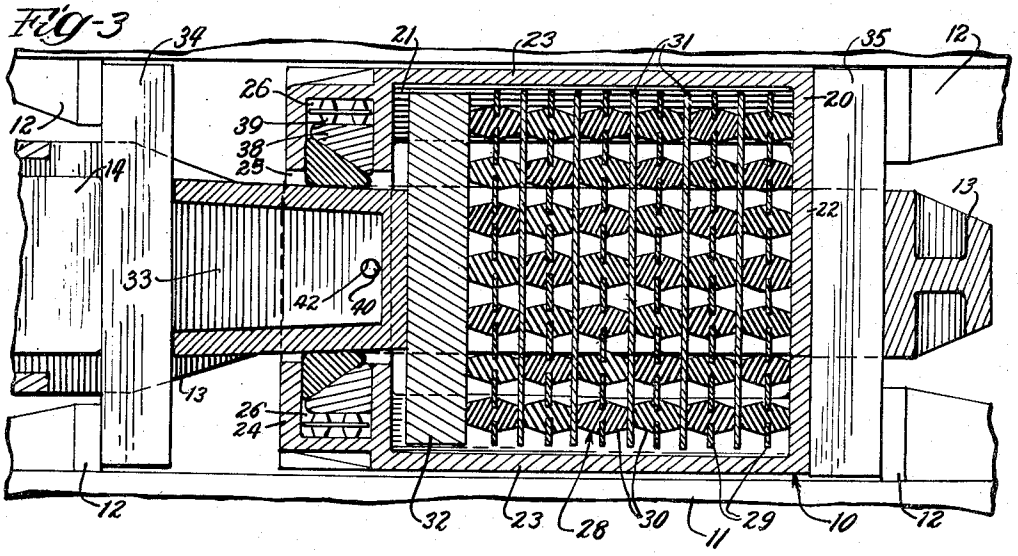
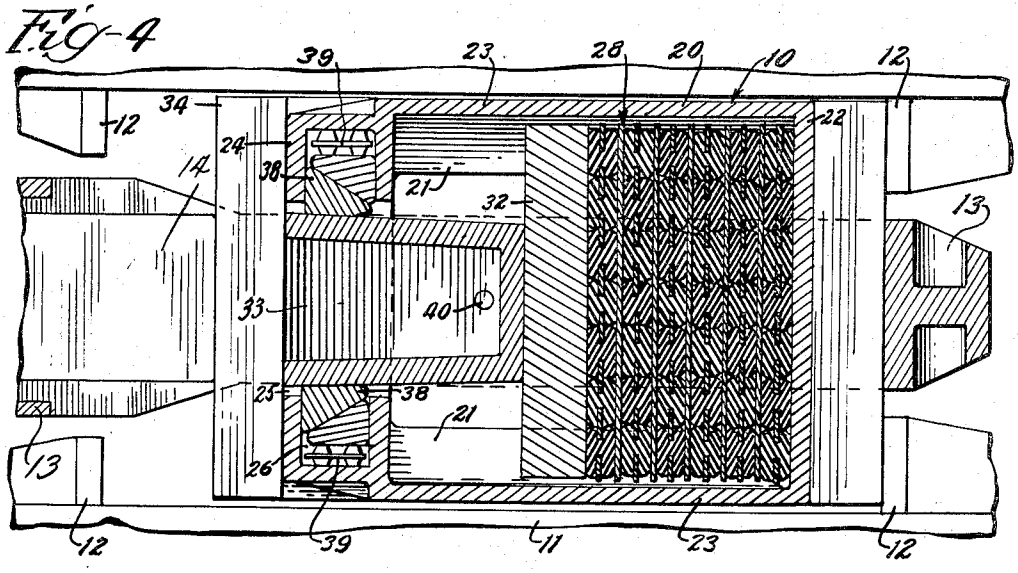


Fig-4



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Fig-5

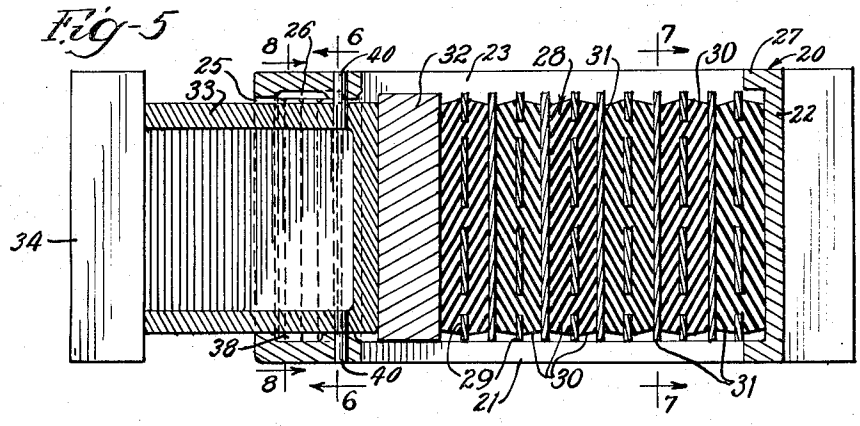


Fig-6

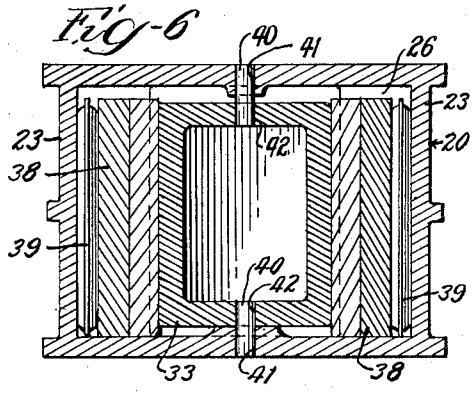


Fig-7

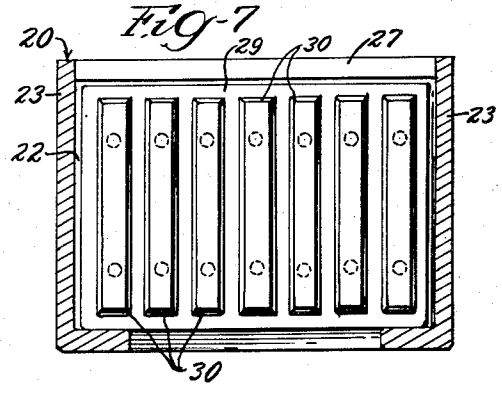
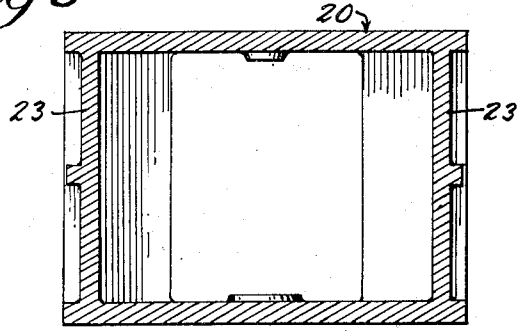


Fig-8



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Fig-9

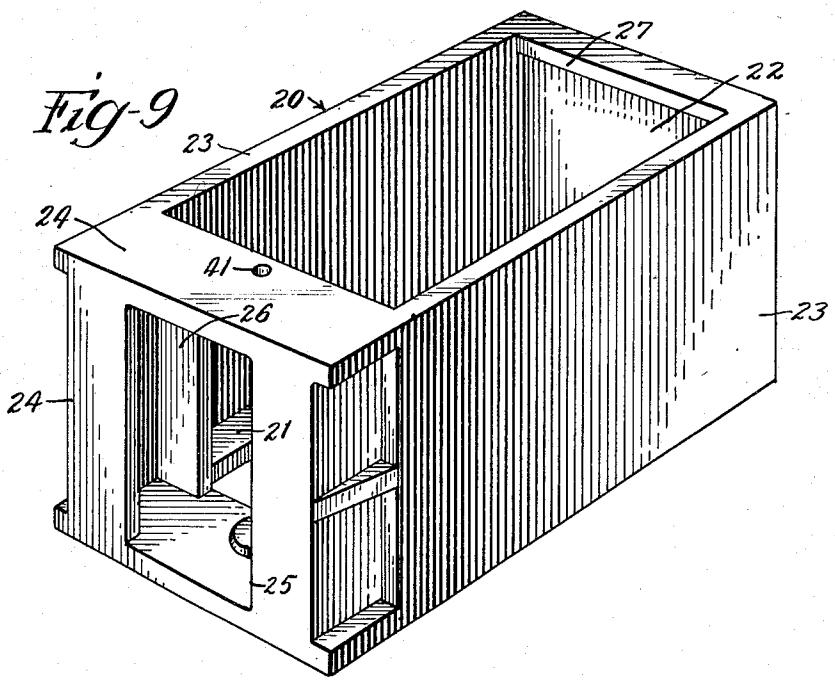


Fig-11

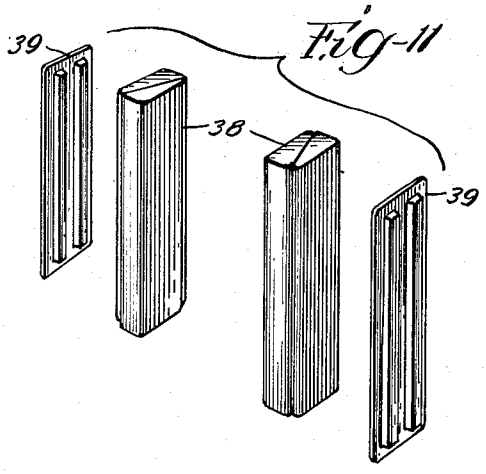
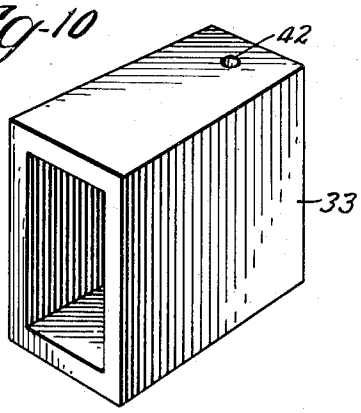


Fig-10



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2,776,759

RUBBER DRAFT GEAR

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Application May 4, 1953, Serial No. 352,751

10 Claims. (Cl. 213—34)

This invention relates to draft gears for railroad cars, and has for its principal object to provide a high capacity gear with increasing energy absorption as it closes with controlled recoil on release.

Generally speaking, this is accomplished by combining a rubber spring cushioning element with friction means to absorb recoil during release.

Further object and advantages of the invention will be apparent as the description is read in connection with the accompanying drawings, in which

Fig. 1 is a horizontal section through familiar parts of a freight car showing the draft gear applied;

Fig. 2 is a vertical section of the same;

Fig. 3 is an enlarged horizontal section through the draft gear and portions of the draft rigging and center sills showing the draft gear in release;

Fig. 4 is a similar section showing the draft gear compressed in buff;

Fig. 5 is a vertical section through the draft gear and associated followers;

Figs. 6, 7, and 8 are vertical sections on the lines 6—6, 7—7, and 8—8 of Fig. 5;

Fig. 9 is a perspective view of the draft gear housing;

Fig. 10 is a perspective view of the thrust wedge; and

Fig. 11 is an exploded perspective view of the friction shoes and friction springs making up the friction means to absorb recoil energy.

But these drawings and the corresponding description are for the purpose of illustrative disclosure only, and are not intended to impose unnecessary limitations on the claims.

In Figs. 1 and 2, the draft gear, indicated generally at 10, is shown in the familiar surroundings of center sills 11, draft gear lugs 12, draft yoke 13, coupler butt or shank 14, draft key 15, coupler carrier iron 16, draft gear carrier iron 17, coupler horn 18, and striking plate 19 (all corresponding to Fig. 10.51 of Car Builders' Cyclopedia, 1946, p. 944). These parts are so familiar that no specific description is deemed necessary.

The draft gear housing generally indicated by 20 includes a bottom 21 with the mid portion removed, a rear wall 22, spaced side walls 23, a hollow front wall 24 having an intermediate opening 25 through it, and friction shoe pockets 26 at each side of the intermediate opening 25.

The top of the housing is almost entirely omitted between the sides and ends except for an overhanging portion 27 extending inwardly from the rear wall 22.

The cushioning element generally indicated by 28 is of the rubber spring type composed of a plurality of perforated plates 29 with rubber bars 30 on each side of the plates and spacer plates 31. A variety of such cushioning elements are known, and no detailed description is deemed necessary. Specifications on the order of those given in Tucker Ser. No. 223,746, filed April 30, 1951, may be used.

The rear end of the cushioning element 28 seats against the rear wall 22. The front end of the element cooperates with a follower 32 in the front end of the housing 20 adjacent to the front wall.

A thrust wedge 33 passing through the intermediate opening 25 cooperates with the follower 32 to deliver the thrust of the front standard follower 34 received from the coupler butt in buff. A rear standard follower 35 is between the rear wall 22 of the housing and the rear draft gear lugs 12.

In each of the friction shoe pockets 26, there is a pair of triangular wedge shoes 38 urged toward the thrust wedge by a rubber spring 39, as seen particularly well in Figs. 3 and 4.

In assembly, the several parts of the cushioning element are dropped into place through the open top of the housing 22 and come to rest on the side portions 21 of the bottom. The follower 32 is inserted between the front wall and the front of the cushioning element. The rubber friction springs 39 and the wedge shoes 38 are inserted in the friction shoe pockets, and the thrust wedge is inserted through the intermediate opening 25 in the front wall 24.

The gear is then put under initial compression in a suitable jig, and a shear pin or pins 40 inserted through aligned openings 41 and 42 in the front wall 24 and the adjacent walls of the thrust wedge 33. In this condition, the draft gear forms a commercial article readily handled, stored, and shipped, and under sufficient initial compression to readily enter a standard draft gear pocket between the center sills 11 and the draft gear lugs 12.

The first real compression of the gear shears the pin or pins 40, and from then on the draft gear is free to be closed and released in the familiar manner of draft gears.

Fig. 3 shows the relation of the parts in full release, and Fig. 4 shows the relation with the draft gear closed under buff. Under draft, the reverse would be true to the extent that the load was sufficient to compress the cushioning element.

Under compression, the wedge 33 in cooperation with the shoes 38 functions as a friction gear supplementing the absorption of the rubber cushioning element, and the friction increases as the gear closes, thereby providing increased absorption as the rebound is increased by the distortion of the rubber blocks.

In one form that has been found satisfactory in service, the thrust wedge 33 has a two-degree taper, and the wedge shoes a thirty-degree taper with their dimensions lengthwise to the car on the order of ⅛" shorter than the width of the friction shoe pockets 26.

The draft gear housing is 16⅝" long, and the thrust wedge is 7⅜" long. Other dimensions are substantially in proportion.

The cushion element, of course, is designed variously according to the capacity desired for the gear.

I claim:

1. In a draft gear, a housing including a bottom, a rear wall, spaced side walls, and a hollow front wall having an intermediate opening through it and friction shoe pockets at each side of the intermediate opening, a cushioning element of the rubber spring type in said housing, a follower between the front wall and the cushioning element, a thrust wedge having one end bearing against the follower and extending through the intermediate opening in the front wall, friction shoes in said friction shoe pockets cooperating with said thrust wedge, and spring means urging the friction shoes against said thrust wedge.

2. In a draft gear, a housing including a bottom, a rear wall, spaced side walls, and a hollow front wall having an intermediate opening through it and friction shoe pockets at each side of the intermediate opening, a cushioning element of the rubber spring type in said housing, a follower between the front wall and the

cushioning element, a thrust wedge having one end bearing against the follower and extending through the intermediate opening in the front wall, pairs of wedge friction shoes in said friction shoe pockets cooperating with the said thrust wedge, and spring means urging the friction shoes against said thrust wedge.

3. In a draft gear, a housing including a bottom wall open through the mid portion, a rear wall, spaced side walls, and a hollow front wall having an intermediate opening through it for a thrust wedge and having pockets at each side of the intermediate opening for friction devices, a cushioning element including a plurality of rubber blocks and plates in said housing supported by said bottom wall and reacting at one end against said rear wall, a thrust wedge bearing against the other end of the cushioning element through the intermediate opening in the front wall, friction shoes in the friction shoe pockets cooperating with the thrust wedge, and spring means urging said friction shoes against the thrust wedge.

4. In a draft gear, front and rear followers engageable respectively with the spaced front and rear draft gear lugs of a railroad car center sill construction, the combination of cushioning and friction means disposed in the space between said followers comprising a housing shorter than said space including a closed rear wall engaged with the rear follower and a front wall having a central lengthwise opening and friction shoe pockets at the sides of said opening and communicating therewith, spring means in said housing, a thrust wedge extending through said central lengthwise opening having its ends reacting against the front follower and the spring means respectively, and friction shoes in said friction shoe pockets frictionally bearing against the sides of said thrust wedge for resisting movement of the thrust wedge through said central lengthwise opening at all times on compression or expansion of said spring means.

5. In a draft gear, front and rear followers engageable respectively with the spaced front and rear draft gear lugs of a railroad car center sill construction, the combination of cushioning and friction means disposed in the space between said followers comprising a housing shorter than said space including a closed rear wall engaged with the rear follower and a front wall having a central lengthwise opening and friction shoe pockets at the sides of said opening and communicating therewith, a front plate within said housing, spring means in the housing reacting between the rear wall thereof and said front plate, a thrust wedge extending through said central lengthwise opening having its ends bearing against the front follower and said front plate respectively, and friction shoes in said friction shoe pockets frictionally bearing against the sides of said thrust wedge for resisting movement of the thrust wedge through said central lengthwise opening at all times on compression or expansion of said spring means.

6. In a draft gear, a housing including a bottom, a rear wall, spaced side walls, and a hollow front wall having an intermediate opening through it and friction shoe pockets at each side of the intermediate opening, a cushioning element in said housing reacting against the front and rear walls thereof, a thrust member having one end reacting against the cushioning element and extending through the intermediate opening in the front wall, friction shoe means in said friction shoe pockets cooperating with said thrust member, and spring-like means urging the friction shoes against said thrust member.

7. A draft gear as claimed in claim 6 wherein the thrust member is wedge-shaped and the cushioning element is of the rubber spring type.

8. In a draft gear for mounting in the draft pocket of a railway car, said pocket having spaced front and rear lugs; a housing longitudinally movable in said draft pocket and including a closed rear wall reacting against said rear lugs, a front wall having a central lengthwise opening and friction shoe pockets at the sides of said opening and communicating therewith, spring means in the housing reacting against the front and rear walls thereof, a thrust member having one end reacting against the said spring means and extending through the opening in the front wall such that its other end reacts against the front lugs, and friction shoe means in said friction shoe pockets frictionally bearing against the sides of said thrust member to resist movement of the thrust member through said central lengthwise opening at all times on compression or expansion of said spring means.

9. A draft gear as claimed in claim 8 wherein the thrust member is wedge-shaped and the spring means is of the rubber spring type.

10. In a draft gear, in combination: A cushioning unit of the rubber spring type, an energy absorbing friction system mounted in tandem with said cushioning unit for parallel action therewith, and comprising a thrust wedge, opposed friction shoes engaging side portions of said wedge and movable laterally outwardly as the wedge is advanced during compression of said gear, and resilient means providing increasing yielding resistance to said outward lateral movement of said shoes as said movement progresses and means for advancing said thrust wedge along said shoes as the gear is compressed to thereby provide maximum frictional energy absorption during the final stages of compression of said cushioning unit and during its initial release.

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