Dec. 11, 1945. A. CAMPBELL 2,390,496

DRAFT MECHANISM FOR RAILWAY CARS

Filed Dec. 29, 1943 2 Sheets-Sheet 1

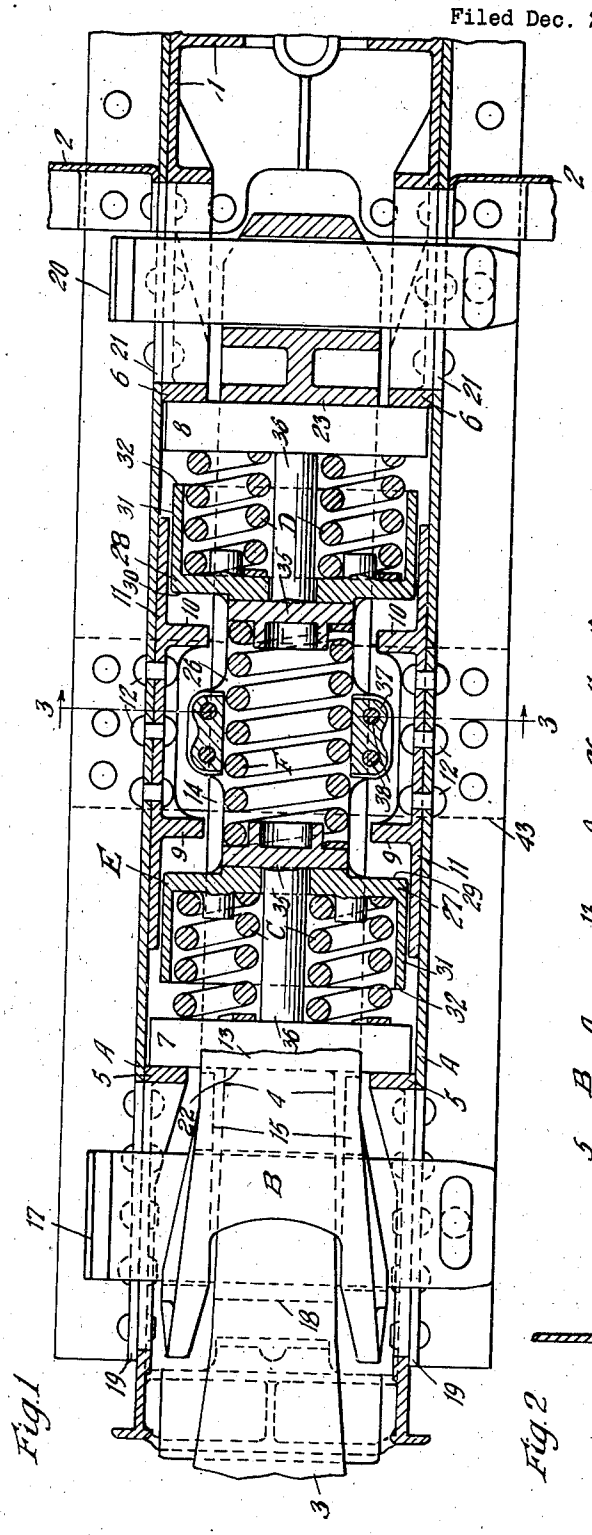


Fig. 1

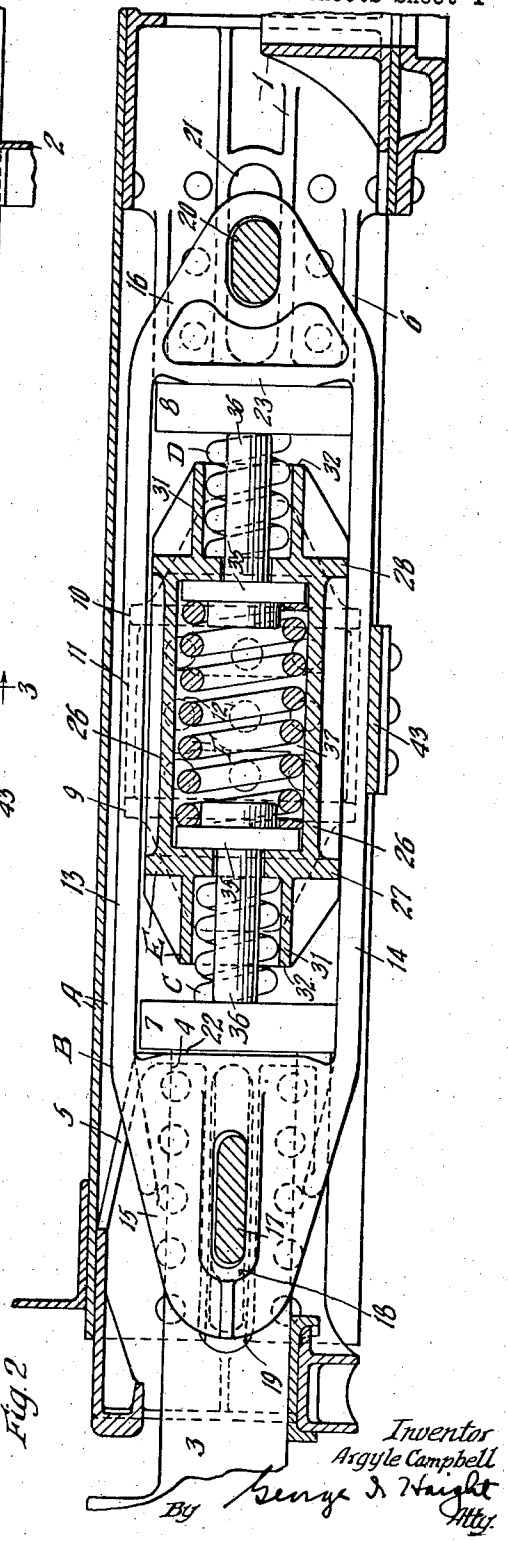


Fig. 2

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DRAFT MECHANISM FOR RAILWAY CARS

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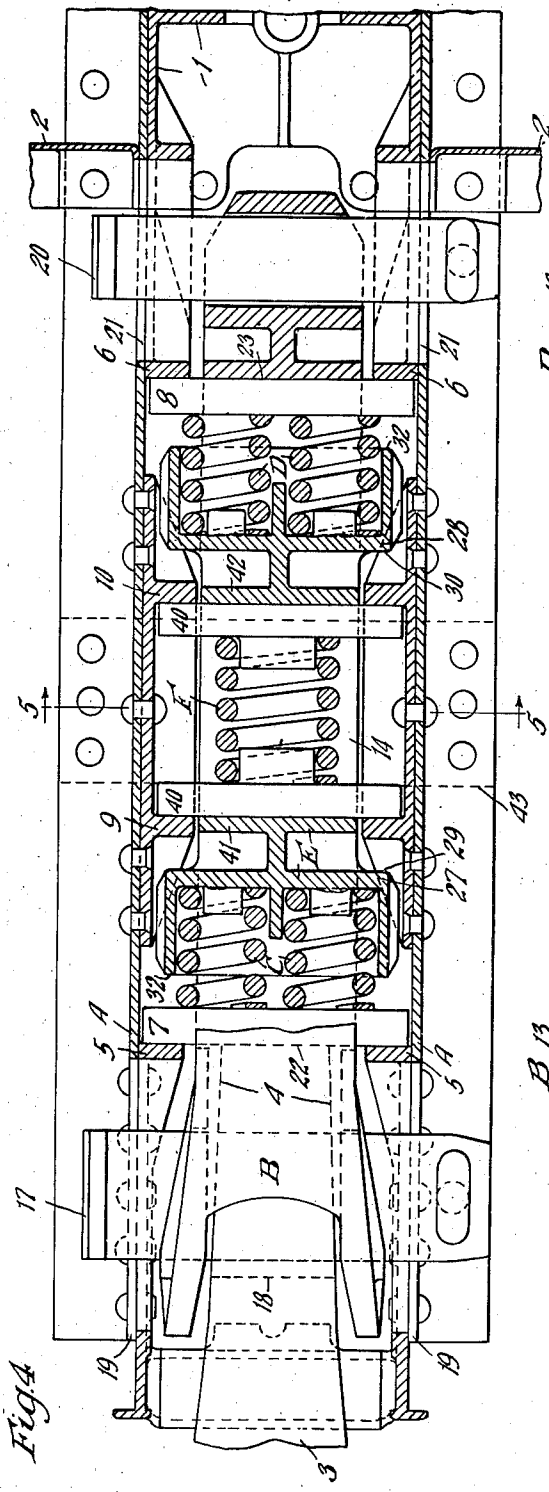


Fig. 4

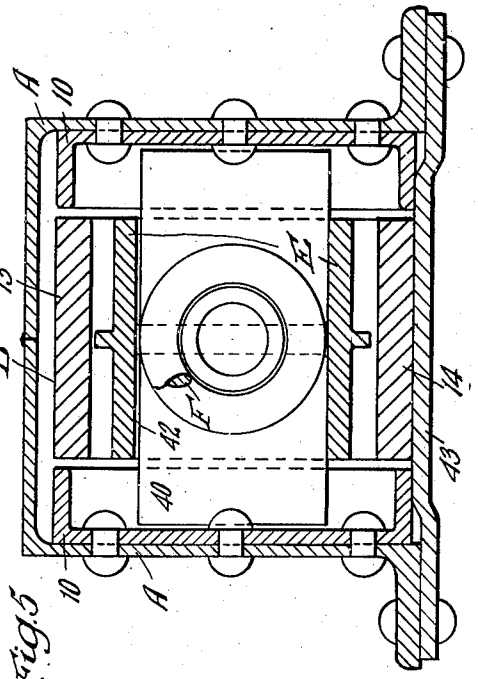


Fig. 5

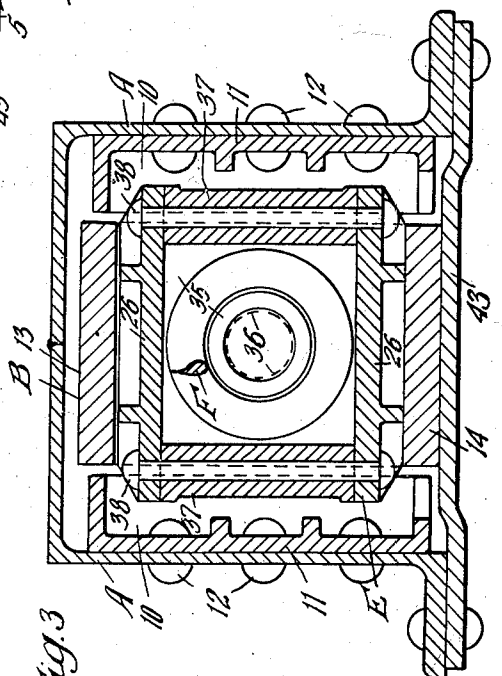


Fig. 3

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# UNITED STATES PATENT OFFICE

2,390,496

## DRAFT MECHANISM FOR RAILWAY CARS

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Application December 29, 1943, Serial No. 516,005

6 Claims. (Cl. 213—45)

My invention relates to improvements in shock absorbing draft mechanism for railway cars.

One of the objects of the invention is to provide for absorbing or cushioning a large portion of the severe shocks by means of a floating or reciprocal element which is acted upon through the springs before such shocks are transmitted to the car body through the center sills.

To accomplish this purpose, I provide a draft gear in which a reciprocal or floating column is associated with the yoke and is cushioned at its ends by springs through which the shocks are transmitted and absorbed before they reach the center sills of the car and to the extent that vibrations are reduced and distributed and thereby limited to minimum effect on the car body and its contents.

My invention consists in the combination and arrangements of parts by which the above and other objects are accomplished and which are set forth in the following specification in connection with the accompanying drawings which illustrate one embodiment of the invention.

Referring to the accompanying drawings,

Fig. 1 is a plan view partly in horizontal section, of the draft gear structure associated with the center sills of the car and illustrating one embodiment of my invention;

Fig. 2 is a longitudinal vertical sectional view of the structure shown in Fig. 1;

Fig. 3 is an enlarged transverse section substantially on the line 3—3 of Fig. 1;

Fig. 4 is a view similar to Fig. 1, but illustrating a modified structure; and

Fig. 5 is an enlarged transverse section substantially on the line 5—5 of Fig. 4.

Referring to the drawings, the usual center sills A are of Z-shape with the upper flanges 1 directed inwardly toward each other and joined by welding longitudinally to the structure. The sill members are shown spaced apart and extend lengthwise of the car. Inwardly of the forward ends of the center sills is shown the usual center filler 1 and bolster 2, and projecting from the forward or front end of the center sills is a coupler 3 of standard construction, having a shank or butt 4 which is connected to and by which the buffing and draft shocks are transmitted to the draft mechanism.

Within the center sills are provided the usual forward and rear draft or stop lugs 5 and 6 respectively, and bearing against these stops are the forward and rear follower plates 7 and 8 respectively. The draft mechanism is located within the spaced center sills, and the shock absorbing mechanism which forms a part of the unit is carried by the yoke B and is located lengthwise between the two follower plates 7 and 8.

In addition to the forward and rear stops, there is provided a pair of center or intermediate stops 9 and 10 one each side of the yoke, the stops in each pair being spaced apart longitudinally of the structure, and disposed oppositely. These center stops are formed on suitable plate castings 11 which, as shown more clearly in Fig. 1, are secured by rivets 12 to the inner walls of the sill members.

The yoke B is preferably cast or formed as a one-piece integral structure and comprises longitudinal, parallelly disposed top and bottom members 13 and 14 respectively, which are connected at their end portions by the vertical walls 15 and 16 which form the yoke ends and which are spaced apart laterally to bring them relatively close to the vertical walls of the center sills but with sufficient clearance, however, to permit the yoke to move freely longitudinally. At the forward end, the shank of the coupler extends in between the yoke end walls and is provided with a transverse or horizontal key 17 which is inserted through a suitable slot 18 in the shank. This key extends through registering slots in the yoke end walls, and when in place locks the yoke to the coupler so that the yoke moves longitudinally in both directions with the coupler. The key likewise extends through registering slots 19 in the vertical walls of the center sills and corresponding slots in the stop lug castings, and thus supports and guides the coupler and the forward end of the yoke. The slots 19 are elongated sufficiently to allow for the longitudinal movement of the yoke in both directions in response to the corresponding movement of the coupler.

In like manner, the rear end walls 16 are slotted to receive a transverse key 20 which moves with the yoke, but which extends through registering slots 21 in the side walls of the sills and in the stop lug castings to support and guide the rear end of the yoke. These guide slots 21 are likewise elongated sufficiently to permit the longitudinal movement of the yoke in either direction. It will thus be seen that the yoke and all of the parts carried thereby are supported and guided at both ends in such manner that it constitutes a floating unit capable of longitudinal movement in both directions in response to the movements of the coupler. At the forward end, the inner end 22 of the coupler shank 4 bears directly upon the forward follower plate 7 so

that on buffing shocks the movements are applied to the forward follower plate. At the rear end, the yoke has a transverse wall 23 normally flush with the rear stops 6, so that it bears against the rear follower plate 8 and transmits draft shocks to the said follower plate 8.

The shock absorbing or cushioning mechanism is carried within the yoke in position between the two end follower plates 7 and 8, and consists generally of three sets of coil springs C, D and F. The end sets of springs C and D, each consisting of two parallelly disposed coil springs 25 bear against the follower plates 7 and 8, and are seated in the ends of a floating cage or column E which is free to move or oscillate as the springs are subjected to the buff and draft shocks.

This floating cage unit consists of top and bottom members 26 joined at their ends by the integral cross heads 27 and 28 which form shoulders 29 and 30 adapted to engage the center stops 9 and 10 respectively during the longitudinal movement of the cage. These cross heads also form seats for the inner ends of springs C and D, and are provided with longitudinally extending vertical and horizontal walls 31 which form box-like enclosures for the said springs. The ends 32 of these walls all lie in planes parallel with the planes of the followers 7 and 8, and form abutments which are adapted to be engaged by the follower plates 7 and 8. In the neutral or normal position of the parts, these abutment shoulders 32 are spaced from the follower plates, as shown in Figs. 1 and 2, the same distance at which the shoulders 29 and 30 are spaced from the center lugs 9 and 10. Thus the space between the abutment 32 and the follower plate 7, plus the space between the shoulder 29 and the center lug 9, constitutes the total length of the stroke of the draft gear from the normal position to a solid position against the stops.

It will thus be seen that on a buff shock, the coupler, yoke, and follower plate 7 will be moved toward the rear end of the gear and will compress the springs in set C which in turn apply pressure to their seats on the cross head 27, and this pressure in turn is transmitted through the cage or column E to the inner end of springs of set D and thence to the follower plate 8 which is in fixed position against the rear draft lugs 6. On the draft shock stroke, reverse action takes place, that is, the forward follower plate is in fixed position against the forward draft lugs 5, and the follower plate 8 compresses the springs D which pressure is transmitted to the springs C through the cage E. Thus the shocks in either direction of buff or draft is absorbed by the cushion effect of all of the springs of both sets C and D, and if the shocks are sufficient to complete the full stroke of the parts it will be distributed to the center sills not only by the forward or rear draft lugs, but by the center lugs as well.

In addition to the sets of springs C and D, there is provided the third set F which, in the present structure, consists of a single coil spring positioned within the floating cage E and compressed between the follower plates 35 which bear against the cross heads 27 and 28, but which are independently movable within the cage. Extension posts 36 extend through suitable holes in the cross heads 27 and 28, and bear against the follower plates 7 and 8 and the followers 35. These extension posts transmit the shocks from the follower plates 7 and 8 to the center spring F in either direction, as the case may be, and thus the cushion afforded to the buff and draft shocks by the spring F supplements that afforded by the spring sets C and D.

The cage E has vertical wall members 37 which are positioned between the top and bottom members 26 of the cage and held in place by the rivets 38 for the purpose of confining the center spring F within the cage, these walls being formed of separate pieces so as to permit the assembly of the spring F within the cage or removal thereof from the cage.

In the structure shown in Fig. 4, the center spring F is positioned within the floating cage E and its ends bear upon follower plates 40 which extend through the cage and normally bear against the center stop lugs 9 and 10. The cage has vertical cross walls 41 and 42 which are spaced apart the distance between the center lugs 9 and 10, and bear upon the follower plates 40, so that the movement of the floating cage E is transmitted to the center spring F in either direction, depending upon the buff or draft shock, as the case may be. In this structure, like that shown in Fig. 1, the spring sets C and D are seated in the box-like enclosures upon the cross heads 27 and 28 which form the shoulders 29 and 30 adapted to engage the center stop lugs 9 and 10. In like manner, the abutment ends 32 of the walls are positioned to be engaged by the follower plates 7 and 8. Thus the buff and draft shocks are imparted by the follower plate 7 or 8, directly and wholly to the springs C and D, and through these springs to the center spring F. Thus, for instance, on a buff shock, the follower plate 7 imparts movement and pressure to the springs C and is transmitted by the floating cage to the springs D. In addition to this, the movement of the cage E is imparted by the cross wall 41 of the cage E to the follower plate 40 and thence to the center spring F. Conversely a draft shock is imparted to follower plate 8 by the yoke and thence to the springs D and through the cage E to the springs C. At the same time, the movement of the cage E is transmitted to the cener spring through the cross wall 41 and the follower plate 40. Thus, all sets of springs act cumulatively to absorb and cushion the buff and draft shocks.

I claim:

1. In a railway car having center sills, the combination of a longitudinally movable yoke member positioned between the center sills, a coupler connected to the forward end of said yoke and adapted to move said yoke longitudinally, forward and rear stops fixedly attached to the inner sides of the center sills, forward and rear follower plates bearing against said stops, a reciprocable column within said yoke and movable independently thereof and having spring seats at the ends thereof, coil springs positioned against said seats and bearing against the adjacent follower plates, an additional coil spring means within said column, and means bearing upon the ends of said additional spring means for transmitting pressure from said follower plates to said additional spring means.

2. In a railway car having center sills, the combination of a longitudinally movable yoke member positioned between the center sills, a coupler connected to the forward end of said yoke and adapted to move said yoke longitudinally, forward and rear stops fixedly attached to the inner sides of the center sills, forward and rear follower plates bearing against said stops, a reciprocable cage movable within and independently of said yoke and comprising top and bottom parallel longitudinal members and cross heads at the ends

thereof forming spring seats, a pair of coil springs at each end of said cage positioned between and bearing upon said seats and the adjacent follower plates, a coil spring between said top and bottom members of the cage, and means at each end of said coil spring for transmitting motion thereto from the adjacent follower plates.

3. In a railway car having center sills, the combination of a longitudinally movable yoke member positioned between the center sills, a coupler connected to the forward end of said yoke and adapted to move said yoke longitudinally, forward and rear stops fixedly attached to the inner sides of the center sills, forward and rear follower plates bearing against said stops, a reciprocable cage movable within and independently of said yoke and comprising top and bottom parallel longitudinal members and cross heads at the ends thereof forming spring seats, a pair of coil springs at each end of said cage positioned between and bearing upon said seats and the adjacent follower plates, a coil spring between said top and bottom members of the cage, means at each end of said coil spring for transmitting pressure thereto from the adjacent follower plates, and means on said cross heads forming stops for engagement by said follower plates.

4. In a railway car having center sills, the combination of a longitudinally movable yoke member positioned between the center sills, a coupler connected to the forward end of said yoke and adapted to move said yoke longitudinally, forward and rear stops fixedly attached to the inner sides of the center sills, forward and rear follower plates bearing against said stops, intermediate stop lugs fixedly attached to the inner sides of the center sills, a reciprocable cage movable within and independently of the yoke and comprising spaced apart longitudinal members and cross heads at the ends thereof forming spring seats and shoulders adapted to engage said intermediate stop lugs, shock absorbing coil springs at each end of said cage positioned between and bearing upon said seats and said follower plates, and longitudinal walls on said cross heads extending toward said follower plates but normally spaced therefrom and adapted to be engaged by said follower plates.

5. In a railway car having center sills, the combination of a longitudinally movable yoke member positioned between the center sills, a coupler connected to the forward end of said yoke and adapted to move said yoke longitudinally, forward and rear stops fixedly attached to the inner sides of the center sills, forward and rear follower plates bearing against said stops, intermediate stop lugs fixedly attached to the inner sides of the center sills, a reciprocable cage movable within and independently of the yoke and comprising spaced apart longitudinal members and cross heads at the ends thereof forming spring seats and shoulders adapted to engage said intermediate stop lugs, shock absorbing coil springs at each end of said cage positioned between and bearing upon said seats and said follower plates, longitudinal walls on said cross heads extending toward said follower plates but normally spaced therefrom and adapted to be engaged by said follower plates, an additional coil spring positioned within and movable independently of said cage, and means extending between the ends of said additional spring and said follower plates and normally bearing upon said spring and plates for transmitting the movement of said follower plates directly to said spring.

6. In a railway car having center sills, the combination of a longitudinally movable yoke member positioned between the center sills, a coupler connected to the forward end of said yoke and adapted to move said yoke longitudinally, forward and rear stops fixedly attached to the inner sides of the center sills, forward and rear follower plates bearing against said stops, intermediate stop lugs fixedly attached to the inner sides of the center sills, a reciprocable cage movable within and independently of the yoke and comprising spaced apart longitudinal members and cross heads at the ends thereof forming spring seats and shoulders adapted to engage said intermediate stop lugs, shock absorbing coil springs at each end of said cage positioned between and bearing upon said seats and said follower plates, longitudinal walls on said cross heads extending toward said follower plates but normally spaced therefrom and adapted to be engaged by said follower plates, transverse follower plates extending through said cage and normally positioned against said intermediate stops, a coil spring positioned within said cage and between and bearing against said transverse follower plates, and means on said cross heads bearing against said transverse follower plates for transmitting the movement of said cage to said coil spring.

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