Nov. 17, 1931. E. C. JOHNSON 1,832,215

DRAFT GEAR FOR RAILWAY CARS

Filed Oct. 18, 1927 2 Sheets-Sheet 1

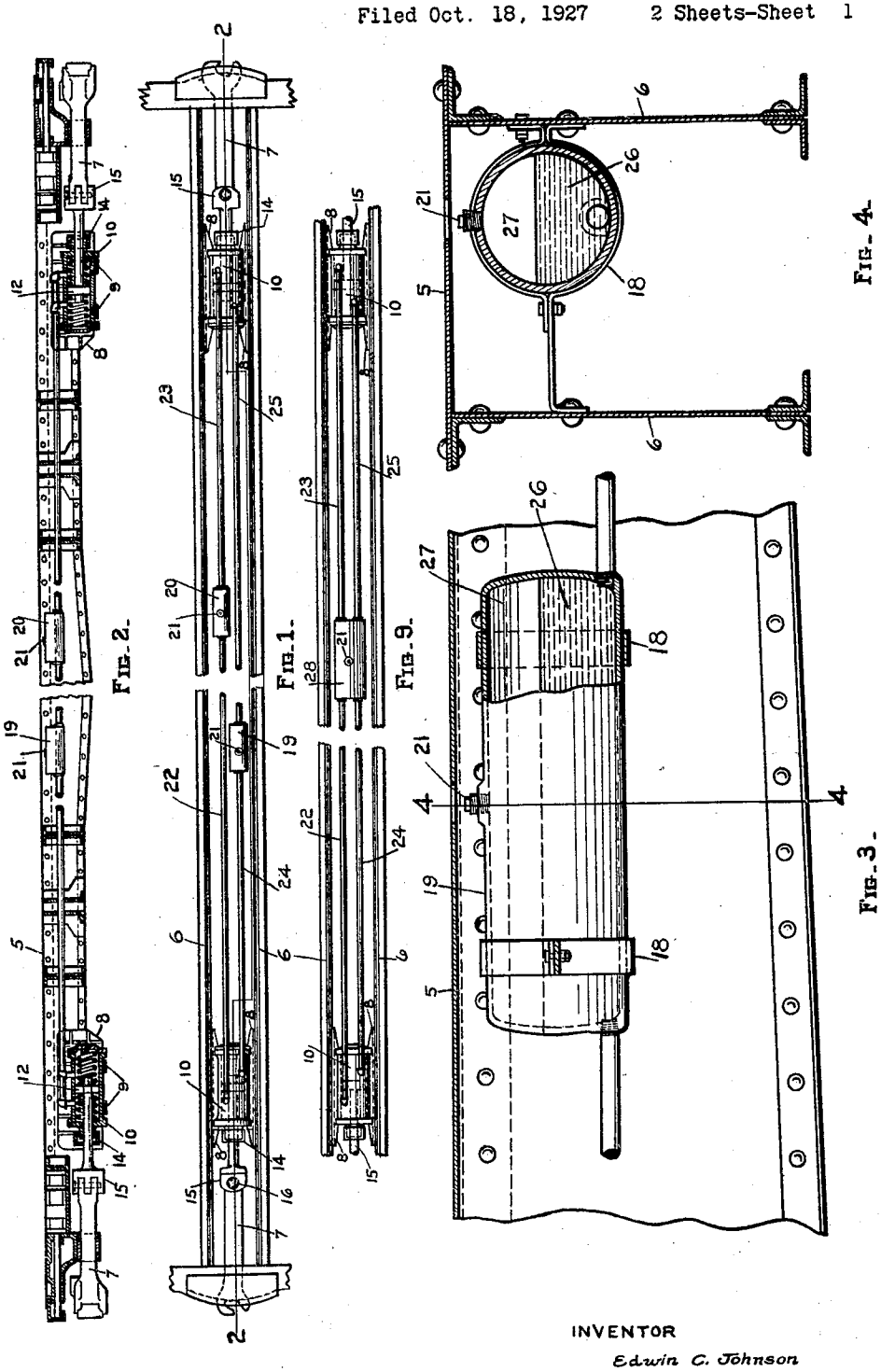


FIG. 2.

FIG. 1.

FIG. 9.

FIG. 4.

FIG. 3.

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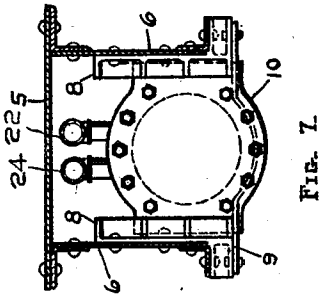


FIG. 7.

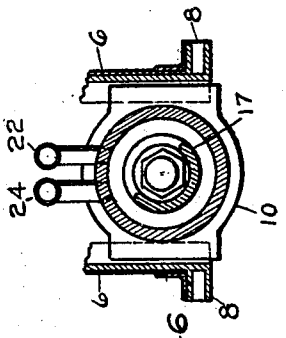


FIG. 8.

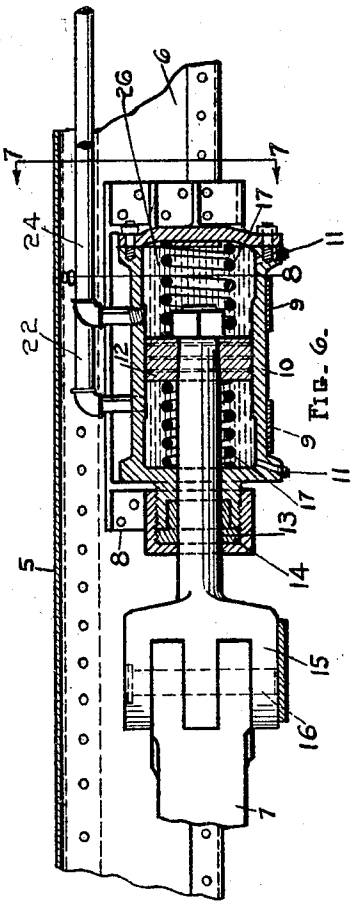


FIG. 6.

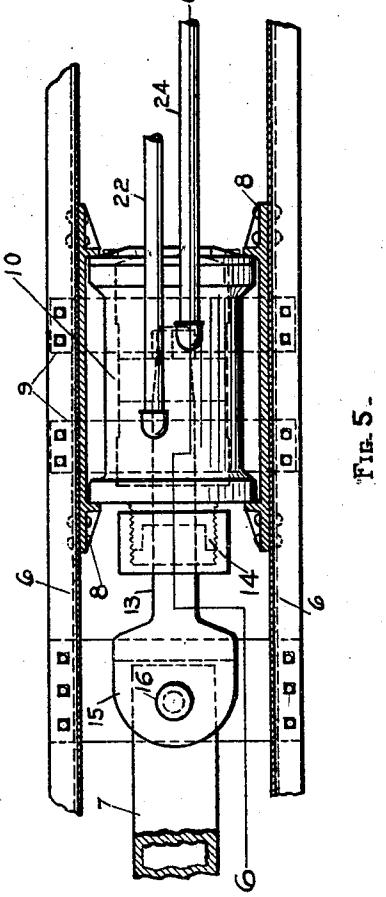


FIG. 5.

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UNITED STATES PATENT OFFICE

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DRAFT GEAR FOR RAILWAY CARS

Application filed October 18, 1927. Serial No. 226,931.

This invention relates to draft gears for railway cars and more particularly to draft gears of the type in which the strains and stresses incident to the movement of the cars of a railway train are yieldingly opposed and cushioned by a fluid resistance.

The primary object of the invention resides in the provision of a system of cooperative elements by which the stresses are uniformly distributed throughout the draft rigging of a train by fluid means.

Another object of the invention is to provide a hydraulic draft gear which is complete in itself for each individual car and requires no outside connections for its operation throughout the length of the train of which the car is a part.

With the above and other objects in view, my invention consists in the construction and arrangement of elements and parts hereinafter to be described in detail and shown in their preferred forms in the accompanying drawings.

In the drawings in the several views of which like parts have been similarly designated,

Figure 1 represents a fragmentary plan view of the draft system in its operative position on a railway car,

Figure 2, a section along the line 2—2, Figure 1,

Figure 3, an enlarged sectional elevation of one of the reservoirs comprised in the system,

Figure 4, a cross section taken on the line 4—4, Figure 3,

Figure 5, a sectional plan view, showing in elevation, one of the pressure cylinders employed in the system,

Figure 6, a longitudinal section of the cylinder taken in the planes indicated by the line 6—6 in Figure 5,

Figure 7, an end view of the cylinder, looking in the direction of the arrow across the line 7—7, Figure 6,

Figure 8, a cross section of the cylinder on the line 8—8, Figure 6, and

Figure 9, a plan view similar to Figure 1, showing a modification in the arrangement of the parts comprised in the invention.

Referring more particularly to the drawings, the reference numeral 5 designates the cover plate below the floor of a railway car, 6 the center sills of the car, and 7 the drawbars at the ends of the same. All of these parts are of conventional arrangement and construction.

Fastened between the sills through the medium of suitable draft lugs 8 and carrier irons 9, and located adjacent the ends of the car and in axial alinement with the drawheads, are pressure cylinders 10. Pistons 12 fitted for reciprocation in the cylinders are fastened at the ends of the rods 13 which pass through stuffing boxes 14 at the outer ends of the cylinders.

The rods are provided with grooved heads 15 for their connection with the ends of the drawbars by the usual pivot joints 16. Coiled springs 17 placed at opposite sides of the piston in each cylinder yieldingly resist its movement in both directions. Fastened between the sills of the car, by means of straps 18 approximately intermediate of the two cylinders are two reservoirs 19 and 20 each provided with a filler opening normally closed by means of a screw plug 21 and providing equalizing means.

The reservoir 20 is connected at its end with the spaces of the two cylinders at the sides of the pistons, outermost with relation to the ends of the car, by means of pipes 22 and 23, and similar conduits 24 and 25 connect the ends of the other reservoir 19, with the spaces of the cylinders at the opposite sides of their pistons.

The cylinders, the pipes and the lower portions of the reservoirs are filled with a liquid such as glycerine or oil, indicated at 26, leaving in the upper portions of the reservoirs, air spaces designated in Figure 3 by the numeral 27.

In the operation of the system, a pull exerted at one of the drawbars will result in a corresponding outward movement of the other draw bar owing to its connection with the drawbar of the next following car. The outward movement of the two drawbars causes a corresponding movement of the pistons in the respective cylinders with the

result that the liquid in the cylinders is partially expelled and forced through the pipes 22 and 23 into the reservoir 20.

The liquid entering the reservoir 20 at opposite ends compresses the air in the upper portion thereof and the stresses and strains due to the movement of the drawbars are in consequence absorbed by the fluid and evenly distributed and equalized at both ends of the car and throughout the length of a train of which the car is a part.

A similar result is obtained when a draw bar is subjected to an impact which causes it to move inwardly. The impact on one of the draw bars will result in a corresponding motion of the other draw bar owing to its connection with the next following car, the pistons in the two cylinders are in consequence moved inwardly toward the center of the car, and the liquid in the cylinders is forced through the pipes 24 and 25 into the reservoir 19 where it compresses the air in the upper portion thereof and thereby absorbs and equalizes the shocks due to the impacts on the draw bars.

In the modified construction illustrated in Figure 9, but one reservoir 28 is used, in connection with the four pipes leading to the two cylinders, it being evident that this one reservoir may perform the functions of the two separate reservoirs of the first described form of the invention provided that the openings connecting with the pipes are sufficiently small to restrict the outflow of liquid through one set of pipes upon the admission of liquid to the reservoir through the pipes of the other set.

Other modifications and changes in the construction and arrangement of the various elements comprised in the system may be resorted to within the scope of the invention as defined in the hereunto appended claims.

It will be seen that by the use of the invention, my draft gear may be applied to railway cars irrespective of their lengths, and that in this respect the invention is of advantage over draft gears at present in use, in which the draw bars at opposite ends of the car, are connected by mechanical equalizing contrivances.

The springs in the cylinders aid in returning the pistons to their normal neutral position in their respective cylinders. The springs also permit of using the draw gears without the fluid resistance in case by leakage or other causes, the hydraulic system is incapacitated. The springs have, otherwise, no important function in the operation of the system and may be dispensed with if desired.

While it is preferred to use a liquid such as glycerine or oil in the system, in addition to the bodies of air in the reservoirs, air alone may be employed with satisfactory results.

The cylinders are each provided with drain-openings normally closed by plugs.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:—

1. A draft gear for railway cars comprising in combination with draw bars at opposite ends of a car, cylinders on the car, pistons in the cylinders, connected with the draw bars, a reservoir in communication with the cylinders at one side of their pistons, a reservoir in communication with the cylinders at the opposite side of their pistons and fluid bodies in the cylinders.

2. A draft gear for railway cars comprising in combination with draw bars at opposite ends of a car, cylinders on the car, pistons in the cylinders connected with the draw bars, means connecting respective ends of the cylinders with each other, and oleic liquid in said means.

In testimony whereof I have affixed my signature.

EDWIN C. JOHNSON.