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J. MERCIER

2,287,389

BUMPER ESPECIALLY APPLICABLE TO RAILWAY VEHICLES

Original Filed March 7, 1936

Fig. 1.

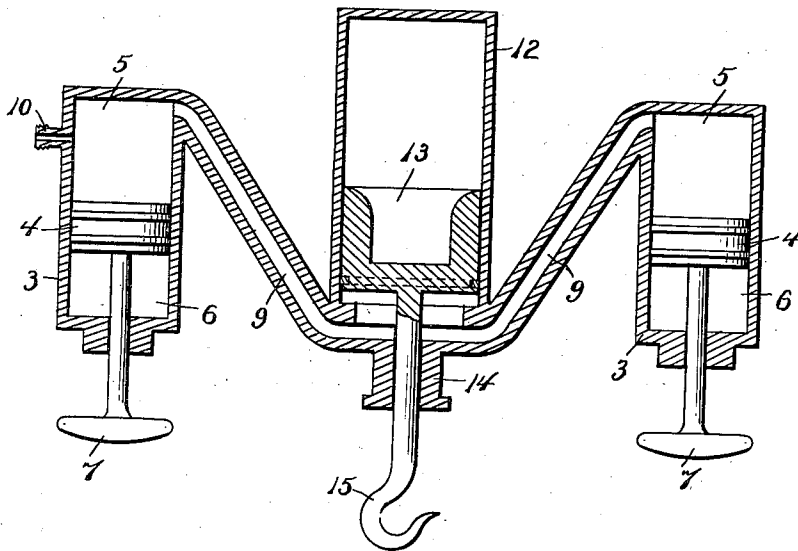
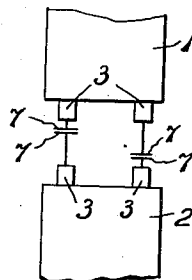


Fig. 2.



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UNITED STATES PATENT OFFICE

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BUMPER, ESPECIALLY APPLICABLE TO
RAILWAY VEHICLES

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Original application March 7, 1936, Serial No. 67,715. Divided and this application December 12, 1939, Serial No. 308,886. In France March 12, 1935

1 Claim. (Cl. 213—223)

My present invention relates to bumpers for railway vehicles and it has for its object to provide another embodiment of the generic invention disclosed in my application filed March 7, 1936, Ser. No. 67,715, issued as Pat. No. 2,187,625 of which the present application is a division.

Essentially the present invention provides two or more buffers disposed on either side of the longitudinal axis of the vehicle, the buffers being rigidly connected with two or more pistons, respectively, movable in corresponding cylinders which contain, at one side of the pistons, a compressible fluid, the cylinder for a piston at one side being so connected with the cylinder for a piston for the other side as to effect communication between the compressible fluid sides of the cylinders whereby the compressible fluid from a cylinder at one side of the vehicle will flow to the cylinder at the other side, and vice versa, according to the respective movements of the pistons, there being a third cylinder provided in communication with such connection, the third cylinder containing a piston connected to a drag hook through which two adjacent cars are coupled together, the piston in the third cylinder being subject, at one side, to the influence of the air in the other two cylinders when both their pistons move inwardly together, and being subjected at the other side to an air spring.

Other objects will in part be obvious and in part be pointed out hereinafter.

To the attainment of the above objects and ends the invention still further resides in those novel features of construction, combination and arrangement of parts, all of which will be first fully described in the following detailed description and then be particularly pointed out in the appended claim, reference being had to the accompanying drawing, in which:

Fig. 1 is a horizontal section illustrating the invention.

Fig. 2 is a diagrammatic view illustrating the working of the system according to the invention.

In the drawing, in which like numbers of reference indicate like parts in both figures, 1 and 2 represent two railway vehicles, each of which has a fixed cylinder 3 located at each side of the axis of the vehicle.

The cylinders 3 of one vehicle align, respectively, with those of the opposing vehicle.

Within each cylinder 3 is a piston 4 whose rigid rod carries a buffer 7.

Each cylinder encloses a chamber 5 containing a compressible fluid under above-atmospheric

pressure. Each cylinder also contains a chamber 6 containing air.

The chambers 5 are at the rear sides of the pistons, while the chambers 6 are at the fore side thereof.

A third cylinder 12 communicates at one end through ducts 9 with the chambers 5 of the respective cylinders 3. The other end of the cylinder 12 is closed. Within the cylinder 12 is a piston 13 connected directly to the drag hook 15 by which two adjacent cars are coupled together, the drag hook 15 having its rod portion passed through a suitable gland 14. The piston 13 is suitably packed so that when it is forced inwardly it will compress the fluid in the cylinder 12 between the piston 13 and the closed end of the cylinder, which fluid then acts as an airspring or cushion.

When the train is running along a curved portion of the track, one of the buffers is pushed outwardly from its cylinder a distance equal to that which the opposite buffer has been pushed into its cylinder. The drag hook 15 keeps its relative position with respect to the other fixed parts 3 and 12 of the vehicle. When a shock occurs, however, both of the buffers 7 are pushed into their respective cylinders. The distance between the fixed parts of two adjacent cars diminishes and the coupling devices are loosened. It is in order to keep the coupling devices stretched, in spite of this, that I provide in the embodiment shown in this invention, the means whereby the fluid discharged by pistons 4—4 pushes piston 13 in a backward direction together with the drag hook. If piston 13 is given an area substantially equal to the sum of the areas of the two pistons 4—4, the displacement of the drag hook 15 is made equal to that of the two pistons 4—4, so that the coupling shall be given a uniform tension. Fluid may be introduced into the cylinders 3 through a small inlet tube 10 provided for connection with a high pressure pump. Eventually, the discharge of the fluid may take place through this tube 10. When not in use, for inflation and deflation purposes, the tube 10 is of course suitably capped.

From the foregoing description, taken in connection with the accompanying drawing, it is thought that the construction, operation and advantages of the invention will be clear to those skilled in the art.

What I claim is:

A bumper device of the type described, for use in connection with a vehicle and especially a railway vehicle, which comprises, in combination,

at least two buffers movably carried by said vehicle on either side of the longitudinal axis thereof, two cylinders rigidly carried by said vehicle, pistons movable in said cylinders with a fluidtight fit and rigid with said buffers, respectively, a third cylinder, a piston movable with a fluidtight fit in said third cylinder, passages for interconnecting both of the first mentioned cylinders at their rear ends and the third mentioned cylinder at its front end, a compressible fluid filling the whole of these passages and the

chambers of said cylinders that are connected together by said passages, means for elastically opposing displacements of the third piston under the effect of a pressure transmitted thereto by said fluid, said fluid being compressible, and a drag hook rigidly connected to the piston in the third cylinder, the area of the cross section of the third cylinder being substantially equal to the sum of the areas of the cross sections of the two first mentioned cylinders.

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