Nov. 3, 1931. R. R. MAUK ET AL 1,830,706

DRAFT GEAR

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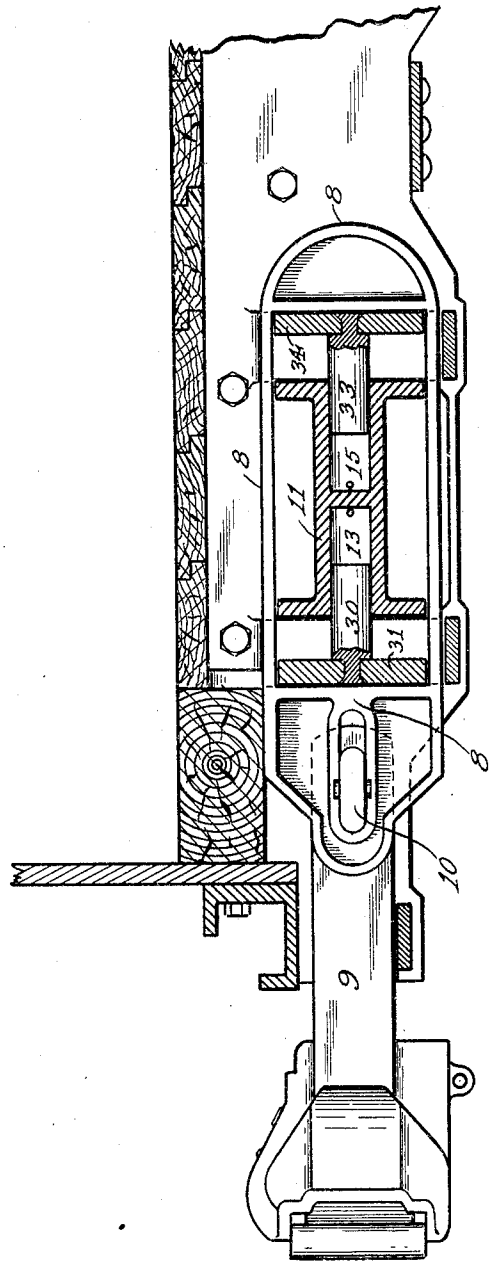



Fig. 1.

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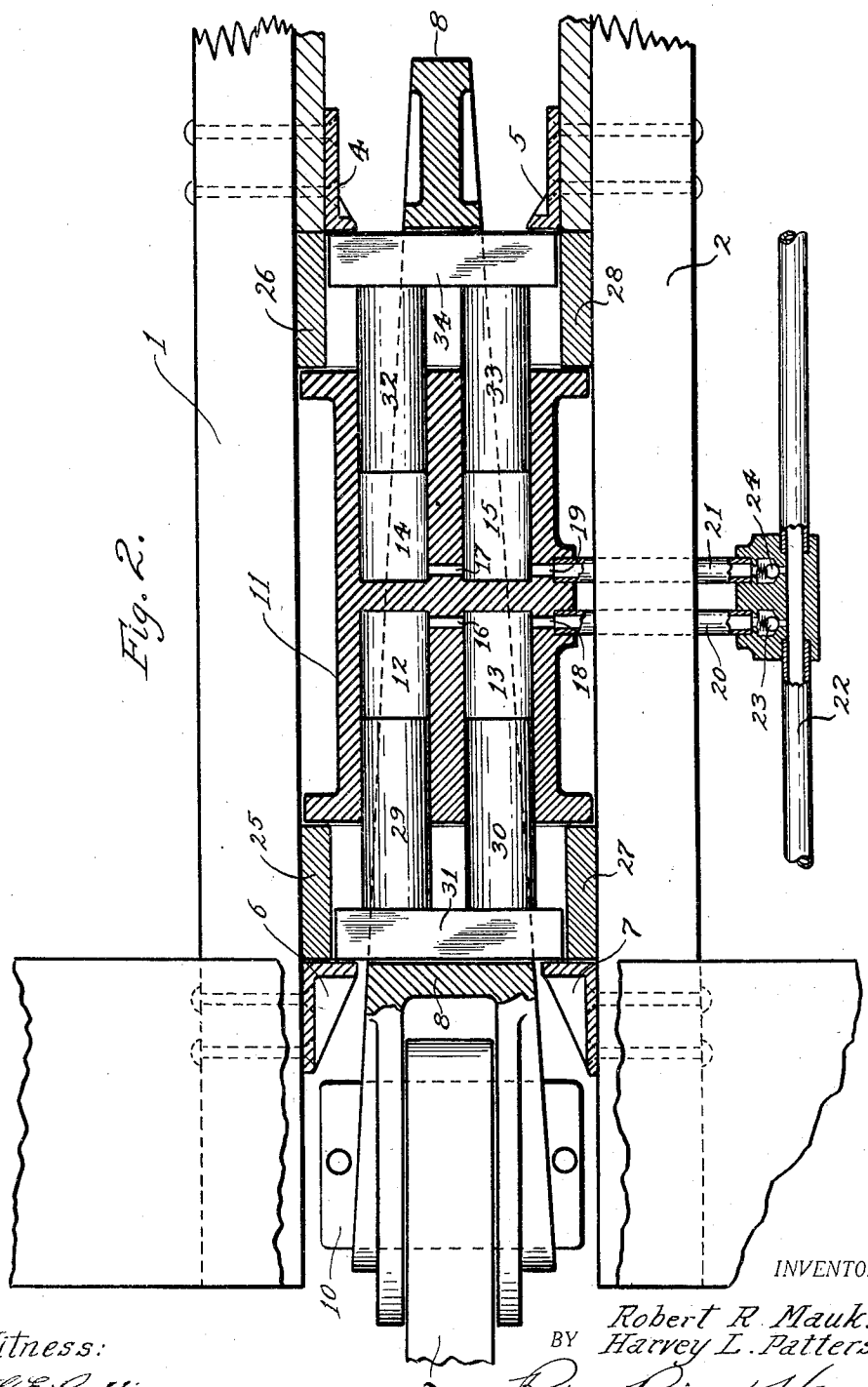



Fig. 2.

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# UNITED STATES PATENT OFFICE

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## DRAFT GEAR

Application filed January 28, 1929. Serial No. 335,413.

This invention relates to a pneumatic cushioning unit for a draft gear of a railway car.

The main objects of this invention are to provide an improved cushioning unit which can be readily assembled into the present standard construction of draft gear and yoke; and to provide a cushioning unit of the pneumatic type which has independent front and rear compression cylinders which are preferably connected to the train air line.

An illustrative embodiment of this invention is shown in the accompanying drawings, in which:

Fig. 1 is a view partly in elevation and partly in vertical longitudinal section of a draft gear and yoke mechanism showing the improved cushioning unit in position therein.

Fig. 2 is an enlarged fragmentary plan view partly in section of the same.

Heretofore pneumatic cushioning units have ordinarily been constructed by using a pair of telescoping cylinders and when telescoped together under pressure, for instance when the draft gear is under tension, the front end of the unit will be engaged against the sill abutments and if the train is brought to a sudden stop the entire unit slides rearwardly causing the rear end of the unit to strike with great force against the rear sill abutments.

In the present construction, a cylinder block is retained in fixed position medially with respect to the draft yoke when in its normal position. The opposite ends of the cylinder block have cylinders formed therein which receive pistons against which the yoke bears through the medium of suitable follower heads on the pistons. When the pistons are slid into their respective cylinders by pressure in one direction, the pistons at the other end of the cylinder block are at the position of their outward limit of movement. When tension is removed from the yoke, as soon as the yoke returns to its normal position it will engage against the opposite set of pistons and will receive a gradually increasing cushioning effect as the rearward movement of the yoke continues.

In the construction shown in the drawings, the customary longitudinally extending car sills 1 and 2 are provided with a pair of rear fixed sill abutments 4 and 5 suitably riveted or bolted thereto and a pair of front fixed sill abutments 6 and 7 which are likewise bolted or riveted to said sills. A yoke 8 of standard construction is mounted between the sills 1 and 2 in the usual manner and a draw bar 9 secured thereto by a flat key 10, although it is to be understood that our improved cushioning unit can be used with any standard type of yoke and draw bar and is not limited to use in connection with the exact construction shown.

The improved cushioning unit comprises a cylinder block 11 of elongated rectangular form adapted to be embraced by the yoke 8. The block 11 may be of cast steel or the like and the opposite ends thereof are provided with a plurality of cylinder bores 12, 13, 14 and 15. In the present construction, one pair of bores 12 and 13 are formed in the front end of the block 11 in parallel relationship to each other and a second pair of cylinders 14 and 15 likewise in spaced parallel relation are formed in the rear end of the block. The cylinders 12 and 14 are in axial alignment with each other and cylinders 13 and 15 are also in axial alignment with each other. The inner ends of the cylinders 12 and 13 terminate in spaced relation to the inner ends of the cylinders 14 and 15 as shown particularly in Fig. 2. A port 16 provides communication between the inner ends of the cylinders 12 and 13 and a similar port 17 performs the same function for the cylinders 14 and 15. The side of the cylinder block 11 is suitably drilled to provide openings or ports 18 and 19 into which are threaded independent pneumatic connections 20 and 21 respectively which in turn communicate with the train air line 22. Suitable back check valves 23 and 24 are provided for the pipes 20 and 21 respectively so that each pair of cylinders has independent communication with the train air line 22.

The cylinder block 11 is held in spaced relation medially of the normal position of the yoke 8 by spacer blocks 25, 26, 27 and 28 which engage the ends of the cylinder block

at the sides thereof and the fixed sill abutments 4, 5, 6 and 7.

The cylinders 12 and 13 are provided with pistons 29 and 30 respectively, axially slidable therein and preferably arranged to have a travel of approximately three inches. The outer ends of the pistons 29 and 30 are connected to a follower head 31 which is longitudinally slidable between the spacer blocks 25 and 27 and which at its outward limit of movement abuts against the fixed sill abutments 6 and 7.

The cylinders 14 and 15 are provided with pistons 32 and 33 respectively, axially slidable therein in the same manner and with the same space for movement as the pistons 29 and 30. The outer ends of the pistons 32 and 33 are rigidly connected to a follower head 34 which is longitudinally slidable between the spacer blocks 26 and 28 and which at its outer limit of movement abuts against the fixed sill abutments 4 and 5.

In the operation of this cushioning unit, when there is a pull on the draft bar 9 and yoke 8 the rear end of the yoke engages the follower head 34 and carries the pistons 32 and 33 inwardly against the air pressure in the cylinders 14 and 15 which air pressure is supplied through the ports 17, 19, pipe 21, check valve 24 from the train air line 22. If the train is brought to a sudden stop the pistons 32 and 33 and the follower head 34 return first to their normal position against the sill abutments 4 and 5 and then the front end of the yoke 8 engages the follower head 31 and carries the pistons 29 and 30 into the cylinders 12 and 13 against the air pressure therein which air pressure has been supplied through the ports 16 and 18, pipe 20 and check valve 23 from the train air line 22.

With this arrangement when one set of cylinders is under pressure by reason of push or pull on the yoke 8, the opposite pair of cylinders is being supplied with air from the train line, each pair of cylinders being independently connected to the train air line with independent check valves. In this way the cylinders have the maximum air pressure therein at all times.

Although but one specific embodiment of this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

We claim:

1. In a draft gear the combination, with front and rear pairs of fixed sill abutments and a yoke which rides therebetween, of a cushioning unit comprising a cylinder block adapted to be embraced by said yoke and retained against longitudinal movement by said sill abutments, said cylinder block having independent cylinders in the opposite ends thereof, pistons in said cylinders, follower heads on said pistons embraced by said yoke and arranged to engage said sill abutments and pneumatic connections to said cylinders.

2. In a draft gear the combination, with front and rear pairs of fixed sill abutments and yoke which rides therebetween, of a cushioning unit comprising a cylinder block embraced by said yoke, spacer blocks at the sides of the opposite ends of said cylinder block engaging said sill abutments and said cylinder block for retaining said cylinder block against longitudinal movement, the opposite ends of said cylinder block being provided with a plurality of cylinder bores, pistons for said cylinders, follower heads at the respective ends of said cylinder block connected to the adjacent pistons, said follower heads having longitudinal sliding movement between said spacer blocks and being adapted to engage said sill abutments to limit their outward travel and pneumatic connections to all of said cylinders.

In testimony whereof we have hereunto set our hands at Grand Rapids, Michigan, this 24th day of January, 1929.

ROBERT R. MAUK.
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