Nov. 26, 1957 D. W. LOWE 2,814,364

RAILWAY CAR IMPACT RETARDER

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Fig. 1.

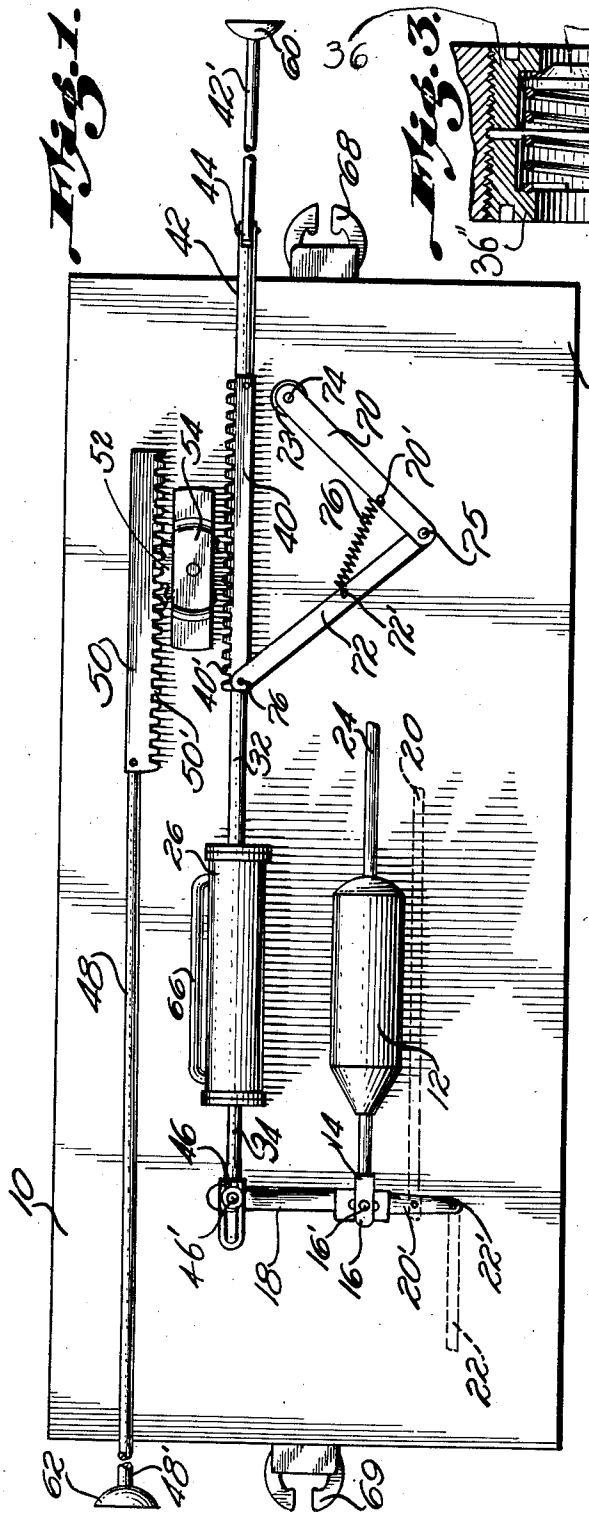


Fig. 3.

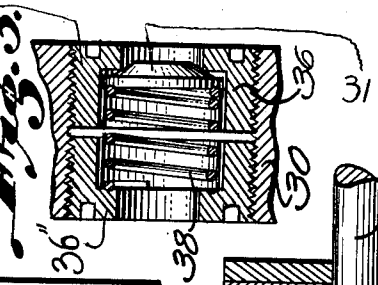
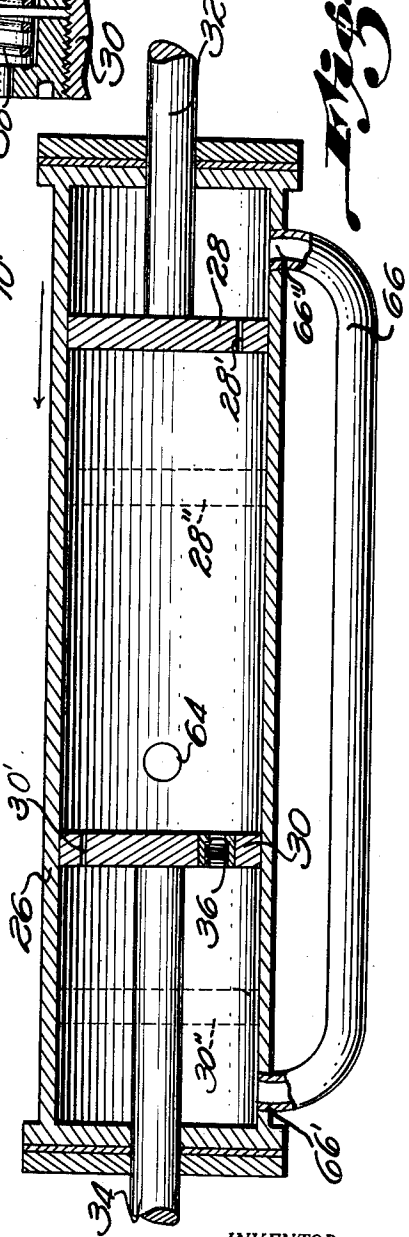


Fig. 2.



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RAILWAY CAR IMPACT RETARDER

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4 Claims. (Cl. 188—148)

The present invention relates to an improved railway car impact retarder, and in particular to a fluid operated device which utilizes the conventional air brake mechanism already carried on the car and is a modification of my Patent No. 2,725,121.

In shifting cars and making up trains and for taking cars in and out of trains there are many times that the cars are freed from the rest of the train and allowed to roll free toward another car to be stopped when the other car is contacted. No control is had over the brakes on that particular car while it is rolling free, except by the emergency hand brake. As the amount of speed the car must have at the time it is released from the train to make its journey can not be very well determined, the car is nearly always given the maximum speed to carry it the distance, consequently, the free-rolling cars many times may contact the stationary cars at a rate of 10 miles an hour which is damaging to the cars and to the contents they may be carrying, and many times no one is on the released car to operate the hand brake.

Releasing the cars and allowing them to roll free for most of their run saves considerable time in making up trains, or releasing cars along the routes upon sidings.

The primary object of the invention is to provide means for operating the present car brake which are normally operated by air, of a free moving car to apply the brakes just prior to contact with another car for reducing the speed of the free moving car.

Another object of the invention is to provide a mechanism that may be easy and inexpensive to attach to the present day railway car and its braking mechanism.

A further object of the invention is to provide a device that may be applied to the present day railway car without altering in any way the present air or hand operation of the brake.

While several objects of the invention have been set forth, other objects including its uses and advantages may become apparent to one skilled in the art as the nature of the invention is more fully disclosed which, consists of its novel construction, combination and arrangement of its several parts as shown in the drawings and described in the following detail description; in the drawings:

Figure 1 is a schematic plan view of the bottom of a railway car showing the relative position and attachment of the impact retarder in respect to the air brake and linkage to the brakes.

Figure 2 is an enlarged sectional view of one of the essential elements of the impact retarder.

Figure 3 is an enlarged fragmentary sectional view of a releasable fluid valve which may be set at predetermined pressures.

In referring to the drawings, like numerals are used to point out like and similar parts throughout the several views.

In Figure 1 there is schematically shown a bottom **10** of a conventional railway car having a conventional cylinder **12**, a rod **14** which has one end connected with a piston (not shown) movable along the inside of the

cylinder. The opposite end of the rod **14** is connected to a link **16** by the pin **16'**. The link **16** is hingedly connected to a cross-bar **18** which in turn is connected with rods **20** and **22** leading to the brakes for the wheels (not shown) located at each end of the car. At **24** there is indicated an air inlet pipe to the cylinder **12**, the air being supplied from any well-known supply source.

Normally the cross-bar **18** stops at the link **16**, but in this case it is continued to a point where it can be conveniently connected to the retarding device.

The retarding device comprises a hydraulic cylinder **26**. Operating within the cylinder **26** is a pair of pistons **28** and **30**. Connected to the piston **28** is one end of a piston rod **32**, and connected to the piston **30** is one end of a piston rod **34**. Each of the pistons has a bleeder opening **28'** and **30'** respectively. There is provided in piston **30** a pressure relief valve **36**. This valve is provided with a movable sealing member **31** acting in only one way. The movable member is loaded with a compression spring **38** the compression of which may be varied to regulate the pressure at which the movable member **31** will operate to open the valve. The valve supporting casing is in two pieces each piece **36'** and **36''** being screwed in from opposite sides of the piston head whereby the pressure on the spring **38** may be varied for predetermining the amount of pressure for opening the valve.

The opposite end of the piston bar **32** is connected to one end of a gear rack member **40** having teeth **40'**. The opposite end of the rack is connected to one end of an operating bar **42**. The outer end **42'** of the operating bar is hinged at a point **44** adjacent the car in order that the operating bar may be folded up out of operating position when a car has been uncoupled and standing alone.

The piston rod **34** connected with the piston **30**, has its opposite end connected to a link member **46** which in turn is connected with the cross-bar **18** by the pin **46'**.

Extending parallel with the operating rod **42** is a second operating rod **48**. This rod **48** has one end connected to one end of a gear rack **50**, similar to gear rack **40**. The teeth **50'** on the gear rack **50** and the teeth **40'** on the gear rack **40** face each other and are connected with a toothed gear wheel **52**. The gear wheel **52** is rotatably retained within a suitable bracket **54** for holding the gear in a fixed location between the racks. The gear racks engage opposite sides of the gear wheel **52**. This arrangement moves the gear racks in opposite directions when the gear **52** is rotated, or if the gear **52** is rotated in one direction by the movement of one of the racks, either rack **40** or rack **50** will move, the other rack in the opposite direction. The outer end **48'** of the operating rod **48** is also hinged as described for the parts **42'** of the rod **42** (the hinge not being shown). On the outer ends of the rods **42'** and **48'** there are contact plates **60** and **62** for contacting the adjacent end of the car toward which the free-rolling car is moving.

When either operating rod **42** or **48** is moved inwardly the rod **32** connected with piston **28** moves in the direction of the arrow shown in Figure 2.

The hydraulic cylinder is kept full of suitable fluid through an opening shown at **64**, to which a supply pipe may be connected. A conduit **66** is provided to convey the fluid from one end of the cylinder to the other as the pistons are moved to release either pressure, or the vacuum created behind the moving pistons.

The cars are usually provided with automatic couplings as shown at **68** and **69**, for pivotally connecting the cars to each other.

In operation, when the free moving car gets within a short distance or a predetermined distance of the car toward which it is moving, either the contact plate **60** or **62** comes in contact with that car to operate the impact

retarder. As the free-moving car moves closer toward the car to which it is moving, the rod **48** or **42** is depressed, moving the piston **28** through the cylinder **26** in the direction of the arrow, shown in Figure 2. As the piston **28** is moved to the position shown by the dotted lines **28''**, the piston **30** is moved toward the position shown by the dotted lines **30''**. When the pistons are moved, the conduit **66**, being connected with the cylinder adjacent its ends at **66'**, and **66''** relieves any pressures or vacuums that would be built up between the outer end of the piston and the end of the cylinder.

When the piston **30** reaches a position such as indicated by the dotted lines **30''**, the brakes are applied and piston **30** stops its travel toward its respective end of the cylinder. However, the movement of the car may continue to push the piston **28** further into the cylinder. To take care of this additional movement when the pressure between the pistons has increased to a predetermined amount, the movable member **31** of the valve will be lifted from its seat and the fluid will pass through the valve to the back of the piston **30** and through the conduit **66** to the rear of piston **28**.

When the forward motion of the piston **28** is stopped, fluid will leak through the bleeder openings **28'** and **30'** relieving the pressure between the piston. Piston **30** will return to its normal off braking position. When the folded end **42'** or **48'** of the operating rods **42** and **48** have been folded up and the force on the rods **42'** or **48'** has been released by folding up their respective ends **42'** or **48'** as previously described, the piston **28** will be returned to its normal position as indicated in full lines in Figure 2.

For moving the piston **28** to its normal resting place there is provided a compass-like member having a pair of hinged members **70** and **72**. One end of each of the members is hingedly connected as shown at **75**. The other end of one of the members **70** is hingedly attached to a stationary plate **73** by the pin **74**, which is fixed to the bottom of the car. The opposite end of the other member **72** is hingedly connected to one end of the rack **40** by the pin **76**. Extending approximately one-third the length of the member **70** from the pin **75** is an aperture **70'**, and extending approximately one-half of the distance between the end of the member **72** is an aperture **72'**. Between apertures **70'** and **72'** is a coiled tension spring **76** which is extended when the rack moves toward the cylinder **26**. The action of the spring **76** moves the rack back to its normal resting place and acts to extend the rods **42** and **48** to their normal distance beyond the outer end of the car so that the extensions **42'** and **48'** are in position to contact the car toward which the free moving car is moving, as has been described hereinbefore.

While one form of the invention has been illustrated and described in detail, it is not intended as a limitation and it is to be understood that certain changes of construction, combination and arrangement of its several parts may be made by those skilled in the art without patentable

variations from the disclosure set forth which will fall within the scope of the appended claims herein and the scope of the invention is best defined in the appended claims.

I claim:

1. In a wheel supported railway car having a braking system including means for engaging said wheels and means for automatically operating the said brakes comprising, in combination, a secondary brake operating means for automatically operating the said brakes when the car is in free rolling movement and in a predetermined distance of an adjacent railway car, said second operating means comprising a hydraulic cylinder being filled from end to end with a suitable liquid, a compression producing piston adjacent one end of the cylinder and a movable pressure receiving piston carried adjacent the opposite end of the cylinder adapted to be moved by the operation of the compression producing piston, an operating means for the said compression producing piston comprising arms extending outwardly from and beyond each end of the car adapted to be slidably carried thereon in the general direction of the movement of the car, one end of each of the said arms being connected to a piston rod, the said piston rod extending through one end of the cylinder having its opposite end connected with the pressure producing piston, means associated with the two slidable arms for operating either arm in the opposite direction when the other arm is being moved relative to the car, resilient means for normally maintaining the slidable arms in their extended position, the pressure receiving piston having one end of a piston rod connected thereto and extending outwardly from the piston rod through the opposite end of the cylinder, the opposite end of the piston rod being connected to the braking mechanism, whereby the movement of the pressure receiving piston will actuate the said brakes when moved by the operation of the compression piston through the movement of either of the slidable arm members.

2. In a braking system as set forth in claim 1 in which a valving and by-passing means is associated with the cylinder and pistons set for a predetermined pressure for allowing the fluid to pass from one portion to another portion of the cylinder when the pressure between the pistons has reached said predetermined pressure.

3. In a braking system as set forth in claim 1 in which a pressure relief valve is located to receive the pressure of the liquid between the pistons for admitting the liquid to the opposite side of the piston when a predetermined pressure has been built up between the pistons and means for conveying the liquid passing through the valve to the area between the piston and the end of the cylinder.

4. In a braking system as set forth in claim 1 in which the ends of a cylinder are connected by conduit for relieving the pressure and vacuum in the areas between the pistons and the cylinder ends.

No references cited.