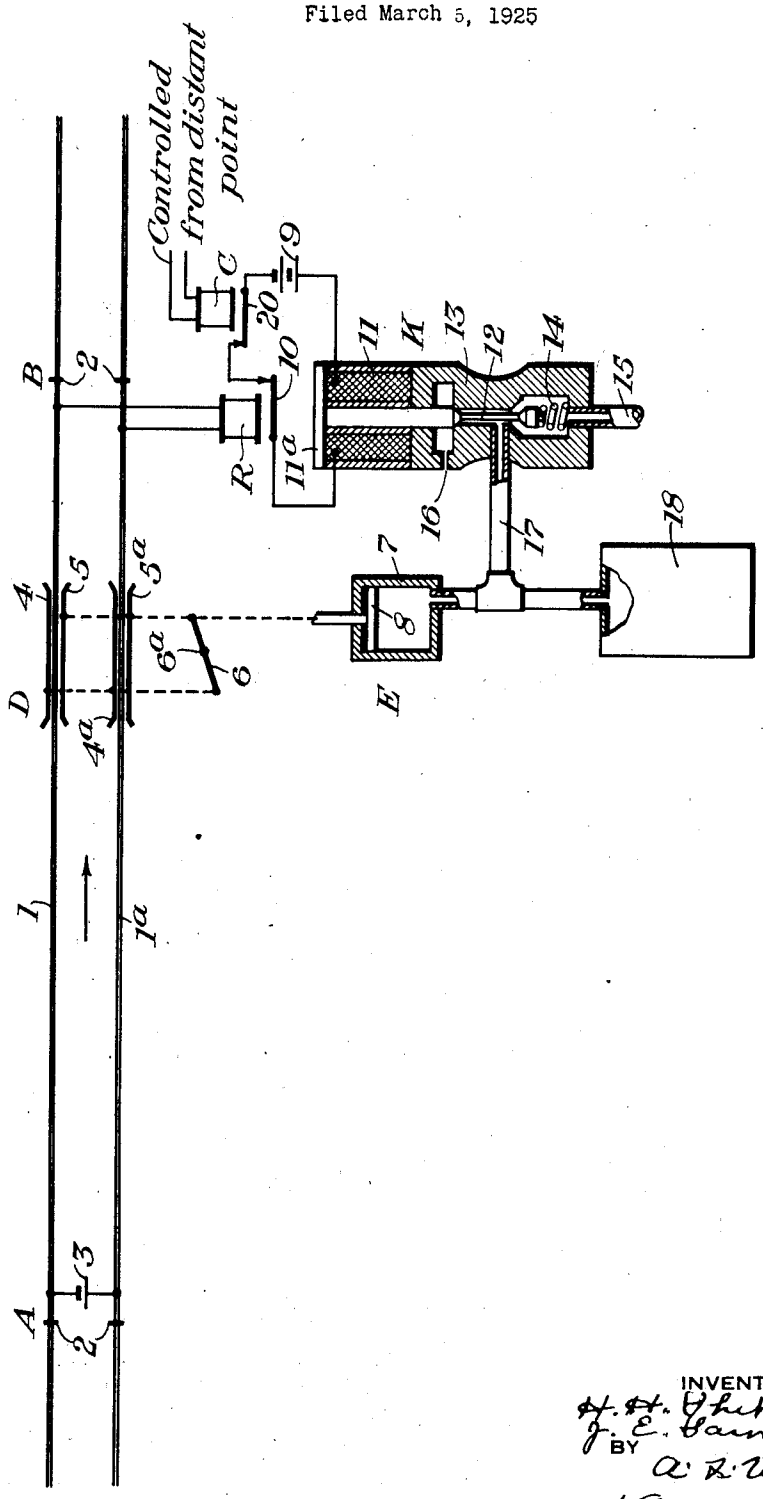
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H. H. SHEPARD ET AL

RAILWAY CAR RETARDER

Filed March 5, 1925



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RAILWAY-CAR RETARDER.

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To all whom it may concern:

Be it known that we, HENRY H. SHEPARD and JOHN E. SAUNDERS, citizens of the United States, residing, respectively, at Scranton, in the county of Lackawanna and State of Pennsylvania, and at East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Railway-Car Retarders, of which the following is a specification.

Our invention relates to railway car retarders. One object of our invention is the provision of means for automatically controlling car retarders in accordance with the speed of cars approaching the retarders.

We will describe one form of retarder controlling apparatus embodying our invention, and will then point out the novel features thereof in claims.

The accompanying drawing is a view, partly diagrammatic, illustrating one form of apparatus embodying our invention.

Referring to the drawing, the rails 1 and 1^a designate the track rails of a stretch of railway track over which cars normally move in the direction indicated by the arrow under such conditions that it is desirable to control the speed of these cars automatically. For example, the stretch of track here shown might be in a classification yard of the "hump" type through which cars move under the influence of gravity. It is obvious that in service of this kind the speed of individual cars or strings of cars will vary through wide limits depending, among other things, upon the speed at which they go over the hump, the temperature, the weight of the car and contents, and the condition of the car as to whether it is a free-running car or otherwise.

In order to control the speed of the cars we provide the stretch of track shown in the drawing with a car retarder D comprising, in the form here illustrated, a pair of braking bars 4 and 5 located adjacent rail 1 and a similar pair of bars 4^a and 5^a located adjacent rail 1^a. The bars of each such pair are located on opposite sides of the associated rail and are so disposed that when the bars are moved toward the rail they occupy positions in which they will engage the wheels or other parts of a passing car, thus retarding the passage of the car.

The braking bars 4, 5, 4^a and 5^a are controlled by a fluid pressure device E comprising a cylinder 7 containing a reciprocable piston 8. A lever 6, pivoted at point 6^a is operatively connected with piston 8 and with the braking bars in the trackway so that when fluid pressure is admitted to cylinder 7, as will appear hereinafter, piston 8 is driven outwardly thereby moving the brake bars into their braking positions. In the absence of pressure in the cylinder 7 the braking bars can be restored to their release positions by a passing car or by other means without any substantial braking effect upon the car.

The portion of track containing the car retarder D is isolated from the rest of the track, by means of insulated joints 2, to form a track section A—B, the arrangement being such that retarder D is adjacent the exit end of the section. Section A—B is provided with a source of track circuit current such as a track battery 3 connected across the rails adjacent the entrance end of the section, and with a track relay R connected across the rails adjacent the exit end of the section. Relay R controls an electromagnetic valve device K which in turn controls the device E which operates the retarder D. Valve device K comprises a valve body 13 containing a valve 12 controlled by armature 11^a of a magnet 11 and biased to an upper position by a spring 14. When relay R is energized current is supplied to magnet 11 over front contact 10 of the relay from battery 9, and valve 12 is urged downwardly against the bias exerted by spring 14. Valve 12 being in its lower position, fluid pressure, usually air, is supplied from a suitable source not shown in the drawing, through pipe 15, valve 12, and pipe 17 to cylinder 7, thereby forcing piston 8 outwardly. If relay R is de-energized, however, valve 12 moves to its upper position, thereby disconnecting cylinder 7 from pipe 15 and connecting the cylinder with atmosphere through a restricted orifice 16. The pressure in cylinder 7 is then gradually reduced by dissipation to atmosphere, thereby gradually diminishing the force with which the braking bars 4, 5, 4^a, 5^a are held in their braking positions. The time interval required for the release of the retarder may be increased by connecting a timing reservoir 18 constantly with the cylinder 7 thereby increasing the volume of air which must be dissipated before the retarder

is fully released. The rate of release of the retarder will be governed by the location of the retarder and by other circumstances, and may be varied to suit conditions by varying the size of orifice 16 or reservoir 18 or both.

As shown in the drawing all parts of the apparatus occupy the positions corresponding to the normal or unoccupied condition of section A—B. Relay R is energized, as also is valve device K, and pressure is therefore being supplied to cylinder 7 and reservoir 18 from pipe 15. The brake bars of retarder D are therefore held in their braking positions by maximum pressure. We will now assume that a car moving at a high rate of speed, passes through section A—B. As soon as this car enters the section relay R becomes de-energized, thereby opening the circuit for magnet 11. As a result the supply of pressure to cylinder 7 and reservoir 18 is discontinued and the pressure in this cylinder and reservoir is gradually dissipated to atmosphere through orifice 16. The car is traveling at a high speed however, and therefore reaches the retarder D before sufficient time has elapsed to materially reduce the pressure in cylinder 7. The brake bars of retarder D are therefore urged against the wheels of the car with comparatively great force and the car is retarded to a considerable degree. After the car passes out of the section A—B, relay R becomes energized again, thereby again supplying pressure to cylinder 7 and restoring the apparatus to the normal condition.

We will next assume that the apparatus is in the condition illustrated in the drawing and that a slowly moving car passes through the section A—B. The operation of the apparatus will be similar to that just described except that during the comparatively long time required for the slowly moving car to move from point A to the retarder D, the pressure in cylinder 7 is materially reduced, so that the retarder exerts only a comparatively small retarding effect upon the car.

It will be plain from the foregoing that each car will be retarded to a degree which is varied in accordance with the time consumed by the car in traveling from point A to retarder D, and therefore in accordance with the speed of the car. A rapidly moving car will be retarded more than a slowly moving car, and therefore the tendency of the system is to so retard cars that all cars will move at substantially the same speed after passing retarder D, irrespective of the speed at which they approach the retarder.

As shown in the drawing, the circuit for valve magnet 11 includes a contact 20 of a line relay C which may be controlled from a distant point by manual means. De-energization of relay C produces the same effect on the car retarder D as de-energization of track relay R, that is, it initiates a gradual reduction of the pressure applied to the retarder brake bars. Our invention thus contemplates combined automatic and manual control of the car retarder.

Although we have herein shown and described only one form of apparatus embodying our invention, it is understood that various changes and modifications may be made therein within the scope of the appended claims without departing from the spirit and scope of our invention.

Having thus described our invention what we claim is:

1. Railway car retarding apparatus comprising a retarder located in the trackway and normally in condition to impose maximum retardation upon cars, and means set into operation when a car approaching said retarder passes a predetermined point for gradually reducing the retardation imposed by said retarder.

2. Railway car retarding apparatus comprising a braking bar located in the trackway, means for normally holding said bar in a position to engage a part of a car, and means set into operation when a car approaching such braking bar passes a predetermined point to gradually reduce the force exerted on said bar by said means.

3. Railway car retarding apparatus comprising a pressure operated car retarder located in the trackway and arranged to retard cars to a varying degree depending upon the amount of pressure supplied thereto, means for normally supplying said retarder with high pressure, and means set into operation when a car approaching said retarder passes a predetermined point for gradually reducing said pressure.

4. Railway car retarding apparatus comprising a pressure operated car retarder located in the trackway and arranged to retard cars to a varying degree depending upon the amount of pressure supplied thereto, means for normally supplying said retarder with high pressure, and means set into operation when a car approaching said retarder passes a predetermined point for reducing said pressure at a predetermined slow rate.

5. In combination, a section of railway track, a braking bar located adjacent the exit end of said section, a pressure responsive device for moving said bar into engagement with a part of a car, and means effective when said section is unoccupied for supplying said device with comparatively high pressure but set into operation when a car enters said section to gradually reduce the pressure supplied to said device.

6. Railway car controlling apparatus comprising a car retarder located in the trackway, and means for automatically gradually

varying the retarding force exerted on cars by said retarder in accordance with the speed of cars approaching the retarder.

7. In combination, a section of railway track, a braking bar located in the trackway adjacent the exit end of said section, a pressure responsive device for moving said bar into position to engage a part of a car, a track relay for said section, and means controlled by said relay for supplying pressure to said device when the relay is energized but effective when the relay becomes deenergized to gradually reduce the pressure supplied to said device.

8. In combination, a section of railway track, a braking bar located in the trackway adjacent the exit end of said section, a pressure responsive device for moving said bar into a position to engage a part of a car, a track relay for said section, and a valve controlled by said relay for controlling the supply of pressure to said device so that the brake bar retards a car by an amount which varies in accordance with the time consumed by the car in travelling from the entrance end of the section to the braking bar.

9. In combination, a section of railway track, a braking bar located in said section, a fluid pressure device for moving said bar into a position to engage part of a car, and means for connecting said device with a source of pressure when said section is unoccupied but for connecting said device with atmosphere through a restricted orifice when the section is occupied.

10. In combination, a section of railway track, a braking bar located in said section, a pressure responsive device for moving said bar into a position to engage a part of a car, a timing reservoir constantly connected with said device, and means for connecting said device with a source of pressure when said section is unoccupied but for connecting said device with atmosphere through a restricted orifice when the section is occupied.

11. In combination, a section of railway track, a braking bar located in said section, a pressure responsive device for moving said bar into a position to engage a part of a car, an electromagnetic valve arranged when energized to connect said device with a source of pressure but to disconnect said device from said source and connect it with atmosphere through a restricted orifice when said valve is deenergized, a track relay for said section, and a circuit for said valve including a front contact of said relay.

12. In combination, a car retarder located in the trackway, a pressure responsive device for operating said retarder, and means for automatically controlling the pressure applied to said device in accordance with the speed of cars approaching the retarder.

13. In combination, a section of railway track, a car retarder for said section, a track relay for said section, and a device controlled by said track relay for gradually varying the retarding force exerted on cars by said retarder in accordance with the speed of cars approaching the retarder.

14. In combination, a section of railway track, a track relay for said section, a car retarder, a device controlled by said track relay for operating said retarder, and means interposed between said relay and said device for gradually varying the retarding force exerted on cars by said retarder in accordance with the speed of cars approaching the retarder.

15. Railway car controlling apparatus comprising a car retarder located in the trackway, manual means for controlling said retarder, and means for automatically controlling said retarder in accordance with the speed of cars approaching the retarder.

16. In combination, a section of railway track, a braking bar located in the trackway adjacent the exit end of said section, a pressure responsive device for moving said bar into position to engage a part of a car, a track relay for said section, a line relay controlled manually from a distant point, and means controlled by said relays for supplying pressure to said device when both relays are energized but effective when either relay becomes energized to gradually reduce the pressure supplied to said device.

17. In combination, a section of railway track, a track relay for said section, a line relay controlled from a distant point, a car retarder, a device controlled by said relays for operating said retarder, and means interposed between said relays and said device for gradually varying the retarding force exerted on cars by said retarder in accordance with lapse of time.

18. Railway car retarding apparatus comprising a pressure operated car retarder located in the trackway and arranged to retard cars to a varying degree depending upon the amount of pressure supplied thereto, means for normally supplying said retarder with high pressure, and adjustable means set into operation when a car approaching said retarder passes a given point for gradually reducing said pressure at a predetermined rate.

19. Railway car retarding apparatus comprising a braking bar located in the trackway in position to engage a part of a car, and means for automatically varying the braking force exerted on the car by said bar in accordance with the speed of the car approaching the bar.

20. In combination, a section of railway track, a track relay for said section, a braking bar for said section located in the trackway and adapted to engage a part of a car, and means controlled by said track relay for varying the braking force exerted on the car

by said bar in accordance with the speed of the car in said section.

21. A railway car retarding device comprising a braking bar located in the trackway and adapted to engage a part of a car, and time controlled means set into operation by a car approaching said bar for gradually varying the braking force exerted on the car by said bar.

In testimony whereof we affix our signatures.

HENRY H. SHEPARD.
JOHN E. SAUNDERS.