March 10, 1942. H. C. CLAUSEN 2,275,888

RAILWAY BRAKING APPARATUS

Original Filed June 21, 1939 2 Sheets-Sheet 1

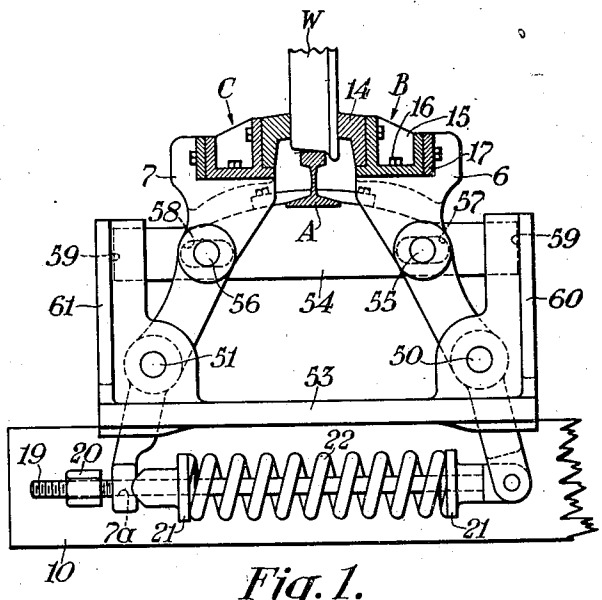


Fig. 1.

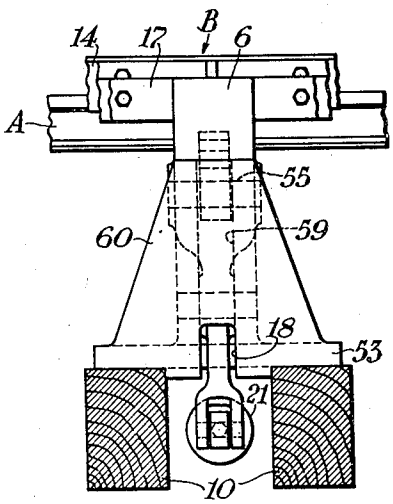


Fig. 2

INVENTOR
Harold C. Clausen.
BY
HIS ATTORNEY.

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RAILWAY BRAKING APPARATUS

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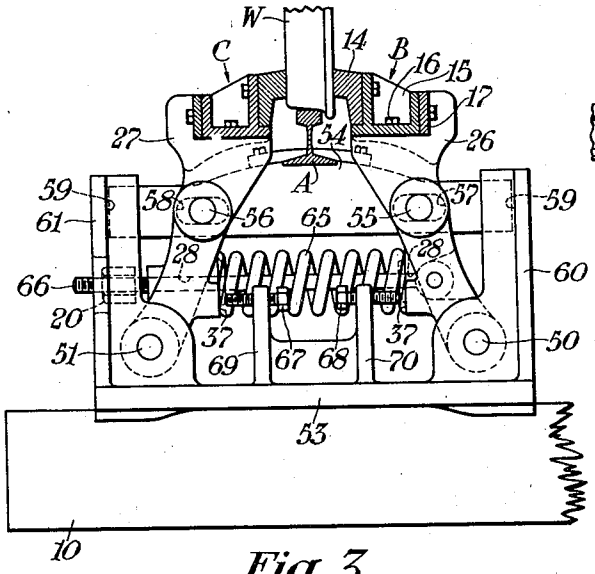


Fig. 3.

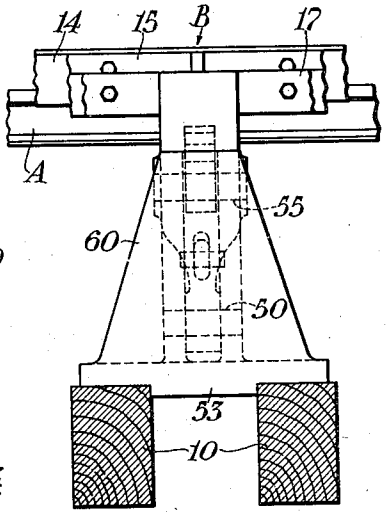


Fig. 4.

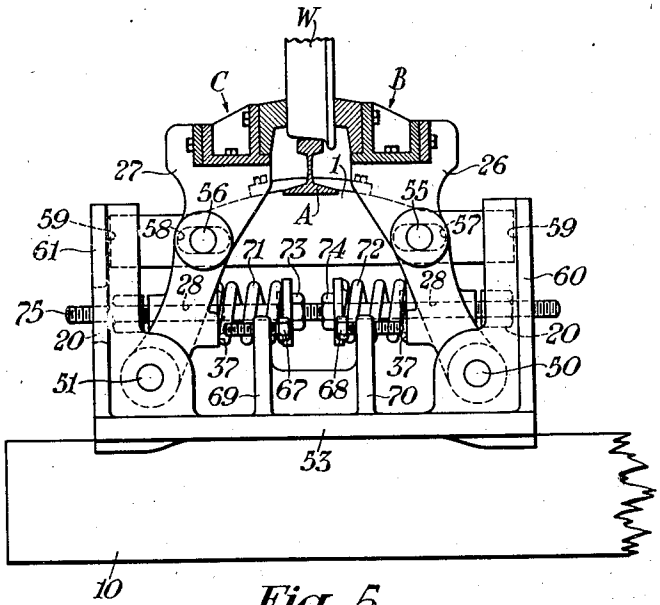


Fig. 5.

INVENTOR
Harold C. Clausen.
BY
HIS ATTORNEY.

Patented Mar. 10, 1942

2,275,888

UNITED STATES PATENT OFFICE

2,275,888

RAILWAY BRAKING APPARATUS

Harold C. Clausen, Wilkinsburg, Pa., assignor to The Union Switch & Signal Company, Swissvale, Pa., a corporation of Pennsylvania

Original application June 21, 1939, Serial No. 280,369. Divided and this application February 14, 1941, Serial No. 378,876

13 Claims. (Cl. 188—62)

My invention relates to railway braking apparatus, and particularly to that class of braking apparatus known as car retarders. More particularly, my present invention relates to car retarders of the type in which the braking bars exert on each car an amount of retardation which is proportional to the weight of the car.

One object of my invention is to provide a car retarder of the type described in which no part of the weight of the car is transmitted to the retarder through the wheel flanges.

Another object of my invention is to provide a car retarder of the type described which can be readily adjusted.

A further object of my invention is to provide a car retarder of the type described in which a fixed amount of retardation is exerted on all cars above a predetermined weight, whereby excessive strains on the various parts of the apparatus are avoided.

A still further object of my invention is to provide a car retarder of the type described which is inexpensive to manufacture and install, and which at the same time is highly efficient in operation.

Other objects and characteristic features of my invention will appear as the description proceeds.

The present application is a division of my copending application, Serial No. 280,369, filed on June 21, 1939, for Railway braking apparatus, now Patent No. 2,238,772, granted April 14, 1941.

I shall describe several forms of car retarders embodying my invention, and shall then point out the novel features thereof in claims.

In the accompanying drawings, Fig. 1 is a vertical sectional view showing one form of car retarder embodying my invention. Fig. 2 is a side view of the car retarder shown in Fig. 1. Fig. 3 is a vertical sectional view showing another form of car retarder embodying my invention. Fig. 4 is a side view of the retarder shown in Fig. 3. Fig. 5 is a view similar to Fig. 3 showing a modification of the structure illustrated in Fig. 3.

Similar reference characters refer to similar parts in each of the several views.

Referring first to Figs. 1 and 2, the reference character A designates one track rail of a stretch of railway track over which the wheels of cars which are to be retarded by means of the braking apparatus embodying my invention are adapted to pass. The rail A is mounted at spaced intervals on cradles 54, only one of which is shown in the drawings, and each cradle, in turn, is operatively connected by means of pivot pins 55 and 56 with two laterally spaced levers 6 and 7. The levers 6 and 7 extend downwardly and outwardly from the pivot pins 55 and 56, and are pivotally attached adjacent their lower ends by means of pivot pins 50 and 51 to a combined lever support and cradle guide 53 secured to two adjacent cross ties 10. The pivot pins 55 and 56 extend with clearance through longitudinally extending slots 57 and 58 provided in the cradle 54, and the ends of the cradle extend into guideways 59 formed in upstanding arms 60 and 61 provided on the lever support and cradle guide, whereby the cradle is free to move vertically but is prevented from moving laterally.

The upper end of the lever 6 carries a braking bar B which extends parallel to the rail A, and the upper end of the lever 7 similarly carries a braking bar C which likewise extends parallel to the rail A. Each braking bar B comprises, as usual, a brake shoe 14 secured to a brake beam 15. The brake beam 15 of each braking bar is adjustably secured to the associated lever by means of bolts 16 and a spacer 17.

The lower ends of the levers 6 and 7 extend downwardly with clearance through slots 18 provided in the support 9, and the lower end of the lever 6 is pivotally attached to one end of a spring bolt 19, the other end of which passes with clearance through an opening 7a provided in the lower end of the lever 7. The end of the bolt which passes through the opening 7a is screw-threaded to receive a nut 20. Surrounding the bolt 19 between two spring guides 21 which are slidably mounted on the bolt between the levers is a compressed coil spring 22. This spring constantly exerts a force on the lower end of the levers which urges them apart to positions which are determined by the adjustment of the nut 20, and the nut 20 will usually be so adjusted that when the lever 7 is engaging the nut 20 the levers will be rotated to positions in which the spacing between the braking bars B and C will be less than the widths of car wheels.

With the retarder constructed as just described, the levers are biased by the weight of the rail and cradle acting on the moment arm between the two vertically offset pivot pins of the levers and by the spring 22, to positions in which the spacing between the braking bars is less than the widths of car wheels, and it will be seen, therefore, that when a car enters the retarder, the wheels W of the car will force the braking bars apart to the positions in which they are shown in Fig. 1, and will thus cause the lever 6 to rotate in a clockwise direction about the pivot pin 50, and the lever 7 to rotate in a coun-

terclockwise direction about the pivot pin 51. This rotation of the levers, in turn, will cause the spring 22 to become compressed, and will also act to move the cradle, and hence the rail A upwardly, thereby causing the weight of the car to be transferred to the pivot pins 55 and 56. Due to the fact that the pivot pins 55 and 56 are offset inwardly from the pivot pins 50 and 51, any force which is exerted on the pivot pins 55 and 56 will exert a turning moment on the levers in the direction to force the braking bars into frictional engagement with the side faces of the car wheels, and it will be apparent, therefore, that the braking bars will be urged into engagement with the wheels of the car by a force which is directly proportional to the weight of the car. The magnitude of this force for any particular weight of car will of course depend partly upon the lever arm ratios which are provided, and partly upon the characteristics of the spring 22, and may be varied by changing either the lever arm ratios or the characteristics of the spring. It should be noted, however, that the spring is not necessary to my invention and may, if desired, be omitted altogether. It should also be noted that if the spring is omitted, the braking bars will still return to their closed positions when no car is in the retarder due to the gravity bias afforded by the weight of the rail and the cradles.

If it is desired to render the retarder inactive for any reason, this may be done by screwing nut 20 onto the bolt 19 far enough to rotate the levers to positions in which the braking bars will be held out of engagement with car wheels traversing the rail.

Referring now to Figs. 3 and 4, the retarder here shown differs from that shown in Figs. 1 and 2 in that the levers 6 and 7 have been replaced by the levers 26 and 27 which latter levers are biased apart by a spring 65 disposed on a bolt 66 that extends with clearance through openings 28 in the levers. A nut 20 is screwed onto the left-hand end of the bolt 66 and serves to limit the position to which the levers are free to rotate in response to the bias of the spring 65. This nut will usually be so adjusted that when the levers occupy the positions which they occupy when no car is passing through the retarder, the braking bars will be spaced apart a distance which is just a little wider than the widths of the wheels. The advantage of this adjustment is that it prevents excessive shock when the car enters the braking apparatus and forces the braking bars into engagement with the wheels.

The structure shown in Figs. 3 and 4 also includes two stop screws 67 and 68 screwed through upstanding lugs 69 and 70 provided on the support 53, and cooperating with the lever at one side of the bosses 37. When it is desired to render the retarder inactive, the nut 20 is backed off and these screws are then screwed into engagement with the levers, to thereby hold the levers in positions in which the braking bars are spaced apart a greater distance than the widths of car wheels.

The operation of the retarder shown in Figs. 3 and 4 will be readily understood from the preceding description without further detailed description. It should be noted, however, that by making the spring 65 sufficiently stiff the retarder can be made to operate in such manner that it will only retard cars having a weight in excess of a predetermined weight, as will be obvious.

Referring now to Fig. 5, the retarder here illustrated is similar to that shown in Figs. 3 and 4 with the exception that the bolt 66 shown in Fig. 3 has been replaced by a bolt 75 which is provided at each end with a nut 20, and which is surrounded between the levers 26 and 27 with two springs 72 and 71. These springs abut at one end against the bosses 37 which surround the openings 28 in the levers, and at their opposite ends against washers 68 and 67, respectively, which latter, in turn, abut against separate adjusting nuts 74 and 73, respectively. With this latter arrangement, it will be seen that by varying the adjustment of the nuts 73 and 74 the critical weight that a car must have to cause the apparatus to function can be readily varied, and that by tightening up on both nuts 20 the apparatus can be rendered ineffective to retard cars.

Although I have herein shown and described only a few forms of railway braking apparatus embodying my 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 my invention.

Having thus described my invention, what I claim is:

1. Railway braking apparatus comprising a support, a cradle guided for vertical sliding movement by said support and provided adjacent each end with a longitudinal slot, a track rail secured to and supported by said cradle, two levers pivoted intermediate their ends on pins slidably mounted in said slots and pivotally attached to said support in such manner that downward movement of said cradle will rotate the upper ends of said levers toward the track rail, and braking bars secured to the upper ends of said levers.

2. Railway braking apparatus comprising a support, a cradle guided for vertical sliding movement by said support and provided adjacent each end with a longitudinal slot, a track rail secured to and supported by said cradle, two levers pivoted intermediate their ends on pins slidably mounted in said slots and pivotally attached to said support in such manner that downward movement of said cradle will rotate the upper ends of said levers toward the track rail, braking bars secured to the upper ends of said levers, and spring means biasing said levers to positions in which the spacing between said braking bars is less than the widths of car wheels.

3. Railway braking apparatus comprising a support, a cradle guided for vertical sliding movement by said support and provided adjacent each end with a longitudinal slot, a track rail secured to and supported by said cradle, two levers pivoted intermediate their ends on pins slidably mounted in said slots and pivotally attached to said support in such manner that downward movement of said cradle will rotate the upper ends of said levers toward the track rail, braking bars secured to the upper ends of said levers, and spring means operatively connected with said levers below their points of attachment to said support and effective when no car is traversing said track rail to bias said levers to positions in which the spacing between said braking bars is less than the widths of car wheels.

4. Railway braking apparatus comprising a support, a cradle guided for vertical sliding movement by said support and provided adjacent each end with a longitudinal slot, a track rail secured to and supported by said cradle, two

levers pivoted intermediate their ends on pins slidably mounted in said slots and pivotally attached to said support in such manner that downward movement of said cradle will rotate the upper ends of said levers toward the track rail, braking bars secured to the upper ends of said levers, and means for at times rotating said levers to and holding them in positions in which said braking bars are out of engagement with the wheels of cars traversing said rail.

5. Railway braking apparatus comprising a support provided with laterally spaced upstanding arms formed with vertically extending guideways, a cradle slidably mounted at its ends in said guideways and provided adjacent each end with a longitudinal slot, a track rail secured to and supported by said cradle, two levers pivoted adjacent their upper ends on pins slidably mounted in said slots and pivotally attached adjacent their lower ends to said support in such manner that downward movement of said cradle will rotate the upper ends of said levers toward the track rail, braking bars secured to the upper ends of said levers, and spring means operatively connected with the lower ends of said levers and effective to bias said levers when no car is traversing said rail to positions in which the spacing between said braking bars is less than the widths of car wheels.

6. Railway braking apparatus comprising a support provided with laterally spaced upstanding arms formed with vertically extending guideways, a cradle slidably mounted at its ends in said guideways and provided adjacent each end with a longitudinal slot, a track rail secured to and supported by said cradle, two levers pivoted adjacent their upper ends on pins slidably mounted in said slots and pivotally attached adjacent their lower ends to said support in such manner that downward movement of said cradle will rotate the upper ends of said levers toward the track rail, braking bars secured to the upper ends of said levers, a bolt pivotally attached to the lower end of one lever and extending with clearance through an opening in the lower end of the other levers, and a spring on said bolt between said levers effective when no car is traversing said rail to bias said levers to positions in which the spacing between said braking bars is less than the widths of car wheels.

7. Railway braking apparatus comprising a support, a cradle guided for vertical sliding movement by said support and provided adjacent each end with a longitudinal slot, a track rail secured to and supported by said cradle, two levers pivoted intermediate their ends on pins slidably mounted in said slots and pivotally attached to said support in such manner that downward movement of said cradle will rotate the upper ends of said levers toward the track rail, braking bars secured to the upper ends of said levers, and spring means biasing said levers to positions in which the spacing between said braking bars is greater than the widths of car wheels.

8. Railway braking apparatus comprising a support provided with laterally spaced upstanding arms formed with vertically extending guideways, a cradle slidably mounted at its ends in said guideways and provided adjacent each end with a longitudinal slot, a track rail secured to and supported by said cradle, two levers pivoted adjacent their upper ends on pins slidably mounted in said slots and pivotally attached adjacent their lower ends to said support in such manner that downward movement of said cradle will rotate the upper ends of said levers toward the track rail, braking bars secured to the upper ends of said levers, a bolt pivotally attached to the lower end of one lever and extending with clearance through an opening in the lower end of the other lever, and a nut on said bolt effective when screwed in one direction to rotate the levers to and hold them in positions in which the spacing between said braking bars is greater than the widths of car wheels.

9. Railway braking apparatus comprising a support provided with laterally spaced upstanding arms formed with vertically extending guideways, a cradle slidably mounted at its ends in said guideways and provided adjacent each end with a longitudinal slot, a track rail secured to and supported by said cradle, two levers pivoted adjacent their upper ends on pins slidably mounted in said slots and pivotally attached at their lower ends to said support in such manner that downward movement of said cradle will rotate the upper ends of said levers toward the track rail, braking bars secured to the upper ends of said levers, and spring means operatively connected with said levers between the associated pivot pins and acting to bias said levers to positions in which the spacing between said braking bars when no car is traversing said rail is greater than the widths of car wheels.

10. Railway braking apparatus comprising a support provided with laterally spaced upstanding arms formed with vertically extending guideways, a cradle slidably mounted at its ends in said guideways and provided adjacent each end with a longitudinal slot, a track rail secured to and supported by said cradle, two levers pivoted adjacent their upper ends on pins slidably mounted in said slots and pivotally attached at their lower ends to said support in such manner that downward movement of said cradle will rotate the upper ends of said levers toward the track rail, braking bars secured to the upper ends of said levers, a bolt pivotally attached at one end to one lever between its point of attachment to said support and its point of connection with said cradle and extending at the other end through a clearance hole provided in the other lever between its point of attachment to said support and its point of connection with said cradle, and a spring disposed on said bolt between said levers and acting when no car is traversing said rail to bias said levers to positions determined by a nut screwed onto the free end of said bolt.

11. Railway braking apparatus comprising a support provided with laterally spaced upstanding arms formed with vertically extending guideways, a cradle slidably mounted at its ends in said guideways and provided adjacent each end with a longitudinal slot, a track rail secured to and supported by said cradle, two levers pivoted adjacent their upper ends on pins slidably mounted in said slots and pivotally attached at their lower ends to said support in such manner that downward movement of said cradle will rotate the upper ends of said levers toward the track rail, braking bars secured to the upper ends of said levers, a bolt pivotally attached at one end to one lever between its point of attachment to said support and its point of connection with said cradle and extending at the other end through a clearance hole provided in the other

lever between its point of attachment to said support and its point of connection with said cradle, a nut screwed onto the free end of said bolt and so adjusted that when said other lever is engaging said nut said braking bars will be spaced apart a distance which is wider than the widths of car wheels, and a spring on said bolt between said levers effective when no car is traversing said rail to bias said levers to positions in which said other lever engages said nut.

12. Railway braking apparatus comprising a support provided with laterally spaced upstanding arms formed with vertically extending guideways, a cradle slidably mounted at its ends in said guideways and provided adjacent each end with a longitudinal slot, a track rail secured to and supported by said cradle, two levers pivoted adjacent their upper ends on pins slidably mounted in said slots and pivotally attached at their lower ends to said support in such manner that downward movement of said cradle will rotate the upper ends of said levers toward the track rail, braking bars secured to the upper ends of said levers, spring means operatively connected with said levers between the associated pivot pins and acting to bias said levers to positions in which the spacing between said braking bars when no car is traversing said rail is greater than the widths of car wheels, and two stop screws screwed through lugs provided on said support and cooperating with the levers in such manner that by adjusting said stop screws said levers can be moved to and held in positions in which said braking bars are out of engagement with the wheels of cars traversing said track rail.

13. Railway braking apparatus comprising a support provided with laterally spaced upstanding arms formed with vertically extending guideways, a cradle slidably mounted at its ends in said guideways and provided adjacent each end with a longitudinal slot, a track rail secured to and supported by said cradle, two levers pivoted adjacent their upper ends on pins slidably mounted in said slots and pivotally attached at their lower ends to said support in such manner that downward movement of said cradle will rotate the upper ends of said levers toward the track rail, braking bars secured to the upper ends of said levers, a bolt extending at its ends through clearance holes provided in the levers between their points of attachment to said support and their point of connection with said cradle, nuts on each end of said bolt for limiting the movement of the levers in the directions to move the braking bars away from the rail, two springs on said bolt between said levers one cooperating with each lever to bias it to the position in which it engages the associated nut, and means for varying the force exerted by each spring to vary the braking force that the braking bars will exert on cars traversing said rail.

HAROLD C. CLAUSEN.