

Aug. 13, 1929.

F. H. PIETZSCH

1,724,512

BRAKE MECHANISM FOR RAILWAY CARS

Filed Oct. 3, 1927

3 Sheets-Sheet 1

Fig. 1.

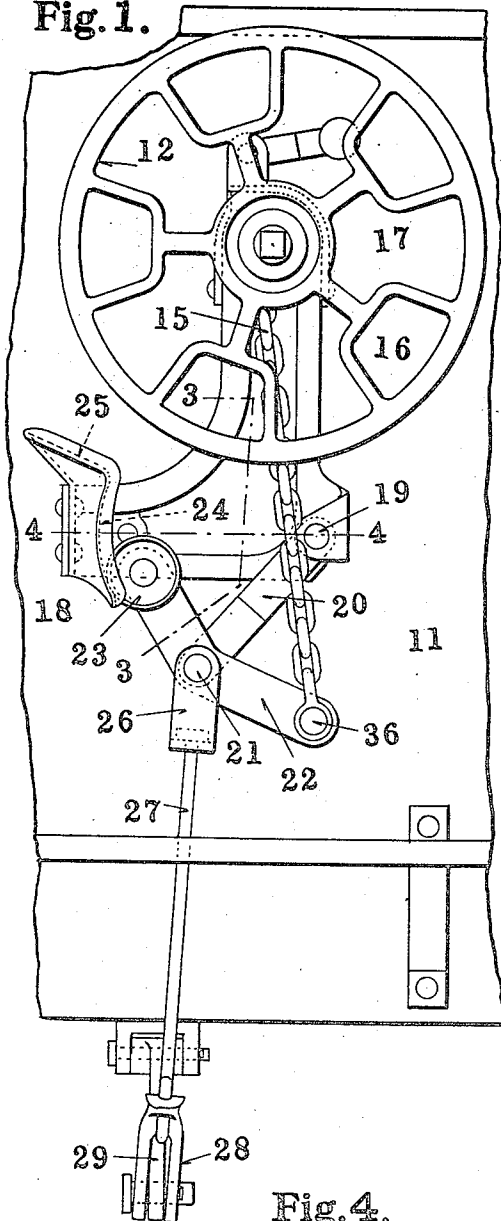


Fig. 2.

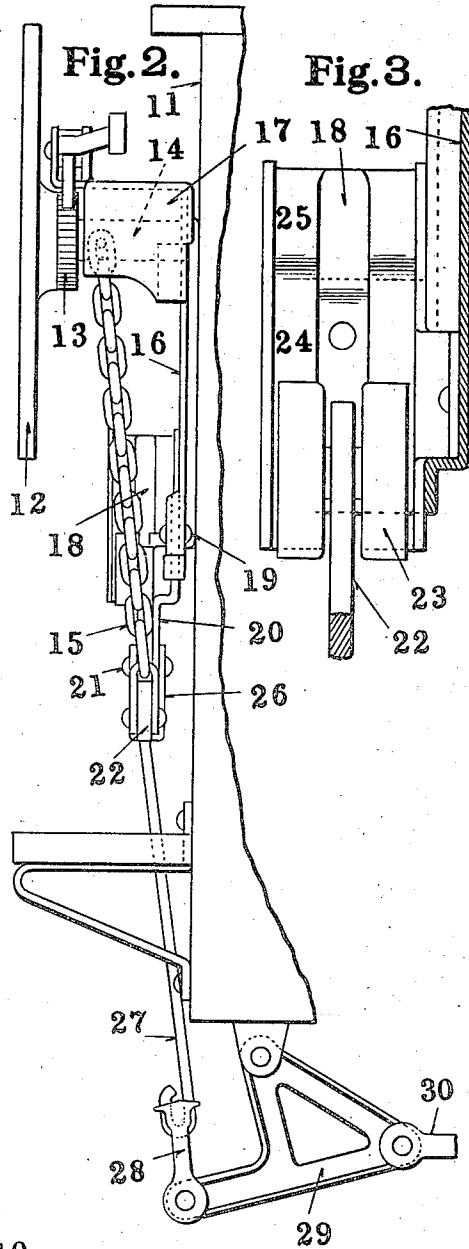


Fig. 3.

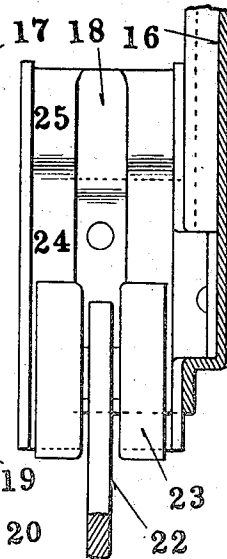
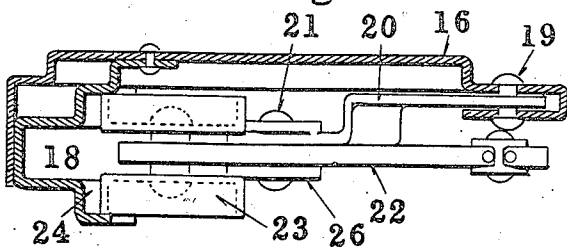


Fig. 4.



Inventor
F. H. Pietzsch

By

E. C. Kupperman
Att'y.

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F. H. PIETZSCH

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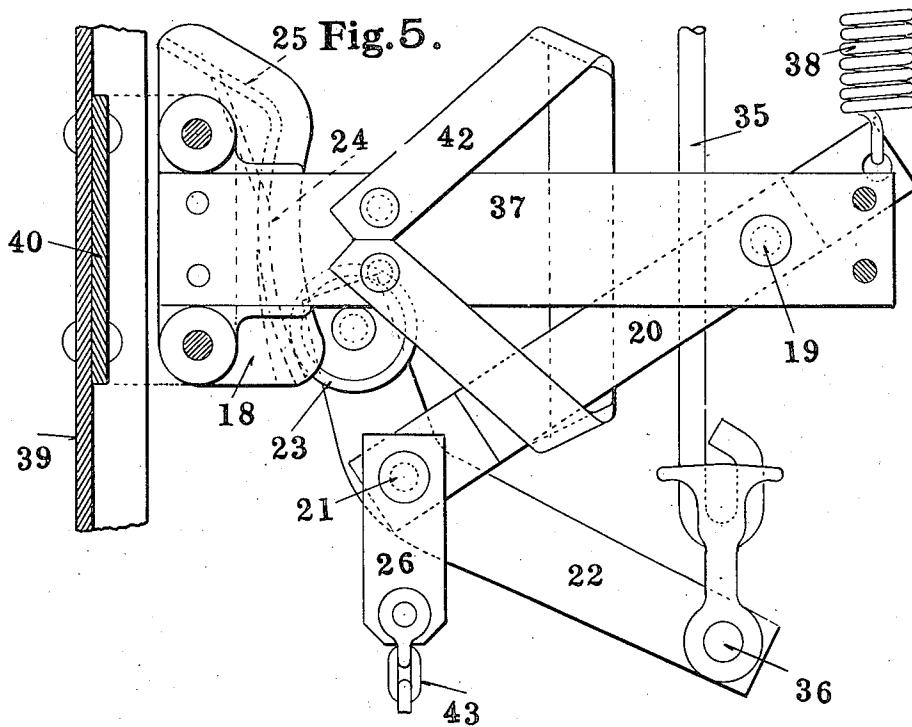


Fig. 6.

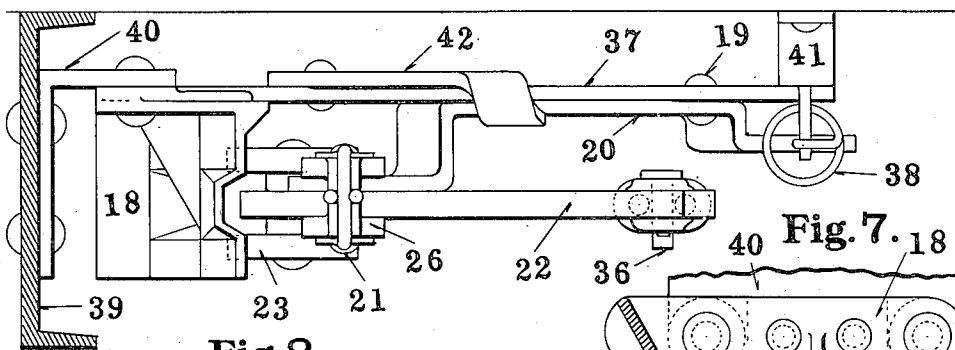
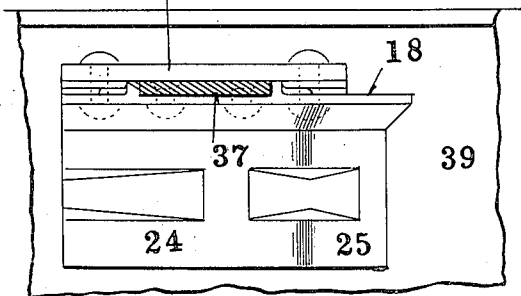
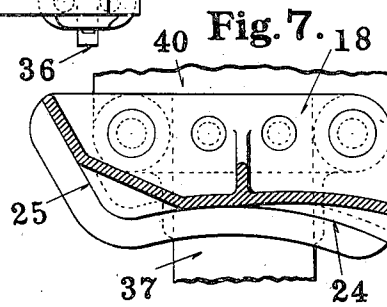


Fig. 8.



Inventor
F. H. Pietzsch

By *E. E. Hoffman*
Att'y.

Aug. 13, 1929.

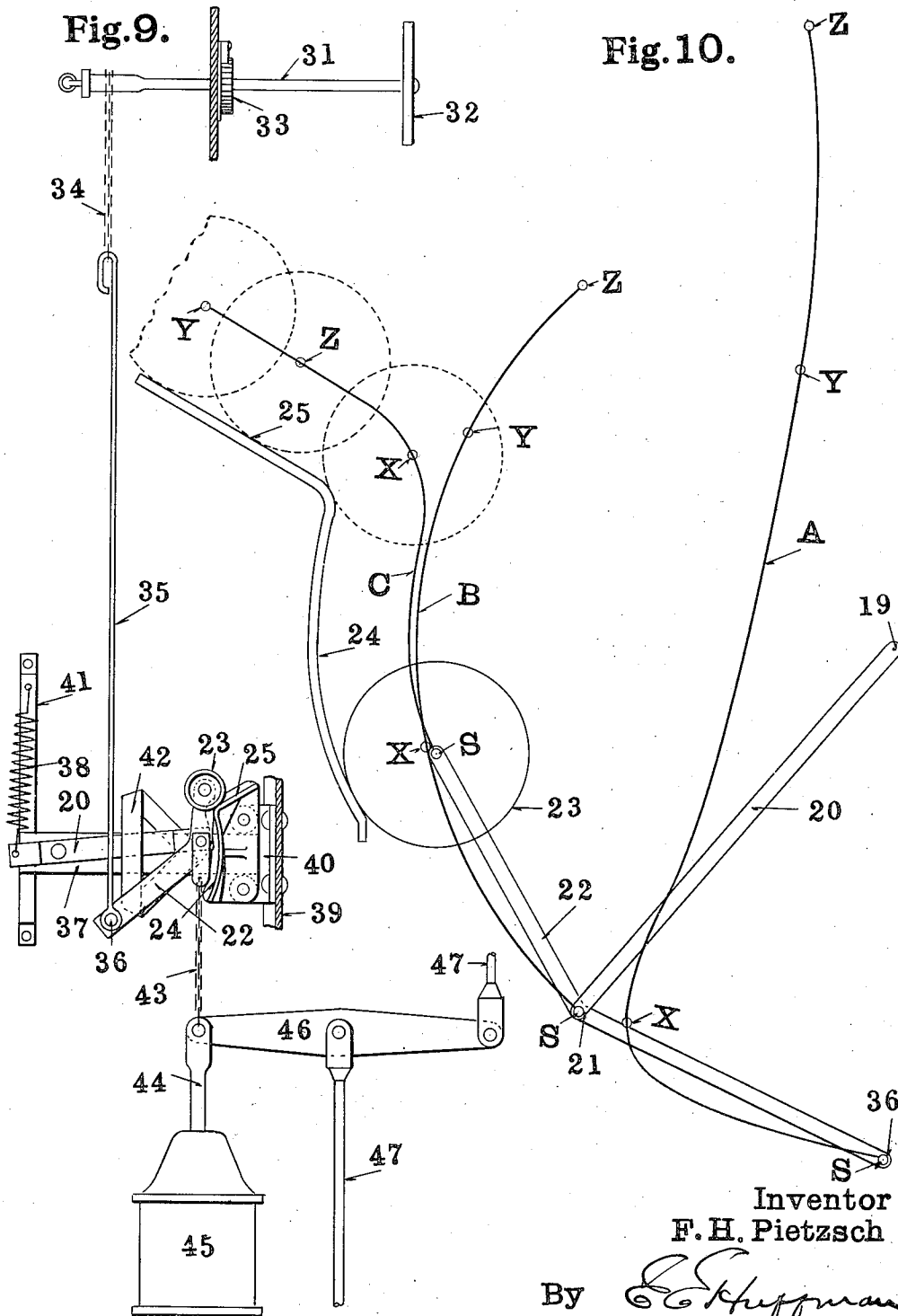
F. H. PIETZSCH

1,724,512

BRAKE MECHANISM FOR RAILWAY CARS

Filed Oct. 3, 1927

3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE.

FRANK H. PIETZSCH, OF ST. LOUIS, MISSOURI, ASSIGNOR TO RAILWAY DEVICES COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

BRAKE MECHANISM FOR RAILWAY CARS.

Application filed October 3, 1927. Serial No. 223,827.

My invention relates to a brake mechanism for railway cars and is particularly applicable to the type of mechanism known as hand brakes. The object of my invention is to provide an improved form of mechanism in which the brake mechanism will be moved rapidly during the first part of the operation to take up the slack, and slowly and with correspondingly increased power during the latter part of the operation when the brake shoes are applied to the wheels.

In the accompanying drawings, which illustrate two forms of brake mechanism made in accordance with my invention, Figure 1 is a front view of one form; Figure 2 is a side elevation; Figure 3 is an enlarged view on the line 3—3 of Figure 1; Figure 4 is an enlarged view on the line 4—4 of Figure 1; Figure 5 is a top plan view of another form; Figure 6 is a rear elevation of the form shown in Figure 5; Figure 7 is a horizontal section through the guide shoe; Figure 8 is a side elevation of the guide shoe; Figure 9 is a semi-diagrammatic view showing the relation of my device to the brake staff and brake cylinder; and Figure 10 is a diagram illustrating the movement of the parts.

Referring first to Figures 1 to 4, which illustrate a brake mechanism of the type having a vertically disposed hand wheel, 11 indicates the end of a car provided with the usual hand wheel 12 having ratchet mechanism 13 and actuating a short horizontal shaft 14 on which a chain 15 is wound to set the brake. Secured to the end of the car is a bracket 16 preferably provided with a housing 17 for the shaft and carrying a guide shoe 18 and a pivot pin 19. Mounted on the latter is the inner end of an arm 20, on the outer end of which is mounted at a point 21 intermediate of its length a lever 22 connected at one end to the chain 15 and carrying on the other end guide wheels 23 cooperating with the track of the guide shoe 18. This track comprises a lower part 24 lying approximately in an arc having its center at the pivot point 19 of the arm 20, and an upper part 25 lying in a line approximately radial to said pivot point. Connected to the pivot point 21 by means of a yoke 26 is the upper end of a rod 27 the lower end of which is connected by a brake jaw 28 to a bell crank lever 29 carried on the

bottom of the car and attached to a rod 30 leading to the brake cylinder.

The form of brake mechanism shown in Figures 5 to 9 is adapted for use in connection with a car having a vertical brake shaft 31 and a horizontal hand wheel 32. The shaft is provided with ratchet mechanism 33 and actuates a chain 34 corresponding to the chain 15 hereinbefore described. This chain is connected preferably by means of a rod 35 with the power changing or "booster" mechanism which, in this form, is situated under the car instead of against its end. The inner end of the rod 35 is pivoted at 36 to the lever 22 mounted on the arm 20 which, in this form of the device, is mounted on a plate 37 and is provided with an extension to which is attached a spring 38. Carried by a sill 39 is a bracket 40 supporting the guide shoe 18 to which is attached one end of the plate 37, the other being carried by a bracket 41 to which the spring 38 is also secured. A guard 42 secured to the plate 37 holds the arm 20 against the lower face of the plate and also forms a stop to limit the movement of the arm in either direction. Secured to the yoke 26 is a chain 43 attached to the pushrod 44 of the brake cylinder 45 which actuates the brake beam 46 to operate the brake rods 47.

The operation of my device will be clear from the diagram Figure 10. The initial positions of the pivot points 36 and 21 and the axis of the roller 23 are indicated by the letter S. As power is applied to the pivot 36 through the hand wheel and connections this point travels along the line A causing the pivot 21, which communicates power to the brake mechanism, to travel along the arc B having the point 19 as its center. The pull on the opposite end of the lever 22 causes the roller 23 to bear against tracks 24, 25 so that the axis of the roller travels along the line C parallel to said tracks. During the first part of the movement while the roller is in contact with the part 24 of the track the arm 20 and lever 22 move substantially as a unitary part, while after the roller comes in contact with the part 25 of the track the lever 22 swings on the pivot 21 the two parts now acting as a toggle thus greatly increasing the force applied to the brake mechanism. The letter X indicates the position of the moving points when the

roller reaches the upper end of the track 24; letter Y their position when it reaches its extreme position on the track 25; and the letter Z the extreme movement of the points 36 and 21 which causes the roller to recede on the track 25. It will be seen that the vertical distance between the points S and X on the line A, which represents the movement of the actuating devices, is much less than the corresponding vertical distance S—X on the line B, which represents the movement applied to the braking mechanism and which is sufficient to take up the normal slack in said mechanism, while the vertical distance X—Z on said line A is greater than the corresponding vertical distance on the line B indicating the increased power applied to the brake mechanism. This latter movement is sufficient not only to apply the brake with the normal amount of slack in the connection but also to take up any additional slack which may develop from wear of the parts.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a device of the class described, the combination with manually operated power applying means, of brake mechanism, and a booster interposed therebetween, said booster comprising an arm, a lever pivoted thereto, and guide mechanism causing said arm to move approximately in unison with the lever during the first part of the braking operation and to act as a toggle during the latter part of said operation.

2. In a device of the class described, the combination with manually operated power applying means, of brake mechanism, and a booster interposed therebetween, said booster comprising an arm having a fixed pivot, a lever pivoted thereto, and a guide consisting of two intersecting tracks cooperating with said lever to control the relative movement of said arm and lever during the braking operation.

3. A booster for railway brakes comprising an arm having a fixed pivot, a lever pivoted to said arm, power applying con-

nection attached to one end of said lever, a guide shoe cooperating with the other end of said lever, and brake applying connections operated from the booster.

4. A booster for railway brakes comprising an arm having a fixed pivot, a lever pivoted to said arm, a power applying connection extending to one end of said lever, a guide shoe cooperating with the other end of said lever and having two intersecting tracks, and brake applying connections operated from the booster.

5. A booster for railway brakes comprising a pivoted arm, a lever pivoted to said arm, power applying connection attached to one end of said lever, a guide shoe cooperating with the other end of said lever and having two intersecting tracks, and a brake applying connection extending from the point of connection between said arm and lever.

6. In a device of the class described, the combination with manually operated power applying means, of an arm having a fixed pivot, a lever pivoted to said arm, a guide cooperating with the lever to control the relative movement of the arm and lever, said guide comprising a portion lying approximately in an arc having said fixed pivot as a center and a second portion diverging from said arc, a connection extending to said power applying means, and a second connection extending to a brake.

7. In a device of the class described, the combination with manually operated power applying means, of an arm having a fixed pivot, a lever pivoted to said arm at a point intermediate of its length, a guide cooperating with one end of said lever, said guide comprising a portion lying approximately in an arc having said fixed pivot as a center and a second portion diverging from said arc, a connection extending from said power applying means to the end of the lever opposite said guide, and a second connection extending from the pivot point of the lever to a brake.

In testimony whereof, I hereunto affix my signature, this 30th day of September, 1927.

FRANK H. PIETZSCH.