

No. 696,521.

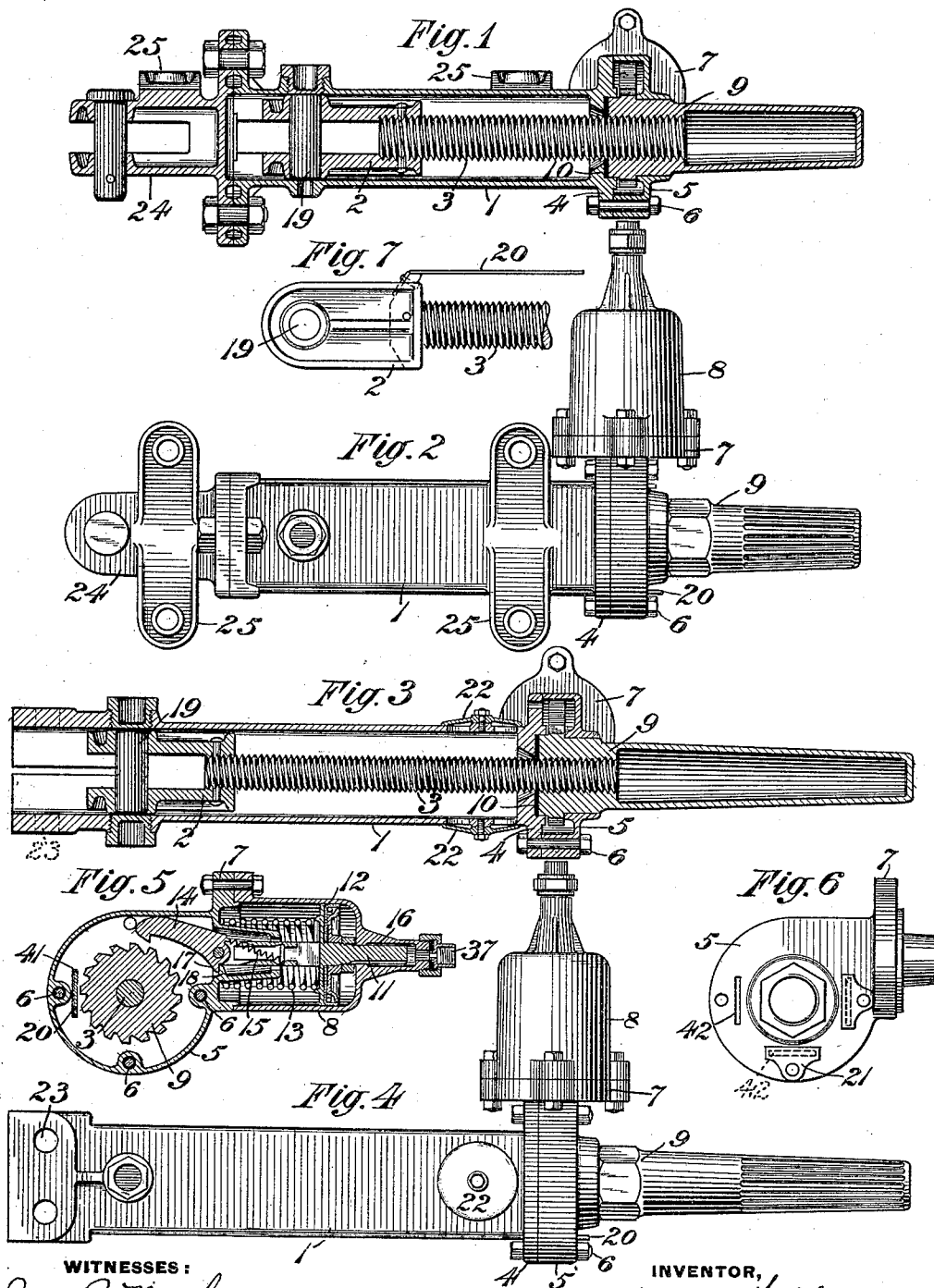
Patented Apr. 1, 1902.

H. A. WAHLERT.  
SLACK ADJUSTER FOR BRAKES.

(Application filed Aug. 3, 1901.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:

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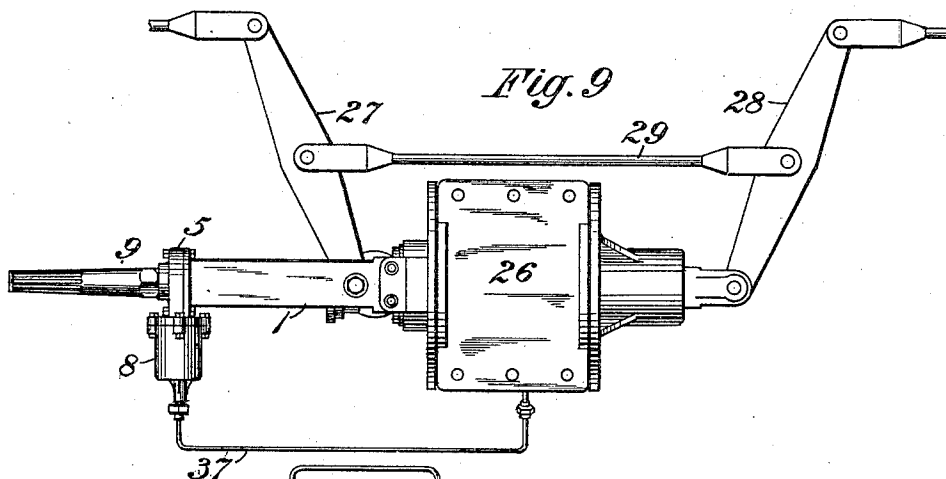
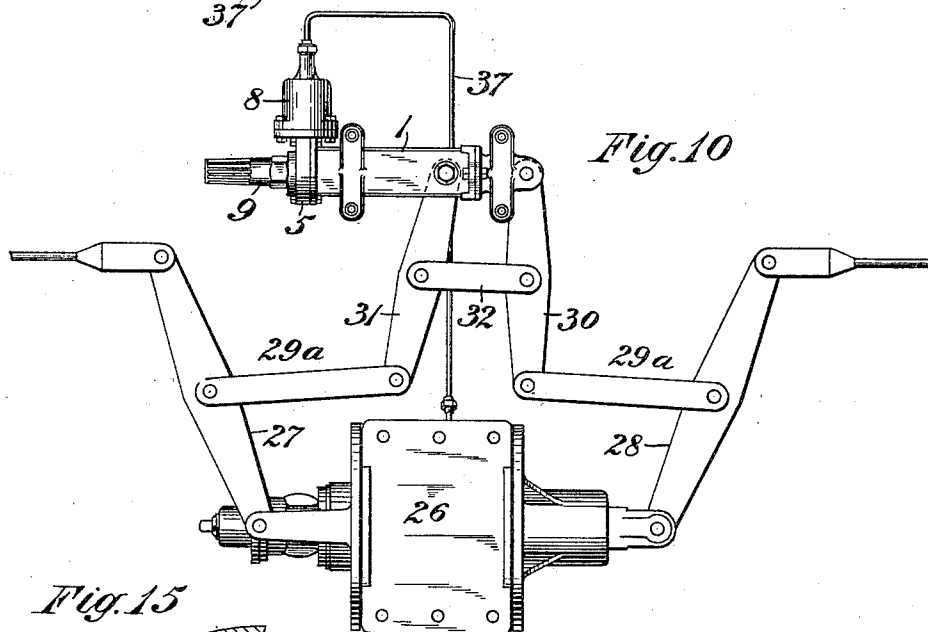
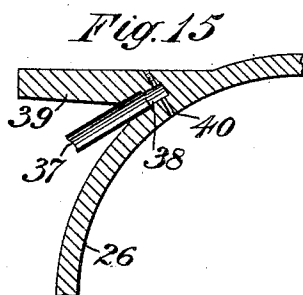
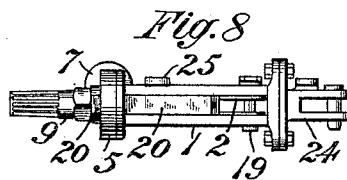
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3 Sheets—Sheet 2.



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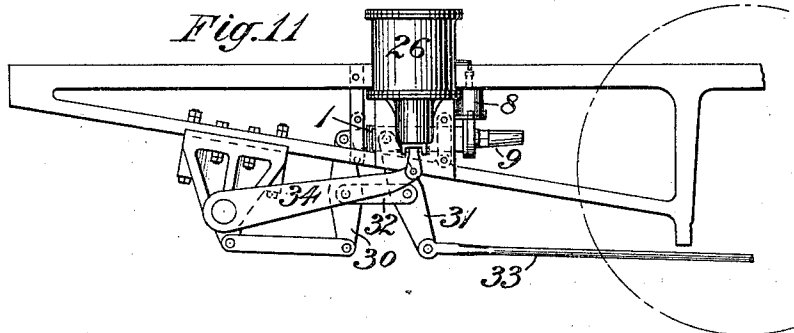
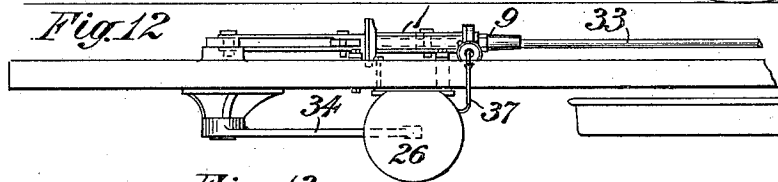
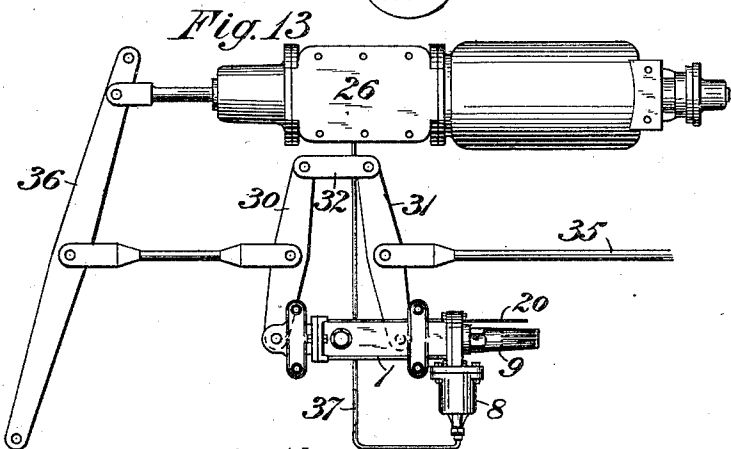
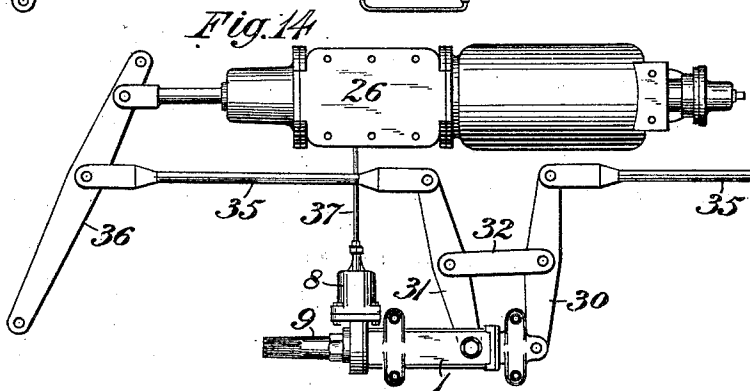
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3 Sheets—Sheet 3.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

HENRY A. WAHLERT, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE AMERICAN BRAKE COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

## SLACK-ADJUSTER FOR BRAKES.

SPECIFICATION forming part of Letters Patent No. 696,521, dated April 1, 1902.

Application filed August 3, 1901. Serial No. 70,753. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY A. WAHLERT, a citizen of the United States, residing in the city of St. Louis, State of Missouri, have invented or discovered a certain new and useful  
5 Improvement in Slack-Adjusters for Brakes, of which improvement the following is a specification.

My invention relates to slack-adjusters for  
10 railway-brakes, and particularly to that class of slack-adjusters in which a take-up motor operated by air-pressure from the brake-cylinder is employed to take up the slack by means of a ratchet-driven screw.

15 My invention consists in an improved form of slack-adjuster casing by means of which all operating parts of the ratchet-and-screw mechanism are inclosed and kept free from dirt and dust and one which is adapted to  
20 be applied to the brake-rigging in various locations.

It also consists in an improved construction of mounting the take-up motor on the adjuster-casing, whereby the motor may be set  
25 up in any one of several positions with respect to the casing as best adapted to its location on the car.

My invention further consists in an improved form of joint between the pressure-  
30 pipe and the brake-cylinder and also in various other combinations and arrangement of parts, all as hereinafter more fully set forth.

I have illustrated my improved construction in the accompanying drawings, in which—

35 Figure 1 is a longitudinal section of one form of the slack-adjuster. Fig. 2 is a plan view of the casing and motor. Fig. 3 is a longitudinal section showing a slightly-different form of casing which is adapted to be  
40 supported on the brake-cylinder head. Fig. 4 is a plan view of the same. Fig. 5 is a transverse sectional view taken on a line through the center of the take-up motor. Fig. 6 is an end view with the take-up-motor cylinder  
45 removed, showing the arrangement of slots by means of which the take-up motor may be secured to the adjuster-casing in different positions. Fig. 7 is a detail view showing the movable fulcrum-block attached to the screw  
50 and the dust-slide. Fig. 8 is a side elevation showing the opening for the lever in the side

of the casing and the dust-slide for closing the opening. Figs. 9 and 10 show different applications of my improved construction to the brake-rigging of a passenger-car. Figs. 55 11 and 12 show a side elevation and a plan view, respectively, of my device applied to a locomotive brake-rigging. Figs. 13 and 14 illustrate two slightly-different applications of my device to the brake-rigging ordinarily  
60 used on freight-cars; and Fig. 15 is a transverse section of a portion of a brake-cylinder, showing my improved method of connecting the pressure-pipe to the brake-cylinder.

Referring now more particularly to Sheet 1  
65 of the drawings, it will be seen that the main body of the slack-adjuster casing is in the form of a long rectangular box 1, inclosing the fulcrum-block 2 and operating-screw 3 and being provided at the end with a flange  
70 4, to which the ratchet-casing 5 is secured by means of bolts 6. The head 7 of the take-up-motor cylinder 8 is shown as cast integral with the ratchet casing or cover 5 and at right angles thereto, though it may be secured by  
75 any other suitable means. The ratchet-nut 9 has a bearing in the ratchet-cover 5 and also in the end of the casing 1 and is provided with a long hollow extension into which the end of the screw 3 projects as the slack is  
80 taken up. A friction-washer 10 is located between the casing and the end of the ratchet-nut.

In the cylinder 8 is located the piston 12, having a stem 11, which is guided at one end  
85 in an extension 16 of the cylinder, while at its other end is pivoted the pawl 14, which extends into the ratchet-casing 5. The spring 13 tends to keep the piston at the end of the cylinder, as shown in Fig. 5, and when in this  
90 position a lug 17 on the pawl engages lug 18 on the cylinder-head or casing and raises the pawl out of engagement with the ratchet-nut 9. When the stem is moved forward by air-  
95 pressure acting on the piston, the light compression-spring 15, which is secured between the stem and the pawl, forces the pawl downward to engage the teeth of the ratchet-nut.

The casing is closed on all sides with the exception of an elongated opening or slot in  
100 one side, through which extends the lever, which is pivoted on the pin 19 of the movable

fulcrum-block 2, and this slot is closed from the lever to the end of the casing by means of the dust-slide 20, secured at one end to the fulcrum-block and at its other end extending through a narrow slot 41 in the end of the casing and a similar slot 42 in the ratchet-cover. As shown in Fig. 6, there are three of these slots 42 in the ratchet-cover, so arranged at right angles to each other that the said cover with the attached take-up motor may be adjusted to any one of the three positions with respect to the slack-adjuster casing which may be best adapted to its location on the car. The two slots which are not in use are covered by suitably-shaped washers 21, adapted to be secured on the bolts 6. In this way the screw and other operating parts are kept constantly covered and protected from the dirt and dust, which would otherwise have free access to these parts and impair the efficient operation of the device.

Hand-holes and covers 22 may be provided in the sides of the casing.

When the adjuster is to be applied to the brake-cylinder head, as shown in Fig. 9, the end of the casing is provided with bolt-holes 23, as shown in Figs. 3 and 4, by which the adjuster may be bolted to a bracket or lug upon the cylinder-head; but when it is desired to locate the adjuster in the tie-rod of the cylinder-levers, as shown in Fig. 10, or in the pull-rod of the brake-rigging, as shown in Figs. 11 to 14, the end of the adjuster-casing is provided with the stationary fulcrum-bracket 24, which is bolted or otherwise secured to the main casing, and means, such as brackets or flanges 25, are secured to or cast integral with the casing for attaching the same to a support in any desired position.

Fig. 9 shows the brake-cylinder 26 with the cylinder-levers 27 and 28 and tie-rod 29 with the slack-adjuster secured to the cylinder-head and the dead cylinder-lever pivoted in the movable fulcrum-block.

When the slack-adjuster is applied to the tie-rod between the cylinder-levers, as shown in Fig. 10, the two adjusting-levers 30 and 31 are pivoted at one end to the stationary fulcrum-bracket and the movable fulcrum-block, respectively, and at their other ends to the two sections 29<sup>a</sup> of the tie-rod, the levers being connected together between their ends by the link 32. As the slack is taken up the movable fulcrum of lever 31 is moved away from the stationary end of lever 30, thus bringing the opposite ends of said levers and the sections of the tie-rod nearer together.

Figs. 11 and 12 show a similar construction applied to the main pull-rod 33 of a locomotive brake-rigging having brake-cylinder 26 and the main cylinder-lever 34 pivoted to a bracket secured on the locomotive-frame.

Fig. 14 illustrates the same arrangement applied to the pull-rod 35 of cylinder-lever 36 of the brake-rigging as ordinarily used on

freight-cars, and Fig. 13 shows a slight modification of this arrangement, in which the adjusting-levers 30 and 31 are connected at their ends by the link 32, while the sections of the pull-rod are attached to the middle of said levers and the screw is formed with a left-hand thread, so that the movable fulcrum will be adjusted in the opposite direction.

The pressure-pipe 37 for conveying air to the take-up motor is connected to the brake-cylinder at the desired point of piston travel, and the joint between the pipe and brake-cylinder is formed by drilling a hole 38 into the supporting-flange 39 of the brake-cylinder tangentially to the exterior of the cylinder, as shown in Fig. 15 of the drawings, the interior of the hole 38 being threaded to receive the threaded end of the pipe 37. The opening 38 communicates with the interior of the brake-cylinder through a small port 40, which is drilled directly through the flange into the cylinder. By means of this construction a strong joint is secured without weakening the wall of the brake-cylinder and without the aid of any additional ribs or projections, which are sometimes cast on the cylinder for the purpose of making this pipe connection.

In the operation of my device when the wear of the brake-shoes becomes sufficient to allow the piston of the brake-cylinder to traverse beyond the port 40 air under pressure from the brake-cylinder passes through the pipe 37 to the take-up-motor cylinder 8, forcing out the piston 12, compressing spring 13, and moving the pawl 14 over the ratchet-nut 9, with the teeth of which the spring 15 causes the pawl to engage. When the brakes are released, the air escapes from the cylinder 8 of the take-up motor, and the spring 13 returns the piston and pawl, rotating the ratchet-nut and taking up the slack of the brake-rigging. This operation is repeated at each application of the brakes until the slack is taken up sufficiently to prevent the piston in the brake-cylinder from passing beyond the port 40. As the slack is taken up the movable fulcrum-block with the dust-slide move lengthwise of the casing and the end of the screw is drawn into the hollow ratchet-nut, so that the screw is kept covered at all times and protected from dirt and dust.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a brake slack-adjuster, the combination with ratchet-driven screw and a movable fulcrum-block, of a closed casing inclosing said screw and means for operating the ratchet.

2. In a brake slack-adjuster, the combination with a ratchet-driven screw and a movable fulcrum-block, of a closed casing forming a guide for said fulcrum-block, and means for operating the ratchet.

3. In a brake slack-adjuster, the combination with a screw and a movable fulcrum-

block, of a closed casing therefor, a ratchet-nut having a hollow extension for said screw, and means for operating the ratchet-nut.

4. In a brake slack-adjuster, the combination with a ratchet-driven screw, of a cover or casing for inclosing the ratchet and a take-up motor supported on the ratchet casing or cover.

5. In a brake slack-adjuster, the combination with a movable fulcrum-block and ratchet-driven screw, of a casing forming a guide for the fulcrum-block, a ratchet-cover secured to the casing, and a take-up motor supported on the ratchet-cover.

6. In a brake slack-adjuster, the combination with a screw and a movable fulcrum-block, of a casing therefor having an elongated opening for a lever, and means for closing the opening.

7. In a brake slack-adjuster, the combination of a movable fulcrum-block, a screw, a casing for the fulcrum-block having an elongated opening in one side for a lever, and a slide for closing the opening.

8. A slack-adjuster comprising a movable fulcrum-block and screw, a casing therefor having a slot in one side for a lever, and a dust-slide secured to the movable fulcrum-block for closing said slot.

9. In a brake slack-adjuster, the combination with a take-up mechanism and a casing therefor, of a take-up motor supported thereon and adapted to be adjusted to any one of a plurality of positions.

10. In a brake slack-adjuster, the combination with a casing inclosing a movable fulcrum-block and a ratchet-driven screw, of a cover for the ratchet carrying a take-up motor, said cover being adjustable to any one of a plurality of positions with respect to the casing.

11. In a brake slack-adjuster, the combination with a casing inclosing a movable fulcrum-block and screw and having an opening in one side for a lever, a dust-slide for said opening, and a ratchet-cover having a plurality of narrow slots and adapted to be adjusted to different positions whereby the dust-slide may extend through any one of said slots.

12. In a brake slack-adjuster, the combination with a ratchet-driven screw, of a take-up motor having a piston and piston-stem, and a pawl pivoted to the piston-stem and adapted to engage said ratchet.

13. In a brake slack-adjuster, the combination with a pawl-and-ratchet mechanism, of a take-up motor having a piston and piston-stem, the pawl being pivoted to the piston-stem, and means for raising the pawl out of engagement with the ratchet when the piston is at one end of its traverse.

14. In a brake slack-adjuster, the combination with a pawl-and-ratchet mechanism, of a take-up motor having a piston and stem connected to the pawl, means for raising the pawl out of engagement with the ratchet when the piston is at one end of its traverse, and a spring for throwing the pawl into engagement with the ratchet when the piston is moved toward the opposite end of its traverse.

15. In a brake slack-adjuster, the combination with a movable fulcrum-block and ratchet-driven screw, of a guide for said movable fulcrum-block and a fixed fulcrum carried by said guide.

16. In a brake slack-adjuster, the combination with a movable fulcrum-block and ratchet-driven screw, of a casing therefor, a fixed fulcrum-bracket secured to said casing and means for securing the casing to a support.

17. In a brake slack-adjuster, the combination of a movable fulcrum-block, an adjusting-lever pivoted thereto, a ratchet-driven screw for moving said movable fulcrum, a stationary fulcrum, another adjusting-lever pivoted thereto, and a link connecting said levers together, the levers also being connected to sections of a pull-rod of the brake-rigging.

18. In a brake slack-adjuster, a brake-cylinder having a supporting-flange, an opening formed in the flange tangentially to the cylinder, a small port connecting the said opening with the interior of the brake-cylinder, and a pressure-pipe secured in said opening for conducting air under pressure to the take-up motor.

19. In a brake slack-adjuster, a brake-cylinder having a projecting flange or lug, an opening formed in said flange tangentially to the cylinder for a pipe connection, and a port connecting said opening with the interior of the brake-cylinder.

In testimony whereof I have hereunto set my hand.

HENRY A. WAHLERT.

Witnesses:

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E. A. WRIGHT.