

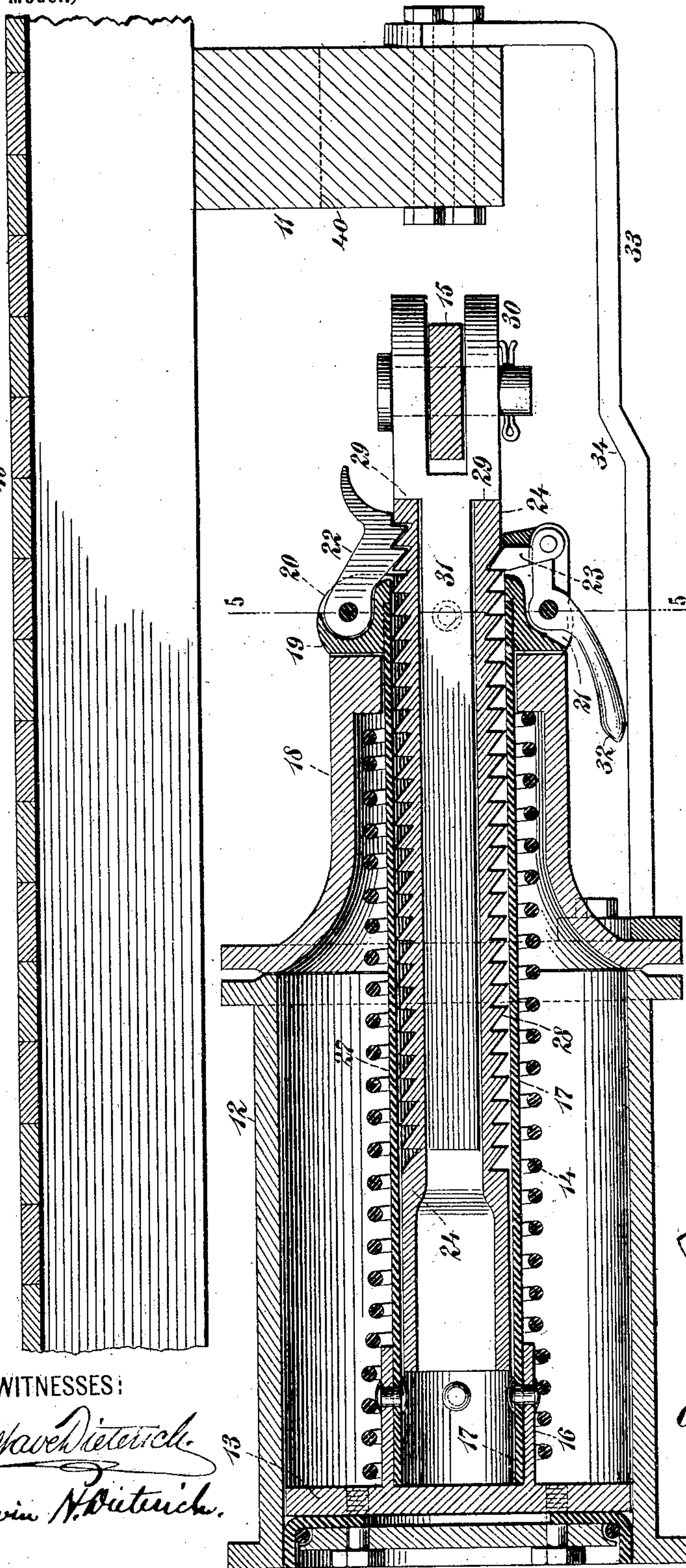
G. E. BURGESS.
CAR BRAKE MECHANISM.

(Application filed Apr. 18, 1902.)

2 Sheets—Sheet 1.

(No Model.)

Fig. 1.



WITNESSES:

Gustave Dietrich
Edwin H. Dietrich

Fig. 3.

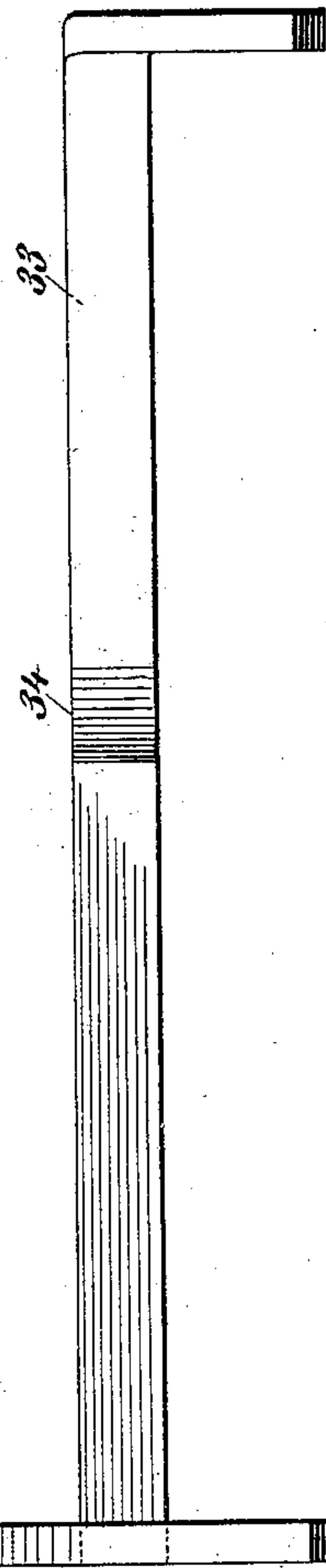
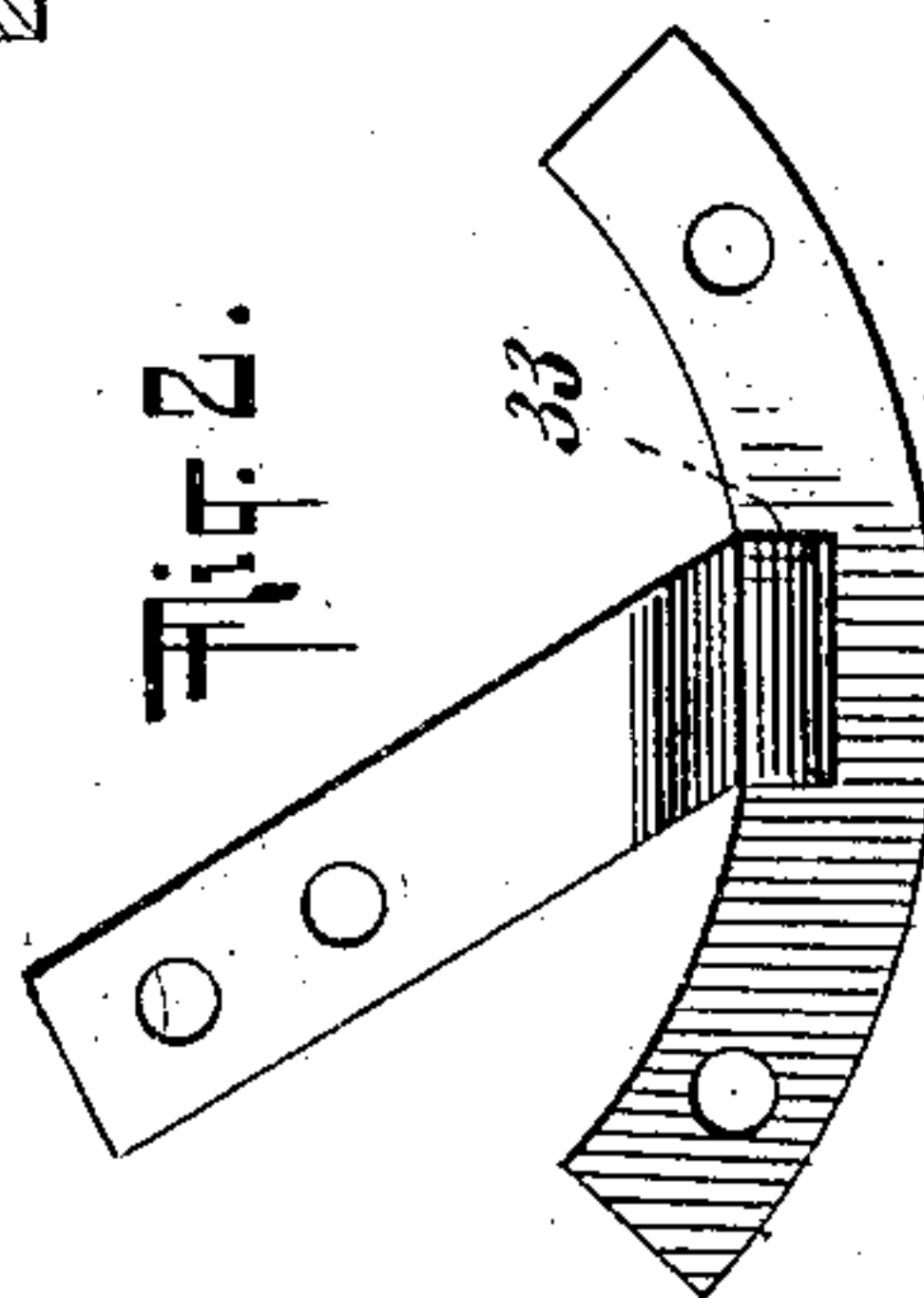


Fig. 2.



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No. 704,508.

Patented July 15, 1902.

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2 Sheets—Sheet 2.

Fig. 4.

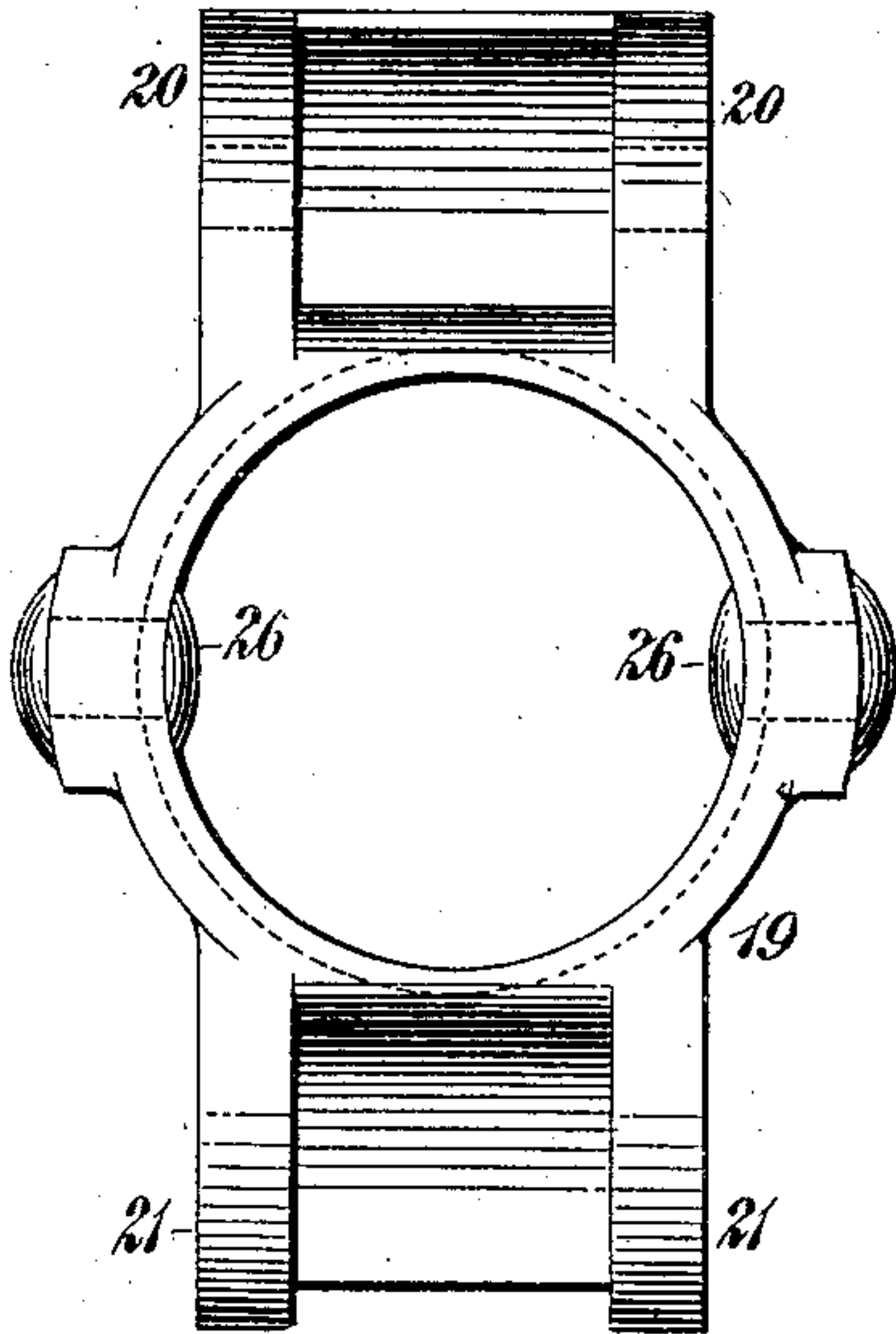
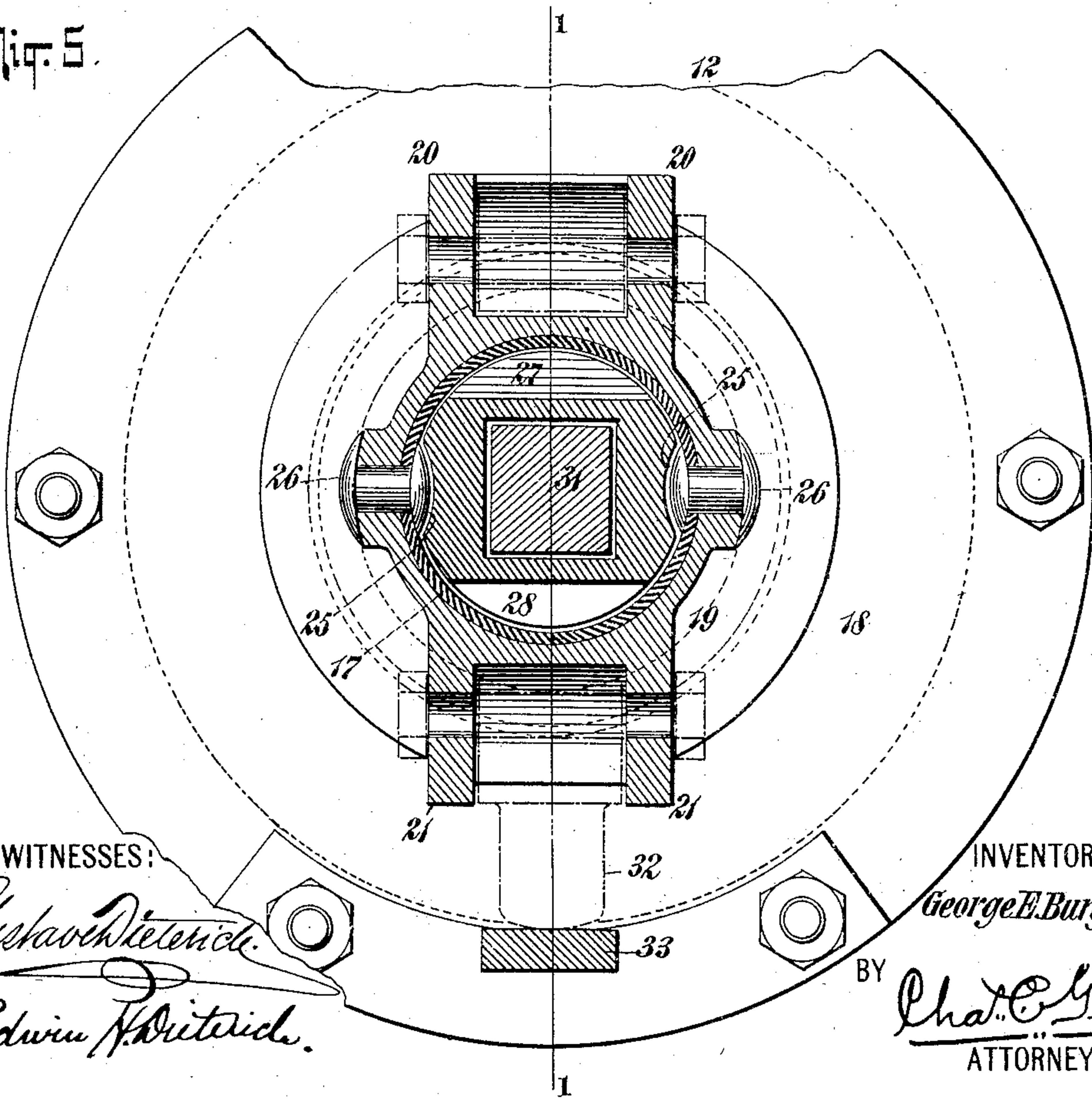


Fig. 5.



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UNITED STATES PATENT OFFICE.

GEORGE E. BURGESS, OF BUFFALO, NEW YORK.

CAR-BRAKE MECHANISM.

SPECIFICATION forming part of Letters Patent No. 704,508, dated July 15, 1902.

Application filed April 18, 1902. Serial No. 103,484. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. BURGESS, a citizen of the United States, and a resident of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Car-Brake Mechanism, of which the following is a specification.

The invention relates to improvements in brakes for cars and the like, and more especially for freight-cars; and it consists in the novel means hereinafter described and claimed for automatically taking up the slack due to the wear of the contacting surfaces of the brake-shoe and wheel and brake connections, my invention being applicable to the present existing car-brake mechanism and being a slack or brake adjuster.

The invention and satisfactory means for carrying the same into effect will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which—

Figure 1 is a central vertical longitudinal section through a portion of a car and air-brake cylinder of usual character with my invention applied thereto. Fig. 2 is a front view of a cam-bar comprising one of the features of my invention. Fig. 3 is a detached top view of same. Fig. 4 is an enlarged front view of a frame connected with the outer end of the hollow piston-rod of the brake-cylinder to receive certain pivoted pawls comprising a part of my invention; and Fig. 5 is a vertical section through the brake-cylinder connections on the dotted line 5 5 of Fig. 1, the pivoted dogs being omitted from Fig. 5 and their pivot-bolts being indicated by dotted lines.

In the drawings, 10 designates a portion of the usual flooring of a car; 11, the customary needle-beam; 12, the usual brake-cylinder; 13, the piston therein; 14, the customary spring by which after the brakes have been applied and the air-pressure released the piston 13 is returned to its normal position at the rear end of the cylinder 12, and 15 the usual cylinder-acting lever, as at present arranged, for operating the brake-shoe connections, the present invention not resulting in any change in the lever 15 or its connections with the brake-shoe. The lever 15 will, as usual, be connected by the customary draft-

rods and intermediate mechanism (not shown) with the brake-shoes and also with the usual hand-wheel, (not shown,) so as to permit of the application of the brakes by hand when necessary.

The piston-head 13 has formed on or connected with it the tubular stud 16, to which is rigidly secured the tubular piston-rod 17, which is of appropriate length, and has secured upon its outer end beyond the cylinder-head 18 the frame 19, which closely encompasses the outer end of the said rod 17, and is formed with ears 20 21, between which, respectively, are pivotally mounted the dogs or pawls 22 23, respectively disposed at the opposite sides of the toothed take-up bar 24, which is within and is adapted to be guided by the hollow piston-rod 17. The take-up bar 24 is hollow and conforms in cross-section to the outline of the interior of the hollow piston-rod 17, except at the opposite sides of said take-up bar, where the latter is provided with the longitudinal grooves 25 to guide upon the inner heads of the rivets 26, Figs. 4 and 5, by means of which the frame 19 is fastened to the outer end of the piston-rod 17. The take-up bar 24 is provided at opposite sides with the oppositely-arranged teeth 27 28, which are respectively engaged by the pawls or dogs 22 23, and the front end of the take-up bar 24 is conformed to the shoulder 29, formed on the head 30 of the push-rod 31, to which the brake-lever 15 is pivoted, and the shank of which is within the take-up bar 24, said shank being preferably polygonal in cross-section and conforming to the interior of the said take-up bar 24, so that said push-rod may not turn axially within said take-up bar.

Upon the admission of the air under pressure against the rear side of the piston-head 13 in the usual manner the latter will be driven forward within the cylinder 12, compressing the spring 14 therein and moving the piston-rod 17 and frame 19, carrying the pawls or dogs 22 23 forward, the dog 22 at such time serving to connect the take-up bar 24 with the piston-rod 17 and effecting the outward movement of said bar with said rod, with the result that the outer end of the bar 24, being in engagement with the shoulder 29 of the push-rod 31, will drive said push-rod 31 outward to effect the movement of the lever 15

and the application of the brakes in the usual manner. When the air-pressure against the piston-head 13 is released, the spring 14 will expand and return the piston-head 13, piston-rod 17, and frame 19 to their initial position, (shown in Fig. 1,) and during this return movement of the piston-rod 17 and frame 19 the pawls or dogs 22 23 will under normal conditions remain in engagement with the take-up bar 24, the dog or pawl 22 at such time performing no special function, while the dog 23 at such time does perform the function, being carried by the frame 19, of compelling the take-up bar 24 to travel inward with the piston-rod 17. The release of the brake-shoes and the consequent movement of their connections will compel a limited movement of the push-rod 31 in a direction inward or rearward with the take-up bar 24.

The teeth formed on the take-up bar 24 permit, in connection with the pawls or dogs 22 23, the proper setting of the brake mechanism when the apparatus is first applied to a car as well as at any subsequent time, and the said take-up bar, in connection with the said pawls or dogs 22 23, also permits the accomplishment of the further important function of automatically taking up any slack which by reason of wear of the contacting parts or otherwise may take place. After the apparatus has been applied to the car and until wear or disarrangement of the parts has occurred the piston-rod 17 and take-up bar 24 will remain in their initial relation to each other and have a uniform stroke, the parts operating in the manner above described, the dog 22 moving the take-up bar 24 outward with the piston-rod 17 and the dog 23 returning said take-up bar 24 inward with said piston-rod; but when after continued use wear on the parts has arisen the take-up bar 24 should be set forward a distance equal to one or more of its teeth, so as to take up or compensate for the slack due to such wear, and to this end I pivot the pawl 23 to the pivoted weighted lever-arm 32 and equip the car with a cam-bar 33, having at a predetermined point the inclined or cam surface 34, against which the said lever-arm 32 will be carried when due to slack or wear in parts. The piston-rod 17 and take-up bar 24 travel forwardly when applying the brakes beyond their normal initial stroke. The effect of the movement of the lever-arm 32 over the cam-surface 34 of the bar 33 is to withdraw the engaging end of the pawl 23 downward from the take-up bar 24, and under this condition of the said pawl 23 when the brakes are released the piston-rod 17 will start inward under the action of the spring 14 in advance of the take-up bar 24, since the pawl 23 is then free of said bar 24 and the pawl 22 may slide over the teeth 27 of said bar. The inward movement of the piston 17 in advance of the take-up bar 24 will, however, be of slight duration, since as soon as the lever-arm 32, connected with the pawl 23, again passes down the incline fur-

nished by the cam 34 the engaging end of said pawl or dog 23 will again engage the teeth of the take-up bar 24 and then the take-up bar 24 will travel inward with the piston-rod 17; but under such condition the take-up bar 24 will not be in its initial relation to the piston-rod 17, but will project outward therefrom a slightly-greater distance than before, this distance being represented by the inward travel of the piston-rod 17 in advance of said bar and being just sufficient to take up the slack which has arisen by the wear of the parts. The take-up bar 24 is thus varied from time to time in its relation to the piston-rod 17, said take-up bar 24 being automatically set forward from time to time, so as to take up or compensate for any slack which may appear either at the brake-shoe or the parts intermediate said shoe and the push-rod 31. In the absence of there being slack to be taken up the pawl 23 will remain in constant engagement with the teeth 28 of the take-up bar 24, and the lever-arm 32 of said pawl 23 will not be acted upon by the cam-surface 34 of the bar 33; but when there is sufficient wear to cause slackness of parts the extra forward movement of the piston-rod 17, take-up bar 24, and push-rod 31 permitted thereby will result in the lever-arm 32 for the pawl 23 being carried against the said cam-surface 34 and in disengaging thereby the pawl 23 from the take-up bar 24, with the result, as above described, of the piston-rod 17 starting inward in advance of the take-up bar 24 and the engagement of the pawl 23 with a tooth of said take-up bar in rear of the tooth previously engaged, the take-up bar 24 being thus automatically set forward a space equal to one or more of the teeth 28 for the purpose of taking up or compensating for the slack.

The cam-bar 33 may be of any suitable construction, and at present I illustrate such bar as being fastened at its rear end to the flange of the cylinder-head 18 and at the other end to the usual needle-beam 11 of the car-frame, said needle-beam being recessed in line with the head 30 of the push-rod 31, so as not to interfere with the movement of said rod, as denoted at 40 in Fig. 1. It is obvious that the present invention is not limited to any special construction of cam-bar 33 or to any special means of securing said bar in position, the essential feature being that the cam-surface 34 shall be presented to the lever-arm 32 of the pawl 23 at such time as said pawl may, by reason of slackness of the parts, be carried beyond its initial stroke.

During the outward travel of the piston-rod 17 the pawl 22 compels the movement of the take-up bar 24 with said piston-rod, and the engagement of the front end of the take-up bar 24 with the push-rod 31 compels the outward movement of said push-rod with said take-up bar and said piston-rod. During the return movement of the piston-rod 17 the pawl 23, carried thereby, insures the inward movement of the take-up bar 24 with said rod.

Upon the release of the brake-shoes they will fall away from the car-wheels, and thus through the draft-rods and intermediate connections will start the push-rod 31 inward with the take-up bar 24 and piston-rod 17; but since the push-rod 31 is not rigidly connected with the take-up bar 24 said rod will not necessarily travel all the way inward with the take-up bar 24 to the position in which it is illustrated in Fig. 1. Upon every outward movement of the take-up bar 24 its front end will engage the shoulders 29 on the head of the push-rod 31 and effect the proper application of the brakes. The push-rod 31 is prevented from axially turning within the take-up bar 24, but is otherwise loose in said bar, and hence on the application of the brakes by the usual hand-wheel (not shown) the operator will not be compelled to effect the compression of the spring 14, which would be the case if the push-rod 31 were fastened to the take-up bar 24.

The dog or pawl 22 cannot disengage itself from the teeth 27 of the take-up bar 24, so as to drop rearward and adjust the take-up bar farther forward, until the locking dog or pawl 23 has been released by the engagement of the lever-arm 32 with the cam 34, and this cam 34 will be so located as not to affect the lever-arm 32 except when by reason of slackness in the parts the standard travel or stroke of the piston-rod is exceeded, the purpose being to keep all of the parts of the brake mechanism to such adjustment that the piston 13 within the cylinder may have a uniform standard stroke.

The locking-dog 23 is pivotally secured to a branch of the lever-arm 32 and is supported between the ears 21 of the frame 19. There is a limited amount of space left in the frame 19 immediately in rear of the locking-dog 23, as shown in Fig. 1, and hence when the lever-arm 32 is elevated and the dog 23 in consequence lowered its engaging end will be enabled to tilt slightly rearward and pass partly below the tooth of the take-up bar 24 in rear of the one from which it became disengaged, whereby during the return stroke of the piston-rod and take-up bar the pawl 23 is enabled to assuredly pass into engagement with a tooth in rear of the one it occupied at the time the cam 34 acted upon the lever-arm 32.

In the absence of the cam 34 the take-up bar 24 may be adjusted at will by the manual operation of the take-up dog or pawl 22 and locking dog or pawl 23; but during the employment of the brake mechanism it is desirable that this adjustment should be automatically effected, and hence the projecting surface afforded by the cam 34 is made use of for at the proper time releasing and enabling the reengagement of said dog or pawl 23.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The brake-cylinder having a hollow piston-rod, combined with the take-up bar there-

in, the push-rod supported within said take-up bar and connected at its outer end with a lever of the brake connections, a take-up pawl connected with the piston-rod for engaging said take-up bar and driving the same forward during the application of the brakes, a locking-pawl connected with said piston-rod for engaging said take-up bar and moving the same inward with said piston-rod, and means for freeing said locking-pawl when it is carried beyond a definite point during the outward stroke of the piston-rod and restoring it into engagement with the take-up bar upon said pawl being moved back along said point during the return stroke of said piston-rod, said take-up bar engaging said push-rod during its outward movement to apply the brakes and leaving said push-rod during its return movement; substantially as set forth.

2. The brake-cylinder having a hollow piston-rod, combined with the take-up bar therein, the push-rod supported within said take-up bar and connected at its outer end with a lever of the brake connections, a take-up pawl connected with the piston-rod for engaging said take-up bar and driving the same forward during the application of the brakes, a locking-pawl connected with said piston-rod for engaging said take-up bar and moving the same inward with said piston-rod; a lever-arm connected with said locking-pawl for actuating the same, and a projecting surface for acting upon said lever-arm to free said locking-pawl when it is carried beyond a definite point during the outward stroke of the piston-rod and restoring it into engagement with the take-up bar upon said pawl being moved back along said point during the return stroke of said piston-rod, said take-up bar engaging said push-rod during its outward movement to apply the brakes and leaving said push-rod during its return movement; substantially as set forth.

3. The brake-cylinder having a hollow piston-rod, combined with the take-up bar having the two series of oppositely-inclined and oppositely-arranged teeth and supported within said piston-rod, the push-rod supported within said take-up bar and connected at its outer end with a lever of the brake connections, a take-up pawl connected with the piston-rod for engaging said take-up bar and driving the same forward during the application of the brakes, a locking-pawl connected with said piston-rod for engaging said take-up bar and moving the same inward with said piston-rod, and means for freeing said locking-pawl when it is carried beyond a definite point during the outward stroke of the piston-rod and restoring it into engagement with the take-up bar upon said pawl being moved back along said point during the return stroke of said piston-rod, said take-up bar engaging said push-rod during its outward movement to apply the brakes and leaving said push-rod during its return movement; substantially as set forth.

4. The brake-cylinder having a hollow piston-rod, combined with the take-up bar therein, the push-rod supported within said take-up bar and connected at its outer end with a lever of the brake connections, a take-up pawl connected with the piston-rod for engaging said take-up bar and driving the same forward during the application of the brakes, and a locking-pawl connected with said piston-rod for engaging said take-up bar and moving the same inward with said piston-rod; substantially as set forth.

5. The brake-cylinder having a hollow piston-rod, combined with the take-up bar therein, the push-rod freely supported within said take-up bar and pivotally connected at its outer end with a lever of the brake connections, a take-up pawl connected with the piston-rod for engaging said take-up bar and driving the same forward during the application of the brakes, and a locking-pawl connected with said piston-rod for engaging said take-up bar and moving the same inward with said piston-rod, said take-up bar engaging said push-rod during its outward movement to apply the brakes and leaving said push-rod during its return movement; substantially as set forth.

6. The brake-cylinder having a hollow piston-rod, combined with the take-up bar therein, the push-rod freely supported within said take-up bar and pivotally connected at its outer end with a lever of the brake connections, a take-up means connected with the piston-rod for engaging said take-up bar and driving the same forward during the application of the brakes, a locking means connected with said piston-rod for engaging said take-up bar and moving the same inward with said piston-rod, and means for automatically freeing said locking means when the latter is carried beyond a definite point during the outward stroke of the piston-rod and then restoring the same into engagement with said take-up bar at a definite point during the return stroke of the piston-rod, said take-up bar being adapted to engage said push-rod during its outward movement and to leave said push-rod substantially free during its inward movement; substantially as set forth.

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Signed at Buffalo, in the county of Erie and State of New York, this 15th day of April, A. D. 1902.

GEORGE E. BURGESS.

Witnesses:

CLARA J. KLOCKE,
MARY KLOCKE.