

(No Model.)

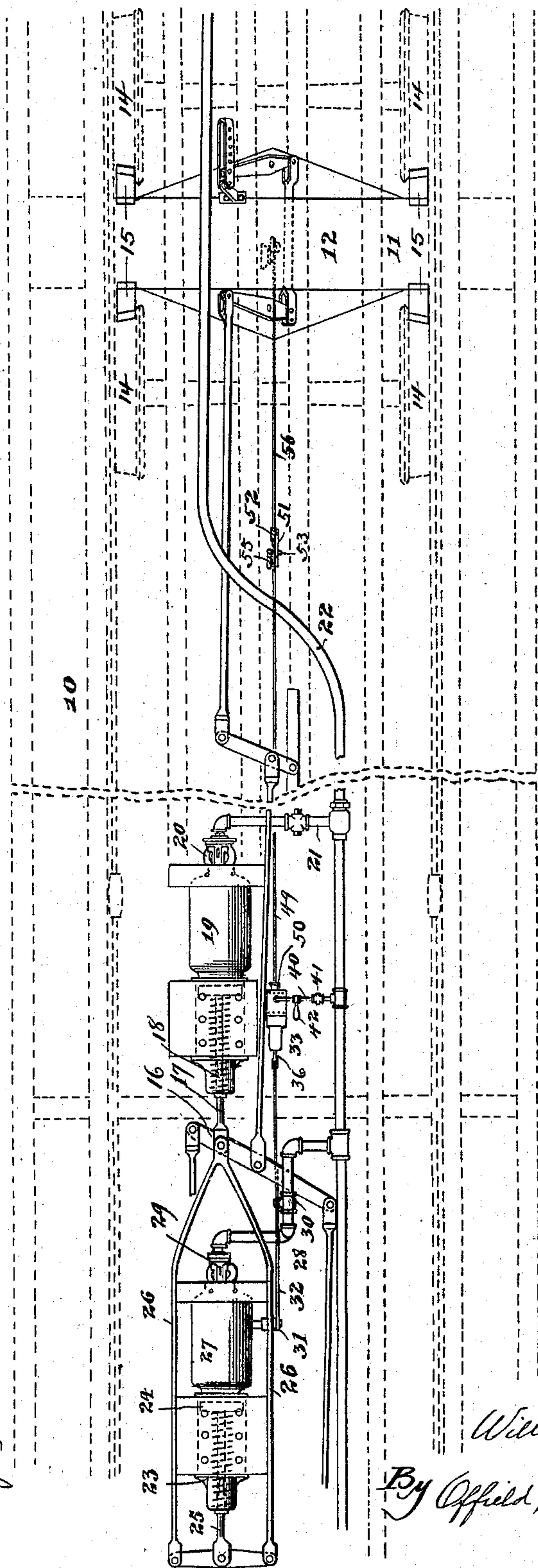
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AIR BRAKE.

No. 605,394.

Patented June 7 1898.

Fig. 1.



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Fig. 2.

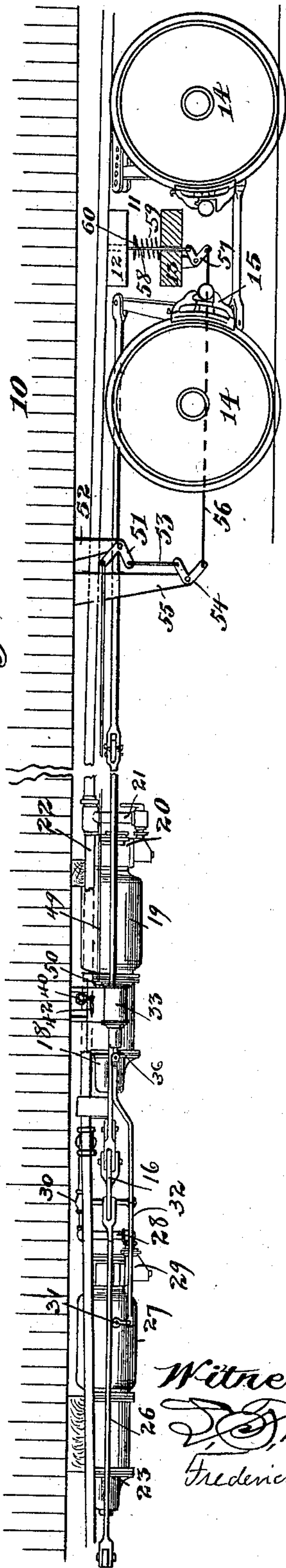
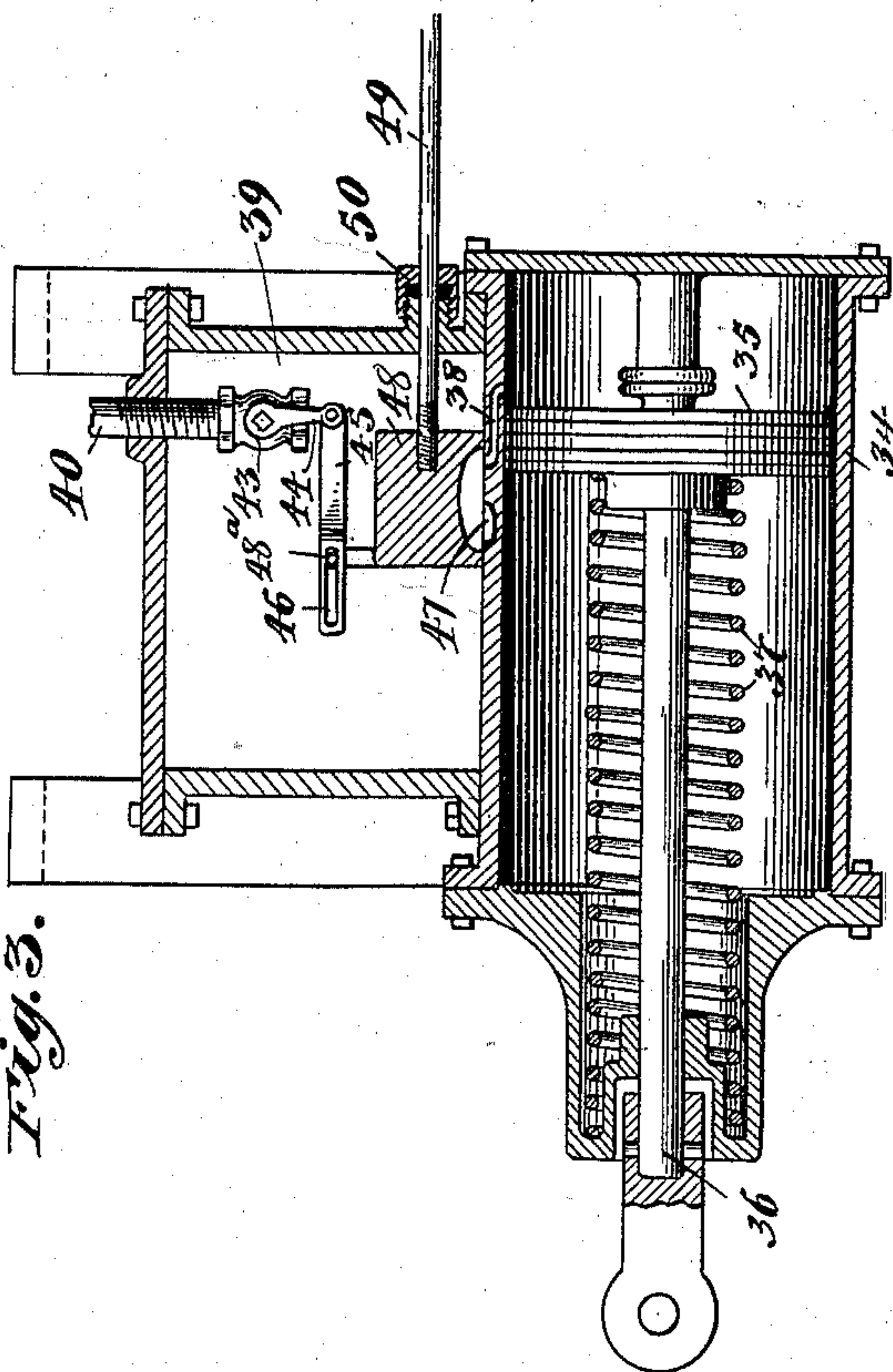


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM H. CLOWRY, OF CHICAGO, ILLINOIS.

AIR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 605,394, dated June 7, 1898.

Application filed January 3, 1898. Serial No. 665,268. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. CLOWRY, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Air-Brakes, of which the following is a specification.

This invention relates to air-brakes, and has for its object to provide means whereby the braking power may be properly proportioned to the load carried by the car, and which means shall be positive and uniform in operation and of superior efficiency.

My invention also has for a further object to provide means whereby upon an excessive depression of the car-body, due to breaking of the springs or other abnormal causes, the auxiliary braking mechanism will not be moved into operative position and held there, but will be cut out.

To these ends my invention consists in certain novel features, which I will now proceed to describe and will then particularly point out in the claims.

In the accompanying drawings, Figure 1 represents a plan view of a brake mechanism embodying my invention, portions of the car framing and truck being shown in dotted lines. Fig. 2 is a side elevation of a portion of a car having my improved brake mechanism applied thereto; and Fig. 3 is a central vertical sectional view, on an enlarged scale, of a motor employed in my preferred form of construction for the purpose of shifting the controlling-valve of the auxiliary brake system.

In the said drawings, in which I have shown a construction embodying my invention in its preferred form, 10 indicates the car-body and 11 the truck thereof, provided with the truck-bolster 12, spring-plank 13, wheels 14, and brake-blocks 15. These latter are operated by the usual levers and connecting-rods from the cylinder-lever 16, to which is connected the piston-rod 17 of the usual brake-cylinder 18.

19 indicates the usual reservoir, commonly known as the "auxiliary" reservoir, and 20 the usual triple valve, connected by means of the pipe 21 with the train brake-pipe 22. These parts may be of any approved construction.

23 indicates an auxiliary brake-cylinder

located in line with the main brake-cylinder 18 and containing the usual piston 24, the rod 25 of which extends out through the end of the cylinder farthest from the main cylinder 18 and cylinder-lever 16. This piston is connected to the cylinder-lever, preferably at the same point and by means of the same pin as the piston-rod 17, by means of a yoke 26, which passes around the auxiliary cylinder 23 and its reservoir 27. This latter is connected with the train-pipe 22 by means of a pipe 28 and is provided with a triple valve 29, similar to the triple valve 20.

30 indicates a valve in the pipe 28, by means of which said pipe may be opened or closed in order to establish a connection between the auxiliary brake-cylinder and the train-pipe or to cut off said connection.

31 indicates an outlet-valve connected with the valve 30 by means of a rod 32, said outlet-valve 31 being opened when the valve 30 is closed, and vice versa.

The valves 30 and 31, which serve to cut in or out the auxiliary braking mechanism, may be operated directly by the variations in the vertical height of the car-body, due to increase or decrease in its load; but in practice I prefer, on account of the small range of vertical movement, to employ, for the purpose of actuating these controlling-valves, a motor 33, which is shown in detail in Fig. 3 of the drawings. This motor consists of a cylinder 34, inclosing a piston 35, the rod 36 of which is coupled to the rod 32, or an extension thereof, and which is normally held in position to close the valve 30 and open the valve 31 by means of a spring 37. Air is supplied to the cylinder 34 by means of a port 38, which communicates with the air-chest 39, to which air under pressure is supplied through a pipe 40, which connects either with the train-pipe 22, as shown in the drawings, or with the reservoir 19 or other suitable source of supply. The pipe 40 is provided with a check-valve 41 and with a cut-out 42, and is also provided within the air-chest 39 with a valve 43, the operating-arm 44 of which is pivoted to a link 45, provided with a slot 46.

47 indicates an exhaust-port leading to the outer air, and 48 a valve, preferably a slide-

valve, of the D type, which, when in the position shown in the drawings, serves to connect the port 38 with the exhaust-port 47 to permit the escape of air from the cylinder 34.

5 Said valve may be so moved as to establish communication between the air-chest 39 and port 38, whereupon air will be admitted to the cylinder 34 to operate the piston 35 thereof and shift the valves 30 and 31. The

10 valve 48 is provided with a pin 48^a, which engages with the slot 46 of the link 45. The movement of the valve 48 is effected by means of a rod 49, which passes through a suitable stuffing-box 50 and which is con-

15 nected, by means of a bell-crank lever 51, mounted on a bracket 52, secured on the under side of the car-body, to a link 53, which is in turn connected to a second bell-crank lever 54, mounted on a second bracket 55, also

20 secured to the under side of the car-body. The bell-crank lever 54 is connected, by means of a rod 56, to a third bell-crank lever 57, mounted on a suitable bracket on the under side of the spring-plank 13.

25 58 indicates a rod or finger extending upward through a suitable aperture in the spring-plank at or near the central point of the car-truck, its upper end being located adjacent to and resting against the under side

30 of the truck-bolster 12, and being held in this position by means of a spring 59, which abuts against the spring-plank 13 at its lower end and against a collar 60 on the rod 58 at its upper end.

35 The mechanism just described operates in the following manner: Under a light load the rod 58 is not depressed or, if depressed, is not carried down a sufficient distance to actuate the slide-valve 48. Under this condi-

40 tion of affairs the spring 37 holds the piston 35 in the position shown in the drawings, and the valve 30 is held closed and the valve 31 open. In the operation of applying the brakes to the car the main cylinder 18 supplies the

45 braking force in the usual manner, there being no air-pressure in the auxiliary cylinder 23 or its reservoir 27 by reason of the fact that the valve 30 is closed and the valve 31 opened, so that the piston 24 may move freely

50 within the cylinder 23 without offering any resistance to the action of the main brake-cylinder. When, however, the weight of the load of the car depresses the car-body and the supporting-spring thereof to the pre-

55 determined point for which the mechanism is set, the rod 58 is depressed to an extent sufficient to shift the valve 48 through the medium of the connecting mechanism and thereby admit air through the port 38 to the interior of the cylinder 34. The piston 35 is then

60 actuated and through the medium of the connecting-rod 32 opens the valve 30 and closes the valve 31, whereupon air is admitted through the pipe 28 to the reservoir 27 of the

65 auxiliary brake-cylinder 23. When the parts are in this position, it will be seen that upon

a reduction of the pressure in the train-pipe 22 power is applied to the braking mechanism not only by the main cylinder 18, but also by the auxiliary cylinder 23, and an in-

70 creased force is thus applied to the cylinder-lever 16 and to the braking mechanism when the car is heavily loaded. Upon a diminution of the load below the predetermined point the spring 59 serves to return the valve 48 to the

75 position shown in the drawings, thereby permitting the air to escape from the cylinder 34, whereupon the spring 37 closes the valve 30 and opens the valve 31, thereby cutting out the auxiliary braking mechanism. 80

When, owing to excessive loading or other causes, the supporting-springs of the car become broken, thus permitting the car-body to be permanently lowered to an excessive extent, the range of motion of the valve 48 is

85 sufficient to cause the pin 48^a thereof to engage the end of the slot 46 and thereby, through the medium of the arm 44, closes the valve 43, and thus cut off the supply of air to the motor 33. This operation cuts out the

90 auxiliary braking mechanism and at the same time opens communication between the ports 38 and 47, so as to cause the auxiliary braking mechanism to remain cut out. The same result may be positively obtained at any time

95 by closing the cut-off valve 42.

By employing a motor for operating the valves 30 and 31 and controlling said motor by the variations in the height of the car-body I am enabled to obtain results in operation of

100 a superior character. The range of motion of the valves should be considerable in order to throw them from a fully-open to a fully-closed position, and they should be moved to the limits of their range of motion at each op-

105 eration. As the variations in the height of the car-body lie within an extremely small range, (approximating three-eighths of an inch,) the employment of a direct lever connection between the car-body and valves re-

110 quires an extensive mechanism for multiplying the range of motion to an extent sufficient to properly operate the valves. This mechanism is not only complicated and ex-

115 pensive, but also of such a character that the movement of the valves is only proportionate to the movement of the car-body, and consequently, unless a maximum depression of the car-body occurs, the valves are not moved to their full extent, and, conversely, they will

120 not be moved to the other limit of their motion unless the car-body rises to the extent of its limit of motion. In other words, the valves will not be respectively entirely opened or entirely closed except at the limits of mo-

125 tion of the car-body. By employing a motor for shifting the valves these latter are moved to the extent of their limit of motion in each direction as soon as the motor is called into

130 operation, and this latter may be readily controlled by a slight or predetermined variation in the position of the car-body. The range

of motion of the valves is therefore independent of the range of motion of the car-body and is, moreover, positive.

I claim—

5 1. The combination, with a car body and truck, and air-braking mechanism therefor, of an auxiliary brake-cylinder having its piston connected with the braking mechanism, a valve controlling the connection between
10 said auxiliary cylinder and the train brake-pipe, a fluid-motor for operating said valve, and means operated by the variations in height of the car-body for actuating said fluid-motor, substantially as described.

15 2. The combination, with a car body and truck, and air-braking mechanism therefor, of an auxiliary brake-cylinder and reservoir provided with a triple valve connected with the train brake-pipe, an outlet-valve and a
20 valve controlling the connection with the

train brake-pipe, and means operated by the variations in height of the car-body for actuating said controlling-valve and outlet-valve, substantially as described.

3. The combination, with a car body and truck, and air-braking mechanism therefor, of an auxiliary brake-cylinder having its piston connected with the braking mechanism, a valve controlling the connection between
25 said auxiliary cylinder and the train brake-pipe, means whereby a normal depression of the car-body will open said controlling-valve, and means whereby an abnormal depression
30 of the car-body will cut out said auxiliary brake-cylinder, substantially as described. 35

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