

(No Model.)

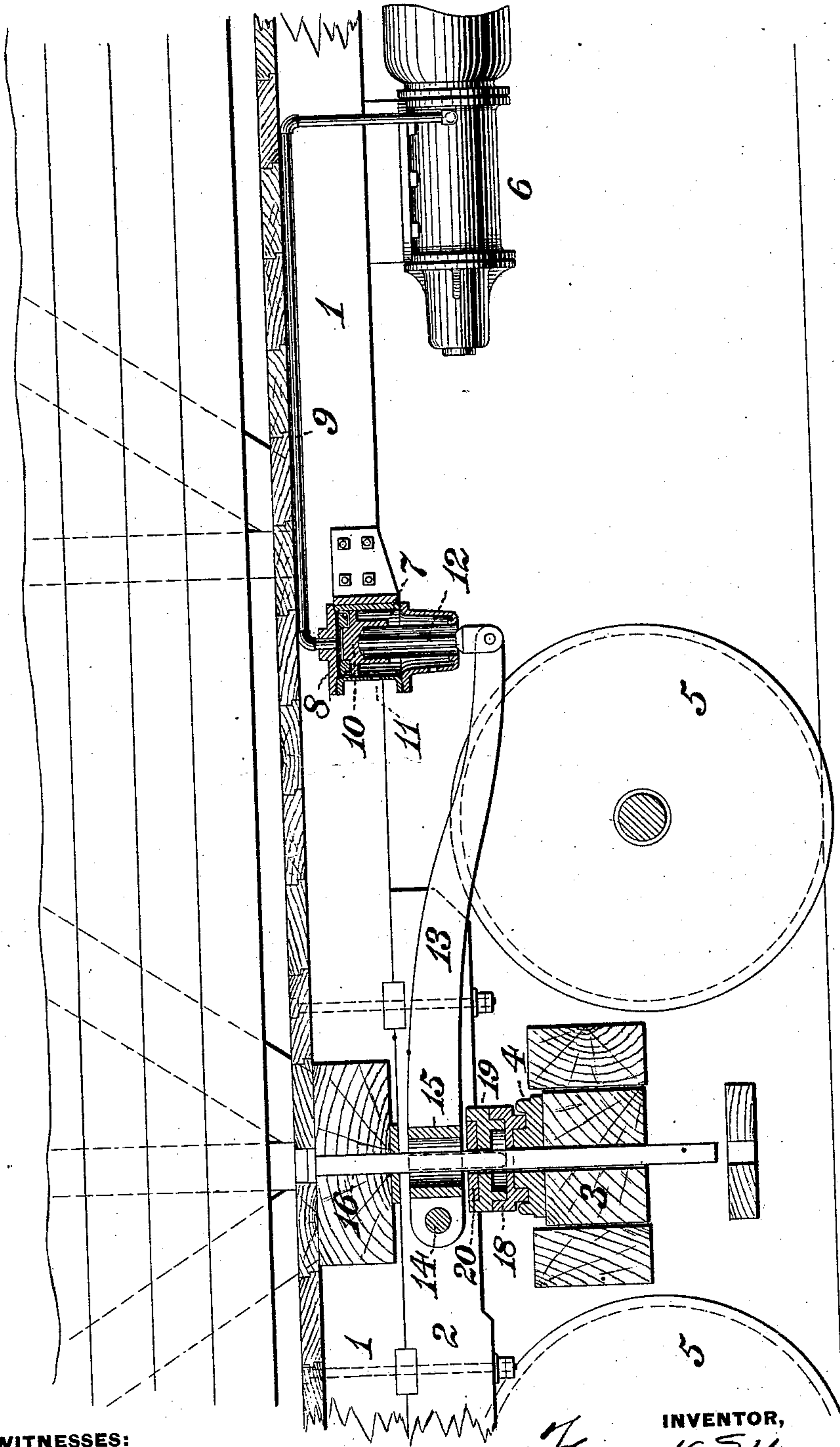
2 Sheets—Sheet 1.

F. MOORE.
AUTOMATIC BRAKE REGULATOR.

No. 455,902.

Patented July 14, 1891.

FIG. 1.



WITNESSES:

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W. E. Gaither

INVENTOR,

Frank Moore
by J. Snowden Bell,
Att'y.

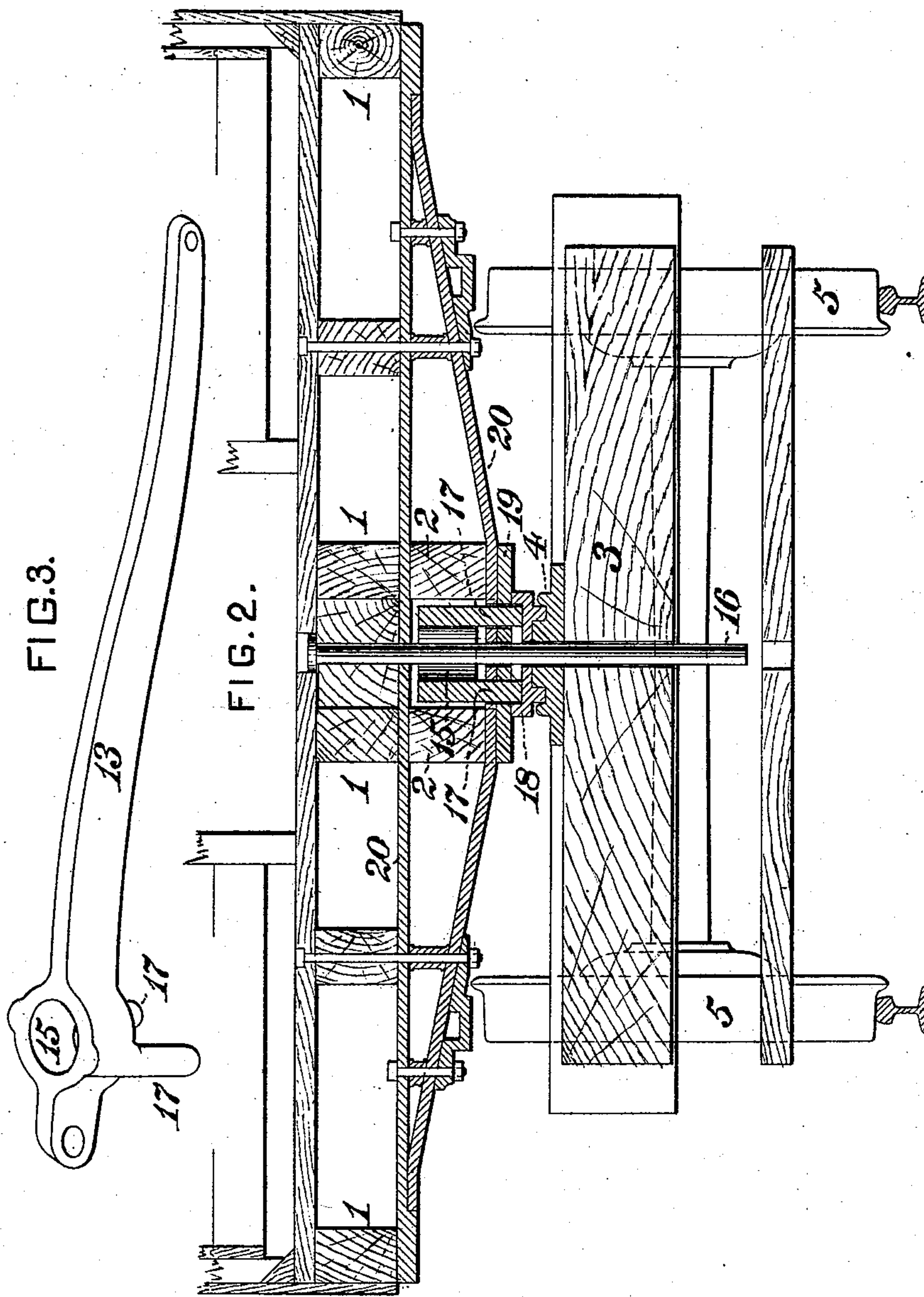
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UNITED STATES PATENT OFFICE.

FRANK MOORE, OF PITTSBURG, PENNSYLVANIA.

AUTOMATIC BRAKE-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 455,902, dated July 14, 1891.

Application filed August 12, 1890. Serial No. 361,792. (No model.)

To all whom it may concern:

Be it known that I, FRANK MOORE, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented or discovered a certain new and useful Improvement in Automatic Brake-Regulators, of which improvement the following is a specification.

The object of my invention is to provide for the automatic regulation of the degree of braking pressure applied to the wheels of a railroad-car proportionately to variations in the weight supported thereon, and thereby to admit of the application of the normal and most effective pressure for maximum load without liability to an unduly great application of pressure and the objectionable and injurious effect resultant thereon when the load of the car is reduced or withdrawn.

To this end my invention, generally stated, consists in the combination, with a brake-cylinder, of a communicating release-chamber, a piston controlling a discharge-port therein, and a regulating-lever coupled to said piston and to a car-body and bearing intermediately upon a car-truck.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a longitudinal central section through a portion of a car body and truck, illustrating an application of my invention; Fig. 2, a transverse section through the same at the center of the truck, and Fig. 3 a view in perspective of the regulating-lever detached.

My invention is herein exemplified in connection with an eight-wheeled freight-car of the ordinary type, the body of which is provided with the usual longitudinal sills 1 and connected draft-timbers 2, and is supported near each of its ends upon a truck, the frame of which comprehends a bolster 3, upon which is secured the center plate 4. A brake-cylinder 6, of standard construction, is secured in proper position below the car-body, its piston acting, through suitable intermediate connections, to apply and release brake-shoes to and from the wheels 5 of the trucks, such operation and the apparatus by which it is effected being well known in the art and not

requiring detailed illustration or description herein.

In the practice of my invention I provide a release-chamber 7, which is secured to the bottom of the car-body near one of the trucks, and is of cylindrical form, with its axis preferably in a substantially vertical plane. The chamber 7 is closed at top by a head or cap 8, to which is connected a pipe 9, leading into the brake-cylinder 6 on the working side of its piston, or that on which fluid-pressure is exerted in applying the brakes, and is provided with a properly-packed piston 10, the normal position of which, or that due to the determined maximum weight of the car and its load, is at or near the top of the release-chamber, in which at a lower level there is formed a discharge port or ports 11. The piston 10 is fixed upon a rod or stem 12, to the lower end of which is coupled a regulating-lever 13, the opposite end of which is pivoted by a bolt 14 to the draft-timbers 2 or other suitable portion of the car-body frame. An eye 15, formed upon the regulating-lever, passes around the center pin 16 of the truck, said eye being provided with lateral bearing-pins 17, the lower ends of which bear upon a supplemental center plate 18, interposed between the truck center plate 4 and the body center plate 19, which is secured to the body-bolster 20. The center plates 4 and 18 are adapted to turn relatively about the axis of the center pin in the usual manner, and the body center plate 19 to move vertically within the recess of the adjacent plate 18, in accordance with the vertical movements of the piston 10 as transmitted to the car-body through the regulating-lever 13. Under the above construction it will be seen that increase of pressure upon the piston 10 above a determined degree will act to depress said piston and raise the car-body, and that a reverse action will be effected upon the relief of such increased pressure.

The operation of the regulating-lever 13 is similar to that of a scale-beam in balancing the car-body and its load by the pressure in the release-chamber, and inasmuch as the regulating-lever is coupled at opposite ends to the car-body and to the rod of the release-

*chamber piston directly and without the intervention of any elastic or variable connection between the car-body and piston the weight of the car body and load will at all times determine absolutely the pressure which will and should be exerted in the brake-cylinder.

My invention differs in the above substantial particulars from all prior devices for regulating the pressure, with which brakes are applied as to which my knowledge and information extend. None of these are designed for or capable of supporting the weight of the car by the pressure of the fluid employed in applying the brakes, each and all of them depending on the amount of compression of an auxiliary spring, which compression is further dependent upon the compression of the springs interposed between the bolster and spring-plank of the truck, thus introducing two variable quantities between the load and the pressure to be regulated. The intervention of springs between the load which is to determine the pressure and the pressure device involves the objection of causing the pressure to be affected by their irregular movements of the car-body and to be dependent at all times on the amount of compression of the main springs of the truck, which is a continually varying quantity.

In the application of my improvement it is immaterial whether or not springs are employed under the truck-bolster, and if such are used their degree or condition of compression has no effect upon the action of the load on the piston of the release-chamber.

A further distinguishing characteristic of my invention is that the movement of the piston in the release-chamber depends absolutely upon the weight supported and acts to lift the weight of the car and its load, which is not the case in prior constructions. In the latter the release-valve is usually held to its seat by an auxiliary spring, the compression of which depends on the compression of the truck-springs, the valve lifting when the compression of the auxiliary spring is not sufficient to hold it to its seat and permitting the air to escape until the pressure is sufficiently reduced; but in no instance, so far as I am aware, does the lifting of the valve raise the load, the prior devices being so constructed as to permit of movement of the valve-stem independently of the parts supporting the load. The compression of the auxiliary spring, against which the valve is lifted, depends entirely on the position of the part carrying the load, which may be governed by conditions other than the mere weight of the load.

In operation, the proportions of the parts being so regulated that under the maximum load of the car their positions will be as shown in the drawings, the application of the brakes is under such conditions effected with the

maximum determined pressure proper for such load in the usual manner. When, however, the load of the car is so far reduced as to render such braking-pressure unduly great, fluid under pressure, which enters the brake-cylinder in making an application of the brakes, passes therefrom through the pipe into the release-chamber 7, and acting upon the piston 10 thereof depresses the same until the excess of pressure above that which is proper and desirable escapes through the discharge-port 11, the pressure in the brake-cylinder effective in the application of the brakes being thereby reduced to that which is in proper relation to the reduced load of the car, which acts through the regulating-lever 13 upon the piston 10 in reverse direction to the pressure thereon from the brake-cylinder, the bearing-pins 17 of the regulating-lever constituting the fulcrum of said lever. Upon the release of pressure through the discharge-port, as above described, the weight of the car body and load, acting upon the regulating-lever through its pivot-bolt 14, lowers the adjacent end of the lever and correspondingly raises the piston 10 through an increased range of traverse due to the difference in length of the lever-arms, restoring the parts to normal position. The discharge chamber and piston and the regulating-lever act in the manner of a safety-valve to relieve such excess of pressure as may be resultant upon decrease of load, and their action being wholly automatic the application of the maximum determined pressure is effected when the same is proper and a regulated reduction thereof made, as from time to time desirable, without involving the necessity of hand adjustments or liability to error in variation by an operator.

I am aware that relief-valves adapted to relieve braking-pressure at a degree automatically adjusted by the weight of the car and load have been heretofore known, and such a valve, broadly, as well as the combination therewith of a lever through which the action of weight is transmitted thereto, I distinctly disclaim.

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

1. In a brake apparatus for railroad-cars, the combination, with a brake-cylinder, of a communicating release-chamber, a piston controlling a port therein, a rod fixed to said piston, and a regulating-lever interposed between and coupled to a car-body and the piston-rod and bearing intermediately upon a car-truck, said lever forming a direct connection between the car-body and the piston-rod, whereby the piston may be moved in one direction by the pressure in the release-chamber and in the other direction by the weight of the car body and load, substantially as set forth.

2. In a brake apparatus for railroad-cars,

the combination of a brake-cylinder, a release-chamber communicating therewith, a piston controlling a discharge-port in said chamber, a regulating-lever coupled at one
5 end to said piston and at the other to the car-frame and provided with intermediate bearing-pins, and a supplemental center plate interposed between the truck and the body

center plates and abutting against said bearing-pins, substantially as set forth.

In testimony whereof I have hereunto set my hand.

FRANK MOORE.

Witnesses:

J. SNOWDEN BELL,
R. H. WHITTLESEY.