

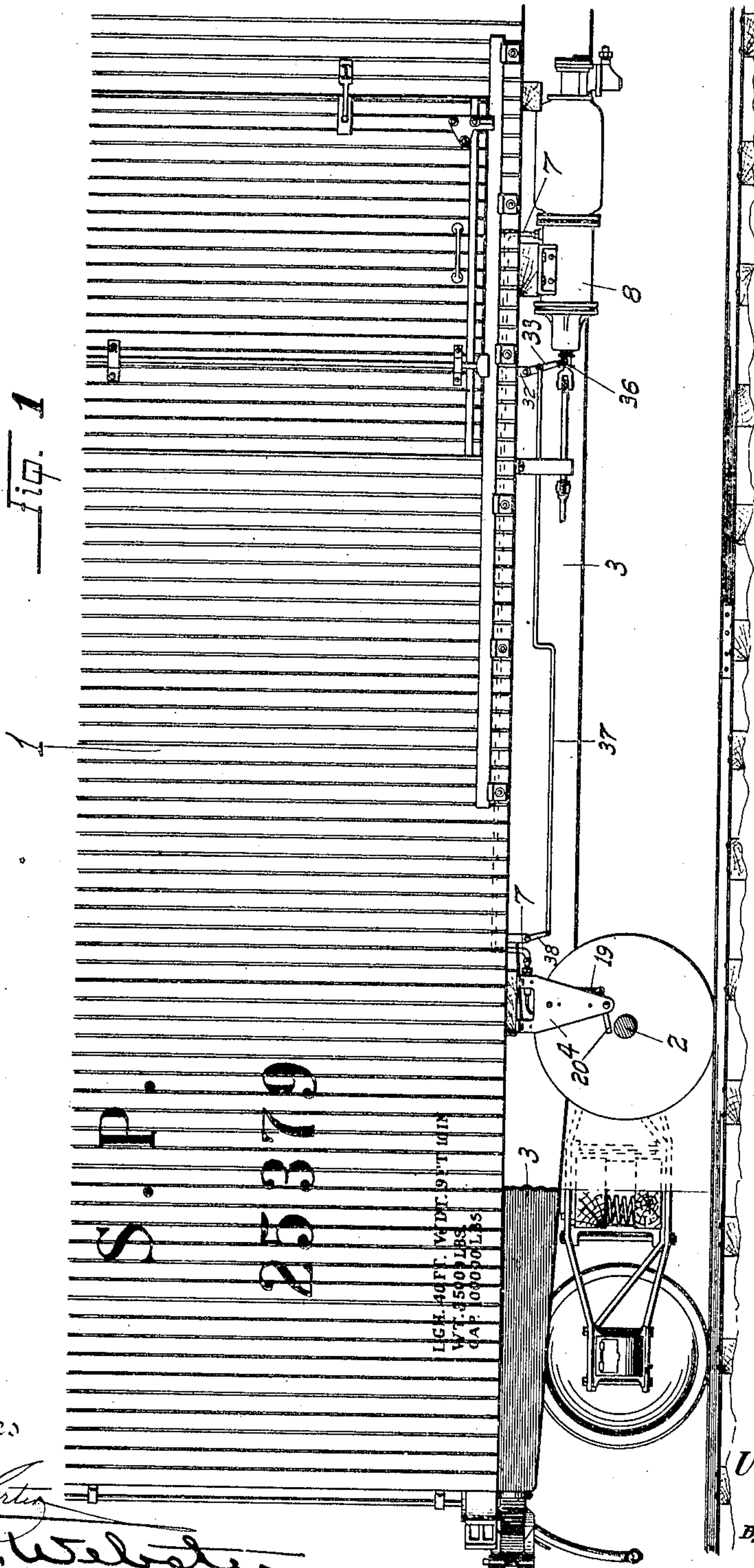
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PATENTED JULY 7, 1908.

U. S. SMITH.  
AUTOMATIC AIR BRAKE PRESSURE ADJUSTER.

APPLICATION FILED SEPT. 18, 1907.

2 SHEETS—SHEET 1.



Witnesses

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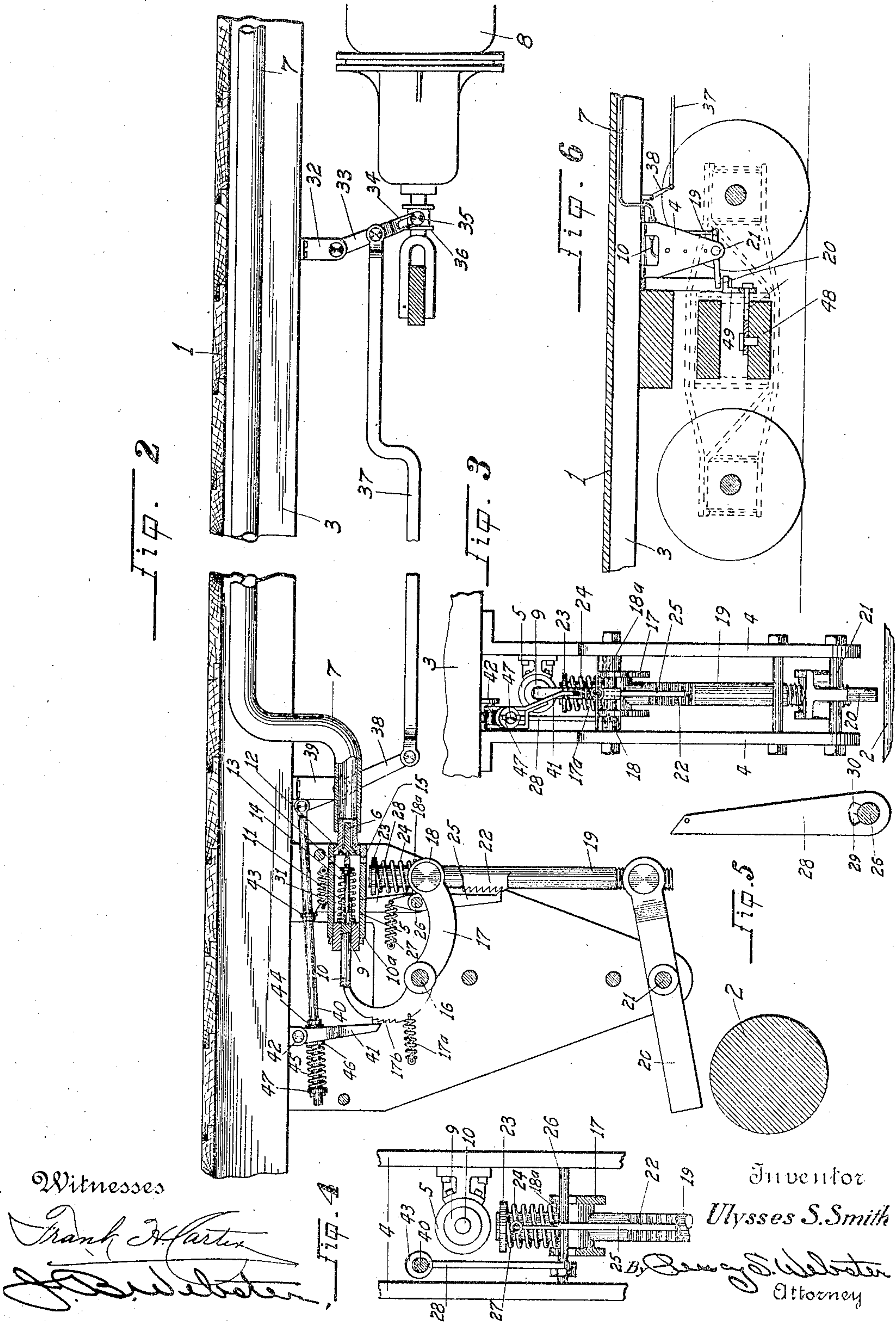
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# UNITED STATES PATENT OFFICE.

ULYSSES S. SMITH, OF SACRAMENTO, CALIFORNIA.

## AUTOMATIC AIR-BRAKE-PRESSURE ADJUSTER.

No. 892,561.

Specification of Letters Patent.

Patented July 7, 1908.

Application filed September 18, 1907. Serial No. 393,459.

*To all whom it may concern:*

Be it known that I, ULYSSES S. SMITH, a citizen of the United States, residing at Sacramento, in the county of Sacramento, State of California, have invented certain new and useful Improvements in Automatic Air-Brake-Pressure Adjusters; and I do declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this application.

This invention relates to improvements in means for automatically adjusting the pressure on air brakes used in connection with railway rolling stock and particularly on freight cars, my object being to produce a means whereby the braking pressure on all cars in a train line may be made uniform according to their weight as they are empty or loaded and also to increase the braking power on the loaded cars without increasing it on the empties. This object I accomplish by first doubling the present braking pressure of the levers on the brake shoes and then fitting the air cylinders with an automatic means for regulating and adjusting the said braking pressure according to the weight in the car; also by such other and further construction and relative arrangement of parts as will appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views.

Figure 1 is a side elevation of a portion of a freight car showing my improved mechanism installed thereon. Fig. 2 is a side sectional view of my improved mechanism. Fig. 3 is an end view of the mechanism. Fig. 4 is a fragmentary view of a portion of the device showing a system of adjusting levers. Fig. 5 is a fragmentary view showing a slot and pin mechanism. Fig. 6 is a view of a truck showing a part of my invention installed thereon.

Referring more particularly to the reference characters on the drawings 1 designates the body of the car and 2 the axles of the wheels thereof. On the under side of said car are secured sills 3. Secured to one of said sills 3 over one of the axles 2 is a double bracket 4. Secured between said

bracket 4 is a cylinder 5 provided at its forward end with a pop valve 6 connected by means of a pipe 7 to the front end of the brake cylinder 8.

Screw mounted in the rear end of the cylinder 5 is a centrally orificed plug 9 carrying a sliding rod 10 in said orifice, the inner end of said rod 10 having a sleeve 11 in which is disposed a pin 12 bearing against the valve 6 and provided with a collar 13, while 14 is a spring bearing between the collar 13 and a collar 10<sup>a</sup> on the rod 10 all for the purpose as will appear.

15 are escape ports in the cylinder 5.

Pivotally mounted between the brackets 4 on a shaft 16 is a curved adjustment lever 17 the upper end thereof being held normally away from the end of the rod 10 by means of a spring 17<sup>a</sup>, and provided with ratchets 17<sup>b</sup> intermediate said spring and said upper end for the purpose as will appear. In a swiveled pin 18 in the lower end of said member 17 is a vertical rod 19. On the lower end of said rod 19 is pivoted an arm 20 which arm is fulcrumed on a pin 21 intermediate the brackets 4 and extends out over the axle 2. Intermediate the arm 20 and the member 17 the rod 19 is provided with a ratchet rack 22. At the upper end of the rod 19 is a collar 23 while 24 is a spring bearing between said collar 23 and a collar 18<sup>a</sup> on the pin 18. Spring 24 is stiff enough to compress spring 14 when in action.

25 is a dog fulcrumed to a shaft 26 and normally held in engagement with the ratchets 22 by means of a spring 27.

28 is an arm swung on the shaft 26 and provided with a segmental slot 29 normally operating over pin 30 secured to said shaft 26, said arm extending upward and being held normally out of engagement with the pin 30 by means of a spring 31.

Swung on a hanger 32 is a lever 33 provided with a slotted end 34 engaging a pin 35 on the brake piston rod 36. Pivoted intermediate the lever 33 is a link rod 37 which is pivoted at its other end to the lower end of a lever 38 fulcrumed on a hanger 39. Pivoted to the upper end of the lever 38 is a trip rod 40 slidably disposed through a dog 41 depending from a hanger 42 and hanging normally in alinement with the ratchets 17<sup>b</sup>. Said trip 40 is provided with a collar 43 adapted to engage the arm 28 under certain operations as will appear. The slotted end 34 is long enough to permit piston 36 to



travel its extreme length of twelve inches and the spring 45 will be long enough to take up the extreme travel of the parts. The trip rod 40 is also provided with a collar 44 bearing normally against the forward side of the dog 41, while 45 is a spring encircling the trip rod 40 to the rear of the dog 41 and bearing between collars 46 and 47 on said rod 40.

In using my improved system, the brake shoes and rods are so adjusted as to be capable of double the pressure now acquired and yet with the regulation seventy pounds pressure. The purpose of this, I will demonstrate later.

The views in this drawing show my improved mechanism as it appears in normal position or rather as it appears on empty cars. In this position the valve 6 is so adjusted by means of the plug 9 being screwed up and forcing the spring 14 to hold the pin 12 against said valve at such tension as to permit about one half the air from the cylinder 8 to escape to the atmosphere through ports 15. This leaves the braking power of this empty car the same as it now is on all cars. Now as the car is loaded the car bed gradually lowers thus driving the bracket 4 downward and causing the arm 20 to engage the axle 2, which action pulls downward the rod 19 and incidentally the lower end of the adjusting lever 17, which causes the said adjusting lever to drive the rod 10, inward. This causes the spring 14 to be compressed, thus reducing the quantity of air which is permitted to pass through the valve 6 and causing it to be expanded on the brake piston head, thus causing the braking power to increase in proportion as the weight of the car increases. As the rod 19 travels downward performing its functions as above, the dog 25 engages with the ratchets 22 thus holding the said rod 19 and its connected parts in the position fixed by the weight of the car, and if the car jolts and drives the arm 20 upward, then it is caught and held by dog 25 in ratchet 22 and rides clear of the axle 2 thus preventing wear. When the air is applied the piston rod 36 drives outward and drives the lever 33 forward which action by means of the link 37 and lever 38 pulls the trip rod 40 forward which causes it to engage the lug 30, turning the shaft 26 and passing over said arm 28, thus releasing the dog 25 and permitting the rod 19 to return to normal or as near normal as permitted by the weight of the car, the lever 17 being held in its similar position by means of the dog 41 engaging the ratchets 17<sup>b</sup>, being pulled to such position by the movement of the rod 40 just described. In a loaded car of course the parts cannot return to normal entirely but only to such position as is permitted by the weight of the car and thus the position in which the lever 17 is locked is that position which maintains on the valve 6 a resistance in proportion to

the weight of the car as described. The object in having this adjustment lever 17 locked in this manner when the brakes are set is to prevent any sudden jolt of the car from offering a greater resistance to the valve 6 than is required to maintain the proper brake power in making a second application or in cutting in the retaining valves coming down the mountain grades, and still permit the arm 20 to be driven upward and locked there by dog 25 in ratchet 22 thus keeping it above said axle.

When the brakes are released the piston rod 36 moves inward and pulls on the levers 33, 37 and 38 in such a manner as to drive the trip rod 40 outward and release the dog 41 and passes the collar 43 back over the arm 28, the spring 31 returning it to normal, and when all the parts are thus released the device is in position to repeat the operation described above, the spring 24 pressing on the lever 17 to adjust to any movement the rod 19 may have made while the said lever 17 was locked as described.

Thus it will be seen that the device as described above is designated to increase or decrease the braking power of a car according to the weight thereof and thus equalize the braking power throughout the train line. And by reason of the fact that on cars provided with the device the maximum pressure is doubled over what is now used on cars, with the use of the same quantity of air pressure, this permits a train line to be made up of cars provided or not provided with the improved pressure adjuster, and with no inconvenience occasioned thereby.

My improved system makes it possible for freight trains to be stopped almost as easily as passenger trains thus making a saving of time in running into stations and yards. Also when loaded cars are put upon a siding or hauled to warehouses and unloaded the adjuster still remains in its load position as described until the cars are again picked up, and put into a train, when first application of brakes releases the adjuster and lets it travel to normal. The same will occur when part of the load is removed, the adjuster 17 releasing the pressure on the valve 6 according as the weight of the car bears the arm 20 onto the axle 2.

I claim that my improved adjuster will give all the braking power needed to handle the heaviest cars in emergency and also permit quick stops to be made and the engineer to have perfect control of the train under high speeds.

Fig. 6 shows a modified form of car from that shown in the other figures, viz. a car having bolsters the lower bolster carrying an arm 49 for engaging the arm 20 instead of the axle as in the other form. Thus it will be seen that I have produced a device for adjusting the braking pressure of cars according to



their weight, which substantially fulfils all the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred embodiment of my invention still many changes from such detail may be resorted to within the scope of my claims, without departing from the spirit of the invention.

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

1. In a device of the character described a car, a brake cylinder thereon, a means for adjusting the air pressure in said brake cylinder according to the weight of the car, and means for locking and releasing said adjusting means as the brakes on said car are set or released, as described.

2. In a device of the character described a car, a brake cylinder thereon, a bracket depending from the under side of said car, a rod slidably secured to said bracket, an arm fulcrumed to said bracket and pivoted to the lower end of said rod, said rod being adapted to contact with some stationary object on the truck of said car as the car body moves downward, and means for regulating the pressure in said brake cylinder by the motion of said rod, as set forth.

3. In a device of the character described a car, a brake cylinder thereon, a depending bracket on side of said car, a curved adjustment lever pivotally mounted on said bracket, a rod slidably disposed through the lower end of said curved lever, a stop collar on said rod adapted to bear against said lever, means for pulling said rod downward with any downward movement of the car, and means in operative connection with the upper end of said adjustment lever for regulating the pressure in said cylinder according to the downward movement of said car, as described.

4. In a device of the character described a car, a brake cylinder thereon, a bracket depending from the under side of said car, a rod slidably disposed on said bracket, a means for moving said rod as the car body moves downward, a means for locking said rod in its moved position, a means for releasing the same and returning it to its normal position, and a means for adjusting the air pressure in said cylinder according to the movements of said rod, as described.

5. In a device of the character described a car, a brake cylinder thereon, a vertical rod

disposed beneath said car, a ratchet rack formed on said rod, a dog adapted to normally engage said ratchets, means for releasing said dog when the brakes on said car are set, means for moving said rod as the car body moves downward and means for regulating the air pressure in said cylinder by the movement of said rod, as set forth.

6. In a device of the kind described a car, a brake cylinder thereon, a bracket downward from said car, a vertical rod slidably disposed on said bracket, a ratchet rack on said rod, a dog pivotally mounted on said bracket and normally engaging said ratchets, a spring holding said dog in such normal adjustment, an arm upward from the shaft of said dog, said arm being provided with a slot, a lug on said shaft operating through said slot; a trip rod disposed above said arm and provided with a trip collar adapted to engage said arm, and means operating said trip rod with the brake piston rod, as set forth.

7. In a device of the character described a car, a brake cylinder thereon, a curved adjustment lever disposed beneath said car, ratchets disposed in said lever, a depending dog on said car extending normally in alignment with said lever, a trip rod in operative connection with said dog, means operating said trip rod, means whereby said lever operates with the downward movement of the body of the car, and means whereby the pressure in said cylinder is regulated by the movement of said lever.

8. In a device of the character described a car, a brake cylinder thereon, an auxiliary cylinder connected with said brake cylinder by pipe, a pop valve disposed at the entrance to said auxiliary cylinder, a centrally orificed screw plug in the rear of said auxiliary cylinder, a rod slidably disposed through said orifice, the inner end of said rod being formed as a sleeve a collar on said rod bearing normally against said plug, a pin slidably disposed in said sleeve and bearing normally against said valve, a collar on said pin, a spring bearing between said two collars, and means for moving the said rod inward as the car body moves downward, as described.

In testimony whereof I affix my signature in presence of two witnesses.

ULYSSES S. SMITH.

Witnesses:

FRANK H. CARTER,  
PERCY S. WEBSTER.