

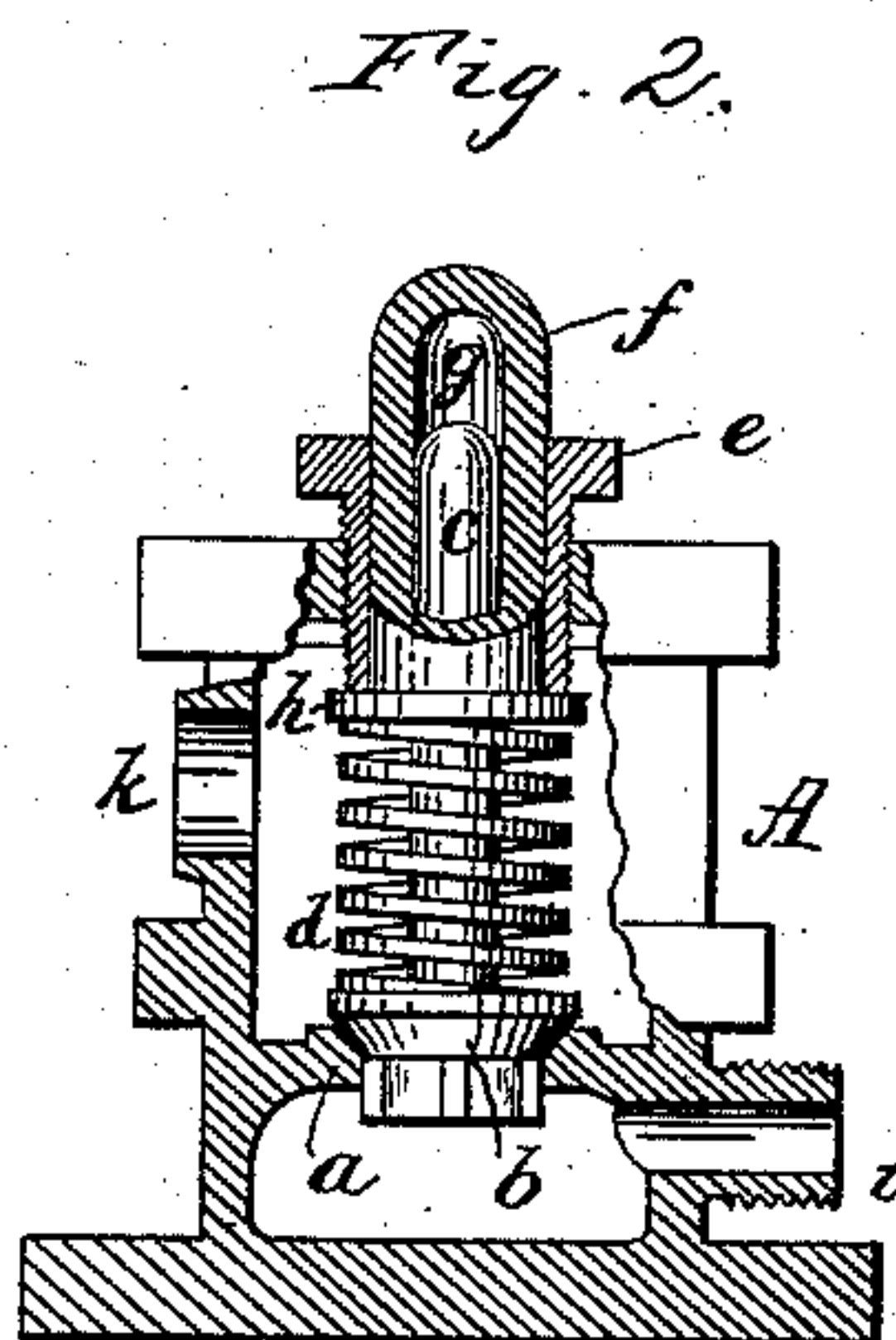
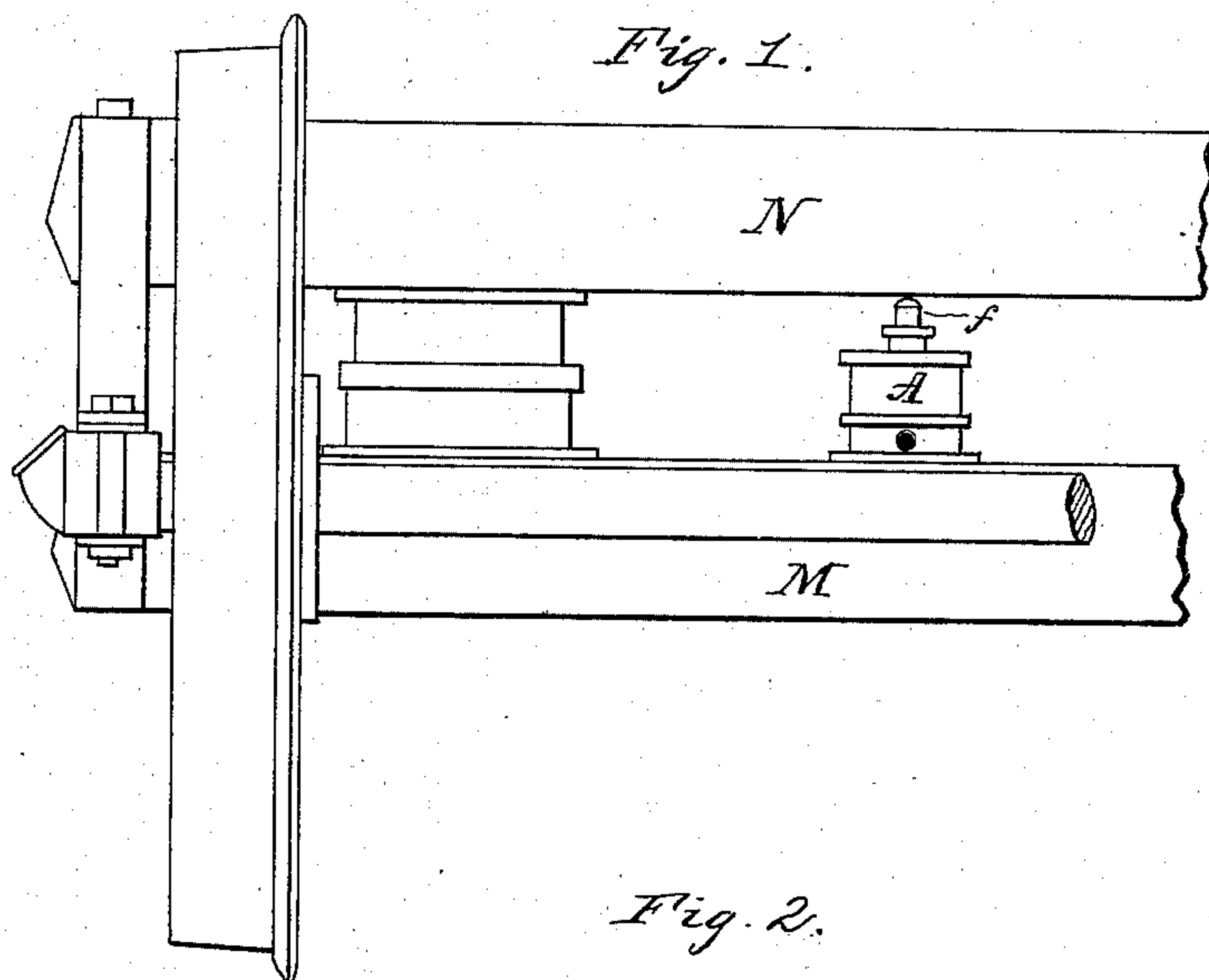
(No Model.)

R. J. WILSON.

RELIEF VALVE FOR RAILWAY PRESSURE BRAKES.

No. 284,154.

Patented Aug. 28, 1883.



Witnesses:-  
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# UNITED STATES PATENT OFFICE.

ROBERT J. WILSON, OF PITTSBURG, PENNSYLVANIA.

## RELIEF-VALVE FOR RAILWAY PRESSURE-BRAKES.

SPECIFICATION forming part of Letters Patent No. 284,154, dated August 22, 1883.

Application filed March 22, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT J. WILSON, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Relief-Valves for Railway Pressure-Brakes; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, in which—

Figure 1 is an end view of part of a car-truck and swinging car-bolster, showing an application of my invention. Fig. 2 is a vertical section of the relief-valve.

In the use of railway-car brakes on the continuous fluid-pressure principle, whether under the compressed-air, vacuum, steam, or hydraulic system, it happens often that one or more cars of a train are empty or only partly loaded, while the rest are full. Such empty or partly-loaded cars will of course have less momentum than the rest, and will obviously not require as great a pressure of the brake-shoes upon the wheels to lock the latter as is required by the full cars. Consequently, if the pressure required to brake the loaded cars is admitted to the cylinders of the empty or light cars, the brake-shoes of the latter are too strongly applied to their wheels, and the result is, that such wheels become locked, and they slide or "skid" upon the rails. A few repetitions of this skidding on the same part of the wheel-face produces the defect known as a "flat wheel," and renders the wheel useless. My object is to prevent such injury to the wheels, for which purpose I apply a relief-valve, automatically adjustable, so as to release the pressure at whatever point the car at the time requires—that is to say, I so arrange a relief-valve that the pressure at which it will open depends directly and positively upon the weight of the car. The greater the load the higher the pressure at which relief takes place, and therein is the essence of my invention.

The invention can be practiced in a variety of ways. For illustration, I show what I consider the simplest and most practicable, as adapted to the air-brake.

I construct a shell or globe, A, with a valve-seat, *a*, and in this fits the valve *b*, shutting against the pressure. Valve *b* is provided with the stem *c*, around which is a spiral spring, *d*, as shown. Into the top of shell A, I insert the threaded bushing *e*, which is bored out centrally to receive the movable guide *f*, whose central recess, *g*, receives and guides the stem *c*. Guide *f* has the flange or lip *h* at its bottom, upon which the bushing *e* bears for adjustment, and the said guide projects upwardly above the top of shell A. The bottom of guide *f* bears against the spring *d*, as shown, and, by screwing the bushing *e* up or down, the guide *f* is pressed more or less powerfully against the spring, so that the valve *b* may thus be adjusted to normally open to a given degree of pressure. The inlet for air is in the wall of the shell A, below the valve-seat *a*, through nipple *i*, and the outlet or vent *k* is in the wall above the valve-seat *a*, as shown.

To nipple *i*, I attach a pipe, which communicates with the brake-cylinder or pressure-pipe, so that the valve *b* is exposed to the same pressure as the brake-piston. In the drawings I show such a relief-valve set on top of the suspension bar or bolster M, and so arranged as that when the car is empty the upper end of the guide *f* is nearly or quite in contact with the bottom of the swinging bolster N of the car-truck. The adjustment is arranged normally to allow the valve *b* to open at the pressure which will properly brake the empty car without skidding the wheels. When the car is loaded more or less, the additional weight of course causes the swinging bolster N to sink in accordance with such increase of weight. The bolster N in thus sinking bears down upon the guide *f*, and compresses the spring *d* more or less, according to the amount of additional weight in the car; hence with the spring *d* thus forcibly compressed against the valve a greater pressure will be required to open the latter, which is exactly what is wanted. The car and its load thus automatically adjust the relief-valve so that it will release the pressure exactly at the point necessary to effectually brake the wheels without injurious skidding. This adjustment of the releasing pressure to suit the conditions of load upon the wheels may be effected in a great variety of ways with-



out departing from the spirit of my invention. The device may be placed on any of the fixed parts of the truck and arranged to be pressed upon by some part of the car-body or attachments thereto; or by a system of levers or cords the valve may be set anywhere. In short, the invention may be put in practice by any means which will directly communicate the downward pressure of the load to the guide *f* or its equivalent, and thereby effect the adjustment of the releasing or blow-off pressure at the valve.

I am aware that it has been proposed to arrange a valve in the pressure system adapted to be adjusted manually by the brakemen or train-men from time to time, according to the varying condition of the track and the load, such arrangement requiring manipulation for every change in said conditions, and being, therefore, not automatic. I am also aware that it has been proposed to operate a mechanical brake by a friction-wheel applied to the car-wheel in such manner that the degree of pressure of the friction-wheel upon the car-wheel depends upon the weight of the car, and which is applied and released by means of fluid-pressure under control of the engineer; but such a device does not embody the use of a relief-valve adjusted by the weight of the car. I am likewise aware that it has been proposed to vary the pressure of the brake-shoes against the car-wheels with the varying speed of the train by the automatic action of the wheels acting as a drag, and thereby moving to a greater or less extent a regulating-valve, which shall to the extent of such opening vary the operative fluid-pressure; but in no case of which I am aware has a relief-valve been arranged to be controlled directly and positively by the weight of the car, so as to open and prevent the effective pressure from reaching a degree at which the wheels would lock, such opening pressure being automatically adjust-

able directly by and in accordance with the variation of weight of the car.

I claim as my invention—

1. In fluid-pressure brake systems, a relief-valve applied to each car, in communication with the cylinder or pressure-pipe of such car, and adapted to open and relieve the pressure at a degree automatically adjusted directly and positively by the amount of load on such car, substantially as described.

2. In fluid-pressure brake systems, the method of independently regulating the pressure applied to the brakes of the respective cars, consisting in applying to the pressure devices of each car a relief-valve adapted to automatic adjustment of its releasing or opening pressure, and effecting such adjustment directly and positively by the varying weight of the load upon the car, substantially as described.

3. In fluid-pressure brake systems, the method of automatically adjusting the relief-valve by the variation of load, consisting in causing an increase of load to operate directly and positively to increase the resisting-power of the relief-valve, and thereby raise the degree of pressure at which said valve opens, substantially as described.

4. In fluid-pressure brake systems, a relief-valve applied to the cylinder or pressure devices of each car, capable of pressure adjustment, and adapted to have its releasing pressure automatically regulated directly and positively by the weight of load on such car, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

ROBERT J. WILSON.

Witnesses:

T. J. MCTIGHE,  
T. J. PATTERSON.