

(No Model.)

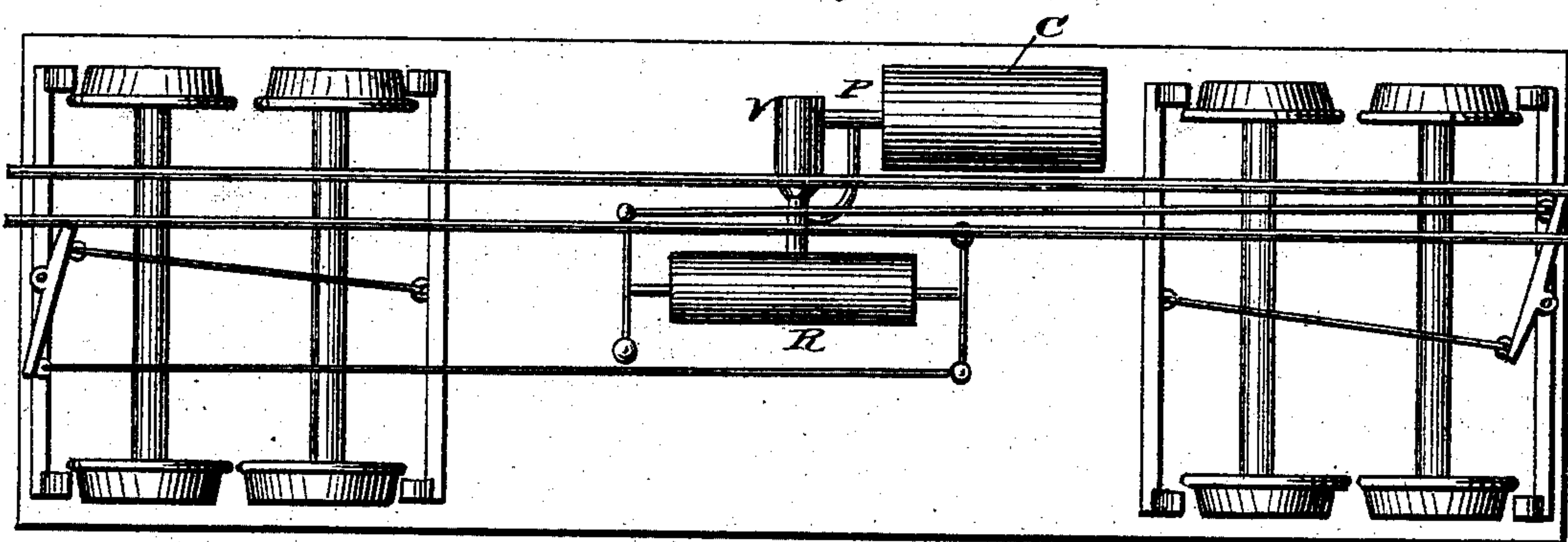
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W. P. THOMPSON.  
Railway Brake.

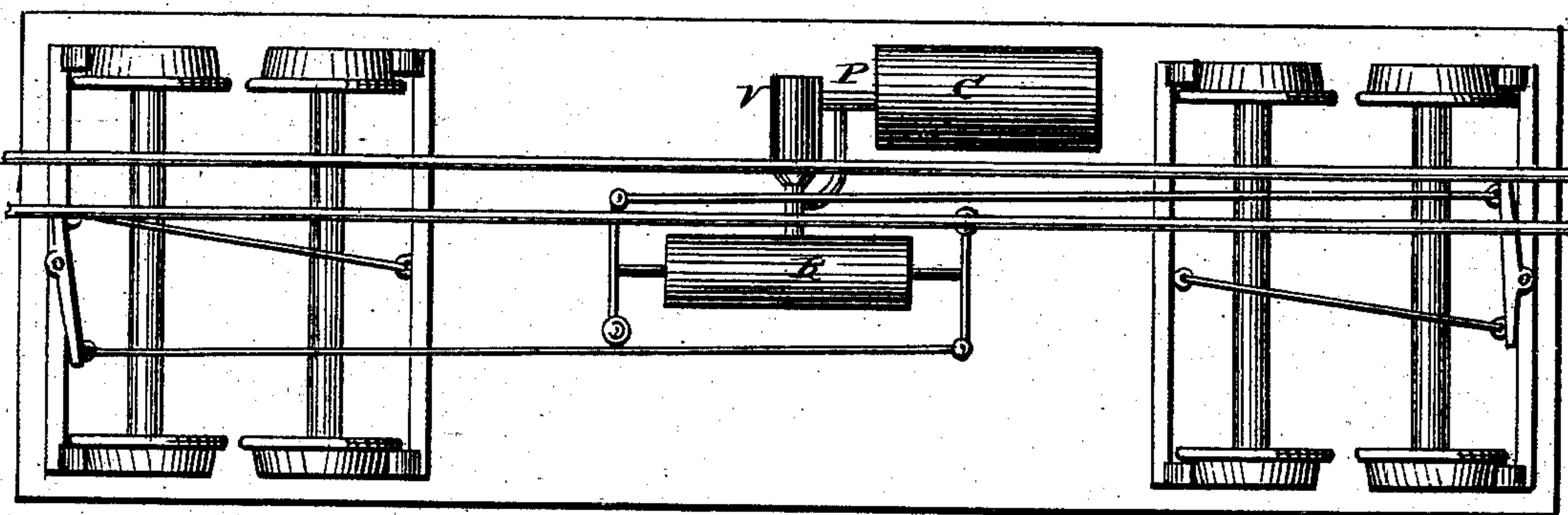
**No. 239,887.**

**Patented April 5, 1881.**

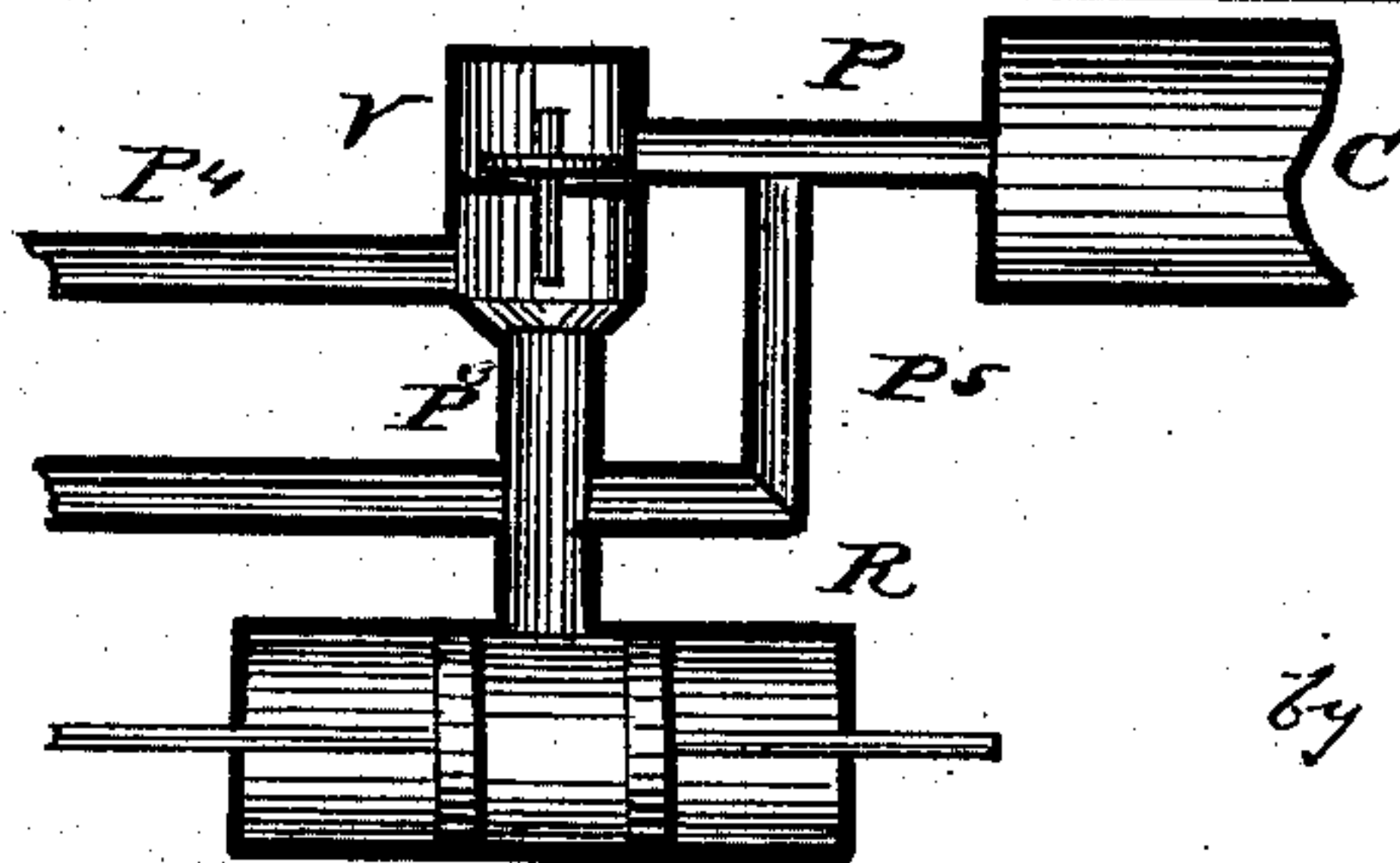
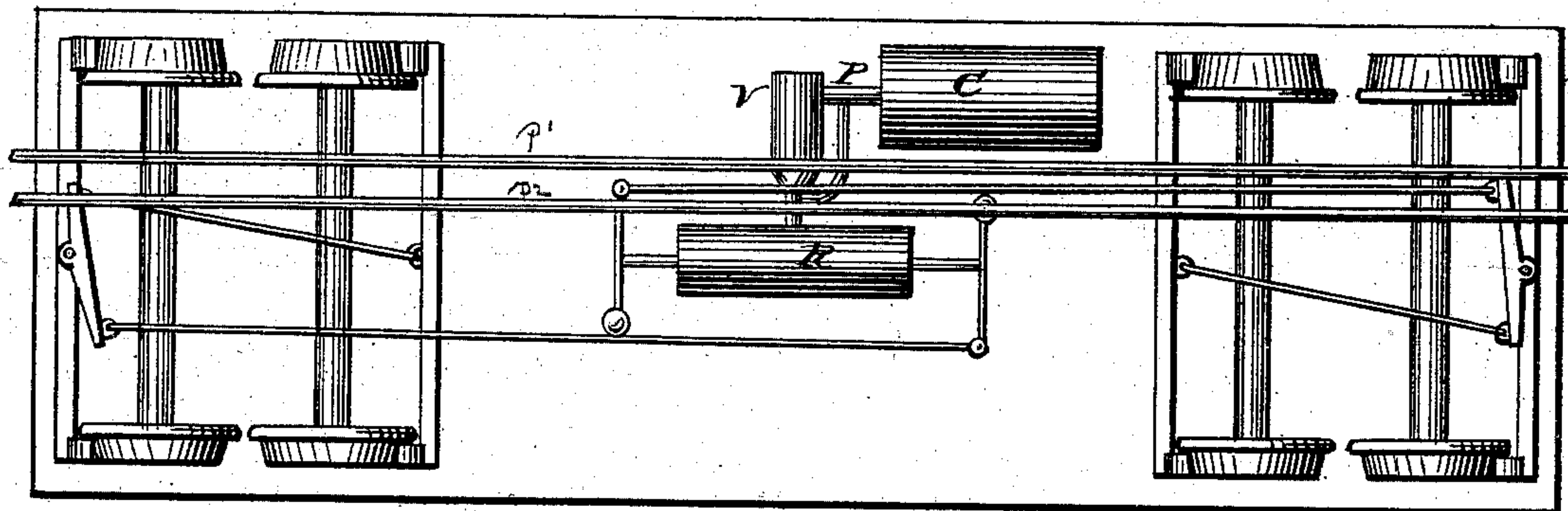
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



*Witnesses:*

P. C. Dietrich  
A. H. Krause

*Inventor:*

Wm P Thompson  
by Skloyd Wiegand  
Atty.

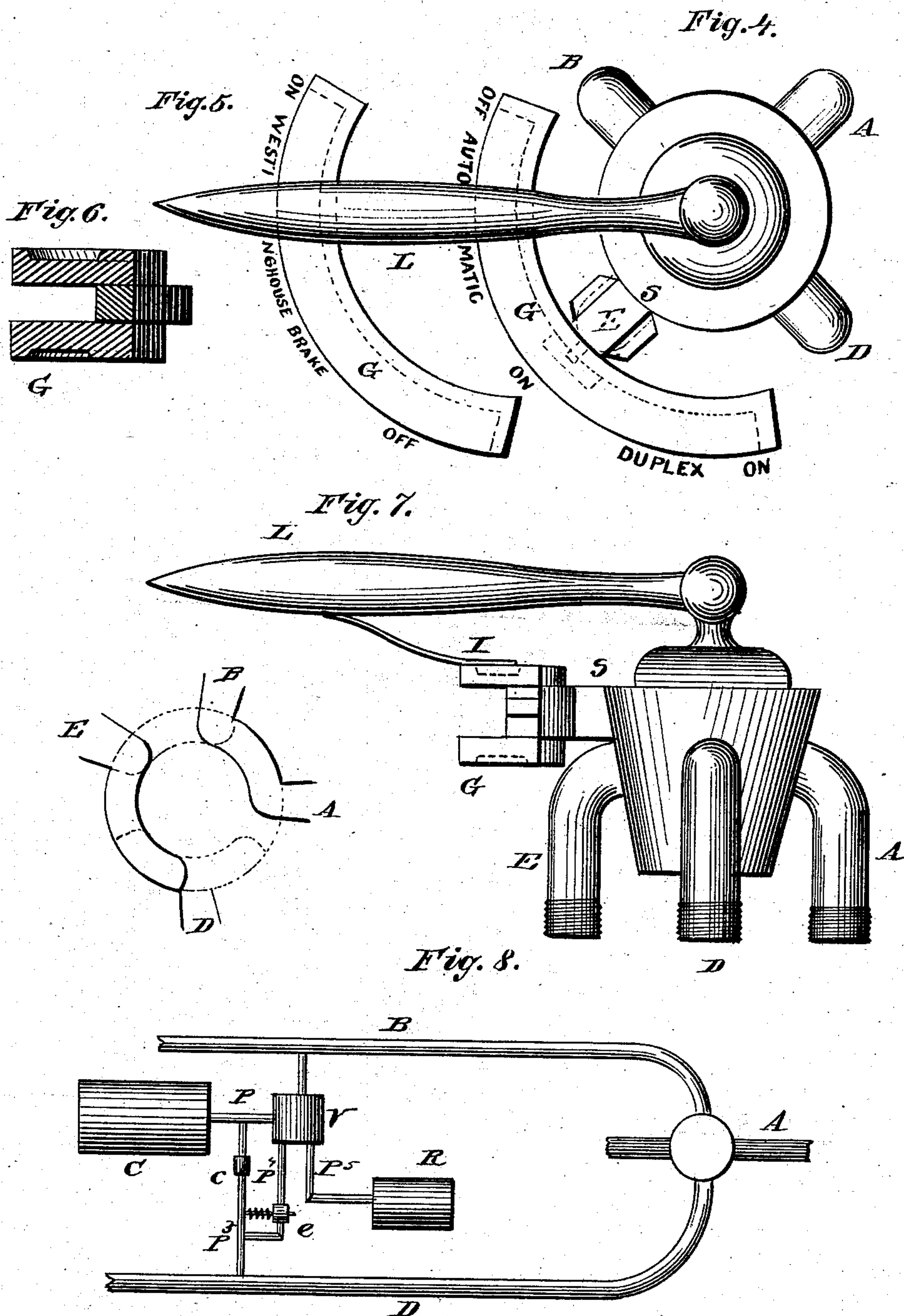
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att'y.



# UNITED STATES PATENT OFFICE.

WILLIAM P. THOMPSON, OF PHILADELPHIA, PENNSYLVANIA.

## RAILWAY-BRAKE.

SPECIFICATION forming part of Letters Patent No. 239,887, dated April 5, 1881.

Application filed November 6, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM P. THOMPSON, of the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Brakes for Retarding and Arresting the Motion of Railway-Carriages; and I do hereby declare the following to be a sufficiently full, clear, and exact description thereof to enable others skilled in the art to make and use the said invention.

My invention relates to that class of railway-brakes which operate by the pressure of air, steam, or other fluid, having a reservoir on the engine connected by a pipe with auxiliary reservoirs under each car, which auxiliary reservoirs are connected by pipes to cylinders and pistons or diaphragms operating the brake-rods. These pipes or channels between the auxiliary reservoirs and brake-cylinders have differential valves placed therein for directing and controlling the flow of the fluid to and from the brake-cylinders, and are known to railway men as "automatic brakes," in contradistinction to pneumatic or other fluid brakes which are operated by the direct flow of air from the tank on the engine to the brake-operating cylinders, which latter arrangement is popularly termed by railroad men "the old Westinghouse system of brakes." The operating of the automatic brakes is under the control of the engineer on the locomotive, who, by letting the pressure on or off the pipe extending under the several cars of the train, applies or releases the brakes.

The object of my invention is to give the engineer more certain and complete control over the speed of the train by enabling him to make more immediate and effective use of the pressure in the large reservoir on the locomotive than has been practicable with the appliances heretofore known, and thus to enable the engineer, at his option, to operate the brakes as old Westinghouse or other equivalent brake acting by pressure directly transmitted from the engine-reservoir, or to operate the brake as "new automatic" by the pressure of the fluid in the auxiliary reservoirs under the cars, so that, in the event of the pressure in the vessels under the several cars proving inadequate to work the brake as "automatic" and check the speed of the train, they

can by this duplex system be promptly operated by direct application of fluid-pressure transmitted through the pipes extending from the reservoir and pump on the engine.

The nature of my invention may be briefly stated to consist of a duplex or double system of valves and pipes extending through the train, connected to the usual reservoir and piston or diaphragm cylinders, through one of which set of pipes the reservoirs under the cars may receive a charge of compressed air or other fluid, and, by means of the differential valves known as "automatic" placed therein, the brakes may be operated on the automatic system, and through the other set of pipes the air or other fluid pressure may be let on to the brake-piston cylinder through a differential valve which opens and closes as the pressure is let on or off through this second line of pipe, or is let on to both the auxiliary and, through the automatic valve, to the brake-piston cylinder simultaneously throughout the train.

My invention consists, further, in the construction of an improved form of duplex valve or cock, by means of which the engineer in the engine may more conveniently and instantly, without risk of mistake, apply his brake as new automatic, or as Westinghouse, or direct old way. In this duplex cock or valve the lever is so arranged that to put off the brake the engineer pushes the lever ahead in the direction of the motion of the train. To put on the brake automatic the lever is pulled back, or, in the reverse way of the motion of the train, half-way; and to put on the brake harder, or by the duplex pipes, it is pulled farther back, or continued in its motion to a greater distance. This duplex cock or valve has a pointer or index extending out to a marked rod or dial-plate which will in the light visibly indicate the effect of the position of the lever, and in the dark will, by falling into depressions, indicate which openings are in communication. This marked bar is reversible, and on its other side has another set of marks and cavities or recesses for use when the duplex system has become inoperative, or when, through any other reason, it is desirable to cease using the second line of pipe and the automatic valves of the first line and operate the brakes



through the first line of pipes as a direct-acting air, steam, or fluid brake mechanism. When the brake apparatus is in use in this way the effect of bringing the opening into communi-  
 5 cation by turning the barrel of the duplex cock has a different result. It is then necessary that the dial should read differently for the same position of the cock-lever.

The mode of making and using this inven-  
 10 tion is herein fully explained, and shown in the drawings annexed, in which—

Figure 1 is a plan of my invention as ap-  
 plied underneath a car with the pressure from the reservoir under the engine to the small  
 15 reservoir and the brakes off the wheels. Fig. 2 is a plan of the same, showing the pressure exhausted from the first line of pipe and the pressure from the small reservoir putting on the brakes. Fig. 3 is a plan of the same, show-  
 20 ing the pressure from the second line of pipes for putting on the brakes. Fig. 4 is a plan of lever, pointer, and indicator, with marks for the duplex brake ready for use. Fig. 5 is a plan of same, showing the dial or indicator bar reversed for the direct brake, ready for use.  
 25 Fig. 6 is an elevation of this indicator-bar. Fig. 7 is a side elevation of duplex cock, showing bearing on which the dial-bar may be re-  
 volved. Fig. 8 is a plan, where the pipe P<sup>5</sup>,  
 30 instead of communicating directly with the cylinder C, is attached to the pipe P<sup>3</sup> between the reservoir R and the automatic valve V, which arrangement charges the reservoir R, as well as the piston-cylinder C, through the  
 35 pipe P<sup>2</sup>.

The same letters of reference apply to the same parts in the several figures.

A is the pipe leading from the tank or res-  
 40 ervoir on the locomotive, which is kept continuously supplied with air or other fluid pressure.

C is the cylinder which contains the piston or diaphragm connected to the brake-rods, and is connected by the pipes P, P<sup>3</sup>, and P<sup>4</sup> to the cylinder and the first line of pressure-pipe, P<sup>1</sup>.

45 To these pipes is attached the automatic valve V, from which extends the pipe P<sup>5</sup> through the double check-valve D to the second line of pipe,

P<sup>2</sup>, which connects in this way under each car up to the duplex cock B, or the engine, from which E is the exhaust-pipe leading to the  
 50 open air.

L is the lever of the duplex cock, having a suitable pointer or indicator; G, a marker upon a pivot-support; and I I are spring-catches or end supports for the indicator-bar, which is by  
 55 them kept firmly in its place until they are made to release it for reversing.

When the pressure from the engine-tank operates the brakes directly the automatic valve performs no other function than the exhaust-  
 60 ing of the brake-cylinders in releasing the brakes.

Having described my invention, what I claim is—

1. In a system of air or other elastic fluid  
 65 pressure brakes, a duplex system of pipes and valves, whereby the engineer may, at his option, from the engine, apply direct pressure from the engine-tank, or the reaction of com-  
 70 pressed fluid in tanks on the cars, such change of mode of operation being effected by valves operated by currents of fluid directed and controlled by the engineer, all arranged substan-  
 tially as and for the purpose set forth.

2. An additional line of pipe extending from  
 75 the engine through the train for the purpose of directly supplying fluid under pressure from the engine to the brake-cylinders, in combination with said brake-cylinders, susceptible al-  
 80 ternatively of operation by re-expansion of air or other elastic fluid contained in reservoirs on each car, all arranged as shown and for the purpose described.

3. In fluid-pressure brakes, the combination  
 85 of valves shown and described for intercepting and changing the direction of fluid from the engine-tank to the auxiliary tanks and conducting the same directly to the brake-operat-  
 ing cylinders, as and for the purpose set forth.

WM. P. THOMPSON.

In presence of—

GEORGE REX MAGEE,  
 J. DANIEL EBY.