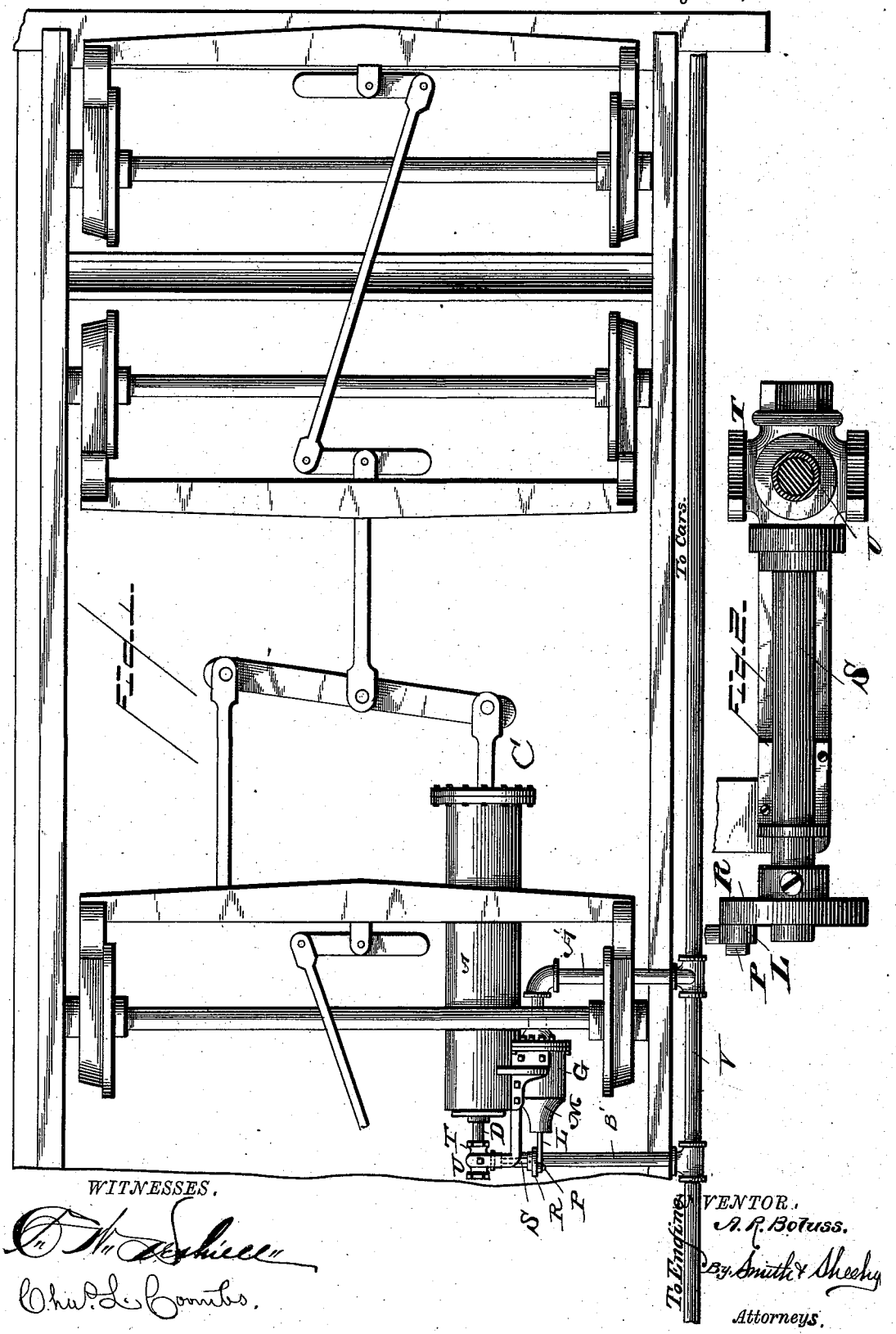
(No Model.) 2 Sheets—Sheet 1.

A. R. BOLUSS.

AIR BRAKE.

No. 382,749. Patented May 15, 1888.



WITNESSES.

Chas. L. Combs.

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(No Model.) 2 Sheets—Sheet 2.

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FIG. 3.

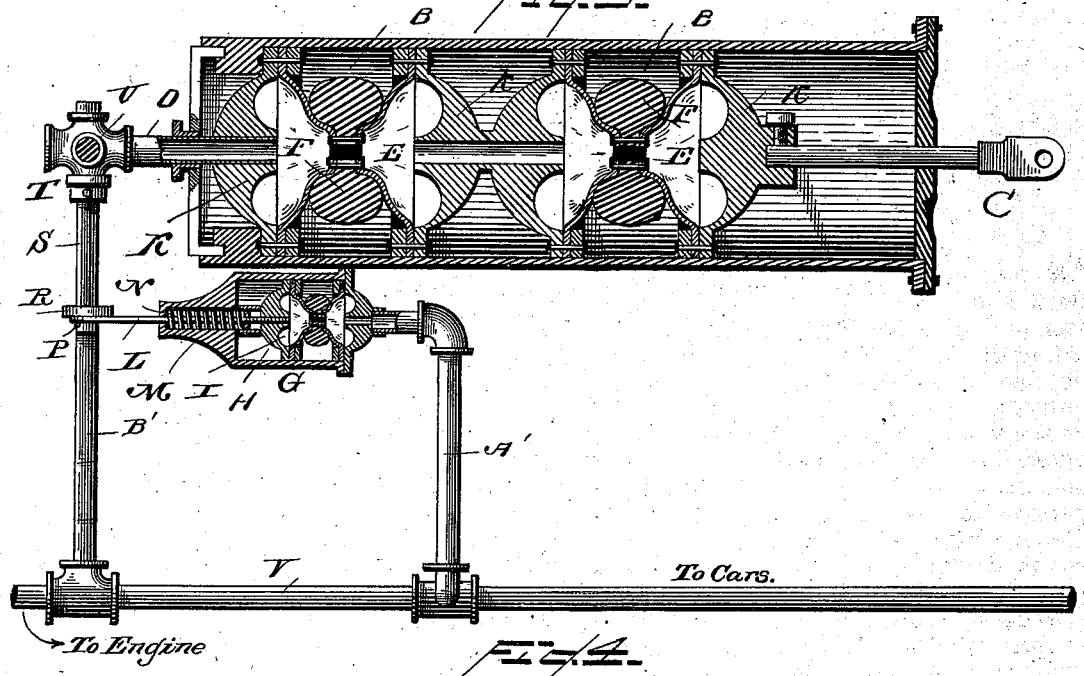


FIG. 4.

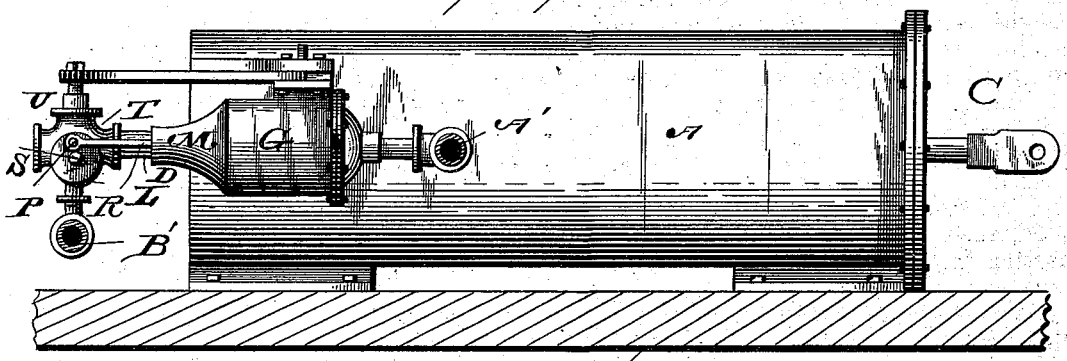
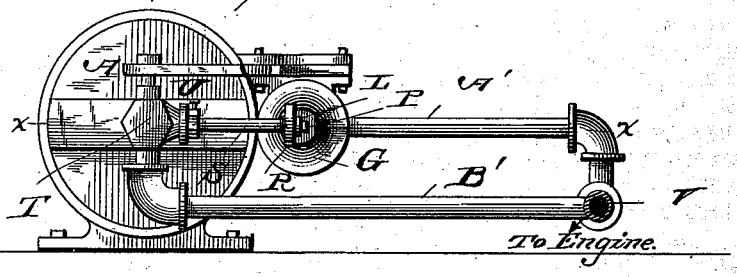


FIG. 5.



WITNESSES.

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UNITED STATES PATENT OFFICE.

ALFRED R. BOLUSS, OF NORWOOD, OHIO.

AIR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 382,749, dated May 15, 1888.

Application filed July 19, 1887. Serial No. 244,772. (No model.)

To all whom it may concern:

Be it known that I, ALFRED R. BOLUSS, a citizen of the United States, residing at Norwood, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Air-Brakes; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain improvements in air-brakes for cars; and it has for its objects to provide for applying and releasing the brakes by the variable pressure of air in the pipes which supply the air to the brake-cylinder, so as to operate the brakes and thus reduce the liability to accident, as more fully hereinafter explained.

The above-mentioned objects I attain by the means illustrated in the accompanying drawings, in which—

Figure 1 represents a plan view of a bottom of a car-truck, showing my improved brake applied thereto; and Fig. 2 represents a top view, enlarged, of the valve for admitting and exhausting the air from the brake-cylinder and the mechanism for operating said valve. Fig. 3 is a horizontal sectional view taken on the line *x x*, Fig. 5. Fig. 4 represents a side elevation of the brake-cylinder, pneumatic valve-chamber, and pipe-connections of the brake; and Fig. 5 represents an end view looking at the rear of the brake-cylinder, and showing the two-way valve, its valve-rod, and operating mechanism.

Referring to the drawings, the letter A indicates the brake-operating cylinder, which has arranged within it a series of expanding and contracting pistons, B, arranged to reciprocate in said cylinder to operate the brake-rod C, which is connected with said pistons at one end. The said pistons consist of a series of plungers arranged to reciprocate in said cylinder and having heads K at each end annularly grooved in opposite directions. In connection with said annularly-grooved heads and the annularly-grooved central section extends a pipe, D, connecting with the air-pressure mechanism on the engine. The respective plungers of the piston are joined by flexible connections E and intermediate ribbed rings, F, by means of which the brake-rods are operated, as more fully hereinafter specified.

The letter G indicates a valve-chamber, which is bolted to a seat on the brake-cylinder, or otherwise conveniently secured in connection with the same. Within the said valve-chamber is located a reciprocating plunger, H, which is provided with an annular groove, I, corresponding with the annularly-grooved head K of the plunger-casing, so that when the plunger meets the head an annular chamber will be left between the two, for the purpose hereinafter described.

The letter L indicates a valve-stem, which passes backward through a tubular extension, M, of the plunger-chamber, and which is surrounded by a spiral spring, N, which keeps the plunger pressed normally toward the head of the cylinder before mentioned. The rear end of said rod connects with a wrist-pin, P, on the face of a disk, R, which is secured to a shaft, S, one end of which passes into a valve-chamber, T, and is provided with a valve, U, for the purpose hereinafter explained.

The letter V indicates a pipe leading from the compressed-air reservoir on the engine, and connecting by means of a branch-pipe, B′, with the valve-chamber T, above mentioned, and also by means of the pipe D with the annular chamber of the head K of the cylinder B. The plunger-chamber communicates with the supply-pipe V by means of a branch pipe, A′.

The valve-chamber T connects with the pipe leading to the expanding plungers in the brake-chamber before mentioned, and to the open air through a suitable branch pipe, the valve therein being a two-way valve arranged so as to admit the compressed air to the brake-cylinder to set the brakes and exhaust the same to release said brakes, as will more fully hereinafter appear. After the pressure is removed from the interior of the plungers in cylinder B, the air which was compressed in this cylinder at one end thereof will react to collapse the diaphragms of the said plungers.

The operation of my invention will be readily understood in connection with the above description, and is as follows:

The pipe V is provided with a valve under

control of the engineer, so that he can instantaneously change the pressure of air in said pipe. To apply the brake, the said valve is operated to turn the full pressure of air on. This, entering the plunger H in its chamber, expands the said plunger, forcing the valve-rod L backward and turning the two-way valve before mentioned into position to admit the air into the brake-cylinder, so as to operate the pistons or plunger therein to set the brakes. To release the brakes, it is only necessary to relieve the pressure in the pipes by means of the controlling-valve, when the spiral spring N will throw the valve to its normal position, so as to open the exhaust and permit the air confined in the brake-cylinder to escape and the pistons therein to fall back.

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

1. In an atmospheric railroad-car brake, the combination, with the cylinder A, provided with hollow expansible plungers and a brake-rod, of the air-supply pipe D, connected to the head of an end plunger, a two-way oscillating valve at the junction of pipes B′ and D, and a supplemental expansible plunger applied in a cylinder communicating with the main supply-pipe V, and provided with a recoil-spring and a rod adapted to oscillate said valve, all substantially as described.

2. The combination, in an atmospheric brake, of expansible plungers communicating by means of a branch pipe with a main supply-pipe, a cut-off valve in said branch pipe, said plungers arranged in a closed cylinder, and a supplemental expansible plunger actuated by the pressure of air and a recoil-spring, and suitably connected to the stem of the said cut-off valve, substantially as described.

3. The combination of the closed cylinder, expansible plungers therein, a brake-rod, a supply branch pipe, D, the main supply-pipe V, the branches A′ B′, the cut-off valve at the junction of pipes D B′, an expansible plunger, and a recoil-spring for oscillating said valve, substantially as described.

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

ALFRED R. BOLUSS.

Witnesses:
EMMA M. GILLETT,
JOHN G. KROHR.