2 Sheets—Sheet 1

J. M. MAXWELL.

Air-Brake for Cars.

No. 207,126. **Patented Aug. 20, 1878.**

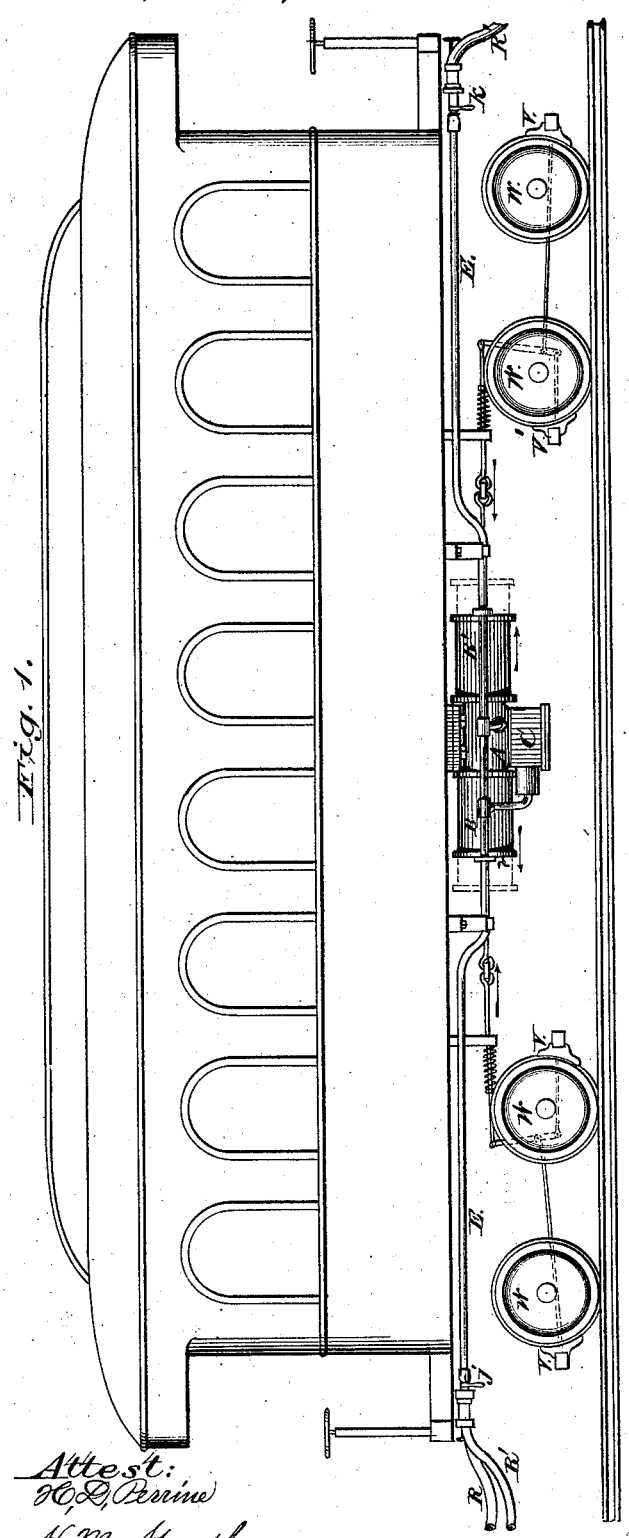

Fig. 1.

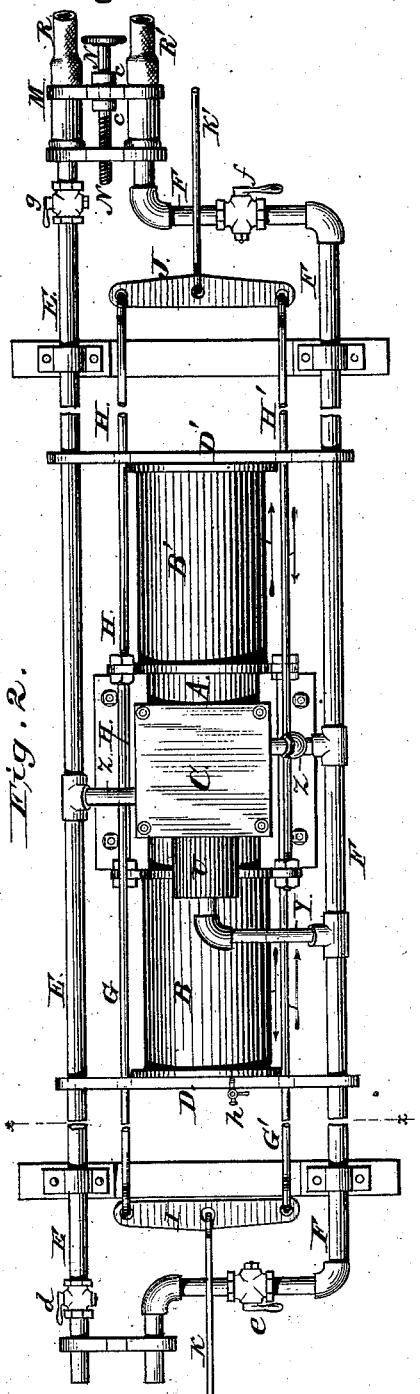

Fig. 2.

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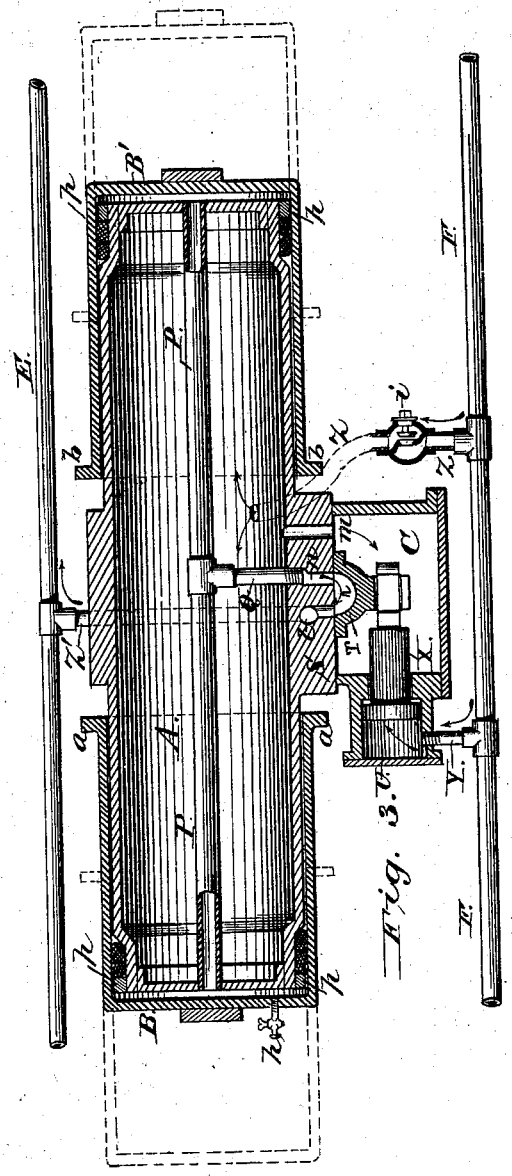

Fig. 3.

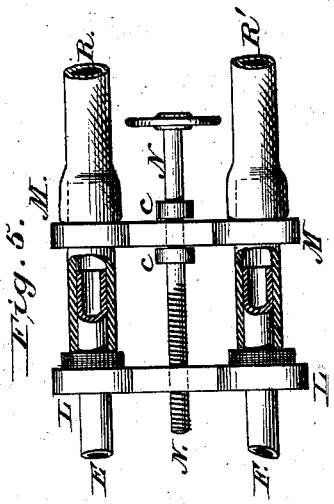

Fig. 5.

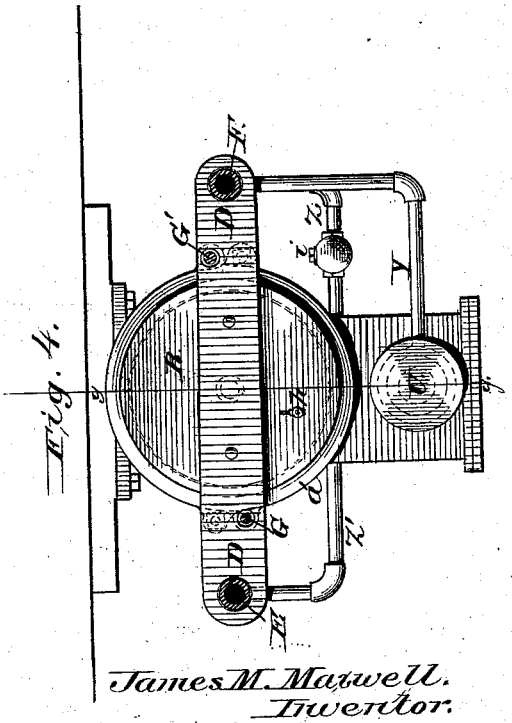

Fig. 4.

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UNITED STATES PATENT OFFICE.

JAMES M. MAXWELL, OF WEBSTER, ASSIGNOR OF ONE-HALF HIS RIGHT TO MICHAEL M. COMERFORD, OF FAIRMONT, WEST VIRGINIA.

IMPROVEMENT IN AIR-BRAKES FOR CARS.

Specification forming part of Letters Patent No. **207,126**, dated August 20, 1878; application filed June 18, 1878.

To all whom it may concern:

Be it known that I, JAMES M. MAXWELL, of the town of Webster, in the county of Taylor and State of West Virginia, have invented certain new and useful Improvements in Air-Brakes for Railway-Cars; and I do hereby declare that the following is a full, clear, and exact description thereof, 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, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 is a side elevation of a railroad-car having my improved brake applied. Fig. 2 is an inverted or bottom view of the brake. Fig. 3 is a vertical central section, the pipes E and F and their connections being shown out of position, in order to illustrate more conveniently their operation. Fig. 4 is a vertical transverse section on line *x x* of Fig. 2. Fig. 5 is an enlarged top view of the pipe-coupling.

The same letter indicates the same part wherever it occurs in the drawings.

The nature of my invention consists in the peculiar features of construction, combination, and arrangement of the air-brake, as hereinafter particularly described and claimed.

In the drawings, A marks an air-reservoir attached to the bottom of the car on the under side. This reservoir is an air-tight cylinder closed at both ends, and communicating with the air-chest C by the ports *l m n*, its only openings. A pipe, P, open at both ends, passes through the cylinder, and is attached to its heads, as shown in Fig. 3. By a lateral pipe, Q, the pipe P opens under port *n* of valve-seat S. On this valve-seat slides a cup or D valve, T, attached to and operated by the sliding piston or plunger X, whose head fits and slides in the air-chamber U. The head of plunger X is of greater diameter than the plunger itself, and when its surface is subjected in chamber U to the same ratio of pressure to superficial area that is exerted in chest C upon the end of plunger X, the plunger is by the differential force driven in, and the D-valve T is brought over ports *l* and *n*, as shown in Fig. 3, when the pressure in U is relieved, while that in C remains, and the valve T slides back and closes the port *l*.

On the outside of reservoir A at the two ends are the sliding cylindrical caps or brake-heads B B′, made to fit air-tight on A by means of the elastic packing *p p*. They are driven outward by compressed air admitted under them through pipe P. By means of rods G G′ H H′, connecting the heads B B′ with the cross-heads I J and the brake-rods K K′, the outward movement of the heads B B′ is made to apply the brakes V V′ to the car-wheels W. (See Figs. 1 and 2.) When the pressure on the heads B B′ is relieved the brakes V V′ are thrown off by the operation of suitable springs, and the heads B B′ are by the same means returned to their initial position. Their position when the brakes are applied is shown in dotted lines in Figs. 1 and 3.

The air-pump and main condensed-air reservoir are, on the locomotive, under the control of the engineer. They are of the usual construction, and, forming no part of my invention, are not shown. Air-pipes E F connect the main reservoir with the brake mechanism on each car. The pipe E may serve as an exhaust, or for the direct application of the compressed air from the main reservoir to the brake-heads B B′. In the former case the course of the air is shown by the arrows *r s*. When used for direct application of the condensed air, the current moves in the opposite direction through pipes E and Z, port *l*, under valve T, and through pipes Q and P to the ends of cylinder A, and under the brake-heads B B′, forcing them out to the position shown in dotted lines.

The pipe F conveys the condensed air from the main reservoir to the reservoir A, its course, as indicated by the arrows, being through pipe Z and check-valve *i* into reservoir A, and through port *m* into air-chest C. At the same time the air passes from F through pipe Y into cylinder U, driving in the plunger X and sliding back valve T till it covers ports *l* and *n*, as shown in Fig. 3. Thus, the reservoir A and chest C are charged with condensed air. To operate the brake from reservoir A the pressure on F is relieved, when the check-

valve *i* closes, plunger X is driven out, valve T is carried back so as to cover port *l*, and the condensed air in A and C passes through ports *m* and *n* and pipes Q and P into the sliding heads B B′, throwing them out and applying the brakes in the same manner as before described.

The outer ends of the heads B B′ are attached to cross-heads D D′, which slide on the pipes E F, as shown in Fig. 4.

The cars are coupled by the hose-and-coupling connection shown in Fig. 2 and on an enlarged scale in Fig. 5. The ends of the pipes E F are passed through the double collar L, and enter tubes attached to the ends of the rubber hose R R′, which are held in the corresponding double collar M. The collars L M are securely united by the screw N, provided with the nuts *c c*, one on either side of the collar M, as shown.

Cocks *d e f g* control the flow of the air.

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

1. The combination, with the condensed-air reservoir A, supplied and operating as described, of the sliding heads B B′ and their connections with the car-brakes, all as specified.

2. The combination, with the pipe F, leading from the main reservoir, of the pipe Z, provided with the check-valve *i*, the reservoir A, air-chest C, valves T and X, pipe Y, and cylinder U, all constructed and operating substantially as set forth.

3. The combination of the reservoir A, pipes P Q, port *n*, valve T, and chest C, all constructed and arranged in the manner and for the purpose described.

4. The combination of the reservoir A, pipes P Q, ports *l n*, valve T, pipe Z, and pipe E, supplied with compressed air from any suitable reservoir, all as and for the purpose set forth.

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

JAMES M. MAXWELL.

Witnesses:
H. M. STANSBURY,
CHAS. F. STANSBURY.