

(No Model.)

R. J. WILSON.
FLUID PRESSURE CAR BRAKE.

No. 291,826.

Patented Jan. 8, 1884.

Fig. 1.

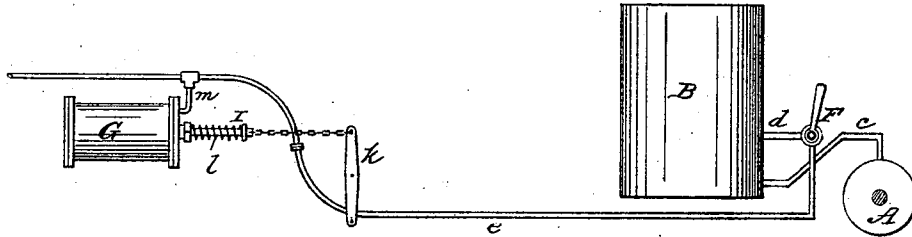


Fig. 2.

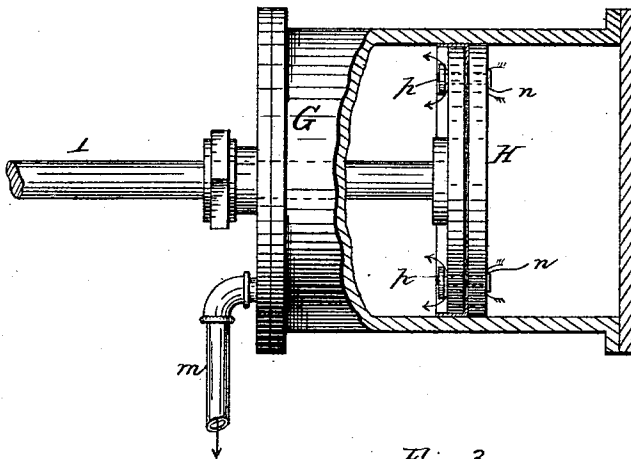
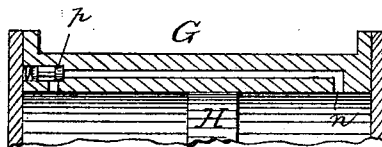


Fig. 3.



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ROBERT J. WILSON, OF PITTSBURG, PENNSYLVANIA.

FLUID-PRESSURE CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 291,826, dated January 8, 1884.

Application filed October 13, 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 Fluid-Pressure Car-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 a diagram showing the relations of the pump, control-valve, vacuum-chamber, train-pipe, brake-cylinder, and brake-lever. Fig. 2 is a side view, partly sectional, of the brake-cylinder. Fig. 3 is a modification.

This invention relates to that form of fluid-pressure brakes for railway-cars known as "vacuum-brakes," and has for its object such an arrangement and combination of devices as will result in thorough efficiency and promptness of action in braking a train with the fewest and simplest possible devices, so that the cost will be exceedingly low.

The invention consists in constituting the brake-cylinder itself a reservoir of potential pressure, while the brakes are not applied, by effecting an equilibrium of the degree of vacuum in both ends of the cylinder, such equilibrium remaining until disturbed either by design or accident, whereupon the vacuum at one end will be replaced by atmospheric pressure, the piston will move, and apply the brakes; and the invention further consists in the arrangement and combination of devices, substantially as hereinafter fully described and claimed.

Briefly, a vacuum-brake is one wherein a more or less perfect vacuum is produced and utilized to exhaust on one side of the piston of a cylinder, thus allowing the normal atmospheric pressure to act upon the other side of the piston and move it to apply the brakes.

In the drawings I show only the essential elements of application to a car already supplied with brakes of the usual form, the construction and arrangement of such brakes being well understood by those skilled in the art.

A designates a steam-pump, usually situ-

ated on the locomotive, and adapted to exhaust the interior of the main vacuum-chamber B through the pipe *c*; also usually located on the locomotive. At the junction of the reservoir-pipe *d* and train-pipe *e*, I place any of the well-known forms of three-way cock, F, adapted to exclude atmospheric pressure from or admit it to train-pipe *e*, while at the same time the pump A and chamber B are maintained in constant communication. The train-pipe *e* passes back along the train from car to car by the usual couplings and flexible connecting-pipes. Under each car I place in a suitable position the fixed cylinder G, having the piston H and piston-rod I, which latter is connected in any of the well-known ways to the brake levers or rods *k*, and is fitted with a spring, *l*, to assist it in relieving the brakes. The train-pipe *e* at each cylinder G is placed in communication therewith by a branch pipe, *m*, in this instance of a vacuum-brake leading into the cylinder on that end of the cylinder from which the piston moves in applying the brakes. Piston H is constructed with one or more ports, *n*, having corresponding check-valves, *p*, arranged to close in the direction taken by the piston in applying the brakes, and to open in the contrary direction. In Fig. 2 of the drawings the piston H moves to the right in applying the brakes and to the left in releasing them. Valves *p* close in moving to the right and open in moving to the left. Branch pipe *m* enters the cylinder at the left of the piston H in this case.

The various devices being arranged thus with the piston H at the limit of its stroke for release of the brakes, the operation will be as follows: The three-way cock is in such position as to keep the pump A and reservoir or tank B in communication, and to place the latter in communication with the train-pipe *e*, and consequently with the respective cylinders G. The effect is to draw the air out of the cylinder G on that side of the piston; but, in addition, the puppet or check valves *p* in piston H open under the influence, and the air also passes out from the other side of the piston, thus maintaining an equilibrium on both ends of the piston, and this remains until it is desired to apply the brakes. Then the three-way cock F is turned to place the train-pipe *e* in communication with the atmosphere.

Immediately the air rushes into the train-pipe and into the cylinder G by branch pipe *m*; but the pressure instantly closes the valve or valves *p* close on their seats and seal the vacuum on the other side of the piston H, thus throwing the whole atmospheric pressure onto the piston H in one direction only—namely, that required to apply the brakes—the piston takes motion therefrom, and the brakes are applied.

To release the brakes the three-way cock F is turned to exclude the atmosphere from the train-pipe *e* and place the latter again in communication with the tank B, whereupon the air is drawn out of pipe *e* and out of the cylinder G on both sides of piston H, and the spring *l* helps to move the piston and relieve the brakes. While the brakes are off at any time, if the train parts and the couplings of train-pipe *e* break or come apart, the air rushes into the vacuum pipe *e* and, by branch *m*, to cylinder G, and thus the brakes are automatically applied.

I do not confine the scope of my said invention to any particular form or construction, as it is capable of application in various ways without departing from its spirit. For instance, the ports *n*, instead of being in the piston H, may be arranged longitudinally in the walls of the cylinder G, and the puppet or check valves *p* adapted thereto, as shown by Fig. 3. Such an arrangement would have precisely the same effect as hereinbefore described—namely, producing an equilibrium in the cylinder G on both sides of the piston, and constituting the direct-acting cylinder a veritable reservoir.

I claim as my invention—

1. An automatic vacuum-brake having a

steam vacuum-pump, a train-pipe, and a brake-cylinder provided with a brake-operating piston, said cylinder being connected to the train-pipe directly, and provided with means for equalizing the vacuum on both ends of said piston while in connection with said vacuum-chamber, and to become sealed at one end only upon admission of air to said train-pipe, substantially as described.

2. An automatic vacuum-brake having a steam vacuum-pump, a reservoir or vacuum-chamber, a train-pipe, and a brake-cylinder provided with a brake-operating piston, said cylinder being connected to the train-pipe directly, and provided with means for equalizing the vacuum on both ends of said piston while in connection with said vacuum-chamber, and to become sealed at one end only upon admission of air to said train-pipe, substantially as described.

3. In an automatic vacuum-brake, the combination, with the steam vacuum-pump A, reservoir B, and train-pipe *e*, of the brake-cylinder G, having piston H, adapted to operate the brakes, said cylinder being in communication directly with pipe *e*, and having one or more check-valves adapted to subject both ends of said cylinder to the influence of the reservoir B, and to subject one end only of said cylinder to atmospheric pressure when admitted to pipe *e*, 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.