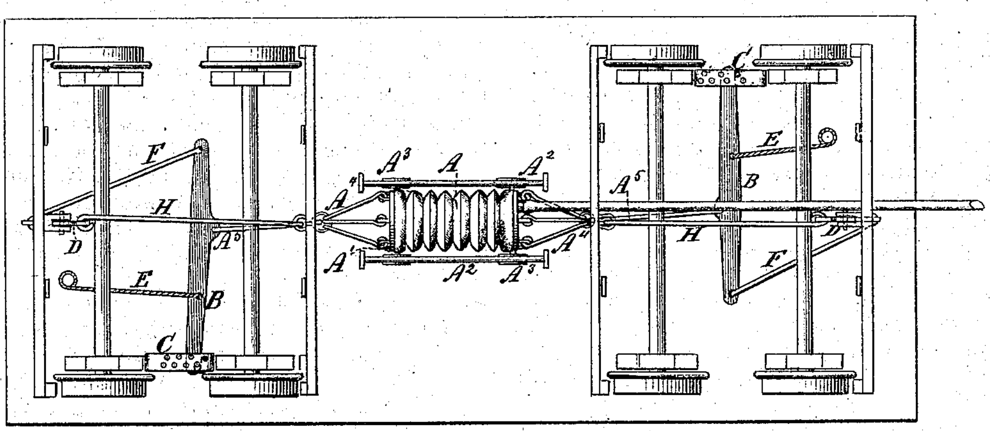
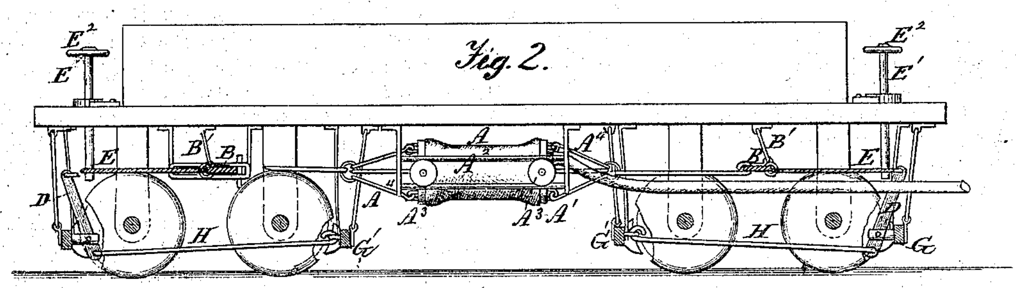
J. Y. SMITH.

Steam and Air-Brakes.

No. 136,781. Patented March 11, 1873.

Fig. 1.





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AM. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS.)

UNITED STATES PATENT OFFICE.

JOHN Y. SMITH, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN STEAM AND AIR BRAKES.

Specification forming part of Letters Patent No. **136,781**, dated March 11, 1873.

To all whom it may concern:

Be it known that I, JOHN Y. SMITH, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Atmospheric-Pressure Car-Brakes, of which the following is a specification:

In the drawing, Figure 1 is a plan view, showing my improved mechanism for applying car-brakes by atmospheric pressure. Fig. 2 is an elevation of the same showing its application to a car.

Corresponding letters refer to corresponding parts in the several figures.

This invention relates to car-brakes, and to the method of applying them to the wheels of cars; and it consists in the construction, combination, and arrangement of some of the parts of which the apparatus is composed, as will be more fully described hereinafter.

In constructing car-brakes of this character I use a flexible diaphragm or cylinder, or a series of such diaphragms, A, to which the rods which connect it or them with the brake-levers are attached.

This diaphragm or cylinder is held in its proper position by means of rods or bars of metal A^2, which are secured to the body of the car in such a manner that the friction wheels or rollers A^3, which are secured to the heads of the cylinder, may roll on or between them, and thus allow the heads to approach each other when the vacuum is formed within the cylinder. To the outer surface of the heads A^1 staples or eye-bolts are secured in such a manner that links or connecting-rods A^4 may be attached thereto, and have their outer ends brought to a common point, and connected to the outer portions of the brake-rods A^5 A^5, the outer ends of which are connected to the levers B which operate the brakes. As a consequence of connecting the operating-levers B B in this manner a much shorter connecting-rod may be used, and the diaphragm or cylinder which is made to apply the brakes, is caused to form a part of such rod, and as the movement is from each end toward the center it follows that each brake, or the brakes upon both trucks of the car, will be applied at one and the same time, and with the same amount of force, thus avoiding the liability of slipping the wheels of one of the trucks while the brakes are not pressed upon the wheels of the other with the requisite amount of force. The levers B B, above referred to, are suspended to the body of the car by links or hangers B′ B′, in order that their point of suspension may travel backward and forward with the heads of the vacuum-chamber, they being carried inward by the pressure upon the heads thereof, and outward by the springing action of the brake-levers and beams, or springs may be attached to them for that purpose. To provide for regulating the amount of force which is to be applied to the wheels of different cars, that portion of the levers B B which are to remain stationary when acted upon by the vacuum-chamber or cylinder, is made to rest in a hanger, C, which is attached to the body of the car or to the truck-frame in such a position as to be readily accessible, it being most so, perhaps, when arranged between the jaws of the truck, and which is to have its lower horizontal portion perforated with a series of holes, as shown in Fig. 1 of the drawing, in order that when the proper position of this end of the lever has been determined a pin may be passed through such holes or one of them, and the lever prevented from moving inward at that end.

The object had in view in thus arranging the levers B, as described, with reference to the hangers C and the vacuum-chamber or cylinder is two-fold: First, it provides for regulating the amount of force to be applied to the brakes by fixing the position and travel of the levers D D, so that when the brake is applied to a light car it may be so adjusted as not to slip the wheels, and when applied to a heavier one, which will bear the application of more force to its wheels without slipping them, it may be adjusted to such car. The remaining object attained by this arrangement is the providing for the movement outward of these outer ends of the levers B, when the brakes are to be applied by hand, as will frequently be the case when the cars are not coupled to the engine.

While the outer ends of the levers B B, under the arrangement above described, are prevented from being moved inward or toward the vacuum-chamber by the pin which passes down by the side thereof and through the

yoke C, they are free to move outward, and are made to do so by having a rope or chain, E, attached to them at any desired point between their outer ends and the point where they are suspended to the car, which rope or chain extends to and is secured to a vertical shaft, E^1, around which it is wound when it is desirable to apply the brakes by hand, a wheel, E^2, being placed upon said shaft for the purpose of allowing the brakes to be set with the requisite amount of force. This application of the brakes may be made from either end of the car; but it will be seen that when operating from either end an additional leverage upon the brake-lever of the opposite end is obtained, owing to the fact that the outer end of the lever B upon that end will be brought into contact with the pin, which prevents it from passing inward, and that as a consequence that point will become the pivotal point upon which the lever will move; and as the force is communicated through the vacuum-chamber and the rods connected with it additional leverage is obtained, because the point at which the connection with the lever B is made is further from the pivotal point of such lever than it is from the point where such connection is made to the outer end of the lever where the connection is made with lever D by means of a rod, F, which rod serves as such connection whether the brakes are to be applied by hand or by atmospheric pressure. The lever D is pivoted in a bifurcated stud, which is attached to the outer brake-levers G, and a connection is made between its lower arm and the beam G′ by means of rod H, in order that the movement of levers B may apply the brakes to all of the wheels of a car.

The air is to be exhausted from the cylinder or vacuum-chamber A by any suitable mechanism—such as a suction-fan, pump, or an ejector, in which steam or gas is used—a pipe or hose being attached to one of the heads of the chamber, from which it leads directly to such exhausting mechanism; or it may be connected with pipes placed upon other cars whose pipes connect with such mechanism. The form of diaphragm or cylinder which I at present prefer to use is shown in Fig. 1, but the one shown in Fig. 2 will work satisfactorily.

It is apparent that this device may be used for applying brakes by the use of compressed air or by steam, the only requirements being that the parts should be placed in different positions, or so that the brakes shall be applied by their closing movement when using atmospheric pressure, and so as to apply them by their opening movements in using compressed air or steam.

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

1. In an apparatus for connecting the brake-levers of cars, the flexible or expansible and contractible portion A and the rigid or non-expansible portions A^4 A^5, the parts being constructed and arranged substantially as and for the purpose specified.

2. The stops G and the adjustable levers B, in combination with the brake-levers D and rod F, whereby the relation of the brake-shoes with reference to the wheels may be adjusted, substantially as and for the purpose set forth.

3. The combination of a flexible vacuum-chamber with the brake-lever or levers of a car, when one end of such lever or levers is made adjustable, substantially as and for the purpose set forth.

4. The combination and arrangement of the adjustable levers B B and their connecting-rods with the mechanism for applying the brakes by hand, whereby additional leverage is obtained upon one end of the car, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN Y. SMITH.

Witnesses:
D. P. HOLLOWAY,
W. BRADFORD.