(No Model.)

E. ANDREWS.

AIR BRAKE.

No. 385,224. Patented June 26, 1888.

Fig. 1.

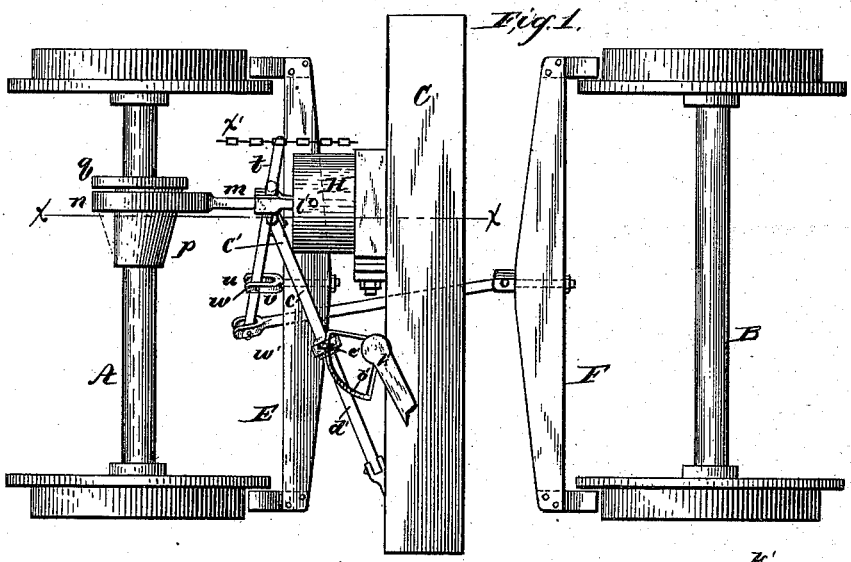

Fig. 2.

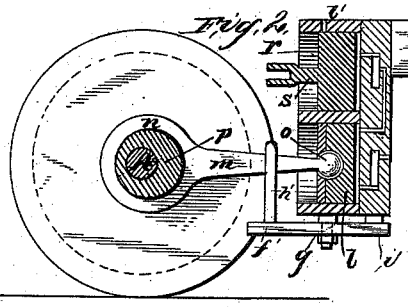

Fig. 3.

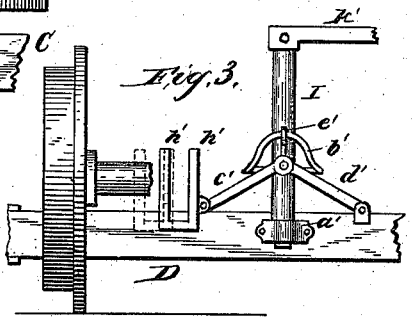

Fig. 9.

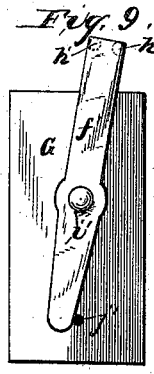

Fig. 4.

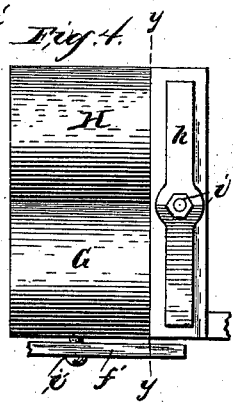

Fig. 5.

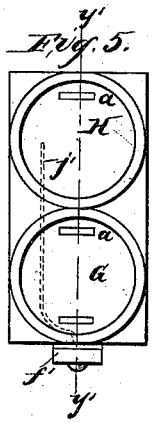

Fig. 6

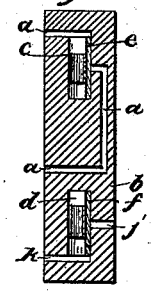

Fig. 7.

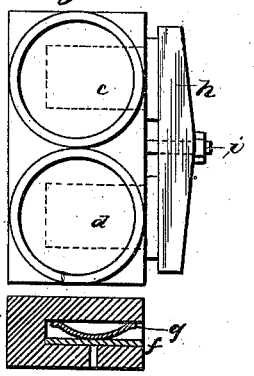

Fig. 8.

Witnesses

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By his attorneys

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UNITED STATES PATENT OFFICE.

EDWARD ANDREWS, OF POTTSVILLE, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO WILLIAM G. MATZ, OF SAME PLACE.

AIR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 385,224, dated June 26, 1888.

Application filed January 26, 1888. Serial No. 261,992. (No model.)

To all whom it may concern:

Be it known that I, EDWARD ANDREWS, a citizen of the United States, residing at Pottsville, in the county of Schuylkill and State of Pennsylvania, have invented certain new and useful Improvements in Air-Brakes; and I do hereby 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.

My invention relates to air-brakes, and has for its object the construction of a brake especially adapted for use on freight-cars—such as coal-cars, cars for carrying merchandise, live stock, and other kinds of freight.

One of the most serious objections to the use of power-brakes that has been encountered in their practical application to freight-cars has been that, owing to the large number of cars usually coupled in a freight-train and the consequent large number of brakes required to be applied to stop the momentum of such a train, it has been found impracticable to tax the locomotive to supply sufficient steam to draw the train and compress air to supply so large a number of brake-cylinders remote from the engine.

It is my purpose to provide a simple, cheap, and effective brake to be applied to the trucks of freight-cars and operated by the momentum of the cars when required, thus relieving the engine of all work, except moving the train.

The invention will be hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 represents a plan of a truck of a freight-car with my improvement applied. Fig. 2 is a vertical longitudinal section on the line *x x*, Fig. 1. Fig. 3 is an end view. Fig. 4 is a side elevation of the compressing and the brake cylinder. Fig. 5 is a transverse section on the line *y y* of Fig. 4. Fig. 6 is a vertical longitudinal section on the line *y' y'* of Fig. 5. Fig. 7 is a plan of the two cylinders. Fig. 8 is an enlarged section of one of the valve-chambers and valve, and Fig. 9 is an inverted plan of the cylinders detached.

Reference being had to the drawings and the letters marked thereon, A B represent the axles of a truck; C, the upper and D the lower bolster, and E F the brake-beams, all of which are of ordinary construction.

G is a compressing-cylinder, and H a brake-cylinder, which are secured to any suitable parts of the car-truck and by any approved means. The two cylinders communicate through ports *a a* in the base *b* of the cylinder. In the base *b* are formed valve-chambers *c d*, which are provided with valves *e f*, held to their seats by springs *g*. The valves are inserted by removing the rectangular cover *h*, which is held in position by a bolt, *i*. Air is admitted to the cylinder G through a port, *j*, communicating with the valve-chamber *d* and the atmosphere, and a port, *k*, communicating with the valve-chamber *d* and the cylinder, as shown in Fig. 6.

The cylinder G is provided with a piston, *l*, to which the rod *m* of the eccentric-strap *n* is attached by a ball-and socket joint, *o*. On the axle A is secured a conical eccentric-cam, *p*, which is provided with a flange, *q*, to prevent the eccentric-strap from being pushed off the eccentric.

The cylinder H is provided with a piston, *r*, the rod *s* of which engages with one end of the lever *t*, which is fulcrumed at *u* in a bolt, *v*, secured to the brake-beam E, and provided with a forked head, *w*. The opposite end of the lever *t* is attached to a rod, *w'*, which connects with the brake beam F. In double-truck cars the lever *t* is connected with the brake-beam and the lever of the other truck by a chain, *x'*.

I is a rock-shaft supported on any suitable part of the truck-frame; but for the purpose of illustration it is shown secured to the lower bolster, D, by a strap, *a'*, in which it revolves. To the shaft I is secured a double-curved sector-shaped cam, *b'*, and to said cam are attached toggle-levers *c' d'* by means of an eye, *e'*, which eye rides upon the cam and raises and lowers the toggle-levers. The toggle-lever *c'* is attached to an arm or shipper, *f'*, which is fulcrumed at *g'* on the cylinder G, and is provided at one end with prongs *h' h'*, between which the eccentric-rod *m* passes, and is moved thereby upon the eccentric-cam *p* on the axle A, to put the air-compressor G into and out of operation. The arm *f'* has a rearward extension, *i'*, the end of which covers a port, *j'*, in

the brake-cylinder, for releasing the brakes by allowing the air to escape when the eccentric is moved out of operating contact with the cam on the axle.

In Fig. 1 the toggle-levers are shown depressed and the eccentric-strap *n* in working contact with the largest portion of the cam *p*, and in Fig. 3 the rock-shaft has been turned, the eye *e'* brought to the center or highest portion of the sector-shaped cam *b'*, the toggle-levers *c' d'* raised, and the arm *f'* drawn toward the center of the axle, which is the position the parts assume when the brakes are not applied.

To the rock-shaft I is attached a lever, *k'*, which extends out to the side of the car-trucks, where it may be seized by train-hands and the brakes applied. In practice I propose to connect said lever with a forked vertical lever (not shown) secured to the car-body by a pivotal connection, and connect the upper end of the lever on the car-body with a rope, which shall extend throughout the train, connect all of the air-brakes, and be under the control of the engineer in the cab.

It will be observed that my brake does not interfere with the ordinary hand-brake mechanism, but can be applied in conjunction therewith.

To prevent injury to the brake-cylinder and the brake levers and rods from excessive pressure when the wheels of the car have become locked, the cylinder H is provided with an escape-port, *l'*, near its outer end, through which the air escapes when the piston *r* has been forced out beyond it.

In turning on the brake by putting the air-pump G into operation, the extension *i'* of the arm or shipper *f'* closes the port *j'* in the brake-cylinder H, and when the brake is thrown off by shifting the eccentric said port is uncovered and the air in the cylinder allowed to escape.

Having thus fully described my invention, what I claim is—

1. In an air-brake, the combination of a compressing-cylinder operated from the axle of the car, a conical eccentric-cam, a laterally-adjustable eccentric strap and rod, and a brake-cylinder having its piston-rod in operating contact with a brake-lever, substantially as described.

2. In an air-brake, the combination of a compressing-cylinder operated from the axle of the car, a conical eccentric-cam, an eccentric-strap having a rod connected to the piston of the air-compressing cylinder by a ball-and-socket joint, a brake-cylinder operating upon the brake-levers, and means for putting on and releasing the brakes, substantially as described.

3. In an air-brake, the combination of a compressing-cylinder and a brake-cylinder having their inner ends in the same plane and connected directly by ports in a base common to both cylinders, valve-chambers and valves in said base, and a detachable cover on one side of the base, substantially as described.

4. In an air-brake, the combination of a compressing-cylinder and a brake-cylinder having their inner ends in the same plane and connected directly by ports in a base common to both cylinders, valves for controlling said ports, a relief-port in said base, connections between the compressing-cylinder and the axle of a car, an arm or lever for controlling said relief-port, and suitable means for applying and releasing the brakes, and simultaneously therewith opening and closing the relief-port, substantially as described.

5. In an air-brake, the combination of a compressing-cylinder and a brake-cylinder having their inner ends in the same plane, connected directly by ports and open outer ends, connections between the brake-cylinder and the brake-beam of a car, and an escape-port in the wall of the brake-cylinder uncovered by its piston under excessive pressure, substantially as described.

6. In an air-brake, the combination of a compressing-cylinder operated from the axle of the car, a brake-cylinder communicating therewith, a shipper, a rock-shaft and cam, and toggle-levers, substantially as described.

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

EDWARD ANDREWS.

Witnesses:
S. A. TERRY,
WM. E. DYRE.