

No. 649,118.

Patented May 8, 1900.

A. L. WATKINS.

AIR BRAKE.

(Application filed Dec. 13, 1898.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

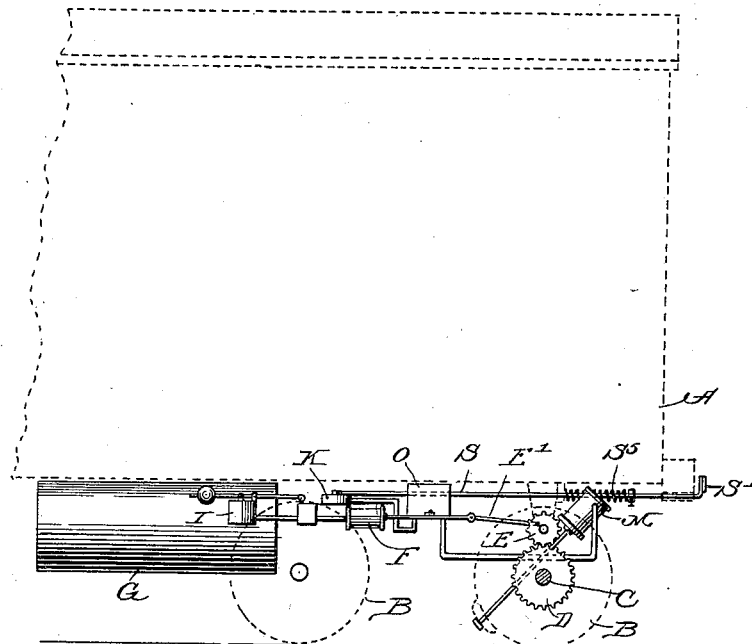
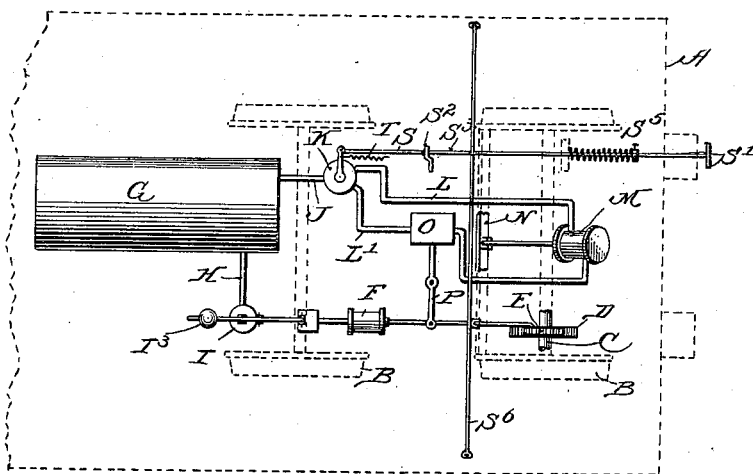


Fig. 2.



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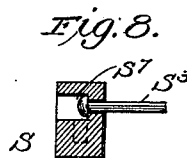
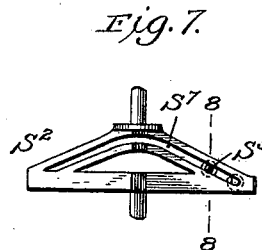
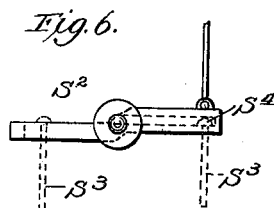
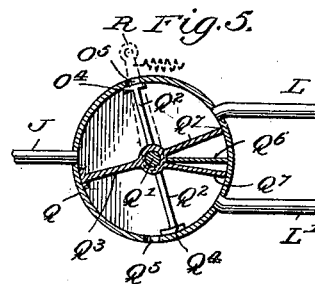
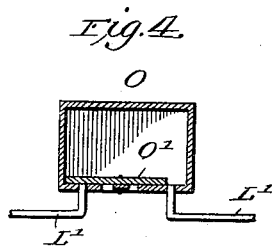
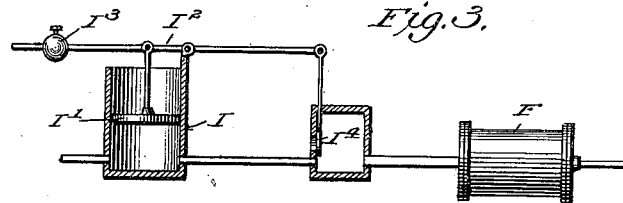
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UNITED STATES PATENT OFFICE.

ARTHUR L. WATKINS, OF BELLEVILLE, ARKANSAS, ASSIGNOR OF ONE-HALF
TO LEE BRUTON, OF SAME PLACE, AND EARNEST BUCKMAN, OF MAR-
VINVILLE, ARKANSAS.

AIR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 649,118, dated May 8, 1900.

Application filed December 13, 1898. Serial No. 699,120. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR L. WATKINS, a citizen of the United States, residing at Belleville, in the county of Yell and State of Arkansas, have invented certain new and useful
5 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
10 it appertains to make and use the same.

In ordinary air-brake devices the brake-actuating cylinders are all operated from the engine, and hence the pipes of the first car must be coupled with devices on the engine
15 and with pipes on the next car in the rear, and so on until the last car of the train is included, and obviously a break at any point leaves at least all brakes to the rear of that point inoperative. To avoid all this coupling
20 and uncoupling and to provide devices that are not affected by derangements on other cars or on the engine are objects of this invention.

In the drawings, Figure 1 is a side elevation of one end of a car provided with my
25 devices. Fig. 2 is a diagrammatic plan of devices beneath the car. Figs. 3, 4, 5, 6, 7, and 8 are detail views.

In the views, A represents a car, and B the truck beneath its end. Upon one of the axles
30 C is fixed a gear D, meshing with a geared crank-plate E, which, by means of a pitman E', operates an ordinary piston air-compressor F for forcing air into a reservoir G through a pipe H. The pipe H is provided with a
35 safety-valve mechanism consisting of a cylinder I, piston I' therein, and centrally-pivoted lever I², bearing an adjustable counterweight I³ on one arm and having its other arm connected to a sliding valve I⁴, which when open
40 allows the compressor to discharge into the open air. By this means the air in the reservoir is kept at a uniform pressure.

From the reservoir a pipe J leads to a valve device at K, and from this one pipe L passes
45 to a cylinder M for actuating a brake N in the usual way, and another pipe L' leads to the opposite end of the cylinder M, so that air passing through this pipe will positively force the brake from the wheels. Between

the devices at K and the cylinder M the pipe 50
L' is divided and a meter O is interposed. This meter consists of a closed chamber provided with a slide-valve O', operated by a centrally-pivoted lever P, connected to the piston-rod
55 of the air-compressor, so that the movements of the piston and valve are synchronous, though opposite. The ports of the meter are the mouths of the two parts of the pipe L', and the length of the valve is such that in
60 oscillating it completely closes the one before it begins to open the other. It follows that no air can pass through the meter unless the piston-rod is in motion—that is, unless the car is moving. This absolutely prevents the
65 positive withdrawal of the brake when the car is stationary, and thereby allows the car to rest securely when left standing upon a grade. The valve devices at K consist of a
70 closed cylindrical casing Q, containing a central hub fixed to an oscillating shaft Q' and provided with three arms Q² Q³ Q³, having valve-plates Q⁴, the first two adapted to close, respectively, openings Q⁵ in the casing, and the other
75 having an analogous plate to close the inlet-opening from the pipe J. The arms Q² allow air to pass them, but the arm Q³ is wider and
80 fits the upper and lower walls, so that no air can pass. Opposite the pipe J a partition Q⁶ extends from the hub to the casing, so that it, together with the hub and the arm Q³, di-
85 vides the box into two compartments not directly communicating. A crank-arm R is fixed to the shaft Q' without the casing. Each compartment has an opening Q⁵, and the pipe L leads from one and the pipe L' from the
90 other. The valves are so arranged with reference to the openings in the casing that if the inlet from J be open the opening Q⁵ in the compartment to which air is thus admitted
95 will be closed, while the other will be open. If, for example, air enters the compartment from which the pipe L leads, air will pass through this pipe and entering the cylinder will cause the brake to be applied, air upon
the opposite side of the piston in this cylinder passing out at the same time through the pipe L' and the corresponding port Q⁵. If by shifting the crank R the arm Q³ be thrown

to the opposite side of the inlet, the conditions are exactly reversed and the brake is thrown from the wheels. If it be desired to balance the valves, arms Q^7 Q^7 , analogous to Q^3 , may be added, as shown in the drawings. To the crank R is pivoted a rod S, which is connected with a buffer plate or disk S' at the end of the car and in position to be pressed by some part—for example, the "bumper" of the next car. It is plain that when this car presses toward the one next in front, if the disk S' be in front or when the car in the rear presses toward this car if the disk be in the rear, the valve mechanism will be turned and the brake will be applied. When pressure on the rod ceases, a spring T returns the rod to normal position, shifts the valve, and throws off the brake, provided that the car be in motion, so that air can pass through the meter O and pipe L'. Were no other devices used, the car could not be backed. The rod S is therefore not connected directly to the buffer, but is attached to one end of a centrally-pivoted lever S². A slot S' extends nearly from end to end of the lever, and in this slot lies a rod S³, connected to the buffer, urged forward by a strong spring S⁵ and provided with a head S⁴, which engages the rear face of the lever when the rod is drawn forward at any time, but which leaves the rear face of the lever when the rod is pushed rearward, unless the rod be approximately in alinement with the rod S. In this latter case the head will abut against a web of metal forming part of the lever and covering the slot at this end, so that the head here lies in a dove-tail recess, laterally open, however, so that the rod can slide in the slot toward the lever's pivotal axis. With the parts in this position, then, pressure upon the buffer, if sufficient to overcome the force of the spring, is transmitted through the rod S³, the web of metal, and the rod S to the valve-arm, opening the valve and allowing the air through the pipe L to apply the brake. The headed rod is at will swung out of such alinement by means of a rod S⁶, running to the side of the car. As soon as the head has passed from beneath the web, pressure upon the buffer merely pushes the rod rearward in the open part of the slot and has no effect upon the valve. If, however, the rod be swung past the pivotal axis of the lever, the spring S⁵ pulls it forward, and its head engaging the rear face of the lever forces the latter to swing, pushing the rod S rearward and opening the valve. If the car be at rest, the rod S³ being out of alinement no bumping of another car nor any other action other than restoring the alinement and starting the car can admit air through the pipe L', and thereby throw off the brake.

It is to be observed that this apparatus does not prevent attaching hand-operated devices to the brakes.

Since changes in construction may be made

without changing the invention I wish to claim my devices broadly as well as specifically.

What I claim is—

1. The combination with a car-axle and a brake-cylinder of an air-chamber provided with inlet and exit ports for compressed air, a passage leading from the exit-port to one end of the brake-cylinder, an oscillating valve always closing one of said ports, and means whereby rotation of the axle oscillates the valve opening each port in succession after closing the other, whereby air passes through the chamber to the cylinder only when the axle rotates.

2. The combination with an air-brake cylinder, of a valve arranged to admit air to either end of the cylinder, a longitudinally-sliding rod for changing the position of said valve, a centrally-pivoted lever having one arm connected to said rod to operate it, a second rod normally alining with the first, sliding along the lever from one arm thereof to the other, and arranged to engage the lever when moved longitudinally in one direction and to engage it when moved in the other direction only when in alinement with the first rod.

3. The combination with the brake-cylinder, of the valve controlling the admission of air for forcing the brake into action, the valve-operating rod, the centrally-pivoted slotted lever having the recessed end connected to said rod, the headed rod lying in the slot in the lever and normally alining with the first rod, with its head in said recess, the spring tending to draw the second rod from the first, and means for swinging the second rod in its slot into and out of alinement with the first.

4. The combination with a brake-cylinder, of a channel for admitting air for applying the brake, a second channel for admitting air to throw off the brake positively, means whereby rotation of the axle only, opens the second channel, and means whereby the first channel may be automatically held open whenever desired.

5. In valve apparatus for air-brakes, the combination with the chamber divided into non-communicating compartments by a partition consisting in part of a swinging arm, an inlet opening into one or the other of said compartments according to the position of said arm, an exhaust-opening in the wall of each compartment, valves swinging with said arm and in position to close the exhaust-opening in the compartment into which the inlet leads and to open the other, an outlet-pipe leading from each compartment, and means for swinging said arm from side to side.

6. The combination with the car and its axle, of the air-compressor operated by the rotation of the axle, the air-reservoir, the pipe leading from the compressor to the reservoir, the safety-valve devices interposed in said pipe, the valve-chamber, the pipe leading from the reservoir to said chamber, the brake-

cylinder, the two pipes leading from the chamber to the ends of the cylinder, respectively, the meter operated from the axle and controlling the passage of air in one of said pipes, a spring normally holding said valve in position to prevent application of the brakes, a buffer at the end of the car, and means whereby pressure upon said buffer may overcome

the action of said spring and cause the opening of said valve and application of the brake. 10
In testimony whereof I affix my signature in presence of two witnesses.

ARTHUR L. WATKINS.

Witnesses:

WALLACE GREENE,
HARRY S. ROHRER.