2 Sheets—Sheet 1.

# W. L. CHAMBERS.

## ATMOSPHERIC CAR BRAKE.

No. 92,265. Patented July 26, 1869.

Fig: 1.

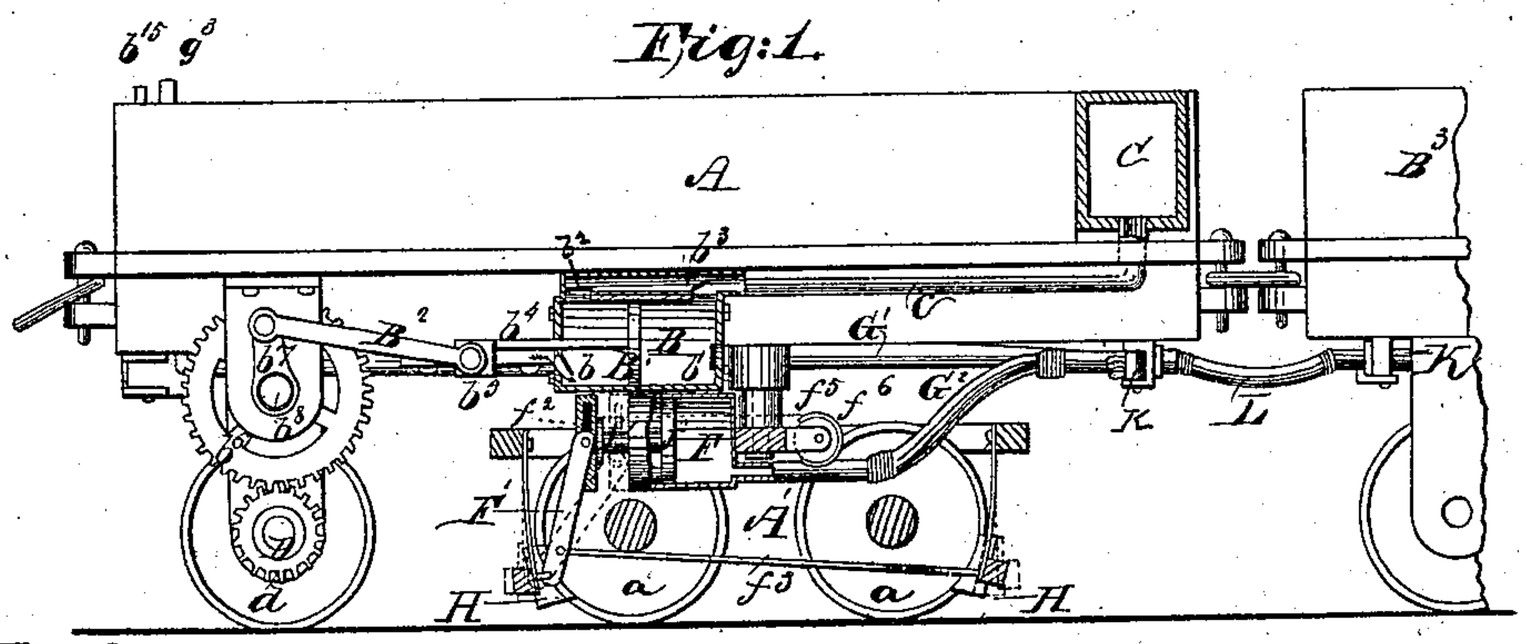
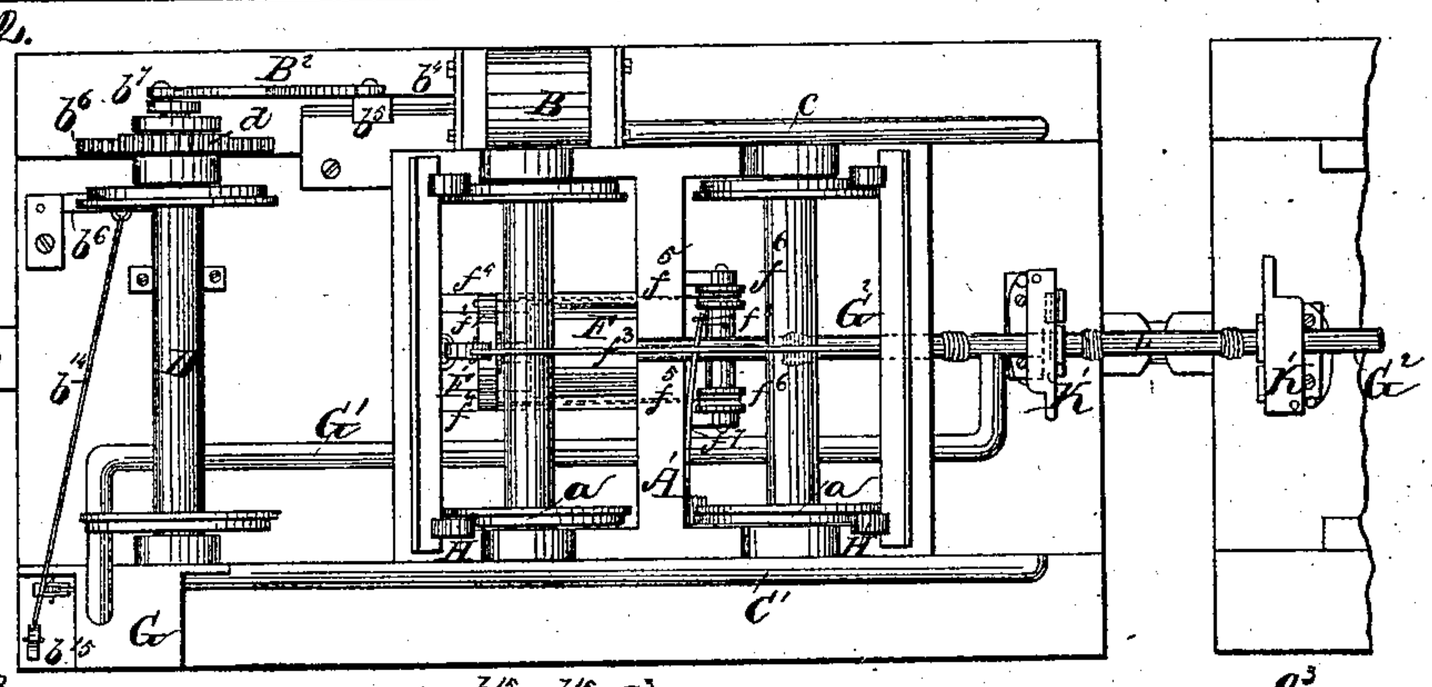


Fig: 2.



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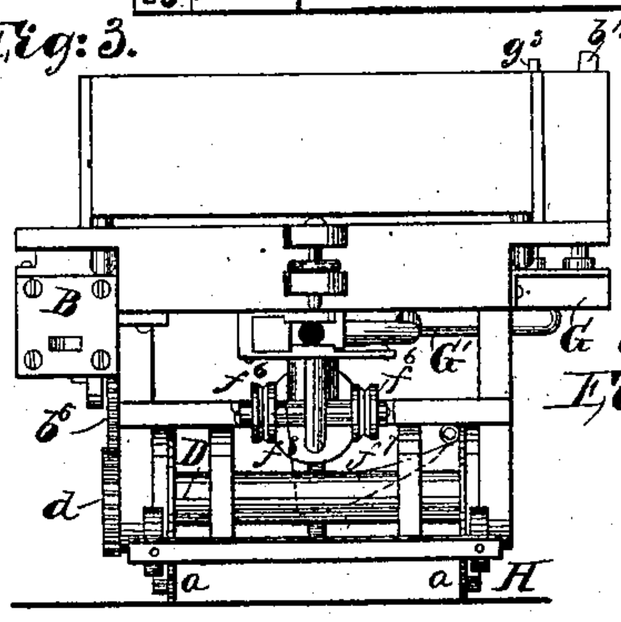

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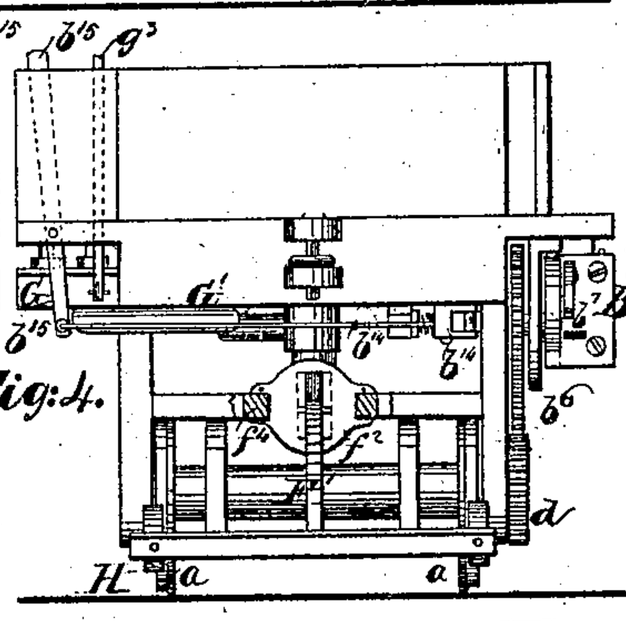

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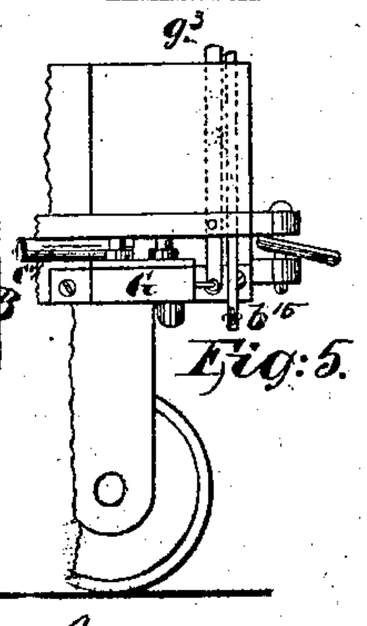

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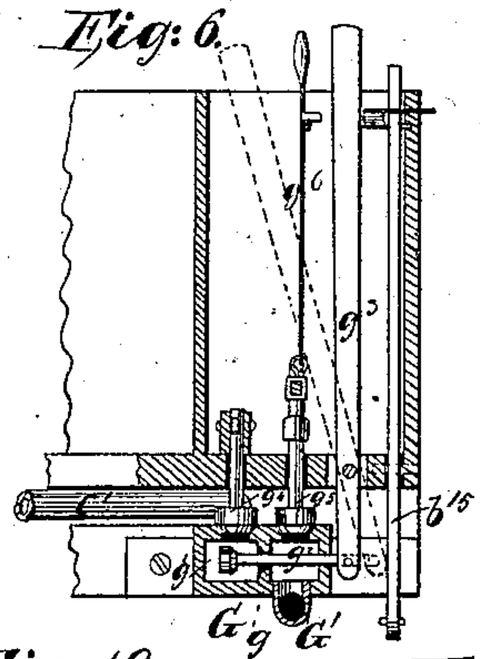
2 Sheets—Sheet 2.

# W. L. CHAMBERS.

## ATMOSPHERIC CAR BRAKE.

No. 92,265. Patented July 26, 1869.

Fig: 6.



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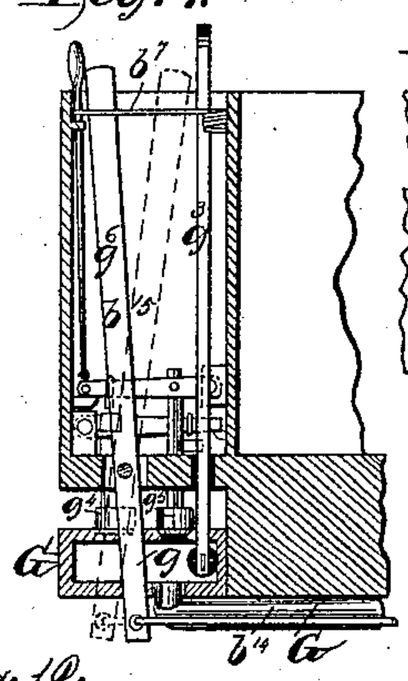

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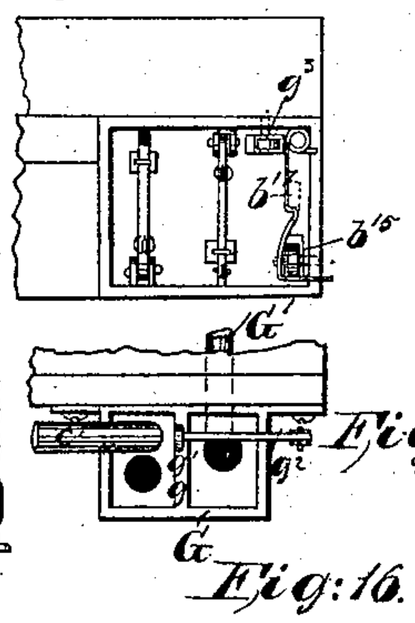

Fig: 9.

Fig: 10.

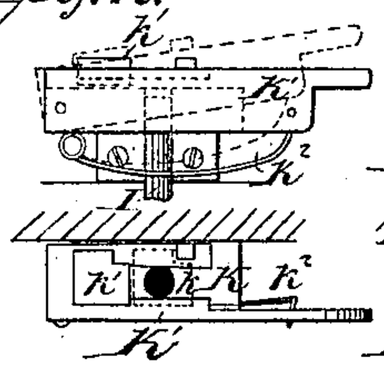

Fig: 11.

Fig: 12.

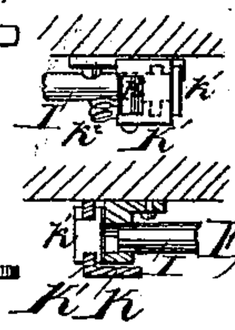

Fig: 13.

Fig: 14.

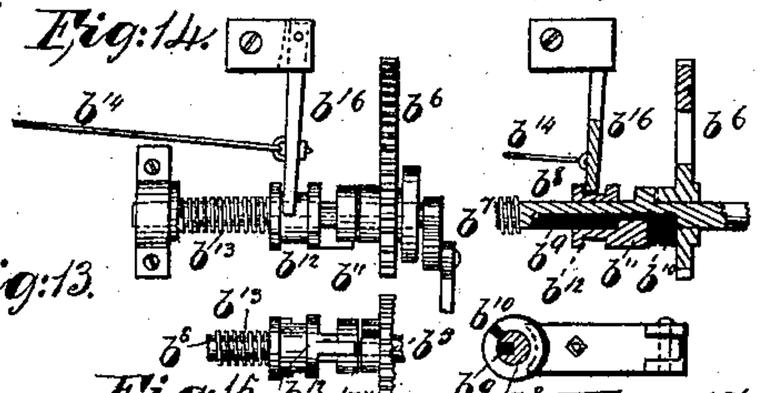

Fig: 15.

Fig: 16.



Fig: 17.

Fig: 18.

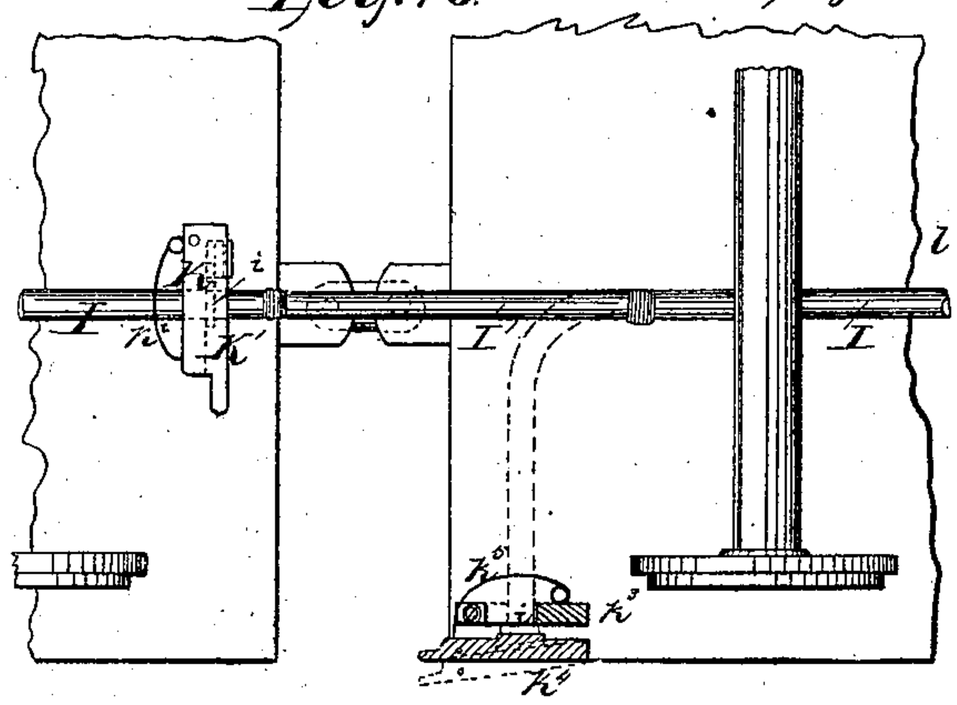

Fig: 19.

Fig: 20.

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# UNITED STATES PATENT OFFICE.

WILLIAM LATTA CHAMBERS, OF PLEASANT UNITY, PENNSYLVANIA.

## IMPROVEMENT IN ATMOSPHERIC CAR-BRAKES.

Specification forming part of Letters Patent No. **92,265**, dated July 6, 1869.

*To all whom it may concern:*

Be it known that I, WILLIAM LATTA CHAMBERS, of Pleasant Unity, in the county of Westmoreland, and in the State of Pennsylvania, have invented an Improved Atmospheric Brake for Cars; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which make part of this specification, and in which—

Figure 1 represents a view, partly in elevation and partly in section, of a tender and a portion of a car with my improved atmospheric brake applied thereto; Fig. 2, a bottom view or plan of the same, inverted; Fig. 3, a rear view of the tender; Fig. 4, a front view of the same; Fig. 5, a side view of a portion of the same; Fig. 6, a vertical longitudinal section through the valve-box; Fig. 7, a vertical transverse section through the same; Fig. 8, a plan or top view of the case inclosing the valve-levers; Fig. 9, a similar view of the valve-box with the cap removed; Figs. 10 to 13, inclusive, are different views of the device employed for closing the ends of the air-tubes; Figs. 14 to 17, inclusive, are views of the coupling employed for throwing the air-pump into and out of gear; Fig. 18, a bottom view of portions of two cars, showing the manner of connecting the air-tubes; Fig. 19, a view, partly in elevation and partly in section, of the short connecting-tube, and Fig. 20 an end view of the same.

The object of my invention is to provide an efficient and reliable brake for railroad-cars which can be operated automatically by the engineer in such manner as to apply the brake-shoes simultaneously to all the wheels in the train by means of compressed air, thereby dispensing with the services of brakemen, and enabling the speed of the train to be quickly checked and the same brought to a stand in a short space of time, thus reducing greatly the risk of accidents from collisions or runs-off; to to which ends my improvements consist in a force-pump and air chamber or reservoir, from which the air is conducted to a cylinder attached to the trucks of the tender and cars and operating pistons therein, connected to the brake-shoes, in the manner hereinafter more fully described.

In the accompanying drawings, which show a convenient arrangement of parts for carrying out the objects of my invention, A represents the tender, and $B^3$ a car of the train.

In the drawings the brake-cylinder and its connections are shown only upon the truck of a six-wheeled tender; but in practice it is intended that similar devices shall be placed upon the trucks of all the cars.

A force-pump, B, provided with a piston, B′, suction-valves $b$ $b'$, and delivery valves $b^2$ $b^3$, is secured upon the tender-frame, its piston being reciprocated by means of the piston-rod $b^4$, cross-head $b^5$, and connecting-rod $B^2$ connected to a crank, $b^7$, on a short shaft, $b^8$, rotating in bearings on the frame and carrying a spur-gear, $b^6$, which meshes into a corresponding pinion, $d$, on the front tender-axle, D.

The gear $b^6$ is loose upon the shaft in which a longitudinal slot, $b^9$, is cut, and a similar slot, $b^{10}$, is formed in the hub of the gear $b^6$.

A feather, $b^{11}$, on a clutch, $b^{12}$, rests in the slot $b^9$, and is pressed up to the slot $b^{10}$ of the gear $b^6$ by a spring, $b^{13}$. When the feather $b^{11}$ enters the slot $b^{10}$ the gear $b^6$ and shaft $b^8$ will rotate together, and the force-pump B will be put in operation, and when withdrawn from the slot $b^{10}$ the gear $b^6$ will rotate loosely on the shaft, and the pump consequently be stopped.

The clutch is moved to withdraw the feather when desired by means of a pivoted shipper, $b^{16}$, whose free end rests in a groove upon the periphery of the clutch, and which is connected by a rod, $b^{14}$, with a pivoted lever, $b^{15}$, the upper end of which is within reach of the engineer, and is held by a spring-detent, $b^{17}$, when the clutch is moved to withdraw the feather, as above. When released the spring $b^{18}$ forces the feather into the slot $b^{10}$, and thereby puts the pump in operation.

Air is forced by the pump B through a pipe, $c$, into an air-chamber or reservoir, C, on the tender, in which a supply of compressed air of proper tension to operate the piston of the brake-cylinder is constantly maintained. This reservoir is connected, by a pipe, $c'$, with a valve-box, G, at the front part of the tender, from which a pipe, G′, extends, communicating, by suitable flexible connections hereinafter to be described, with the various brake-cylinders of the train.

F represents a brake-cylinder, attached to the tender-truck A′, and connected by a flexible tube, $G^2$, with the pipe G′. A cylinder similarly constructed and operated is attached to each truck of the train, as before stated; but that of the tender only will be here described and referred to.

Within the box G is a partition, $g$, between

the pipes $c'$ and G′, in which is an opening closed by a valve, $g'$. This valve is secured upon a stem, $g^2$, connected to a pivoted lever, $g^3$, within reach of the engineer.

By the movement of the valve $g'$ compressed air is admitted to or shut off from the various brake-cylinders at pleasure.

The valve-box G is provided with two suitably-weighted safety-valves, $g^4$ and $g^5$, placed on different sides of the partition $g$. When the pressure of air in the reservoir C is greater than is necessary or safe, the valve $g^4$ will rise and allow it to escape.

The valve $g^5$ serves as a safety-valve for the brake-cylinders and their connecting-pipes, and is raised by the engineer to allow the air to escape therefrom when the brakes are to be released.

The brake-cylinder F is provided with a piston, $f$, connected, by a piston-rod, $f'$, to a cross-head, $f^2$, working on guides $f^4$ on the truck-frame.

The brake-shoes H are pressed against the wheels $a$ in the ordinary manner by means of an arm, F′, the upper end of which is provided with pins working in slots in the cross-head $f^2$, the two pairs of brake-shoes being connected by a rod, $f^3$.

The cross-head $f^2$ is connected, by chains $f^5$, with spiral pulleys $f^6$ on a horizontal shaft in rear of the cylinder F which shaft is connected, by a chain, $f^8$, with a spring, $f^7$, secured to the frame.

When the compressed air is allowed to escape from the cylinder by raising the valve $g^5$, as before described, the spring $f^2$ draws the piston $f$ backward by means of the connections just stated, and thereby releases the brakes. The spiral form of the pulleys $f^6$ enable greater leverage to be had in proportion as the chains are wound up.

In order to provide an air-tight connection between the air-tubes of the different cars, and at the same time to allow them to conform to the curvature of the road, the following devices are employed.

A pipe, I, is secured longitudinally upon the bottom of each car, which is connected by a flexible pipe with the brake-cylinder on its trucks. At one end of the car the pipe I terminates in a stationary box, K, and at the other is secured air-tight to a flexible pipe, I′, sufficiently long to be connected to the pipe of the next car or of the tender, and to allow the cars to curve properly.

The box K is provided with a pivoted door, K′, in which is made a longitudinal slot, $k$, and which is pressed up to the box by a spring, $k^2$.

A valve, $k'$, slides in the slot $k$ by which the opening of the pipe I can be closed when the car is the last of the train. When another car is attached, the valve $k'$ is moved in the slot $k$ until the opening of the pipe I is exposed. The free end of the flexible pipe I′, which is provided with a collar, $i$, is then inserted in the slot $k$ and brought up to the opening of the pipe I, when the spring $k^2$, acting upon the pivoted door K′, holds the pipes closely in contact, and communication is established with the valve-box G on the tender.

When that end of the car which carries the flexible pipe I′ is the last of the train, the rear opening of the pipe is closed by inserting its collar $i$ in a slotted frame, $k^3$, at the end and side of the car. A pivoted valve, $k^4$, is pressed against the mouth of the pipe by a spring, $k^5$.

The pipe G′, by which compressed air is conveyed from the valve-box G on the tender, terminates in a box, K, of the construction first above described, and when the tender is coupled to that end of the car which carries the flexible pipe I′, the connection is made between the two in the manner stated.

When the end of the car which carries the box K is next the tender, the connection between the boxes is made by a short flexible tube, L, having collars $l$ $l$ on its ends, which are inserted in the slot $k$ of the pivoted doors K′.

From the foregoing description it will be seen that all the brakes of a train can be simultaneously applied and released by the engineer, and by the application of a power which is is always under his command, without depending on the attention of brakemen or involving any loss of time in passing from one brake to another, as is the case in brakes of the ordinary construction.

The speed of a train can be quickly checked, and the danger of loss of life and damage from collisions and runs greatly reduced by the use of my improvemonts, which can be readily applied to cars of the ordinary construction.

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

1. The cylinder B, operated as described, the brake-cylinder F, and brake F′, arranged relatively to each other as herein described.

2. The valve-box G, valve $g'$, and safety-valves $g^4$ $g^5$, in combination with the reservoir C, pipes $c'$ G′, and brake-cylinders F, the whole constructed substantially as set forth.

3. The brake-cylinder F, piston $f$, arm F′, and brake-shoes H, with the chains $f^5$, pulleys $f^6$, and spring $f^7$, the whole arranged substantially as described.

4. The boxes K, and pivoted doors K′, in combination with the flexible pipes I′ L, and air-pipes $G^2$ and I, constructed substantially as described.

5. The shaft $b^8$, and gear-wheel $b^6$, in combination with the shipper $b^{12}$, spring $b^{13}$, and pivoted-lever $b^{16}$, the whole arranged substantially as described and set forth.

The above specification signed by me this 18th day of February, 1869.

WILLIAM LATTA CHAMBERS.

Witnesses:
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