

No. 751,024.

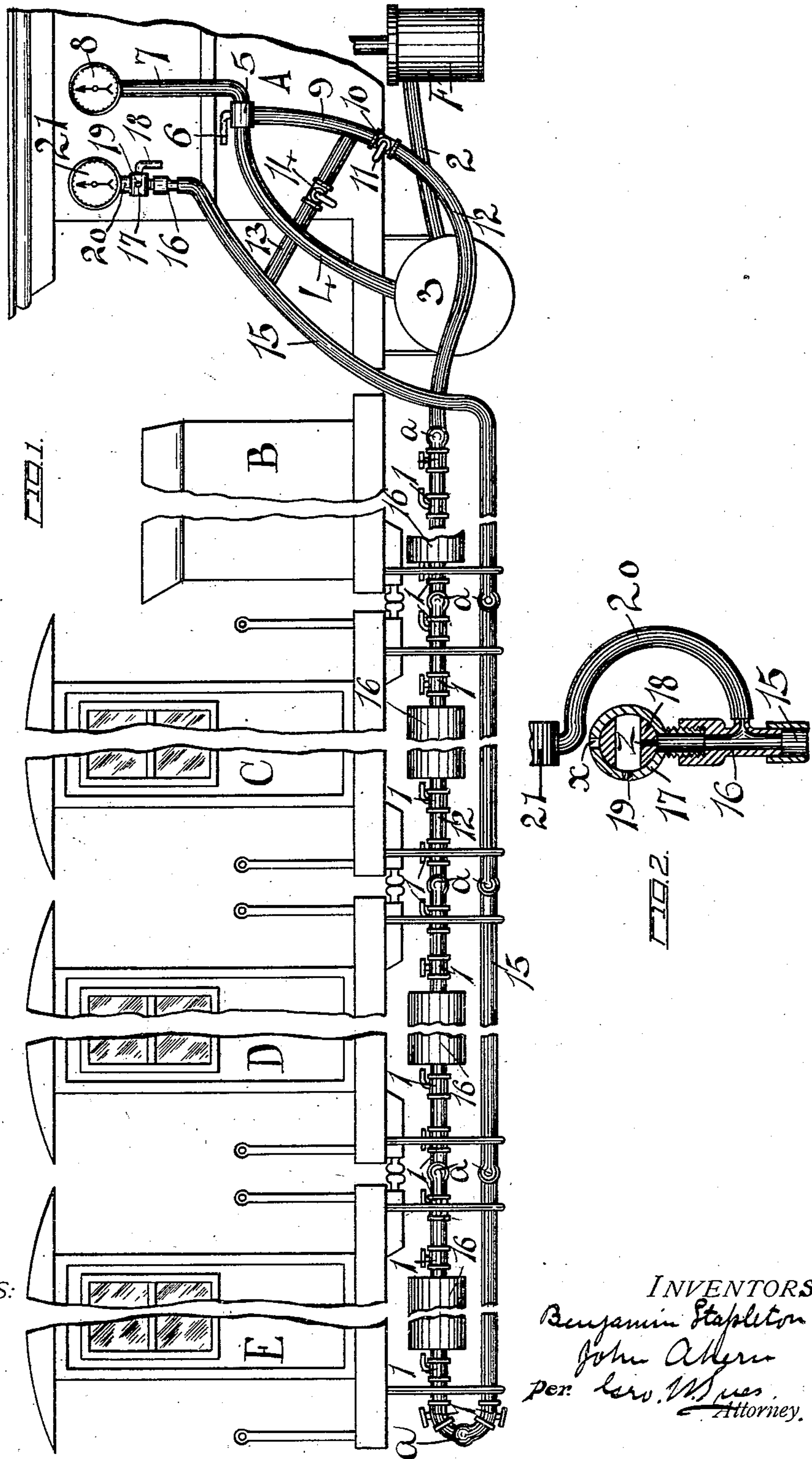
PATENTED FEB. 2, 1904.

B. STAPLETON & J. AHERN.

AUTOMATIC AIR BRAKE.

APPLICATION FILED APR. 14, 1902.

NO MODEL.



WITNESSES:

J. J. Larson.

W. C. Windsor.

INVENTORS:

Benjamin Stapleton

John Ahern

per Geo. W. Jones
Attorney.

UNITED STATES PATENT OFFICE.

BENJAMIN STAPLETON AND JOHN AHERN, OF PERRY, IOWA.

AUTOMATIC AIR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 751,024, dated February 2, 1904.

Application filed April 14, 1902. Serial No. 102,907. (No model.)

To all whom it may concern:

Be it known that we, BENJAMIN STAPLETON and JOHN AHERN, residing at Perry, in the county of Dallas and State of Iowa, have invented certain useful Improvements in Automatic Air-Brakes; and we do hereby declare that the following is 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, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to a new and novel improvement in safety appliances adapted to be used in connection with the air-brakes of railway-cars.

The aim of our invention is to provide a means whereby locomotive engineers may positively know whether or not the train-pipes in connection with each car-brake are in proper connection.

In the accompanying drawings we have shown in Figure 1 a broken portion of a railroad-train disclosing the arrangement of our safety appliance, while Fig. 2 discloses a sectional view of the emergency exhaust-valve provided with a leakage-valve.

It is a well-known fact that under the arrangements as at present used in the equipment of railroad-trains with air-brakes it is impossible for the locomotive engineer in the cab to know positively that the air-pressure will operate each brake. One or a number of car-brakes may be inoperative and he not have any knowledge of the fact, only to discover at the critical moment when applying the brakes that some of the cars were cut out. To eliminate this factor of uncertainty in connection with the operation of air-brakes, we provide a means whereby the locomotive engineer will positively know at all times whether or not all the brakes are in proper working order.

In carrying out the aim of our invention we use an ordinary air-storage tank 3, which is secured to the locomotive A at any suitable point, as disclosed in Fig. 1. Leading into this tank is the pipe 2, extending from a suitable pump F, as is usual in the art, so that this tank 3 is normally under air-pressure. Extending from this tank 3 is a pipe 4, which

leads to the engineer's brake-valve 5, the valve-stem 6 of which is used to operate the brakes. Leading from this valve 5 is the pipe 7 in communication with the usual gage or indicator 8, indicating the air-pressure.

Extending from the engineer's brake-valve 5 is the pipe 9, secured to the cut-out cock 10, provided with the stem 11, from which extends the sectional service-pipe 12, which is connected by means of suitable couplings *a* and extends to the end of the train. This service-pipe 12 is in valve connection with the usual auxiliary reservoirs 16, as used in the ordinary car service, this service-pipe in the drawings being shown as secured to the cars C, D, and E.

Extending forward from the rear coach or car E is the train-pipe 15 in sections, secured by means of suitable couplings *a*. This train-pipe 15 continues to the emergency exhaust-valve 17, provided with an operating-handle 18. This emergency-valve 17 is secured to the nipple 16, secured to the pipe 15, as shown in Fig. 2, and extending from this nipple is the tube 20, leading to the gage 21. This emergency-valve is provided with the escape-openings 19 and *x*, the opening 19 forming a leakage-groove, the valve being exhausted through the opening *x*.

The pipes 15 and 9 are connected by means of the cross-pipe 13, between which is a cut-out cock 14, as shown.

Adjacent each coupling *a* are the usual so-called "angle-cocks" 1, as is usual in the art.

Now in our construction it will be noticed that the air-pressure is directed through the engineer's brake-valve 5 to the gage 8, where the pressure within the reservoir 3 is indicated. From thence the air is directed through the service-pipe 12 to the last car D. Ordinarily if one of the angle-cocks 1—below the car D, for instance—were cut out it would be impossible for the engineer to tell whether or not the brakes upon the rear car E were in circuit, as the dial 8 would indicate just as much with all cars in circuit as with only one. Our invention obviates this objection, as we bring into circuit the train-pipe 15 in connection with the gage 21, so that the pressure within the entire pipe system will be indi-

cated upon the two gages 8 and 21 to register practically the same amount of pressure if there is no obstruction within the pipes and the air-brake system is in proper order. Now
 5 should an obstruction form within one of the pipe-sections 12 or 15 the air within the pipe-section 15 to the rear of the obstruction would soon escape through the leakage-groove 19 within the emergency-valve 17, lowering the
 10 pressure-record upon the gage 21 and disclosing an obstruction. The engineer could then at once set about to remedy the defect. From this it will be seen that we provide a pipe-circuit, at each end of which is provided a
 15 gage, so that the pressure must register practically the same upon both gages.

In case of need the emergency-valve 17 may be used to set the brakes, and the service-pipe system may further be cut out by means of
 20 the cock 10.

Upon the railroad systems extending across the mountainous districts of the United States, for instance, regular points have been designated where trains are held so many minutes
 25 for the purpose of cooling the wheels made hot by the continual application of the brake-shoes. In our system this loss of time may be obviated and at the same time be less wearing on the rolling-stock.

30 In referring to the drawings the operator could shut one of the cocks 1 below the coach C, and so divide the train into two sections, one section comprising the locomotive A, the tender B, and the coach C, and the remaining
 35 section the coaches D and E. Now in applying the brakes the engineer can operate the engineer's brake-valve 5 to set the brakes upon the tender and first coach until he knows that the wheels are quite hot. Then he can
 40 set the brakes upon the rear coaches D and E, which would be accomplished in first closing the cock 10 and then opening the cock 14, the air being regulated to the engineer's brake-valve 5, as previously described. The
 45 brakes upon the first train-section would then be released to cool, the brakes upon the rear of the train being set, so that the engineer can alternately set the brakes upon the forward or rear half of his train, and thus allow
 50 the wheels of one train-section to cool while the remaining section has its brakes set. From this it will be seen that in the use of our invention it is not possible for the brakes to become inoperative without the engineer having
 55 instant knowledge of the fact.

The service and train pipes can be arranged in any suitable way below the car to accommodate the structural peculiarities of each coach, and,

60 Having thus described our said invention, what we claim as new, and desire to secure by United States Letters Patent, is—

1. In an air-brake system, the combination
 65 of a pipe extending the full length of the train and recurving and provided at each end with

a gage, and a leakage-groove within said pipe, adjacent to one of said gages, said pipe being in combination with a suitable air-supply.

2. In an air-brake system, the combination with a gage, a pipe extending from said gage 70 and extending to the end of the train, thence recurving and ending in a gage placed adjacent said first-mentioned gage, a leakage-groove within one pipe end, an engineer's operating-valve in connection with said pipe sys- 75 tem, and a suitable air-supply in connection with said pipe, arranged substantially in the manner set forth.

3. The combination in an air-brake system, of a gage, a pipe extending from said gage to 80 the rear of the train and recurving and terminating in a second gage, an emergency-cock adjacent said last-mentioned gage, a leakage-groove within said emergency-cock, an engineer's brake-valve within said pipe system, 85 and a suitable air-supply, all arranged substantially as and for the purpose set forth.

4. The combination in an air-brake system, of a gage, a service-pipe extending to the end of the train and recurving and terminating in 90 a second gage, a valved cross-pipe connection extending from near one end of said pipe to the other, a leakage-groove within said service-pipe, adjacent said last-mentioned gage, an emergency exhaust-cock in said pipe adja- 95 cent said last-mentioned gage, an engineer's brake-valve within said pipe system adjacent said first-mentioned gage, and a suitable air-supply in connection with said service-pipe, all arranged substantially as and for the pur- 100 pose set forth.

5. The combination with the air-brake mechanisms of a train, of a pipe in connection with said air-brake mechanism of each car and extending the full length of the train, a gage 105 at the forward end of said pipe, said pipe recurving and being provided with a second gage and its remaining end, a leakage-valve adjacent said last-mentioned gage, an engi- 110 neer's brake-lever within said pipe, an emergency-cock within said pipe, and a suitable air-supply, all arranged substantially as and for the purpose set forth.

6. The combination in a railroad-train, of a service-pipe having a starting end and extend- 115 ing a suitable distance and recurving and terminating near said starting end, a pressure-gage secured to said starting end of said service-pipe, a pressure-gage secured to said terminating end of said service-pipe, and an air- 120 supply pipe entering said service-pipe intermediate of its ends, so arranged that the pressure within said air-supply pipe is registered at each end.

7. In an air-brake system, the combination 125 of a pressure-gage, of a service-pipe extending from said gage rearward and recurving, a cut-out cock within said service-pipe, a second gage secured to said recurved pipe end, an air-supply pipe in connection with said serv- 130

ice-pipe, an emergency-valve within said pipe intermediate of its ends and a cross-pipe uniting the ends of said service-pipe, as and for the purpose set forth.

5 8. In an air-brake system, the combination with a pressure-indicator, of a pipe extending from said indicator, and recurving and ending adjacent aforesaid indicator, a second indicator secured to the remaining end of said re-
10 curved pipe, an air-supply connected to said

pipe, brake mechanisms in connection with said pipe, and a leakage-valve within said pipe intermediate of its ends, all arranged substantially as and for the purpose set forth.

Signed in the presence of two witnesses.

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BENJAMIN STAPLETON.

JOHN AHERN.

Witnesses:

GEORGE W. SUES,

WM. N. CROMWELL.