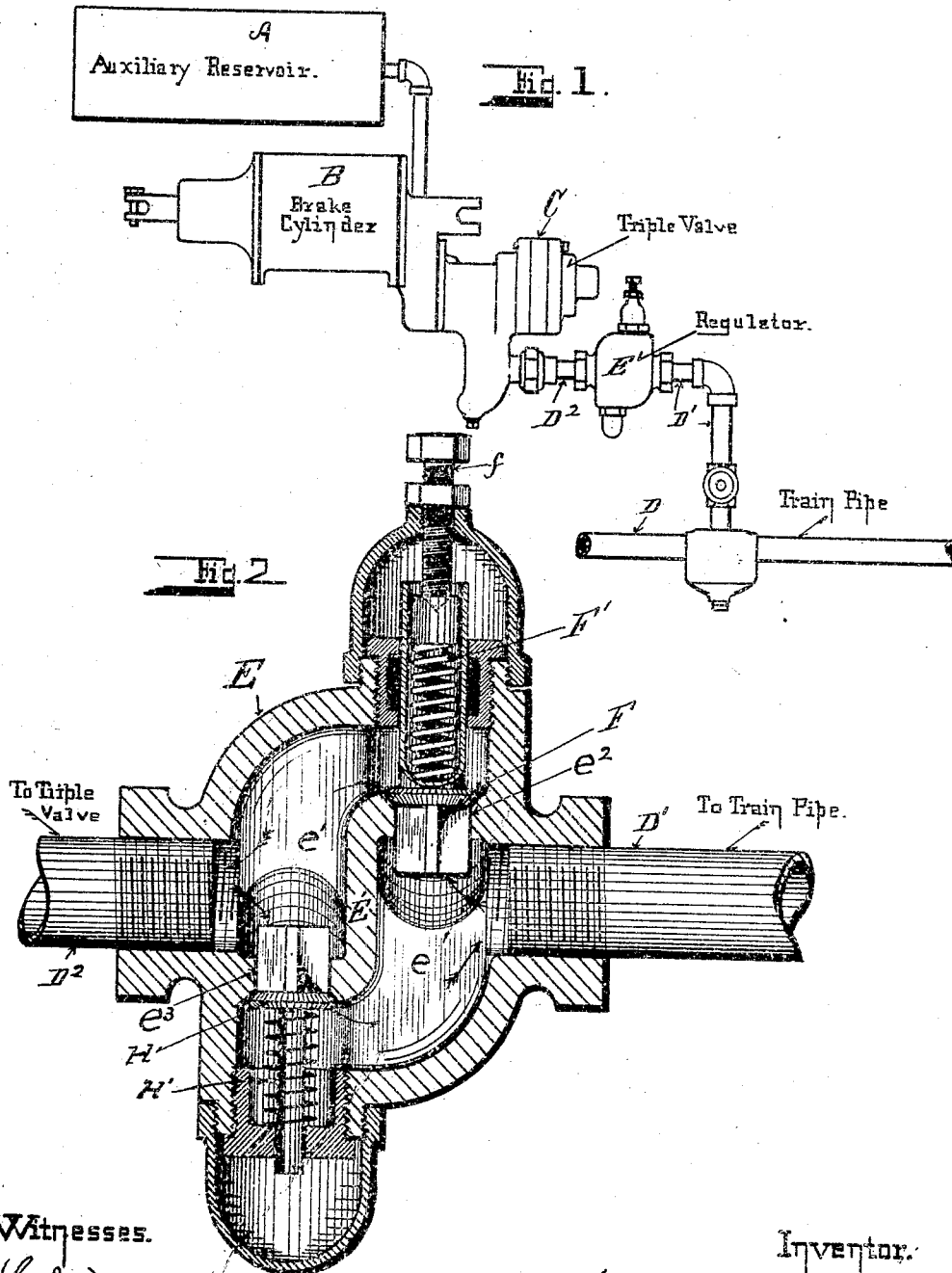


C. J. DOERR.
REGULATOR FOR AIR BRAKES.
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939,896.

Patented Nov. 9, 1909.



Witnesses.

G. J. Maud
Florence Stockert.

Inventor.

Charles J. Doerr
By J. C. & H. M. Stinson
Attys.

UNITED STATES PATENT OFFICE.

CHARLES J. DOERR, OF ERIE, PENNSYLVANIA, ASSIGNOR OF ONE-THIRD TO WARD E. HULBERT AND ONE-THIRD TO GUSTAVE M. SIEGRIST, BOTH OF ERIE, PENNSYLVANIA.

REGULATOR FOR AIR-BRAKES

939,896.

Specification of Letters Patent.

Patented Nov. 9, 1909.

Application filed June 3, 1909. Serial No. 499,892.

To all whom it may concern:

Be it known that I, CHARLES J. DOERR, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Regulators for 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming part of this specification.

My invention relates to regulators for air-brakes, ordinarily located between the train-pipe and the triple-valve, whereby the simultaneous release of all of the brakes of a train is insured.

As is well known in the art, all of the brake mechanisms of a train are supplied with air for actuating them, through a general train pipe, with which the brake mechanism of each car is connected by means of branch pipes, and when the engineer desires to apply the brakes he opens an exhaust connecting with the train-pipe so as to allow more or less air to escape therefrom thereby producing a reduction of the air pressure therein, according to the brake pressure he desires to apply to the train, and when he desires to release the brakes on the train, he admits air under pressure into the train pipe, which when it reaches the required pressure therein operates the brake mechanism to release the brakes on the train. It is therefore manifest, that when the air-cock on the locomotive is opened to exhaust, the pressure in the train pipe will rapidly fall, first near the front of the train, and if the train is a long one, somewhat later at the rear of the train so as to finally operate the brake mechanisms to set the brakes on all of the cars of the train. When, however it is desired to release the brakes the engineer admits air into the train pipe until the pressure therein is reached which is required to operate the brake mechanisms to release the brakes. In doing this on long trains, when the air is first admitted to the train-pipe at the forward end of the train, the pressure at that point rises sufficiently to operate the brake mechanisms on the forward cars to more or less release the brakes thereon, be-

fore the pressure in the train pipe at the rear of the train rises to the operative point, thus producing irregularities in the release of the brakes on the cars of long trains so that in starting the train, jerks and strains more or less violent are produced on the couplings connecting the cars.

The object of this invention is to so control the admission of air to the brake mechanisms of the several cars of the train that the pressure must be raised in the train pipe throughout its entire length to a predetermined point before any of the brake mechanisms connected therewith will be operated thereby to release the brakes on any of the cars of the train, and thereby produce the simultaneous release of all of the brake mechanisms of the train, without detriment to the promptness and efficiency necessary under the various conditions of such operation. A mechanism I have devised to produce this result, is hereinafter fully set forth and described and claimed and illustrated in the accompanying drawings, in which:

Figure 1 shows a view in elevation of an air-brake mechanism embodying my improved regulator. Fig. 2 shows a sectional view of my improved regulator forming part of the mechanism shown in Fig. 1.

In Fig. 1 of these drawings A represents the auxiliary reservoir; B the brake cylinder; C the triple valve; D the train pipe and D' D" the branch pipe leading from the train pipe to the triple valve in an ordinary air-brake mechanism. In my improvement I secure in the branch pipe D' D" my improved regulator E so that the air passing to and from the train pipe D passes therethrough, and is controlled thereby in its passage from the train-pipe D to the triple valve C so that it cannot pass to the triple valve C until the pressure at which the regulator valve is adjusted is reached in the train pipe D. This regulator E (see Fig. 2) is provided with chambers e e' separated by a diaphragm E', the chamber e connecting with the part D' of the branch pipe and thence with the train pipe D, and the chamber e' connecting with the part D" of the branch pipe leading thence to the triple valve C. In the diaphragm E' there is an inlet opening e" provided with a valve F opening toward the chamber e' and which is provided with a spring F' having an ad-

justing screw *f* by means whereof the valve *F* can be adjusted to open at any predetermined pressure, say for example seventy pounds, more or less; as may be desired in the operation of the brake mechanism, which pressure must be reached before the valve *F* will rise and allow the air to pass there-through from the train-pipe to the triple valve. In the diaphragm *E* there is another opening *e*³ provided with a valve *H* opening toward the chamber *e* and which is provided with a light spring *H'* of sufficient strength to normally retain said valve *H* seated, when no pressure is exerted thereon to open it, and when open it allows the air to escape from the triple valve mechanism to the train-pipe *D*.

In operation when air is applied to the train-pipe *D* the pressure therein must rise to the predetermined point at which the regulator valve *F* is set to open, before it will pass there-through to the brake-operating mechanism, and the effect of this is that when that pressure is reached at any one point in the train-pipe, it will practically have reached that pressure throughout its entire length, before any of the valves *F* will operate, so that the brake mechanism on every car in the train will operate simultaneously, and thereby release the brakes on all of them at the same time. When, however, the pressure of air in the train-pipe is lowered by the opening of the escape-cock on the locomotive, or by other means, then the valve *H* instantly opens and allows the brake-mechanism to operate to set the brakes on the train. I have thus shown and described a convenient construction embodying my invention. It is manifest, however, that the construction of the regulator can be considerably varied without departing from the spirit of my invention. For, example, a single compound valve mechanism could be utilized therein so as to produce all of the results produced in the construction shown and described. Therefore I do not limit myself to the exact form of construction shown herein.

Having thus described my invention so as to enable others to construct and utilize the same, what I claim as new and desire to secure by Letters-Patent is:

1. An automatic regulator for air-brake systems comprising substantially two chambers, one communicating with the train-pipe and the other with the triple-valve, valve mechanism in the wall separating said chambers adapted to open toward the chamber communicating with the triple-valve when the pressure in the chamber communicating with the train-pipe rises above the predeter-

mined point, and adapted to open toward the chamber communicating with the train-pipe, when the pressure in that chamber falls below the pressure in the other chamber, substantially as set forth.

2. An automatic regulator for air-brake systems comprising substantially two chambers having valve openings between them, one chamber communicating with a train-pipe and the other with the triple-valve, a valve for closing one of the openings between said chambers opening toward the chamber communicating with the triple-valve, adjustable spring mechanism for applying pressure to said valve, and a valve for closing the other opening between said chambers opening toward the chamber communicating with the train-pipe, adapted to close when the pressure in the chamber communicating with the train-pipe is greater than the pressure in the other chamber, substantially as set forth.

3. The combination in an air-brake regulator adapted to be inserted in the branch-pipe leading from the train-pipe to the triple valve of an air-brake mechanism, of a hollow shell, a wall having two openings therein dividing said shell into two chambers, one of which communicates with the train-pipe and the other with the triple-valve, and valves operating in opposite directions for closing the openings in said dividing wall, and adjustable spring mechanism operating on one of said valves to prevent the opening thereof before a predetermined pressure is established in the chamber communicating with the train pipe, substantially as set forth.

4. An air-brake regulator adapted to be placed in the branch-pipe leading from the train-pipe to the triple-valve of an air-brake system, consisting substantially of a shell, a wall having openings therein and dividing said shell into two chambers, one of which communicates with the train-pipe and the other with the triple-valve, a valve opening toward the triple-valve for closing one of said openings, adjustable spring mechanism for applying pressure to said valve, and a valve opening toward the train-pipe adapted to close the other of said openings when the pressure in the chamber communicating with the train-pipe is greater than the pressure in the chamber communicating with the triple-valve, substantially as set forth.

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

CHARLES J. DOERR.

Witnesses:

H. M. STURGEON,
H. J. CURTON.