

(No Model.)

2 Sheets—Sheet 1.

H. R. MASON.
QUICK RELEASE VALVE FOR AIR BRAKES.

No. 467,038.

Patented Jan. 12, 1892.

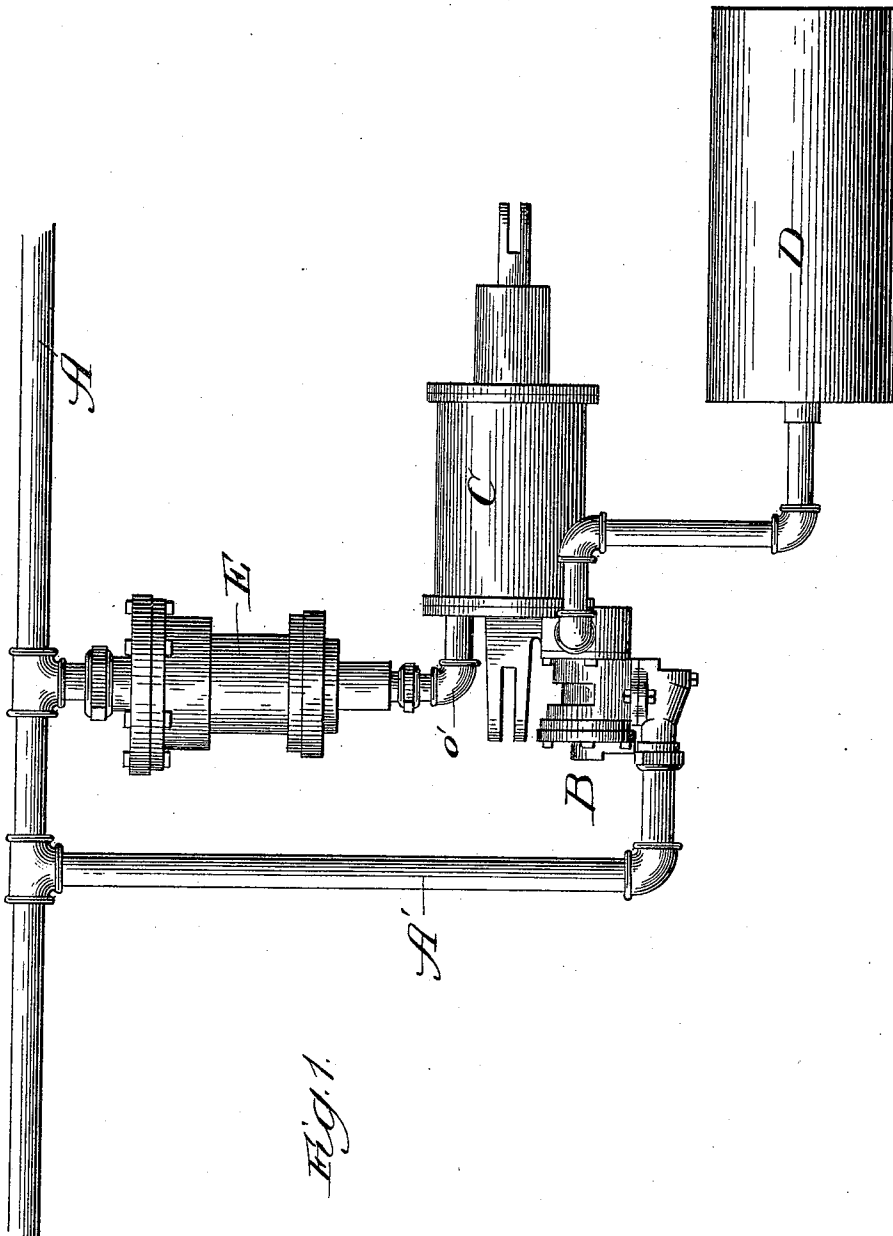


Fig. 1.

Witnesses:
E. C. Taylor,
Clifford H. White.

Inventor:
Harry R. Mason,
By Dyrenforth & Dyrenforth,
Attorneys.

(No Model.)

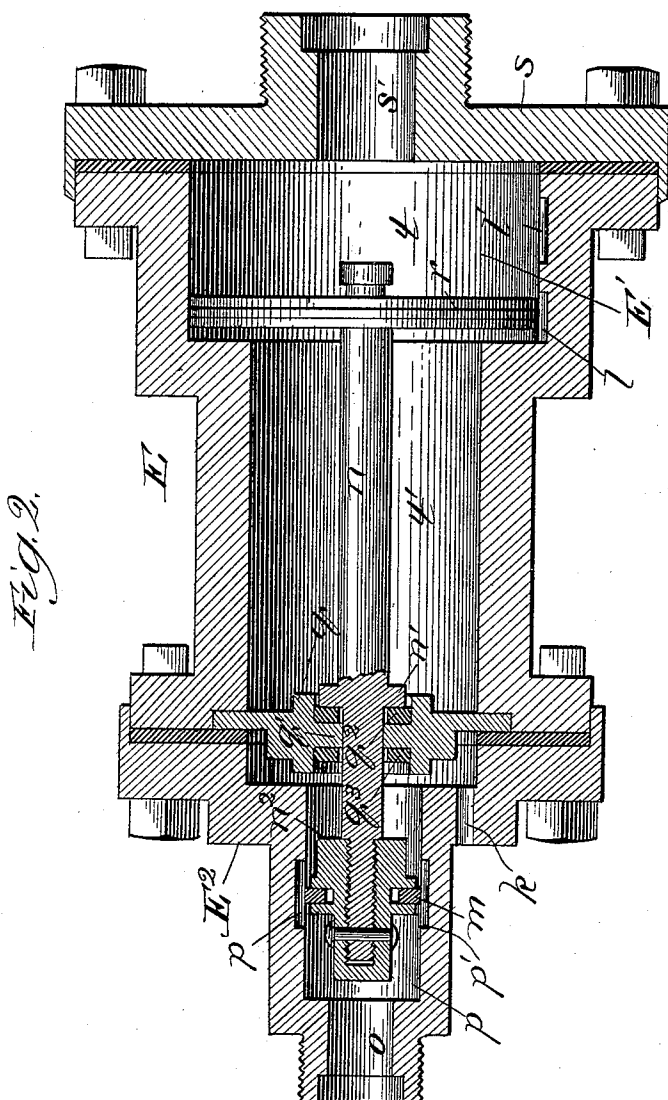
2 Sheets—Sheet 2.

H. R. MASON.

QUICK RELEASE VALVE FOR AIR BRAKES.

No. 467,038.

Patented Jan. 12, 1892.



Witnesses:
 East E. Chubbard,
 Clifford A. White.

Inventor
Harry R. Mason,
By Durenforth & Durenforth,
Attys—

UNITED STATES PATENT OFFICE.

HARRY R. MASON, OF CHICAGO, ILLINOIS.

QUICK-RELEASE VALVE FOR AIR-BRAKES.

SPECIFICATION forming part of Letters Patent No. 467,038, dated January 12, 1892.

Application filed August 22, 1891. Serial No. 403,440. (No model.)

To all whom it may concern:

Be it known that I, HARRY R. MASON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Quick-Release Valves for Air-Brakes, of which the following is a specification.

My invention relates to an improved valve device for use in connection with air-brake systems of the class now generally employed upon railway-trains, wherein the brakes are applied by the force of air-pressure directed into the brake-cylinder from auxiliary reservoirs upon the cars of the train, due, through the agency of what are technically termed "triple valves," to a reduction of pressure in the train-pipe, and wherein the brakes are released by the cutting off of the flow of pressure to the brake-cylinder and exhausting the latter, all of which is effected through the agency of the triple valve by re-establishing the pressure in the train-pipe.

In the constructions now generally employed the release of the brakes is effected altogether by the opening of a valve in the triple-valve device which permits the escape through the latter of the pressure in the brake-cylinder to the open air. It is desirable that the release of brakes under all circumstances be effected without delay and that it be accomplished, as nearly as possible, simultaneously throughout the train.

My object is to provide valve mechanism to operate with or in place of that hitherto employed for effecting the venting of the brake-cylinder, which shall be in direct communication with the train-pipe, to be actuated by the variations of pressure in the latter independently of the operations of the triple valve.

In the drawings, Figure 1 is a broken view, in the nature of a diagram, of a portion of the brake-operating mechanism on a car, and showing my improved valve device; and Fig. 2, an enlarged central section of my valve device.

A is the train-pipe which is supplied with pressure from the main reservoir upon the locomotive, the pressure being controlled by means of the engineer's brake-valve, also upon the locomotive.

A' is a branch of the train-pipe which communicates with a triple valve B; C, a "brake-cylinder," and D an "auxiliary reservoir," both of which communicates with the triple valve.

The functions and general operations of the parts named are well known and need no description.

E is a valve communicating at one end with the train-pipe and at its opposite end with the brake-cylinder at the same end of the latter as that with which the triple valve communicates. The valve E comprises a shell affording a chamber E', having an enlarged portion *t* and a reduced portion *t'*, the portions *t t'* being virtually separate chambers. Fitting upon the enlarged end of the shell is a cap *s*, having a central opening *s'* through it, at which it communicates with the train-pipe A. In the part *t* of the chamber E' is a valve *r*, which fits and slides against the inner wall of the shell. On the end of the shell opposite the cap *s* is a cap E², and adjacent to the latter cap is a diaphragm *q*, which closes that end of the chamber. In the cap E² is a chamber *p*, and in its end and extending from the chamber *p* is an opening *o*, from which a pipe *o'* extends to the brake-cylinder. The valve *r* is upon the end of a valve-stem *n*, which extends centrally of the chamber *t'* and through an opening *q'* in the diaphragm *q* to the chamber *p*, where it carries a valve *m*, which fits and slides against the wall of that chamber. In the wall of the chamber *t* are grooves *l l'* in the positions shown, and in the wall of the chamber *p* are one or more grooves *p'*, also in the position shown. On the valve-stem *m* is a boss or stop *n'*, which by striking against a seat *q²* on the diaphragm *q* limits the movement of the valves in the forward direction, and on the valve-stem *n* adjacent to the valve *m* is a shoulder or stop *n²*, which limits the backward movement of the valves by striking against a seat *q³* on the diaphragm *q*. Extending through the cap E² in the position shown is an outlet-passage *k*. The valves *r* and *m* fit snugly against the walls of their chambers, against which they slide, so that air can only pass the valves when they are brought coincident with the grooves in the walls of the chambers. The opening *q'* is just large enough to permit the valve-stem to

slide freely through it and fits over the latter with sufficient closeness to prevent material leakage. When the stem n is in its forward position shown, the valve r registers with the groove l and the valve m with the grooves p' , whereby air may pass around both valves. When the stem n is at its backward limit, the valve r registers with the groove l' , and the valve m closes communication between the chamber p and outlet-passage k .

In operation, as the train-pipe A is charged with air-pressure to release brakes, pressure entering therefrom at the opening s' forces the valves to their forward positions shown and passes around the valve r through the groove l until the chamber t' is filled with the same pressure approximately as that in the train-pipe. At the same time the valve m , registering with the grooves p' , permits all pressure to escape around that valve and thence through the passage k from the brake-cylinder to the outside air. After the pressures on opposite sides of the valve r are established a slight but material reduction of the pressure in the train-pipe will cause the then superior pressure in the chamber t' , before it can become sufficiently reduced by escaping through the passage l , to force the valve r backward until the stop n^2 meets the seat q^3 , when the valve r will register with the passage l' and the valve p' will be in the position of closing communication between the brake-cylinder and outside air through the passage k . Any further reduction of pressure in the train-pipe will not affect the valves, and the open passage l' will cause the pressure in the chamber t' to become reduced with that of the train-pipe. With the first impulse of pressure directed into the train-pipe to release brakes the valve r , and consequently the valve m , will be driven to their forward positions and the passage p' opened.

The opening of the passage p' permits the brake-cylinder to be vented with great rapidity, whereby the piston therein will travel its full distance and effect quick and complete release of the brakes.

I do not limit myself to the construction of the valve mechanism shown and described, as it is subject to modifications which would not depart from the spirit of my invention as defined by the claims.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a brake system, the combination, with the train-pipe and brake-cylinder, of quick-release-valve mechanism independent of the triple valve, comprising a shell having an expansion-chamber communicating with the train-pipe only and an exhaust-passage from the brake-cylinder to the outside air, a valve governing the exhaust through said passage controlled by a valve interposed between the train-pipe and expansion-chamber and movable by differential pressure, whereby the said interposed valve operates to move forward when the train-pipe pressure exceeds that of the expansion-chamber to open the exhaust-passage valve and backward when the train-pipe pressure is reduced to close the exhaust-passage valve, a passage between the train-pipe and expansion-chamber opened by the said interposed valve when in its forward position, and a passage for the retrogression of pressure from the expansion-chamber to the train-pipe opened by the said interposed valve when it is moved backward, substantially as and for the purpose set forth.

2. In combination with the train-pipe and brake-cylinder of a brake system, a quick-release-valve device independent of the triple valve, comprising a shell provided with an expansion-chamber communicating with the train-pipe only and an exhaust-passage from the brake-cylinder to the outside air, a valve governing the exhaust through said passage controlled by a valve interposed between the train-pipe and expansion-chamber, the said interposed valve being governed entirely by differential air-pressure, a passage for pressure from the train-pipe to the expansion-chamber opened by movement of the interposed valve when the train-pipe pressure is the greater, and a passage for the retrogression of air from the expansion-chamber to the train-pipe opened by movement of the interposed valve when the train-pipe pressure is reduced for a service or emergency stop, substantially as and for the purpose set forth.

HARRY R. MASON.

In presence of—

J. W. DYRENFORTH,
J. N. HANSON.