

**THE
WESTINGHOUSE
COMBINED AUTOMATIC
AND NON-AUTOMATIC
BRAKE EQUIPMENT FOR LOCOMOTIVES**

**INSTRUCTION
BOOK**

**THE
WESTINGHOUSE BRAKE CO. OF AUSTRALASIA, LTD.
GEORGE STREET, CONCORD WEST,
N.S.W.**

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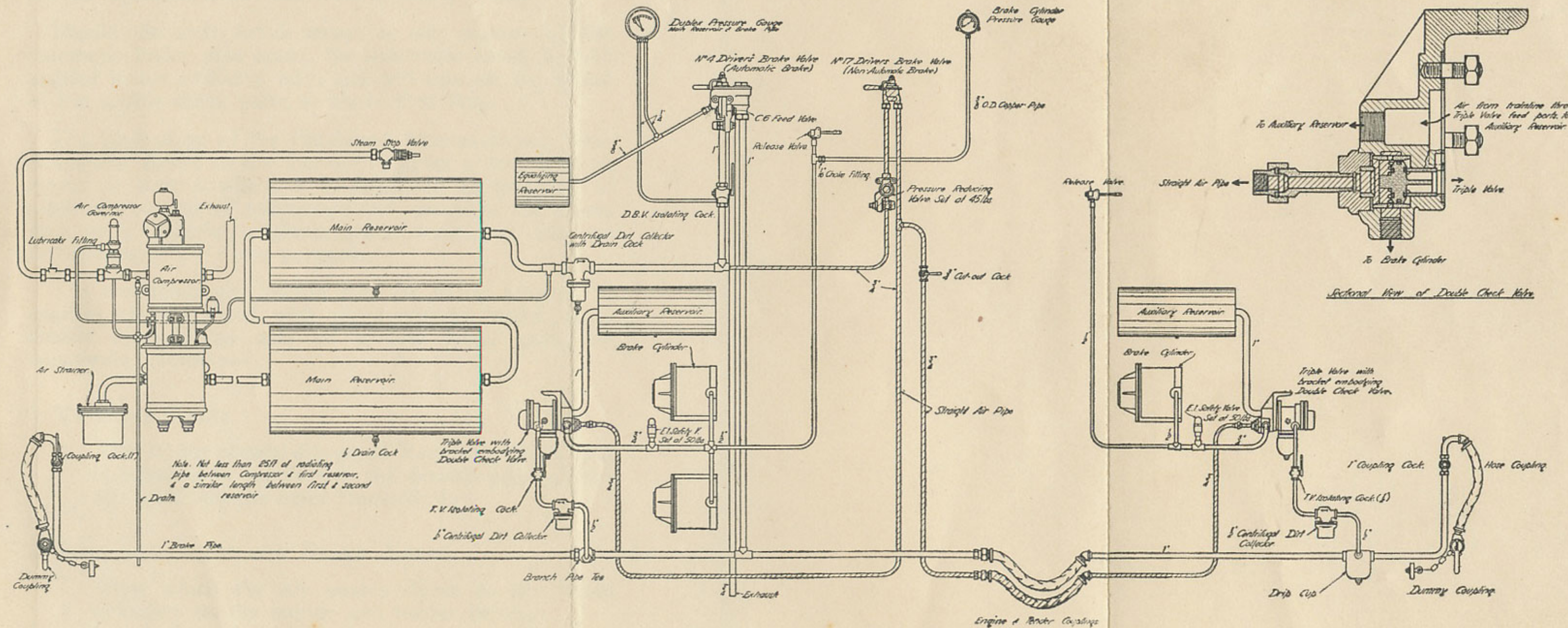
THE Combined Automatic and Non-Automatic Engine and Tender Equipment consists of the standard automatic arrangement, with the addition of a Non-Automatic Brake Valve and a few simple parts which permit the use of straight-air operation on the engine and tender brakes without interfering with their automatic action when the automatic brake valve is used, both being operative at all times. The many and important advantages of an independent engine and tender brake are thus obtained, while preserving the functions of the automatic on these and the train brakes.

One brake cylinder only is used for both systems, but at the junction of the two systems a special valve, called the "Double Check Valve," is placed which automatically opens up communication between the brake cylinder and either system, as determined by the working of either of the two brake valves on the engine. The action of the automatic brake is as usual, with the exception that the air, in its passage from the auxiliary reservoir to the brake cylinder, is intercepted by the Double Check Valve.

This valve has three connections, one centrally situated, which leads to the brake cylinder and is in communication with ports over which the check valve piston moves. The other two connections are at either end of the valve, and communicate with the brake cylinder passage in the triple valve and the non-automatic brake pipes

DESCRIPTION and OPERATION of NON-AUTOMATIC BRAKE VALVE AND DOUBLE CHECK VALVE

FIGURE 1 shows a diagrammatic layout complete for engine and tender



**DIAGRAMMATIC ARRANGEMENT OF FITTINGS AND CONNECTIONS FOR DOUBLE BRAKE ON ENGINE WITH TENDER
(COMBINED AUTO AND NON-AUTOMATIC BRAKE)**

Note.—Non-Automatic Brake Parts are shown shaded.

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respectively. Seatings are arranged at each end, so that the piston may blank off either the triple valve or the brake pipe, and open up connection from the other to the brake cylinder, according to the direction from which the air admitted enters the Double Check Valve.

Should the train break away, or any rupture of the automatic brake pipe occur, the automatic brake will be applied in the ordinary way, and will operate the piston of the double check valve as above described.

The application of the Combined Automatic and Non-Automatic Brake on the locomotive gives a very efficient means of control where it is important to provide for rapid alternations of application and release of the brake, such as in shunting engines, grade work, etc., and we recommend it for these purposes.

The non-automatic feature may be easily adapted to engines already fitted with the automatic brake, as it entails the addition only of a few small parts, as enumerated below:—

1. REDUCING VALVE.

This is our standard type of Reducing Valve, and is adjusted to regulate to the desired pressure the air fed from the main reservoir to

2. THE NON-AUTOMATIC BRAKE VALVE,

from which the air passes direct to the brake cylinders on the engine and tender through

3. THE DOUBLE CHECK VALVE,

which, when the brakes are applied by the Non-Automatic Brake Valve, closes the passage between the triple valve and brake cylinder, and

opens up a passage from the Non-Automatic Brake Valve direct to the brake cylinders.

4. A GAUGE

to show the pressure of air in the straight-air pipe, and consequently in all brake cylinders on the engine and tender, when the brakes are being operated from the Non-Automatic Brake Valve.

5. SAFETY VALVE.

This valve is placed on the driver brake cylinders to blow down any surplus of air pressure accruing from the application of the automatic brake on top of non-automatic, or vice-versa.

6. $\frac{3}{4}$ " ISOLATING COCK.

This cock is placed in the straight-air line leading back to the tender, so that in the event of a rupture of the hose pipe between engine and tender, the latter may be isolated and the non-automatic control still retained on the driver brakes.

7. 2 RELEASE VALVES.

These valves are placed in the cab of the engine within easy access of the engineman, one being connected to the brake cylinder pipe of the engine, and the other to the tender, thus affording an independent release, either after an automatic or non-automatic brake application.

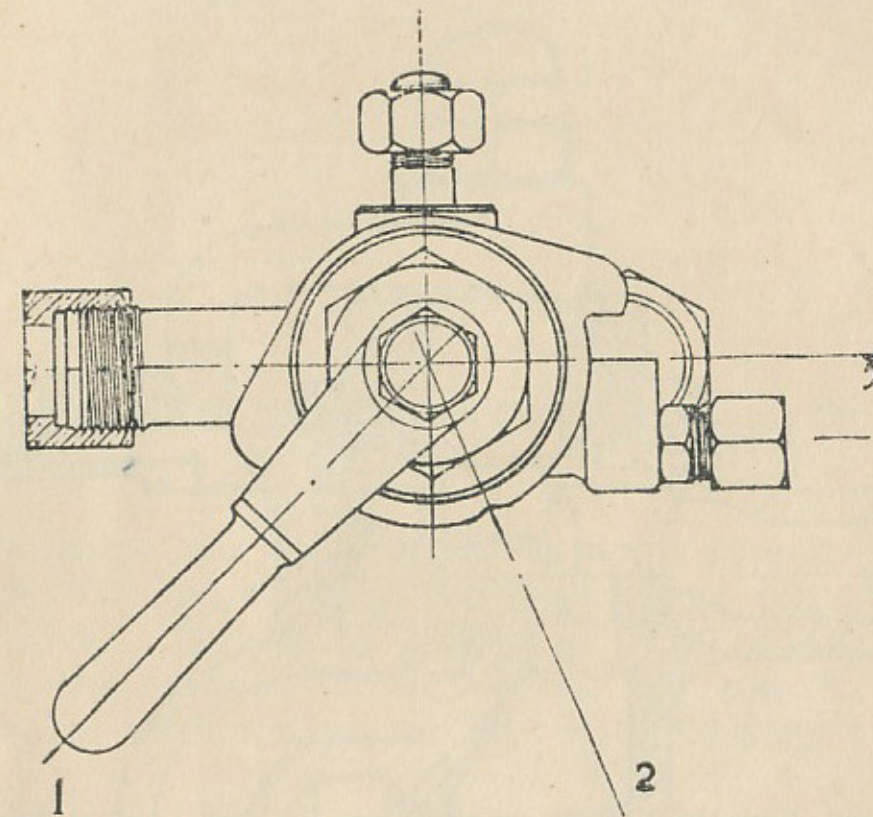


Fig. 2

NON-AUTOMATIC BRAKE VALVE PLAN

FIGURE 2 is a plan view of the NON-AUTOMATIC BRAKE VALVE, showing the relative positions of the operating handle.

POSITION No. 1.—Ordinary running position; also release position after non-automatic application.

POSITION No. 2.—Lap position, holding brakes applied after a non-automatic application.

POSITION No. 3.—Application position admitting air from main reservoir to straight air pipe.

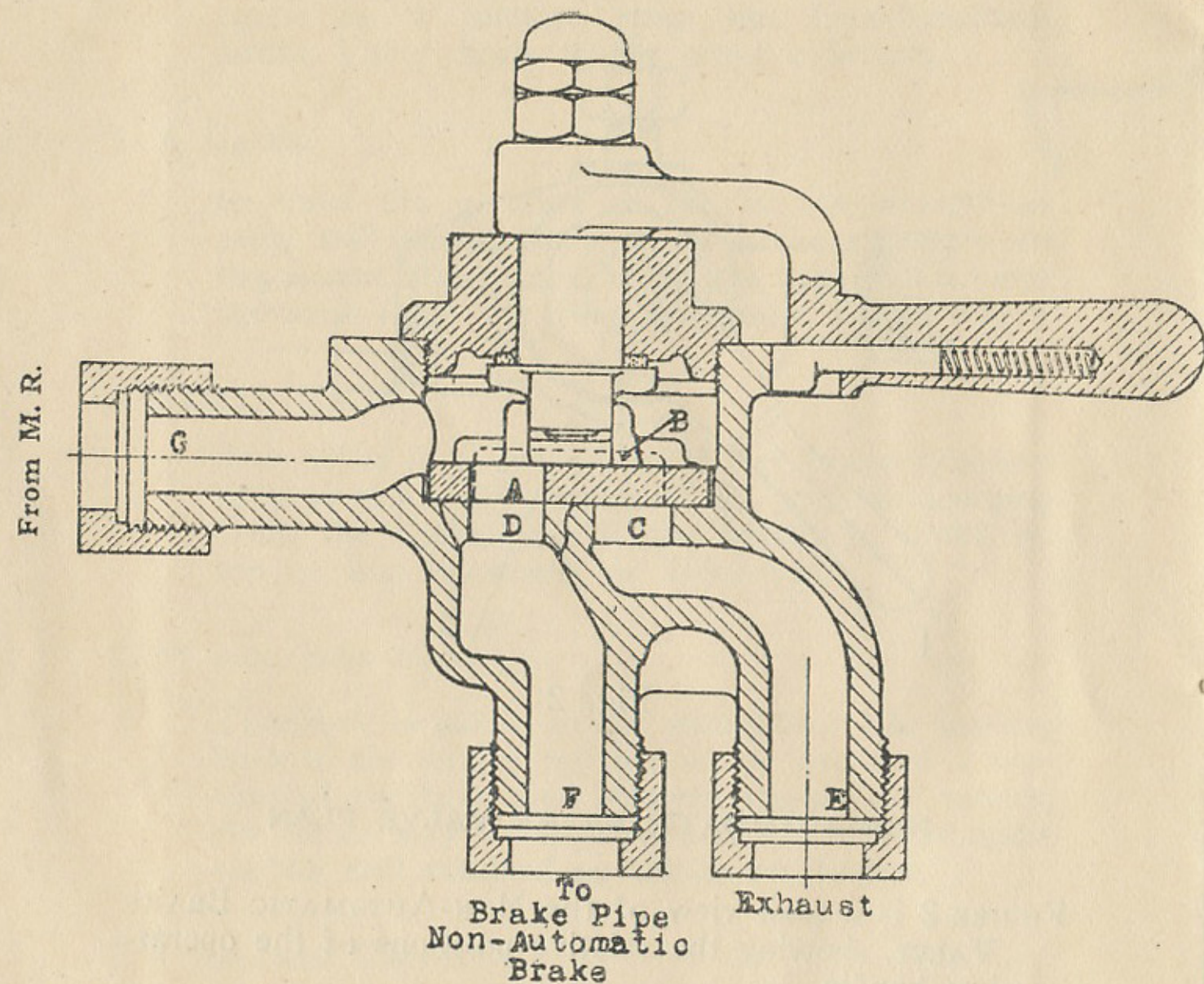


Fig. 3

NON-AUTOMATIC BRAKE VALVE

SECTIONAL VIEW

FIGURE 3 shows a vertical sectional view of the BRAKE VALVE.

In POSITION No. 1 air from the main reservoir enters at "G" and flows to the chamber on top of rotary valve. The Non-Automatic Brake Pipe is open to the exhaust through ports "D" and "C" in the valve seat, and cavity "B" in the rotary valve.

In POSITION No. 2 all ports are blanked and communication between passages "F" and "E" is cut off.

In POSITION No. 3 air from the main reservoir is admitted to passage "F" through port "A" in the rotary valve, and port "D" in the seat, the exhaust passage "E" being blanked in this position.

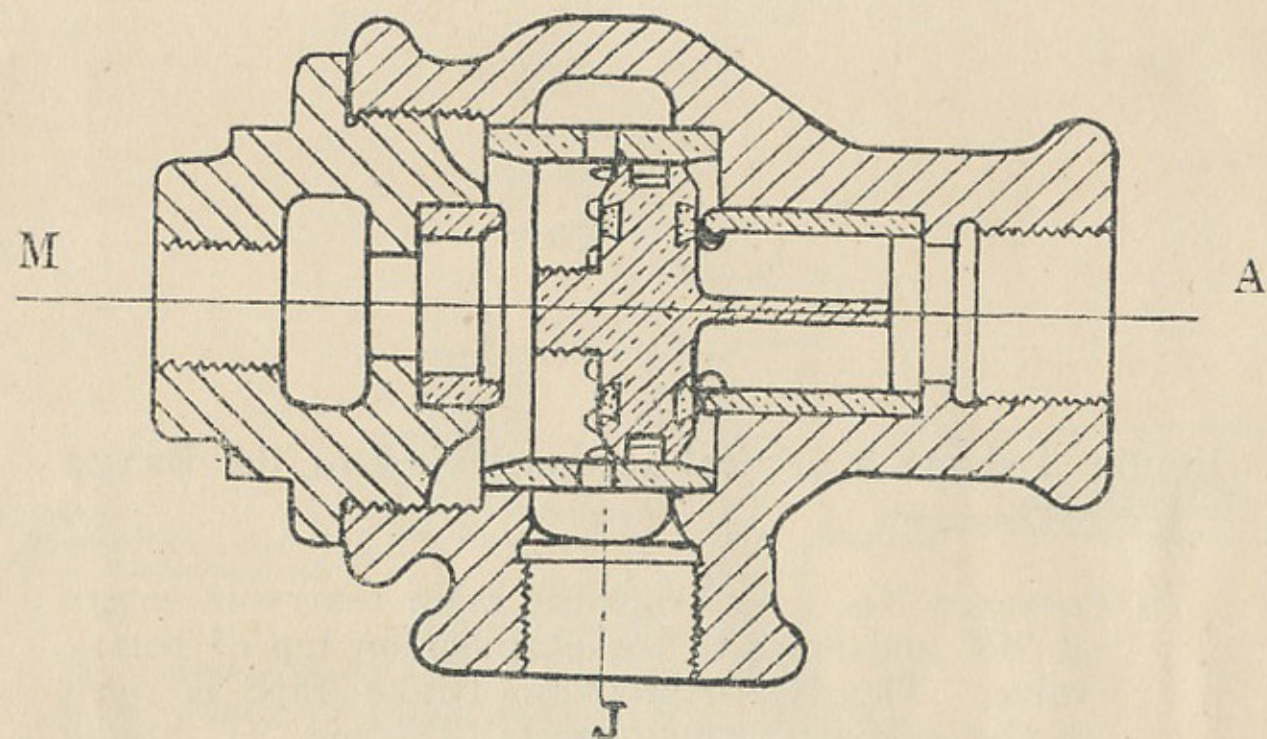


Fig. 4

DOUBLE CHECK VALVE

FIGURE 4 shows a vertical section of the DOUBLE CHECK VALVE.

When the brake is applied automatically, either by means of the brake valve on the engine or by the parting of the train, the triple valve piston moves down, opens the port to the cylinders, and allows the air to pass from the auxiliary reservoir towards the brake cylinder.

The air, in its passage towards the brake cylinder, enters the Double Check Valve at "A," moving its piston to the left and closing branch pipe "M" of the non-automatic system, allowing the auxiliary reservoir air to flow through the passage "J" to the brake cylinder.

The brake is released in the usual manner by increasing the pressure in the brake pipe of the automatic system, or, if an independent release of either engine or tender brake is desired, by opening the respective release valve.

In a non-automatic application of the brake on the engine and tender, air is admitted through the non-auto-

matic brake valve and straight-air pipe to passage "M" of the Double Check Valve, moving its piston to the left, shutting off communication between passages "A" and "J," and allowing air to flow through passage "J" to the brake cylinders.

To release the pressure in the brake cylinders, or to graduate the brake off or on as required, the pressure in the straight-air pipe leading to the brake cylinders may be—by the manipulation of the Non-Automatic Brake Valve—increased or diminished, as the driver desires.

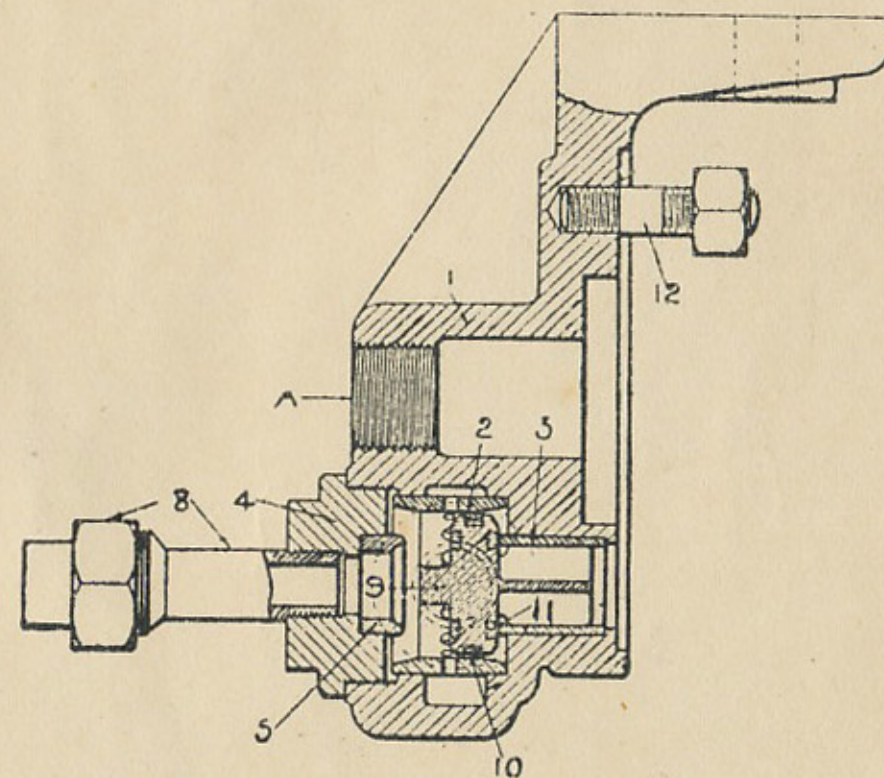


Fig. 5

FIGURE 5 shows a vertical section of the DOUBLE CHECK VALVE, which is identical with the one previously described, with the exception that it is embodied in the triple valve bracket, thus reducing the number of pipe connections and therefore minimising leakage.

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