An Automatic Pressure Retainer for Driver Brakes.

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The following paper was written while Mr. Muhlfeld was Master Mechanic of the G.T.R. at Montreal, before his recent appointment as Superintendent of Machinery and Rolling Stock on the Intercolonial Ry.:

To facilitate the handling of air-braked freight and passenger trains, the length and speed of which are constantly increasing, the retained application of the locomotive driver brake, after the train brakes have been fully released, has been shown to be a decided advantage. This practice is of special benefit in the handling of long freight trains through side tracks and switches and down grades, and when making water crane, coal chute, grade crossing and despatching station stops. The retention of the application of the driver brake on freight locomotives when the train brakes are released, keeps the cars bunched, and prevents the locomotive from surging ahead, and the slack from running out of the head cars before the rear car brakes are fully released; this latter action usually results in damage to merchandise and draft gear, and causes delays on account of break-in-twos. It also permits of water crane and coal chute stops being made without uncoupling the locomotive from the train, and with passenger trains it eliminates the back-lash of the cars, due to the trucks resuming their normal position when the train brakes are not fully released at the time the dead stop is made. Further, retaining a reduced driver brake cylinder pressure permits of the locomotive and train being moved with the driver brakes partially set for a sufficient distance to make good an irregular stop at a water crane, coal chute, or switch, and the starting of trains is facilitated through the train brakes being fully released by the time the stop is made. The results which can be obtained from the retention of the driver brake cylinder pressure with the devices now in use have been but fairly satisfactory for the reason that they are not entirely automatic, or that the automatic action is not available without a corresponding irregular action of the brake valve. To satisfactorily make use of the retention of the application of the driver brake, the operation must be positive and entirely automatic in connection with the usual working of the engineer's brake valve handle when applying and releasing the train brakes. With this idea in view, the retaining device, shown by the accompanying drawings, has been designed and put in service.

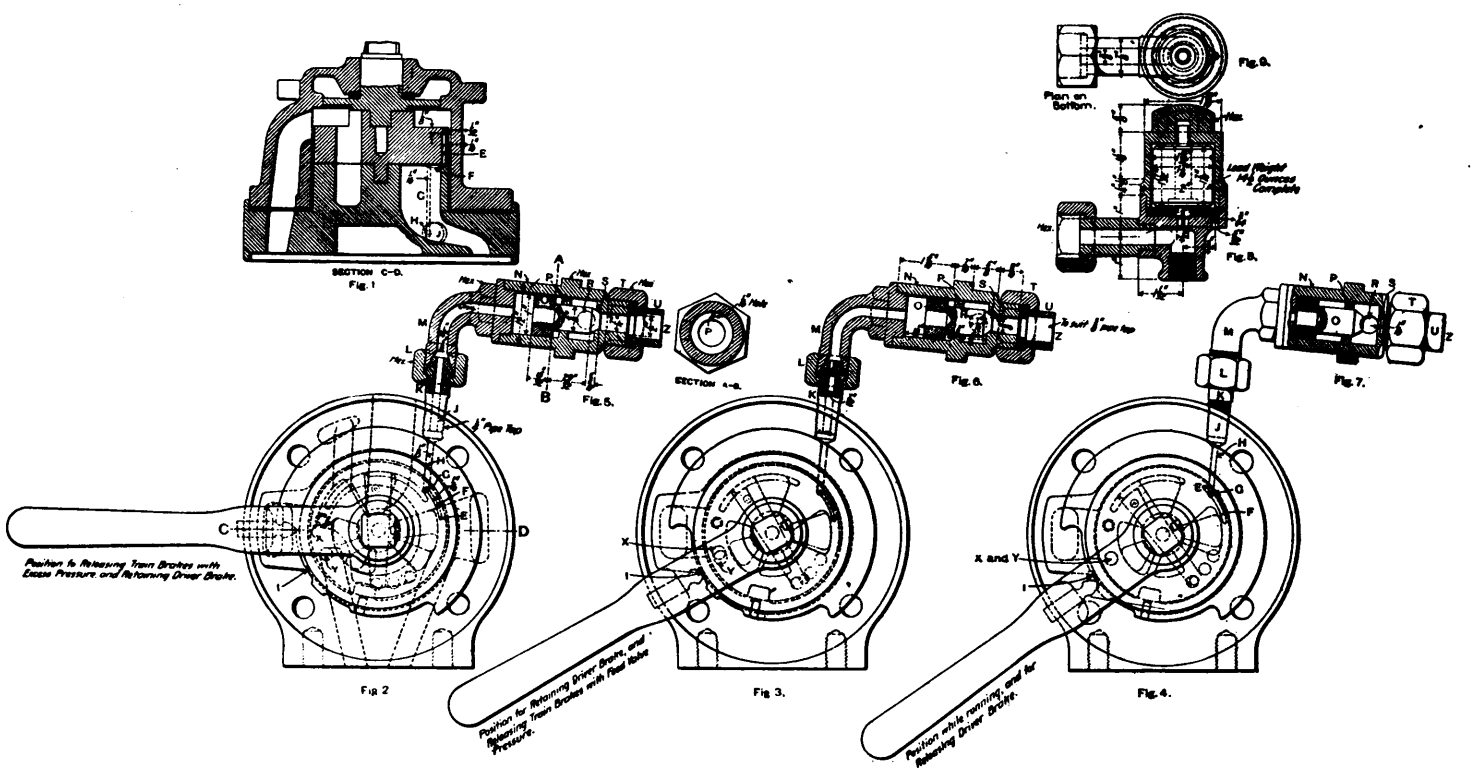
Referring to the illustrations, figs. 1, 2, 3, and 4 show sectional views and top plans of the parts of a Westinghouse G-6 engineer's brake valve, which are affected, either in alteration or in the operation of the pressure retainer device, which is shown in section by figs. 5, 6 and 7. Figs. 8 and 9 show a sectional elevation and top plan of a pressure reducing valve which can be used in connection with the pressure retainer, or not, as desired. The relative positions of the brake valve handle and the retainer differential valve are shown as they are in actual operation. The reference letters are: E, air inlet port in rotary valve; F, air passage grove on valve seat; G, outlet port to pressure retainer; H and J, outlet passages to pressure retainer; and I, stop notch for the brake valve handle latch. These are the alterations in the engineer's brake valve proper, which, as will be noted, are readily made, and do not in any way interfere with the construction, maintenance or operation of the brake valve itself.

The following letters refer to the pressure retainer: K, connecting nipple; L, nipple coupling nut; M, cap; N, valve body; O, differential valve; P, differential valve, air leakage and pressure equalizing port; R, triple value exhaust relief port; S, pressure retainer valve seat; T, body coupling nut; and U, body coupling nut tail piece. The pressure retainer device can be made entirely of brass or malleable iron, and in the main consists of but two stationary parts, the valve body and the valve body cap, and one operating part, the valve. The retainer is attached to the brake valve body by the nipple, as shown, and the body coupling nut tail piece U is connected to a ⅜-in. gas pipe leading to the triple valve exhaust port. If the pressure reducing valve is to be used in connection with the retainer it is attached between the retainer and the pipe leading to the triple valve exhaust.

X is the feed valve air inlet port in the rotary valve; Y the feed valve air inlet port in the rotary valve seat; and Z the pipe connection to the driver brake triple valve exhaust. With the brake valve handle in full release position, fig. 2, the air from the excess pressure storage will pass through inlet E, groove F and outlet port and passages G, H and J, to the retainer valve body N, forcing differential valve O to its seat and closing the triple valve exhaust opening Z. The leakage of air past the differential valve O to its seat and closing the triple P and the exhaust release port R. This action will remain so long as the brake valve handle is kept in full release position, retainer position, or intermediate of these positions, as shown in figs. 2 and 3. In fig. 2, it will be noted that while the warning port is closed and the brake valve feed valve to the train pipe is in operation the pressure still remains in the retainer to prevent the release of the driver brake.

Fig. 4 shows the brake valve handle in running position when the supply of air is closed to the retainer. The immediate reduction by leakage of the confined pressure above the differential piston past its loose fit and the restricted passage through the air leakage port P causes a rapid equalization of pressure, when the differential valve O is promptly forced from its seat S by the driver brake cylinder pressure; the exhaust release port R providing for the latter's quick release to the atmosphere.

In the handling of long air-braked freight trains it is often necessary, to facilitate prompt release of the train brakes, to leave the brake valve handle in full release position some time before returning it to running position, while in the handling of passenger trains this practice would result in immediate overcharging of the train pipe and cause slid flat wheels. With the arrangement as described it will be possible to retain the driver brake pressure with the brake valve handle either in full



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