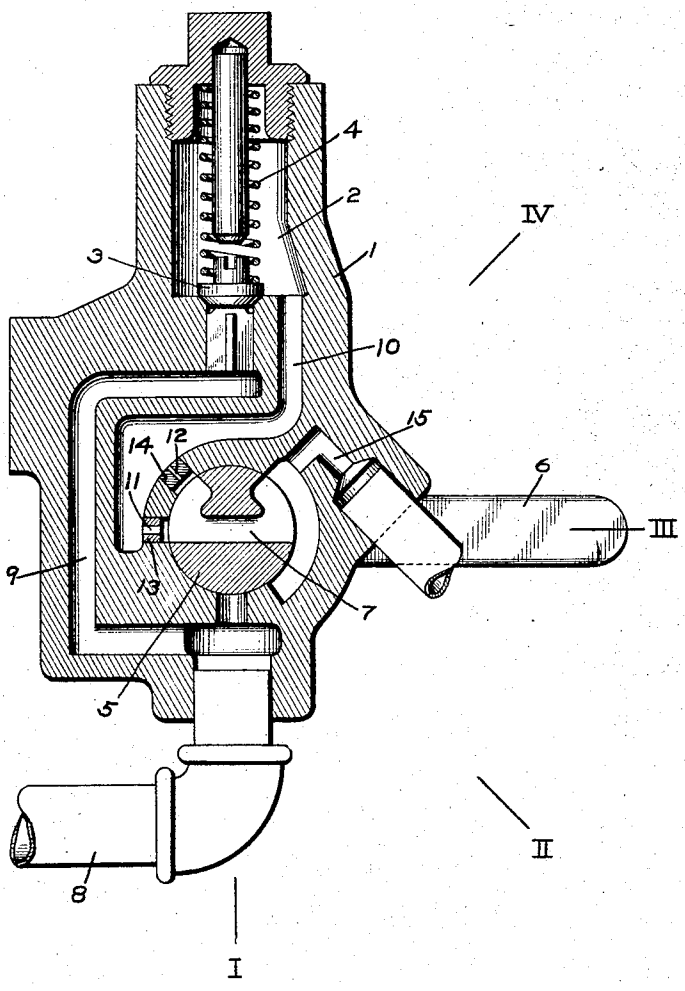
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W. E. DEAN

PRESSURE RETAINING VALVE DEVICE

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UNITED STATES PATENT OFFICE.

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PRESSURE-RETAINING-VALVE DEVICE.

Application filed June 18, 1923. Serial No. 646,047.

To all whom it may concern:

Be it known that I, WILLIAM E. DEAN, a citizen of the United States, residing at Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Pressure-Retaining-Valve Devices, of which the following is a specification.

This invention relates to fluid pressure brakes, and more particularly to a brake cylinder pressure retaining valve device.

A retaining valve device is commonly employed on railway vehicles, for the purpose of retaining a predetermined pressure in the brake cylinder, so that the brakes will not be wholly released when the retaining valve device is in operation and the brake pipe pressure is increased to permit the recharge of the usual auxiliary reservoirs throughout the train while the train is being held by the retained brake cylinder pressure, the above being particularly useful when operating on grades to prevent possibility of the train running away or getting out of control.

For this purpose, the retaining valve device comprises either a weighted or a spring pressed valve adapted to lift and permit the escape of fluid under pressure from the brake cylinder until the pressure in the brake cylinder has been reduced to a predetermined degree, such as fifteen pounds, when the valve closes and prevents the further escape of fluid from the brake cylinder. Double pressure retaining valve devices are also employed, in which two weighted or spring pressed retaining valves are provided, so that under extreme conditions of heavily loaded trains on grades a higher pressure may be retained in the brake cylinder. Such double pressure retaining valve devices may be adapted to retain a pressure of fifteen pounds with one retaining valve and thirty pounds with the other valve, or the two valves may be set at twenty five and fifty pounds respectively, for example.

Retaining valve devices for different railroads may be specified which vary in their retaining capacities, according to the varying operating conditions and the varying opinions of different operating officials, so that there are in use a variety of retaining valves.

One object of my invention is to provide a retaining valve device such that one retaining valve device can be used for all classes of service.

Another object of my invention is to provide a retaining valve device which will facilitate the starting of a train which has been brought to a stop on a grade.

Another object of my invention is to provide a retaining valve device which will facilitate the handling of trains over letups in grades.

Another object of my invention is to provide a retaining valve device which will permit the use of the same retaining position regardless of the car loading.

Other objects of my invention are to provide a retaining valve device, such that the effect of leakage is minimized, recharge of the auxiliary reservoirs is facilitated, and general flexibility is provided.

For accomplishing the above objects, my improved retaining valve device contemplates the use of a retaining valve of low retaining value, for example, one capable of retaining only ten pounds pressure in the brake cylinder, and associated with said low value retaining valve are means for varying the rate of blow down or escape of fluid under pressure from the brake cylinder, so that according to the position in which the retainer valve handle may be set, any one of a plurality of different rates of blow down may be provided.

In the accompanying drawing, the single figure is a central sectional view of the retaining valve embodying my improvement.

As shown in the drawing, a retaining valve device embodying my invention may comprise a casing 1 having a valve chamber 2 containing a retaining valve 3, shown as subject to the pressure of a spring 4, adjusted to hold the valve 3 seated at a low pressure, such as ten pounds, it being understood that a weighted retaining valve may be employed if desired.

In the casing 1 is a controlling plug cock or valve 5 adapted to be operated by a handle 6 and provided with a port 7. A pipe 8, which is connected to the exhaust port of the triple valve device on the car in the usual manner is connected to the casing 1 and a passage 9 leads from said pipe to the under side of the retaining valve 3.

A passage 10 leads from valve chamber 2 and communicates with the cock 5 through restricted ports 11 and 12 as provided in choke plugs 13 and 14, the restricted port 11 being of greater flow capacity than the port 12. An atmospheric exhaust port 15 also communicates with the face of the cock 5.

The cock 5 has four operating positions, and in position No. I, the port 7 in the cock connects the triple valve exhaust pipe 8 with the atmospheric exhaust port 15, so that the retaining valve is cut out of action, and the brake cylinder is exhausted direct to the atmosphere. In position No. II, fluid under pressure from the brake cylinder flows from pipe 8 through passage 9, and if the brake cylinder pressure exceeds the pressure holding the valve 3 seated, the valve 3 is lifted from its seat, so that fluid flows through passage 10 and the smaller restricted port 12 to port 7 and thence escapes at the exhaust port 15. In position No. III, as shown in the drawing, both restricted ports 11 and 12 are connected to the port 7, so that the rate of flow is its maximum in this position. In position No. IV, only the restricted port 11 is connected to the port 7, so that the rate of flow down in this position corresponds with the capacity of the port 11.

With the above described construction, the ultimate pressure of fluid retained in the brake cylinder is low, since the single retaining valve 3 is set at a low pressure, but at the same time, the varying rates of blow down permit the holding of a relatively high pressure in the brake cylinder for a sufficient period of time to accomplish the desired purposes of the usual high pressure retaining valve.

Since the ultimate pressure retained in the brake cylinder is low, the train may be more easily started from rest on a grade, and the train may be moved over let-ups in grade with greater facility.

By reason of the slow rate of blow down available, more time is given within which the recharge of the system with fluid under pressure may be effected without releasing the brakes when the brake valve is moved to release position.

For heavy grade work with loaded cars the retaining valve device may be set to position No. II in which only the smaller restricted port 12 provides communication for the exhaust of fluid from the brake cylinder. For lighter grades, position No. IV may be employed, in which the larger restricted port 11 provides communication for the release of fluid from the brake cylinder, while for still lighter service, position No. III may be employed, in which both restricted ports 11 and 12 are cut in.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A retaining valve device comprising a retaining valve for retaining a relatively low pressure in the brake cylinder, a restricted port, and a manually operated valve for controlling communication from the brake cylinder past said retaining valve and through said restricted port to the atmosphere.

2. A retaining valve device comprising a retaining valve for retaining a predetermined low pressure in the brake cylinder, a plurality of restricted ports, and a manually operated valve for controlling communication from the brake cylinder past said valve and through said ports to the atmosphere.

3. A valve for retaining fluid pressure in the brake cylinder, a manually operated valve for controlling communication from the brake cylinder past said retaining valve to the atmosphere, and a plurality of restricted ports controlled by said manually operated valve in different positions for varing the rate of exhaust from the brake cylinder.

4. A retaining valve device comprising a retaining valve for retaining a predetermined pressure in the brake cylinder, a plurality of restricted ports of different flow capacities, and a manually operated valve for establishing communication from the brake cylinder through one or more of said ports to the atmosphere.

In testimony whereof I have hereunto set my hand.

WILLIAM E. DEAN.