W. K. RANKIN.

EMERGENCY VALVE.

APPLICATION FILED JAN. 7, 1908.

903,502. Patented Nov. 10, 1908.

Fig. 1

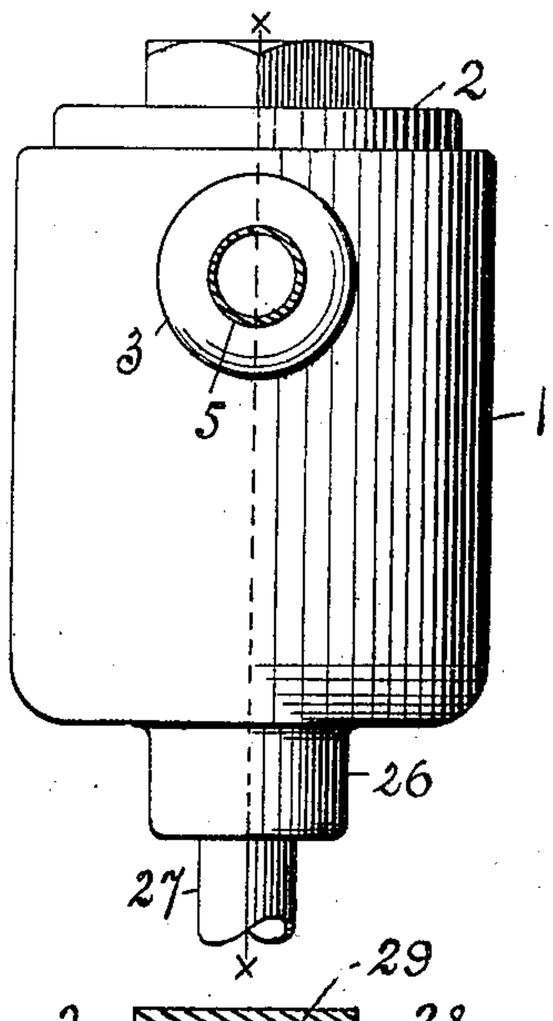

Fig. 2

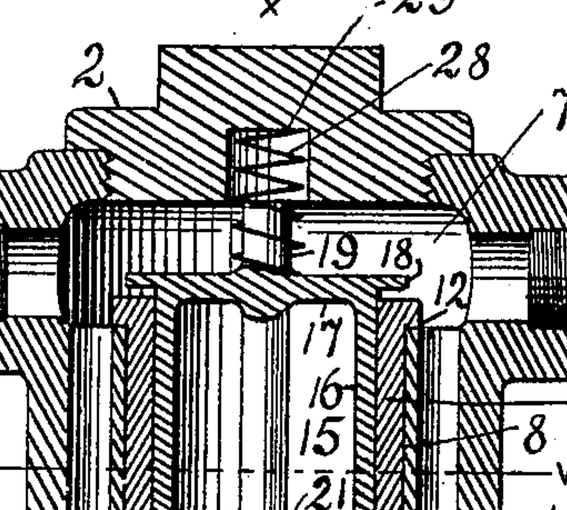

Fig. 3

Witnesses.
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EMERGENCY-VALVE.

No. 903,502. Specification of Letters Patent. Patented Nov. 10, 1908.

Application filed January 7, 1908. Serial No. 409,679.

To all whom it may concern:

Be it known that I, WILLIAM K. RANKIN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Emergency-Valves, of which the following is a specification.

This invention is for a valve to be introduced in the train pipes of a line of cars to permit of a quick reduction of the train line pressure.

The invention is illustrated in the accompanying drawing in which similar parts bear the same reference characters and wherein

Figure 1 is an exterior elevation view. Fig. 2 is a vertical section on line X X Fig. 1. Fig. 3 is a horizontal section on line V V Fig. 2.

Casing 1 has a top cover 2 screwed thereto, and bosses 3, 4 into which are screwed pipes 5, 6 for a direct fluid pressure passage through and to an upper chamber 7 in the casing. Within the casing there is a circular seat 8 vertically disposed between the upper chamber 7 and a bottom chamber 9; connecting chambers 7 9 there are a series of passages 10 which permit free fluid flowing so that the pressure entering chamber 7 by pipe 5 (or 6) also freely enters the chamber 9.

A cup shaped valve seat, comprising a circular wall 11 fits into seat 8, it has a flange 12 at its upper end resting on and above seat 8, and a bottom head 13 with a central boss or hub 14. Within the valve seat there is an inverted-cup valve 15, having an annular wall 16, a closed top 17 with a projecting flange 18, and integral with top 17 an upwardly projecting boss 19 and a downwardly projecting stem 20. Stem 20 passes through hub 14 without contact, as the hub bore is enlarged sufficiently to form an annular passage 21 around the stem for fluid flowing into valve 15, so that under normal conditions the pressure within chambers 7, 9 and valve 15 are equalized.

Secured to the lower end of stem 20 there is a disk valve 22 having a ring 23 of soft material seated upon a bushing 24 forced into case 1 around an opening 25 of a hub 26 into which is screwed a pipe 27 which may lead to a brake cylinder (not shown) or to the atmosphere. A spring 28 around boss 19 and in pocket 29 of cover 2 bears upon top 17 of valve 15. Under the usual or normal conditions of brake service the pressure in chambers 7, 9 being continuously uniform, will flow through passage 21 into valve 15, and the pressure within the valve 15 and chambers 7, 9 will be equal. But when there is an emergency application of the brakes and the consequent sudden and rapid reduction of pressure in chambers 7, 9 the annular passage 21 is not of sufficient area to permit a rapid flow from within valve 15, and in consequence the fluid confined in the valve 15 expands and forces the valve upwards, carrying up disk valve 22, opening passage 25 and thereby making a reduction in the train pipe, simultaneously for each car in the train. Spring 28 and the larger area of valve 22 than passage 25 tend to keep the passage closed, under normal pressure conditions.

I claim—

1. In an emergency valve, a case with upper and lower communicating chambers; a fluid pressure entrance and exit for the upper chamber; a fluid pressure exit for the lower chamber; a disk valve covering the exit; a vertically operative inverted-cup valve connected to the disk valve for coöperative action; a restricted fluid pressure passage to the cup valve and whereby the interior of the cup valve is subjected to the same normal fluid pressure as exists in the chambers aforesaid, and whereby, owing to the restriction of the passage, a sudden reduction of pressure in said chambers will prevent a quick reduction in the valve, resulting in an expansion of the confined pressure, the lifting of the valves, and the opening of the exit passage from the lower chamber.

2. An emergency valve comprising a case containing an upper chamber with a fluid pressure inlet thereto and exit therefrom; a lower chamber having a fluid pressure exit therefrom and separated from the upper chamber by an inverted cup shaped valve seat; multiple fluid pressure passages between the chambers; an inverted and vertically movable cup valve having an enlarged top and resilient pressure means above the valve; a restricted fluid pressure passage to the interior of the valve; a valve covering the fluid pressure exit from the lower chamber, coöperatively connected to the cup valve, and a seat of soft material therefor.

3. An emergency valve of cylindrical formation having a head exposed directly to normal fluid pressure within a chamber of an inclosing case whereto there are inlet and outlet fluid pressure passages, and an open end exposed by a restricted passage to a second chamber in the same case having the same normal fluid pressure as the first named chamber; a fluid pressure passage from the last named chamber; a valve controlling the passage and resilient means for the closure; and means for the coöperation of the valves and the opening of the fluid pressure exit from the last named chamber, when, by a sudden reduction of pressure in the chambers the pressure within the cylindrical valve expands owing to the restricted means aforesaid which prevents a quick reduction of its contained pressure.

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

WILLIAM K. RANKIN.

Witnesses:
LEWIS H. REDNER,
R. C. WRIGHT.