J. E. OSMER.

ENGINEER'S VALVE.

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978,393.

Patented Dec. 13, 1910.

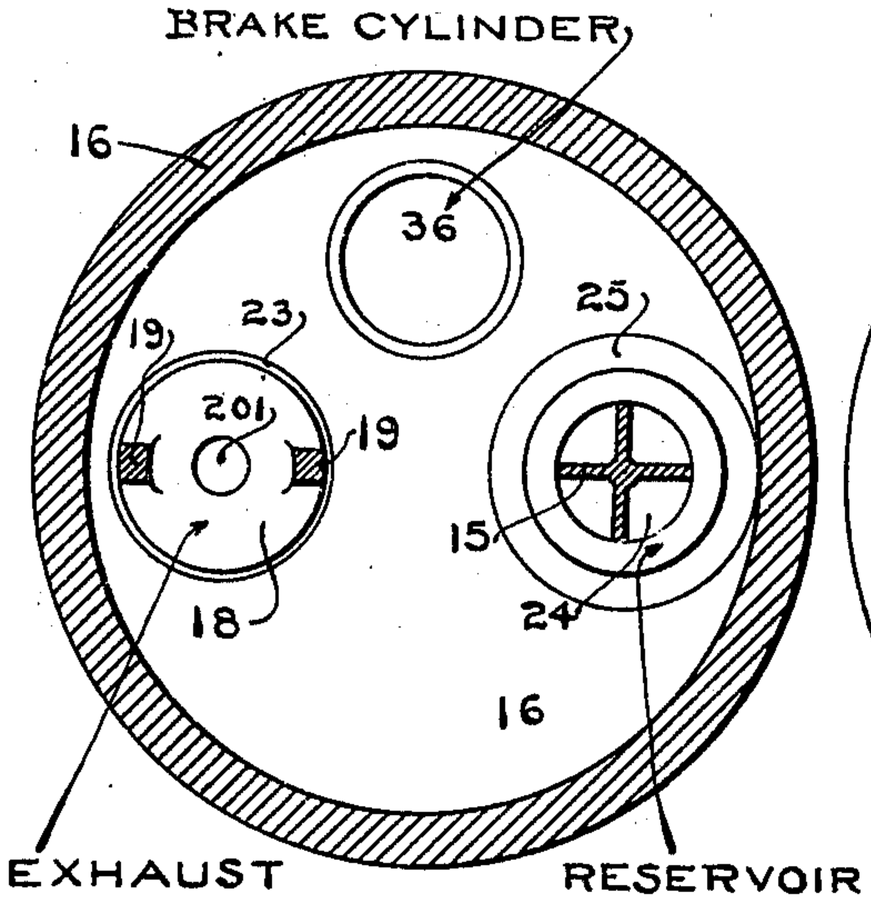


FIG. 2.

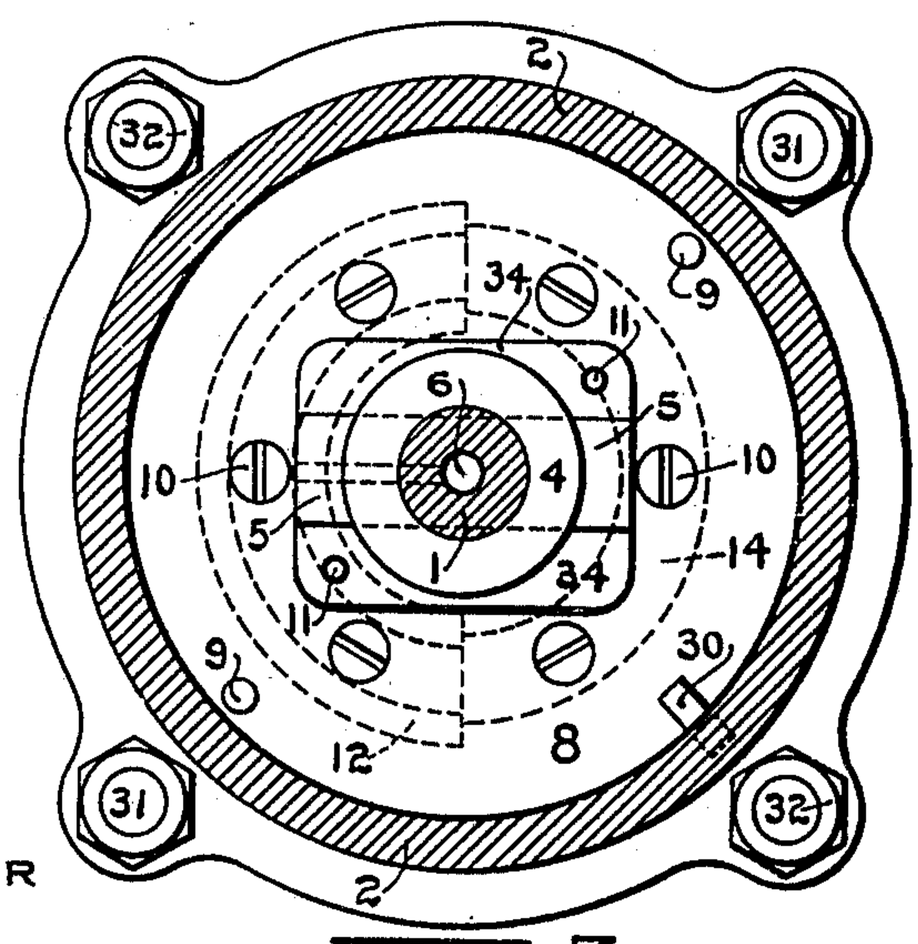


FIG. 3.

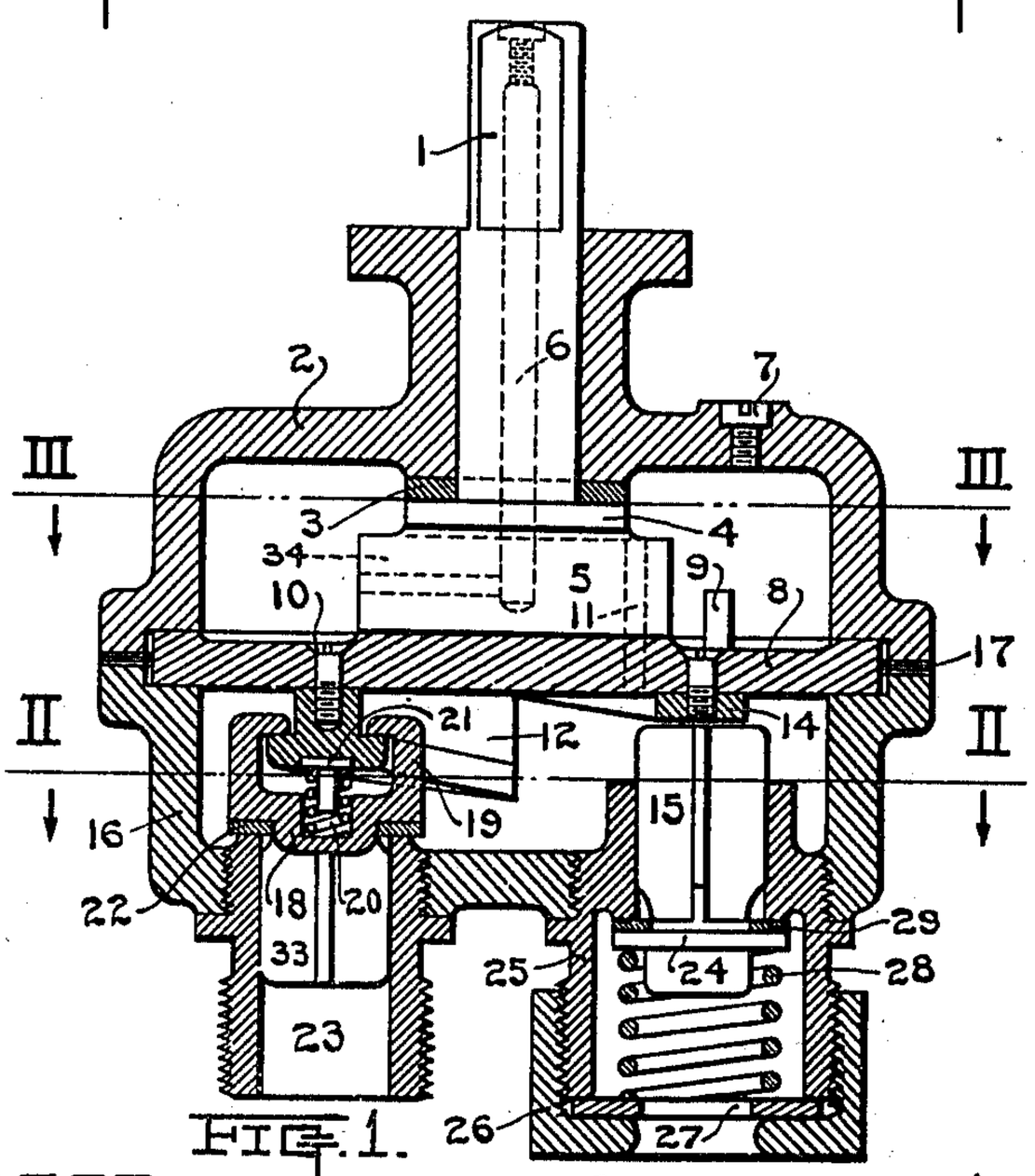


FIG. 1.

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# UNITED STATES PATENT OFFICE.

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## ENGINEER'S VALVE.

978,393. Specification of Letters Patent. **Patented Dec. 13, 1910.**

Application filed July 11, 1910. Serial No. 571,318.

*To all whom it may concern:*

Be it known that I, JOHN E. OSMER, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a certain new and useful Improvement in Engineers' Valves, of which the following is a specification.

This invention relates to improvements in the construction of engineers' valves for fluid pressure brakes, and particularly to engineers' valves adapted to be used with either straight or automatic air brake systems.

The object of the invention is to provide an engineer's valve which is simple in construction and efficient in operation.

In engineers' valves as heretofore produced, it has been customary to construct the valve proper so that its opening or closing necessitated a sliding of the valve upon the valve seat. Such construction caused a great deal of undesirable wearing to occur along the contact surface between the valve and valve seat, and therefore unavoidably prevented the maintenance of perfect coaction between these elements. In the present invention the valves in opening are lifted away from their seats rather than being slid over same, thus preventing the occurrence of unnecessary wear between the elements. During the closing operation of the valves, the valves are brought toward the seats and contact with same only after the valve is entirely closed.

A clear conception of one embodiment of the invention can be obtained by referring to the accompanying drawing in which like reference characters designate the same or similar parts in like or different views.

Figure 1 is a central vertical section through an engineer's valve built in accordance with the invention. Fig. 2 is a horizontal transverse section through the device shown in Fig. 1, the section being taken along the line II—II of Fig. 1 looking in the direction of the arrows. Fig. 3 is a similar section taken on the line III—III of Fig. 1 looking in the direction of the arrows.

The casing of the engineer's valve consists essentially of a body cap 2 and body base 16, which cap and base are separated by a gasket 17. The fastening of the cap 2 to the body base 16 is by means of bolts 31 and nuts 30 coacting therewith. The stem 1 is mounted concentrically within the body cap 2 and has its upper end projecting from said cap, the outwardly projecting portion being adapted to receive the operating handle of the valve. The collar 4 is formed in one with, and at the lower end of the stem 1. The transverse key or rectangular portion 5 is also formed in one with the stem 1 and projects downwardly from the collar 4. The upper surface of the collar 4 coacts with a washer 3, which washer in turn coacts with the lower surface of the body cap 2. The washer 3 is made of leather or other suitable packing material. A conduit 6, which is normally closed at its upper end by means of a cap screw or other device, is formed concentric with the stem 1 and has its lower end connected to the interior of the body cap 2 by means of a horizontal passage formed through the rectangular portion 5.

A plate or disk 8 is fitted between parallel surfaces formed one at the lower end of the cap 2, and the other at the upper end of the body base 16. The disk 8 has upwardly projecting parallel lugs 34 formed thereon. The groove formed between the lugs 34 has parallel sides which coact with corresponding parallel sides of the portion 5 of the stem 1. Vertical passages 11 pass through the lugs 34, thus forming a communication between the interiors of the cap 2 and base 16. The pins 9 project vertically upward from the disk 8 and are placed one hundred eighty degrees apart. The pin 30, see Fig. 3, projects radially inward from the body cap 2 and is in such position that a rotation of the disk 8 of ninety degrees will cause either of the pins 9 to strike the pin 30.

The valve seat 23, which is screw threaded into the lower portion of the base 16, has its interior bored to receive guides 33 formed at the lower portion of the valve 18. The valve 18 has an annular seating portion 22 formed thereon, which seating portion coacts with the upper portion of the valve seat 23. Hook shaped arms 19 project vertically upward from the valve 18, the upper or hooked end of these portions 19 extending inwardly. The T-shaped track or wedge 12 is semicircular in form and is fastened to the lower surface of the disk 8 by means of screws 10. The surface of coaction of the projections 19

with the wedge 12 is helical in form. A helical spring 20 coacts at its lower end with the upper portion of the valve 18 and with its upper end against a guide 21, which in turn coacts against the lower surface of the wedge 12. The spring 20 is maintained in position upon the valve 18 by its insertion in the socket 201 formed in the valve 18.

The valve seat 25 is screwed into the lower portion of the base 16 and is bored at its upper end to receive the guides 15 formed on the valve 24. The valve 24 is provided with a seating portion 29 which coacts against an annular horizontal surface formed on the valve seat 25. The upper end of the guide 15 coacts with the lower helical surface of the wedge 14. The wedge 14 is semicircular in form and is fastened to the lower surface of the disk 8 by means of screws 10. The helical spring 28 coacts against the lower surface of the valve 24 and against an upper surface of the washer 27, thus tending to keep the valve 24 seated. The washer 27 is kept in coaction with the lower portion of the valve seat 25 by means of a lock nut 26.

The opening or passage 36 is formed through the bottom of the base 16 and forms a communication between the interior of the base 16 and the brake cylinder air passage or brake pipe. The lower portion of the valve seat 23 is suitably connected to the exhaust air passage of the system. The lower portion of the lock nut 26 is suitably connected with the reservoir or air supply passage of the system.

During the operation of the valve in connection with a straight air brake system, air under pressure is furnished through the connection leading to the lock nut 26 and passes to the chamber formed in back of the valve 24. As the valve stem 1 is rotated in an anticlockwise direction, the thickness of the portion of the wedge 14 which coacts against the upper end of the guide 15 increases, thus forcing the valve 24 away from the valve seat 25 and permitting the air under pressure to pass into the interior of the valve body or casing. Due to nonobstruction of the passage 36, the air admitted to the interior of the valve casing passes freely through the passage 36 to the brake cylinder to which this passage normally connects. Such passage of air under pressure to the brake cylinder will cause a setting of the brakes.

If it is desired to release the brakes, the handle 1 is rotated in a clockwise direction until lap position, in which position the valve is shown in Fig. 1, is reached. Upon continued clockwise rotation, the wedge 14 ceases its coaction with the end of the guide 15, shortly after which event the wedge 12 takes effect upon the projections 19 of the valve 18. The clockwise shifting of the wedge 12 when in coaction with the projections 19, causes the wedge 12 to lift the valve 18 away from the seat 23, thus opening same and forming a communication between the exhaust air passage to which the valve seat 23 normally connects and the interior of the valve casing. Since the interior of the valve casing is at all times in communication with the brake cylinder, an opening of the valve 18 with the valve 24 in closed position, will cause a free exhaust or release of the air from the brake cylinder. With the valve stem 1 in lap position, both valves 18, 24, are closed there being no communication between either the air supply or the free exhaust and the interior of the brake cylinder.

In using the valve in connection with automatic air brake systems, the passage 36 is connected with the brake pipe of the system. The brakes in this case are set by opening the valve 18, or, in other words, by clockwise rotation of the valve stem 1 from lap position. This opening of the valve 18 causes a reduction of pressure in the brake pipe which connects with the passage 36, thus operating the triple valve and setting the brakes. The release of the brakes is accomplished by re-charging the brake pipe connecting with passage 36, this recharging resulting from the opening of the valve 24.

The lubrication of the valve is accomplished by the admission of oil into the chamber formed within the cap 2, through the conduit 6 or through an opening in the cap 2 which is normally closed by the set screw 7. The oil thus admitted to the cap 2 collects above the disk 8 and is held there on account of the upward pressure exerted against the disk 8 by the spring 20 and the air under pressure within the base 16. During coaction of the guide 15 with the wedge 14, the spring 28 also serves to force the disk upward. As the disk 8 is rotated the oil contained above it eventually seeps through the joint formed between the disk 8 and cap 2, thus thoroughly lubricating the surface of coaction between these elements. By locating the passages 11 so that they emerge from the projections 34 at their upper ends, the oil contained above the disk 8 is prevented from flowing through these passages 11 into the base 16.

It is not essential to have a separate cap 2, stem 1, and disk 8, as shown, as the disk 8 which carries the wedges 12, 14, could be rotated directly upon the valve base 16, the operating stem in this case being attached directly to the disk 8. Such construction would necessitate thorough packing of the joint between the disk 8 and the body base 16, against the flow of air under pressure established and acting between these elements. With the construction shown, such unnecessary packing is avoided and the pressure on either side of the disk 8 is balanced.

It will also be noted that it is not essential to have but two valves 18, 24, as herein shown.

It should be understood that it is not desired to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

It is claimed and desired to secure by Letters Patent,—

1. In an engineer's valve, a plurality of ports, a valve controlling each of said ports, a separate wedge for opening each of said valves, each of said wedges being spaced from its corresponding valve, and means for shifting each of said wedges in contact with its corresponding valve to open same.

2. In an engineer's valve, a plurality of ports, a valve controlling each of said ports, a separate wedge for opening each of said valves, and means for simultaneously moving said wedges, the one to open one of said valves and another to permit closing of another of said valves.

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

JOHN E. OSMER.

Witnesses:
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G. F. De Wein.