No. 885,578 PATENTED APR. 21, 1908.

J. C. BOWERS.

SAFETY DISCHARGE VALVE MECHANISM.

APPLICATION FILED JAN. 28, 1908.

Fig. 1.

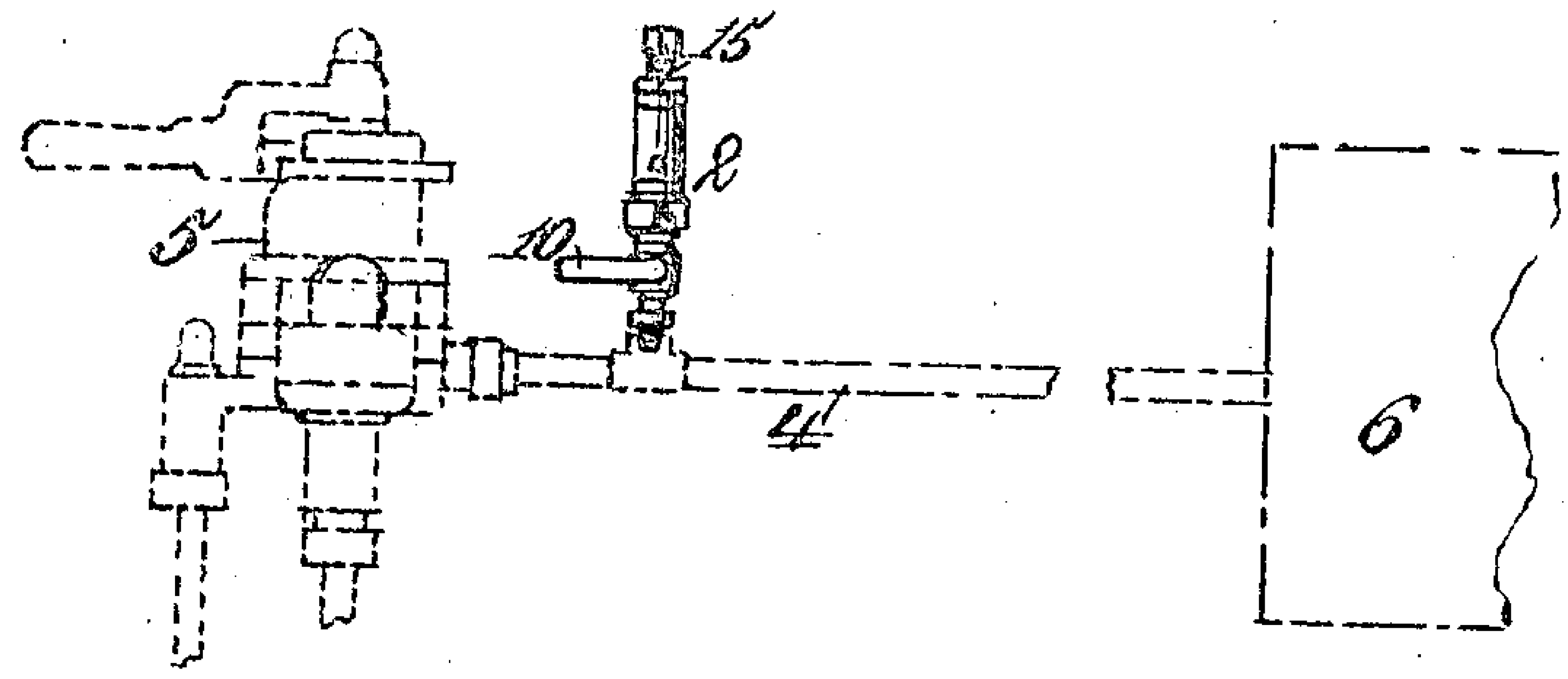


Fig. 2.

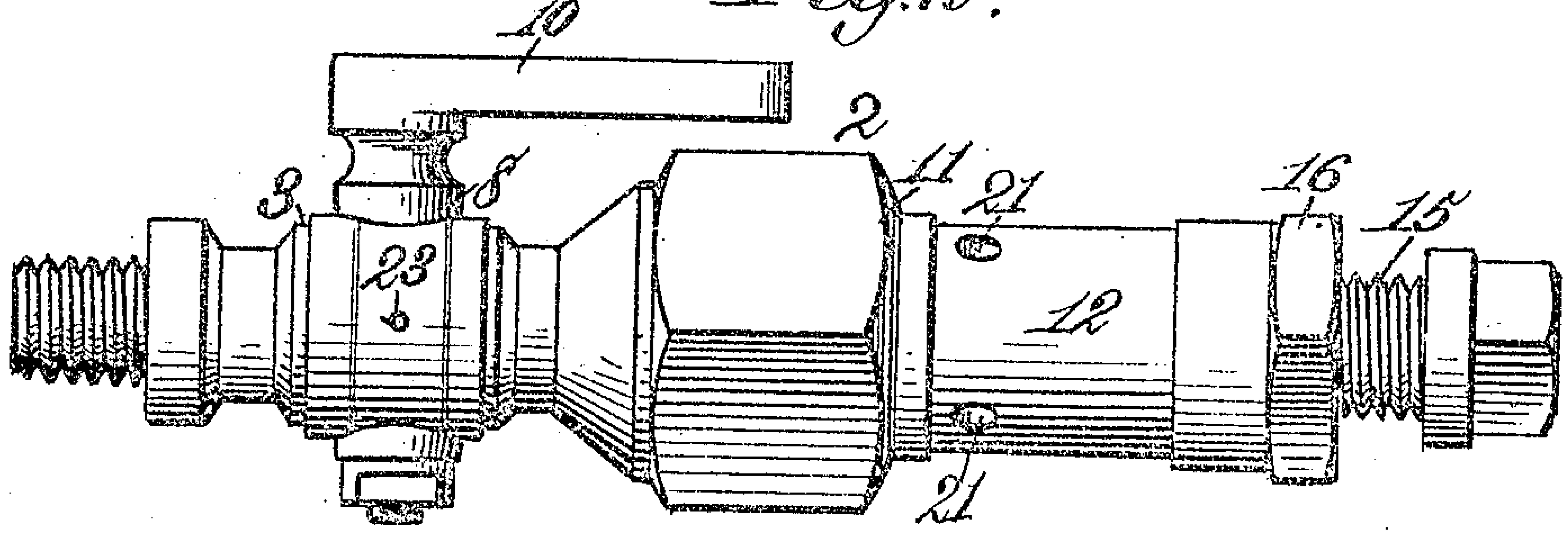


Fig. 3.

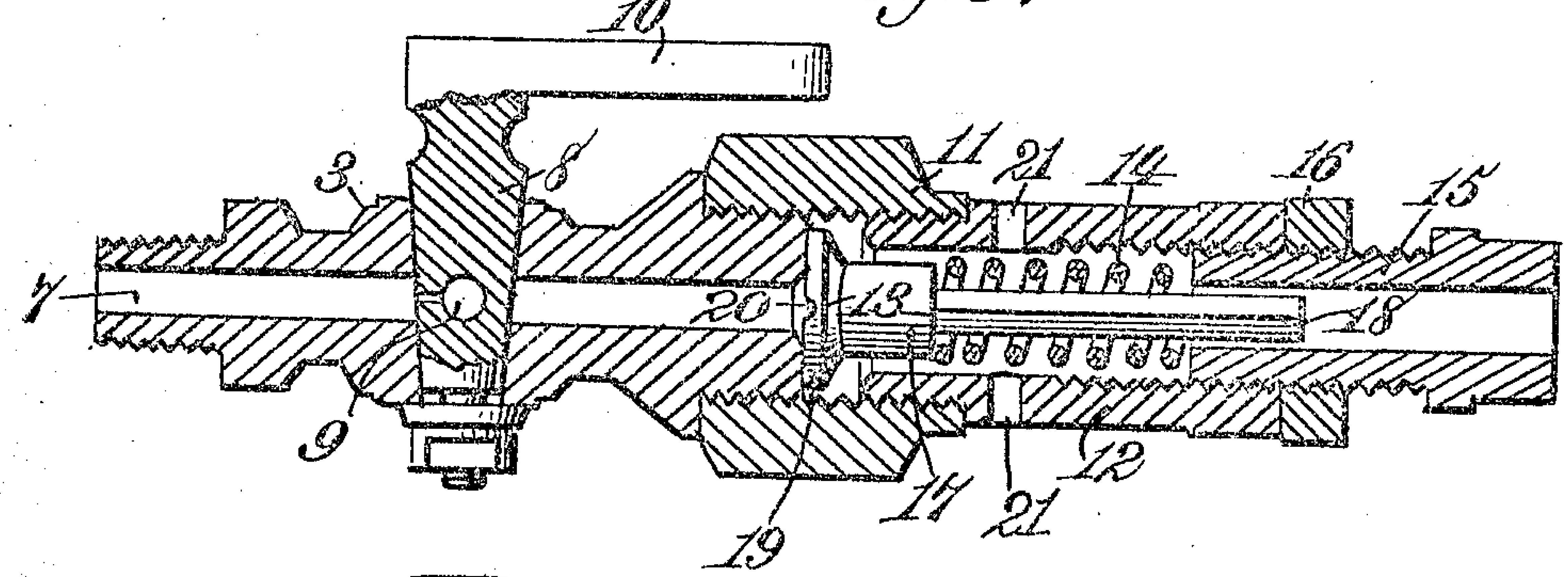


Fig. 4.

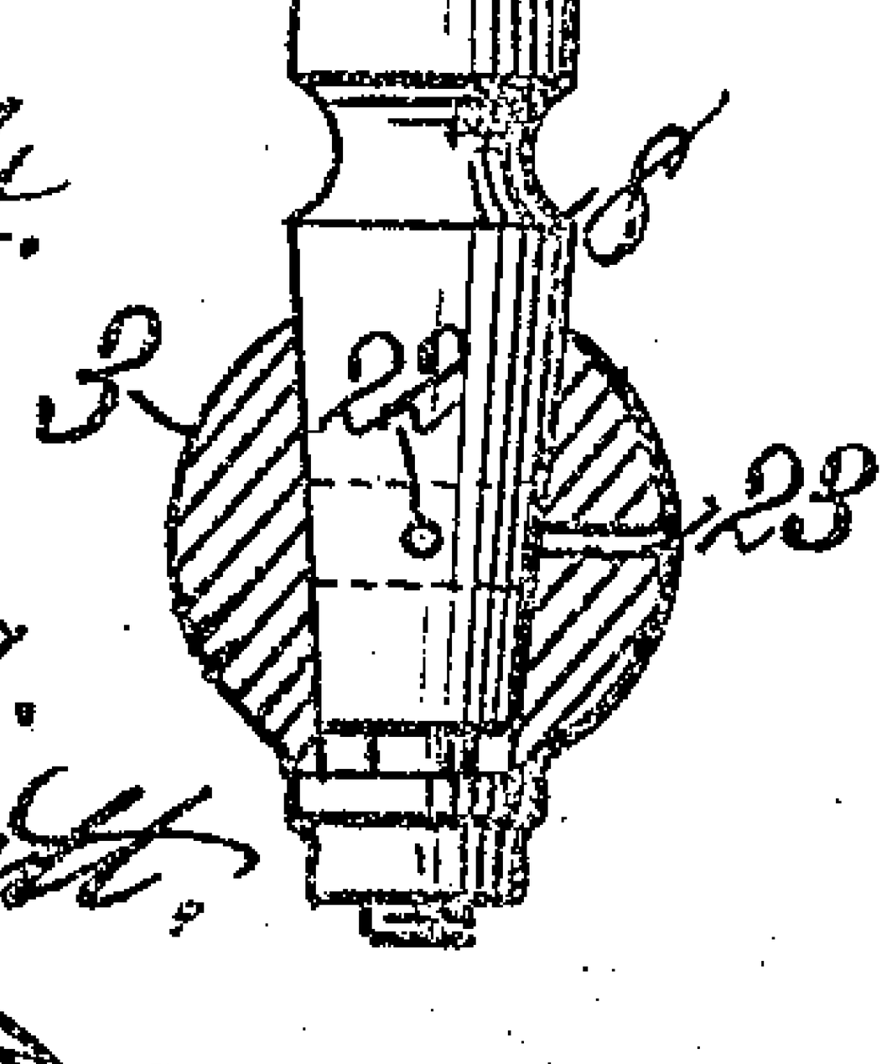
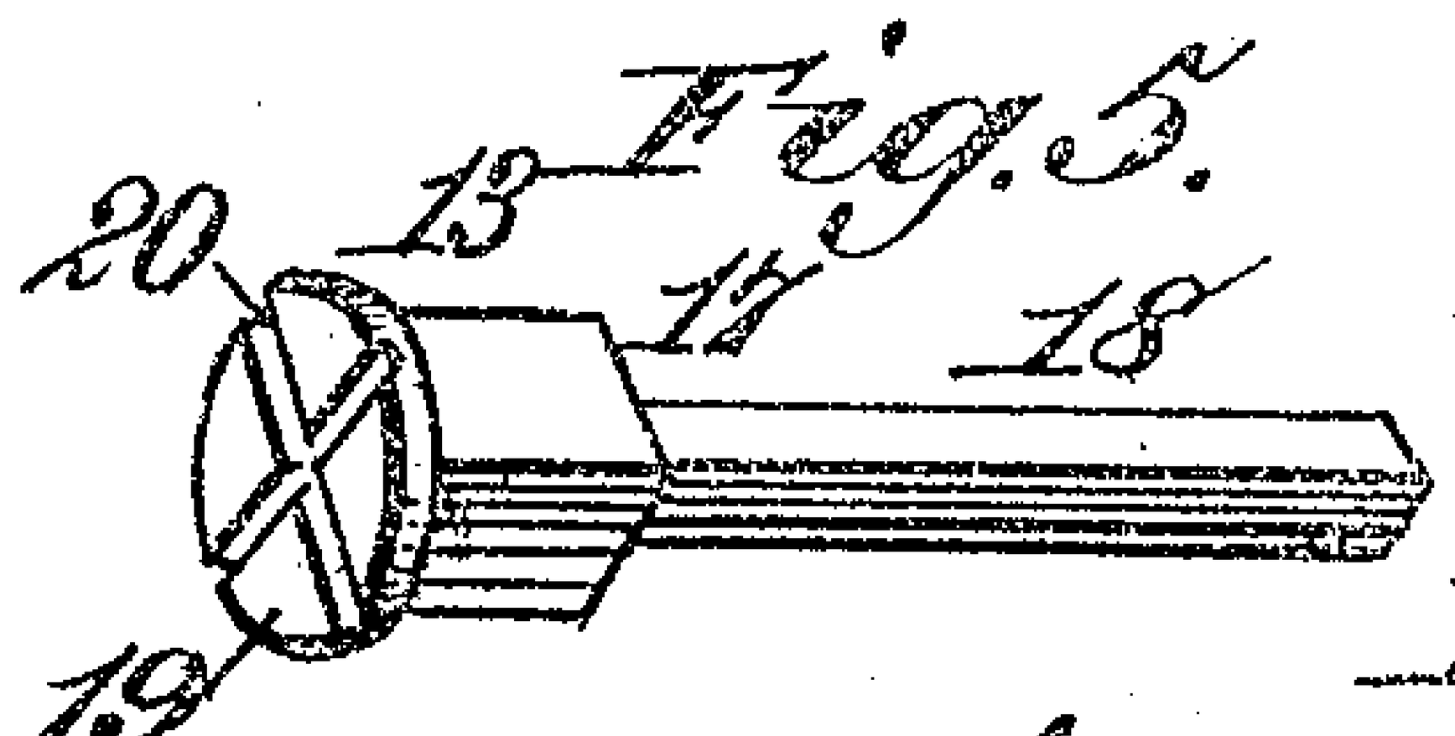


Fig. 5.



Witnesses.
Robert Everett.
[illegible]

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By James L. Norris,
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UNITED STATES PATENT OFFICE.

JOHN C. BOWERS, OF TAYLOR, TEXAS, ASSIGNOR OF ONE-HALF TO JOHN F. BLACK, OF TAYLOR, TEXAS.

SAFETY-DISCHARGE-VALVE MECHANISM.

No. 885,578. Specification of Letters Patent. Patented April 21, 1908.

Application filed January 28, 1908. Serial No. 413,024.

To all whom it may concern:

Be it known that I, JOHN C. BOWERS, a citizen of the United States, residing at Taylor, in the county of Williamson and State of Texas, have invented new and useful Improvements in Safety-Discharge-Valve Mechanism, of which the following is a specification.

This invention relates to safety discharge valve mechanism adapted primarily for connection with air brake apparatus, the object of the invention being to provide a simple and effective device of this character which is operative automatically to cause the discharge of air from the train line or pipe to an extent sufficient to obtain the application of the brakes when the pressure in said train line has been gradually reduced through leakage, pump stoppage or from any other cause not noticed by train men, to a point which would endanger safety in operation of the train.

In the drawings accompanying and forming part of this specification, I show in detail one simple form of embodiment of the invention, which, to enable those skilled in the art to practice the same, will be set forth in detail in the following description while the novelty of the invention will be included in the claims succeeding said description.

Referring to said drawings:—Figure 1 is an elevation on a reduced scale of safety discharge valve mechanism involving my invention, and showing the same operatively connected with a pipe connecting the engineer's brake valve and equalizing reservoir; Fig. 2 is an elevation on an enlarged scale of the device; Fig. 3 is a longitudinal sectional view of the same; Fig. 4 is a transverse section taken through the device at the manually operable valve; and Fig. 5 is a perspective view of the automatically operable valve.

Like characters refer to like parts throughout the several figures of the drawings.

The different operative parts of the device are inclosed by a casing as 2. This casing is composed of several parts, one of which is a valve body as 3 shown as externally threaded at one end for connection to a pipe as 4 connecting the engineer's brake valve 5 and equalizing reservoir 6. The engineer's brake valve 5, the equalizing reservoir 6 and pipe connection 4 may be and preferably are of well known construction, for which reason they need not be described in detail.

The valve body 3 is represented as having a longitudinal passage or bore as 7 across which the plug valve 8 extends, said plug valve having a port as 9. When the valve 8 is closed, its port 9 is out of register with the passage or bore 7 which latter, as will be clear, is in communication with the pipe 4. When said valve is open the port 9 and passage 7 coincide. I have shown the valve 8 as closed in Fig. 3, and the reason for this will hereinafter appear. The valve 8 is hand-operable, and for this purpose it may be provided with an arm or lever as 10 preferably arranged adjacent to the handle of the engineer's brake valve 5.

To the outer end of the valve body 3 there is shown as connected by a threaded joint the nut or sleeve 11 and into the same is threaded the tube 12, the sleeve or nut 11 and tube 12 constituting a boxing for the automatically operable valve designated in a general way by 13 and the operating spring 14 for said valve. Into the outer end of the tube 12 is fitted a hollow screw 15 surrounded by the jam nut 16 which abuts in practice solidly against the tube 12. Said tube 12 with the screw 15, sleeve or nut 11 and valve body 3, constitute in the present instance such a casing as that to which I have hereinbefore briefly referred for inclosing the different working parts of the device. One end of the spring 14 abuts against the screw 15, while the opposite end thereof abuts against the body 17 of the valve 13, said spring surrounding the stem 18 of said valve. The head or operative portion of the valve is denoted by 19, and it is of substantially circular or disk form, it having on the inner face thereof the similar intersecting grooves or relief passages 20, the function of which will be hereinafter set forth. The valve stem 18 moves longitudinally of and within the tube 12 and screw 15. By the manipulation of said screw 15, the tension of the spring 14 can be regulated so as to obtain the automatic action of the valve 13 in opposition to a predetermined amount of pressure. The tube 12 is shown as having two relief openings, each designated as 21, which communicate with the atmosphere, and the opening through the screw 15 may also serve as a relief port.

During normal action the valve 8 will be open, so that the pressure of the equalizing reservoir 6 can, through the pipe or other connection 4, act against the inner face of the

valve 13 for the purpose of holding the tapered portion 22 of said valve against a correspondingly shaped seat at the inner end of the tube 12, this being the closed and normal position of said valve 13; that is, when the valve 13 is in such relation it shuts the passage 7 off from the atmosphere. It will be assumed that a low pressure is present in the reservoir 6 and that the spring 14 has been adjusted to overcome this lower pressure. As soon as this result takes place, the spring 14 becomes effective for moving the flat inner face of the valve 19 against the outer flat face of the valve body 3, whereby the ports 21 are put into communication with said passage 7. When this occurs air can flow from said passage 7 through the crossing channels 20 into the sleeve or nut 11, then into the tube 12 and through the ports 21 to the atmosphere, thereby obtaining such a reduction of air pressure as to effect the setting of the brakes. This action occurs in a rapid manner and, when it ensues, the attention of the engineer or other individual is at once called to any defect that requires remedying in the system. So long as the normal or prescribed pressure is maintained in the system the device is not operative and does not affect the usual operation of the brake devices in any manner whatsoever regardless of the position of brake valve handle whether the latter be at full release, running or lap position.

In charging the train line, the valve or cock 8 should be closed until the pressure in the passage 7 will overcome the spring 14, at which time said valve 8 is opened. I provide, as will now appear, means for positively indicating to a train man the fact that the valve 8 is closed. In said valve or cock 8 is a port 22 of small diameter communicating with the port 9 and which when the valve 8 is closed, is adapted to receive air from the inner side of the passage 7, such air passing through said port 22, through the port 9 and escaping laterally through a tell-tale port as 23 in the valve body 3, with which said tell-tale port 23 the main port 9 is adapted to register when the valve 8 is closed, as shown in Figs. 3 and 4. Should therefore, the valve or cock 8 be inadvertently left closed, the engineer will be at once apprised of this fact by the blowing of air through the tell-tale port 23, which air passes from the passage 7 successively through the ports 22, 9, and 23.

It will be clear from the foregoing description taken in connection with the annexed drawings that I combine with the equalizing reservoir, engineer's brake valve, and intermediate pipe connection, a casing in communication with said pipe connection or equivalent part of whatever character it may be. In this casing is mounted a valve held to its seat normally by pressure of air in said equalizing reservoir to prevent the escape to atmosphere of pressure. In conjunction with this valve I provide means such as a spring acting against the same and of such a nature as to move said valve away from said seat when the pressure in the equalizing reservoir has been lowered to a certain point, at which time the air from the reservoir can pass to the atmosphere by way of a suitable duct through said casing, which duct, as will be clear from what has been stated, is constituted in the present instance by several passages or ports.

I prefer that the casing 2 containing the valve 8 be placed in the cab of an engine so that the handle, lever, or arm 10 of said valve will be freely accessible to the engineer operating the customary brake valve 5. The automatically operative valve can act under normal conditions no matter what the position of the engineer's brake valve may be, whether in full release or any other position, to effect under the conditions hereinbefore set forth the setting of the brakes. The safety valve 13 can be made to operate by the action of its spring at any desired pressure; in other words, the opening of the said safety valve can be regulated by the adjustment in tension of the spring 14. It will be understood that the safety valve 13 is not cut in for operation until the pressure in the reservoir 6 has been pumped up to exceed the tension of the spring 14. When such pressure is reached the valve 8 is opened so that the air can act against the valve 13 to force the same against its seat on the tube 12 and thereby cut the reservoir 6 off from the atmosphere. It will be assumed that a train equipped with a device such as that hereinbefore described is running and that air commences to escape to atmosphere by way of safety valve mechanism. This calls attention to the fact that air is being reduced below pressure at which the said safety valve is set, and this warning will be given before the brakes are applied. If it is desired to not stop the train the valve 8 is closed and the pressure in the reservoir 6 is elevated up to a point sufficient to hold the safety valve to its seat, at which time the valve 8 is opened to permit the pressure to act against the safety valve to again force the latter to its seat and in readiness for service as before.

What I claim is:

1. The combination of the equalizing reservoir, engineer's brake valve, and intermediate connection of an air brake system, a casing in communication with said reservoir, a valve in said casing, normally held to its seat by pressure of air in said reservoir, to prevent the escape of air to atmosphere, and means acting against said valve to permit the air to pass to atmosphere when the pressure in the reservoir passes below a certain point.

2. The combination of a casing having an

air passage, a valve in said casing held closed against its seat by pressure of air in said passage, means to force the valve away from said seat when the pressure in said passage is reduced to a certain point, and a second valve for controlling the flow of air through said passage, said second valve having means cooperative therewith for putting the pressure side of the passage into communication with the atmosphere when said second valve is closed.

3. The combination of a casing having an air passage, a valve in said casing held closed against its seat by pressure of air in said passage, a spring to force the valve away from its seat and against the outlet end of said passage when the pressure of air therein is reduced to a predetermined point, and a second valve having a port adapted to register with said passage when said second valve is opened, the second valve having a second port and the casing having a tell-tale port, said second port and said tell-tale port being adapted to register when said second valve is closed.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN C. BOWERS.

Witnesses:
H. S. SMITH,
G. D. PATTERSON.