J. M. BAKER.

PLAY PIPE FOR USE WITH FIRE HOSE.

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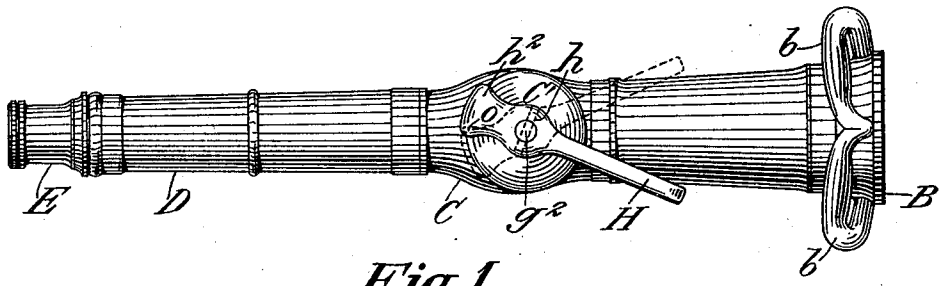


Fig. 1.

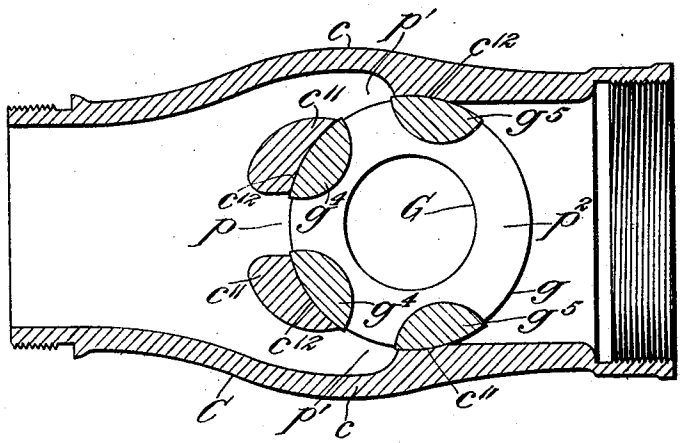


Fig. 2.

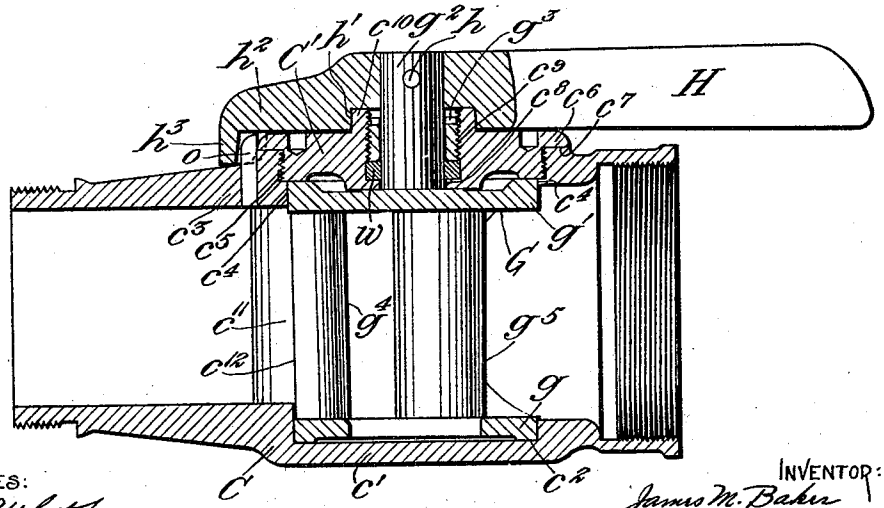


Fig. 3.

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PLAY-PIPE FOR USE WITH FIRE-HOSE.

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To all whom it may concern:

Be it known that I, JAMES M. BAKER, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Play-Pipes for Use with Fire-Hose, of which the following is a specification.

My invention relates to play-pipes for use on high-pressure fire-hose and consists particularly of improvements in the structure and arrangement of the controlling-valve therefor.

The particular object of my improvement is to provide a device of this type with a control-valve adapted to prevent the force of the water passing therethrough from causing the pipe to "kick" or "pull back" when held in the hands of the operator.

A further object of the improvement is to adapt the control-valve for easier and more convenient manipulation in turning on and shutting off the water, and to prevent the force of the stream from causing the pipe to be jerked or thrown about during this operation.

The manner and means for carrying out my improvement are fully described in the following specification, illustrated by the accompanying drawings, in which like reference characters designate like parts.

In the drawings:—Figure 1 is a plan view of the complete play-pipe comprising several coupled sections, in one of which is embodied my improved control-valve which forms the essential feature of the invention; Fig. 2 is an enlarged, sectional view taken in a horizontal plane extending through the center of the valve-housing; and Fig. 3 is a similar, sectional view in a vertical plane extending through the axis of the valve.

Referring first to Fig. 1 of the drawings, I have here illustrated a play-pipe of conventional design with my improved valve-construction applied thereto. As usual in devices of this type the pipe is constructed of a plurality of parts or sections coupled together by means of screw-threaded joints at their ends.

B designates the butt end of the pipe which is adapted to be screwed onto the coupling at the end of the hose and is usually provided with handles *b*, *b* for convenience in holding it in operation; C represents the mid-section or housing in which the control-valve is seated; D is the delivery section through which the water is directed after passing through the valve; and E is the nozzle for regulating the size of the stream. Usually the nozzle E is made separate from the delivery section D so that it may be detached to allow for the substitution of other nozzles having different sizes of outlet orifices.

My improvements are applied directly to the valve-section C of the pipe which is shown in detail in the enlarged views, Figs. 2 and 3. Referring to Fig. 2, the side-walls of the section or valve-housing C are bellied out at *c*—*c*, while the bottom wall *c'* is formed substantially flat and provided with a circular depression or valve-seat c^2, see Fig. 3. The upper wall or top c^3 of the housing C is also substantially flat in cross-section and is provided with a circular valve-seat c^4, slightly larger than the seat c^2. Extending through the top c^3 of the housing C is a still larger, circular, threaded opening c^5 adapted to receive the flanged cover-plate or cap C'. Preferably, the flange c^6 of the cap C' is machined on its under side to adapt it to be screwed snugly against the finished face c^7 of the wall c^3 of the housing C to provide a water-tight joint therebetween.

The valve-plug or gate G, shown more particularly in Fig. 3, is inserted through the opening c^5 with its circular bottom g seating in the depression c^2, while its upper, disk-like end g' fits the bearing or seat c^4. Preferably, the circumferential, bearing surfaces of the plug G are of the usual tapered construction to adapt the valve to a snug fit in its seat. Projecting upwardly from the top of the plug G is an axial pintle or stem g^2 which is adapted to extend through a central opening c^8 in the cap C'. As shown in Fig. 3, the opening c^8 is enlarged at c^9 and adapted to receive the threaded stuffing-box gland g^3 which screws down against a packing washer *w* to provide against leakage around the stem.

Secured to the end of the valve-stem g^2 by a pin *h* is an operating-lever or handle H through which the valve-plug G is turned. Preferably, the under side of the handle H is provided with a counterbore *h'* adapted to fit over an upstanding, circular bearing c^{10} on the cap C' on which it rotates. The forward end of the handle H has an arcuate lug or projection h^2 overlapping the edge of the cap C' and formed with

an overhanging flange or lip h^3. The flange h^3 fits over the top of a detent-pin o driven into the wall of the housing C and its opposite sides are adapted to strike against the pin to limit the range of swinging movement of the handle as shown more particularly in Fig. 1.

The essential feature of my improved device resides in the novel form and arrangement of the valve-ports for controlling the flow of water through the pipe. Referring to Figs. 2 and 3, the valve-housing C is formed with a plurality of walls or barriers c^{11}, c^{11} extending vertically across its opening adjacent the valve-seats and having their rear faces c^{12}, c^{12} machined to conform to the exterior surface of the plug G. As illustrated in Fig. 2 the barriers c^{11}, c^{11} are so positioned as to leave a central port p between them and also two corresponding side ports p', p' adjacent the diverging side walls c, c of the pipe. The plug G is also formed with corresponding walls or barriers g^4, g^4 and g^5, g^5 adapted to close the ports p and p'. The barriers g^4, g^4 are fitted to turn against the finished faces of the walls c^{11}, c^{11}, and are somewhat wider than the latter in cross-section to adapt them to slightly overlap their edges. When the plug G is turned into the position shown in Fig. 2, the barriers g^4, g^4 will register with the walls c^{11}, c^{11} while the barriers g^5, g^5 will lie adjacent the side-walls of the housing C which are also machined to receive their cylindrical faces c^{12}. It will also be noted that the two barriers g^5, g^5 are so placed as to leave a relatively large opening between them which forms the inlet-port p^2 for the valve. Directly opposite the inlet-port p^2 is the central, more contracted outlet-port p, while adjacent the side-walls of the valve-housing are the two additional outlet-ports p'. The three ports p, p', p' have a combined opening equal approximately to the area of the inlet-port p^2, but it is to be noted that as the water passes through the outlet-ports the current will be divided into three separate streams. When the plug G is rotated a small fraction of a turn, about one-eighth of a complete rotation in either direction, its walls or barriers g^4 and g^5 will entirely close the ports p and p'. Preferably, the handle or turning-lever H is so arranged that when it is in the position shown by full lines in Fig. 1, the ports p, p' will be open, as illustrated in Fig. 2; while a slight movement of the handle to carry it to the position illustrated by dotted lines in Fig. 1 will serve to close the ports.

The principal object of my invention, as before explained, is to break up the stream of water passing through the valve to deflect it through separate courses. This is accomplished by providing a plurality of separated outlet-ports through which the water passes in divergent streams, and after passing through the valve the streams converge again and unite to flow through the delivery end of the pipe. In this way the force of the water against the walls of the pipe is so controlled and equalized that all tendency for it to cause the pipe to "pull back" or thrash about is eliminated. In fact, it has been demonstrated that a play-pipe provided with my improved valve can be laid in the palm of the hand while the water is playing through it and there will be absolutely no tendency for it to kick or "pull back" even under high pressure. With the type of valve usually employed in devices of this sort it requires the combined strength of several men to hold the pipe, and even then it will sometimes thrash about and get beyond control.

Another advantage of my improved valve results from the ease and convenience with which it can be manipulated to turn on or shut off the water. Through the novel arrangement of the ports of the valve the pressure of the water against its sides is balanced and equalized to such an extent as to prevent any tendency for the plug or gate G to bind or stick against turning. It has been demonstrated that a very slight pressure of the fingers is sufficient to turn the control-lever either to open or close the valve even when the pipe is under extremely high pressure.

I am cognizant of the fact that various types of balance-valves have heretofore been devised for use in throttling steam or other fluid pressure, and I am aware that some of these have been provided with a plurality of outlet-ports for the fluid passing through them. It is my belief, however, that no such device has heretofore been applied to use in a play-pipe for fire-hose, and furthermore, none of them has had the same number or arrangement of ports as that here shown. That is to say, I believe the present arrangement of one relatively large inlet-port and three separate, contracted outlet-ports, with one of the latter directly opposite the inlet-port and on the axis of the pipe, is novel. Furthermore, it is through this particular arrangement of the ports that the advantages explained above are provided, that is, the division of the flowing stream into three parts, with one of them having an unobstructed passage through the center of the pipe while the two others are deflected toward the side-walls. Through this system only can the pressure be equalized, and therefore without claiming broadly the use of a plurality of ports in the valve, what I seek protection for is the precise arrangement shown and described.

What I claim is:—

1. In a play-pipe for use with fire-hose, the combination with a valve-housing hav-

ing three contracted outlet-ports arranged across its interior with one of said ports on the axis of the pipe and the other two adjacent the side-walls thereof, of a conical valve-plug in the housing having four longitudinal barriers so disposed circumferentially of the plug as to form three equally-spaced ports adapted to register with the outlet-ports of the pipe and a fourth enlarged inlet-port arranged opposite these smaller ports.

2. In a play-pipe for use with fire-hose, the combination with a valve-housing formed with circular valve-seats and two barrier-walls extending across the opening of the housing in line with the seats, said barriers forming three spaced-apart outlet-ports, and a rotatable valve-plug fitted to the seats in the housing and formed with four barriers so disposed circumferentially of the plug as to form three ports adapted to register with the outlet-ports in the pipe and a fourth enlarged inlet-port arranged opposite the three smaller ports.

3. In a play-pipe for use with fire-hose, the combination with a valve-housing formed with circular valve-seats and an opening through which the valve-plug is inserted, said housing having two barriers extending across its interior in line with the valve-seats to form three equally-spaced outlet-ports, a valve-plug fitted to the seats in the housing and having four barriers so spaced as to form three ports adapted to register with the outlet-ports of the housing and a fourth larger port arranged opposite the three smaller ports, a cover-plate adapted to close the top of the valve-opening in the housing, a stem on the valve-plug extending through the cover-plate, a handle secured to the end of said stem, and a detent to limit the movement of the handle to regulate the turning of the plug in opening and closing the ports.

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

JAMES M. BAKER.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."