M. C. SCHWEINERT.

VALVE.

APPLICATION FILED MAR. 8, 1913.

1,210,707. Patented Jan. 2, 1917.

Fig. 1.

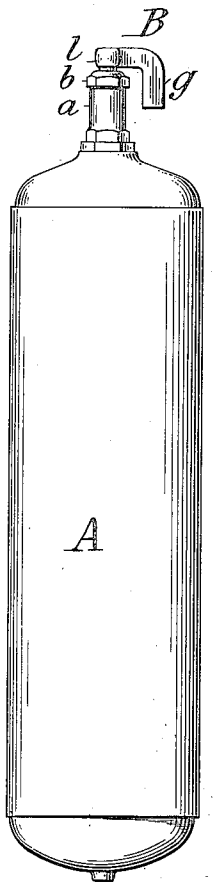


Fig. 2.

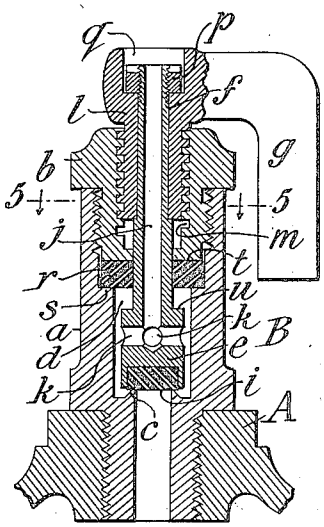


Fig. 3.

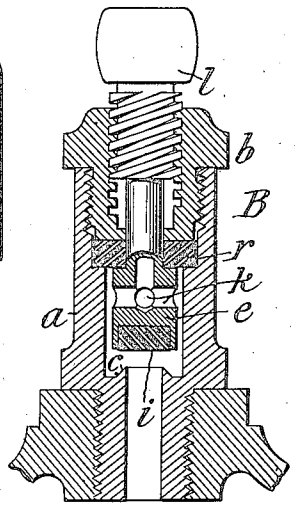


Fig. 4.

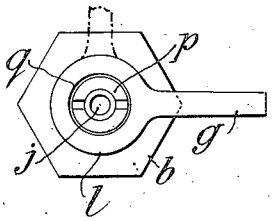


Fig. 5.

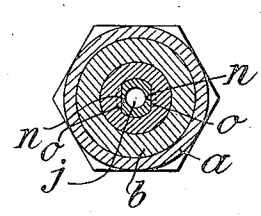
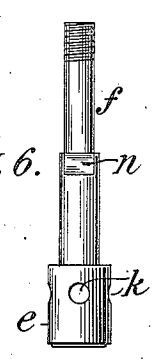


Fig. 6.



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VALVE.

1,210,707. Specification of Letters Patent. Patented Jan. 2, 1917.

Application filed March 8, 1913. Serial No. 753,066.

To all whom it may concern:

Be it known that I, MAXIMILIAN CHARLES SCHWEINERT, a citizen of the United States, residing in West Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Valves, of which the following is a specification.

This invention relates to valves and aims to provide certain improvements therein.

The invention is particularly directed to valves for fire extinguishers which contain liquids or gases under heavy pressure. In this type of device it is common to provide a valve designed to be operated upon when the extinguisher is to be used whereby the fluid is discharged in a stream or jet. As such devices are apt to remain unused for considerable periods of time it is practically necessary to provide a valve which is absolutely tight so that there shall be no leakage during the period of disuse. Such valves have heretofore been constructed as conical ground valves of the pet-cock type, but these have involved certain disadvantages which it is the object of the present invention to avoid. Chief among these is the fact that in order to secure a tight closure it is necessary to adjust the parts of the valve so closely that the valve can be opened only with difficulty. This difficulty is usually increased by the fact that the metal of the valve is attacked to some extent by the fluids contained in the extinguisher. Hence it sometimes happens that when a fire occurs it is found impossible to open the extinguisher. As such devices are intended for use at a moment's notice and may be manipulated by women and children, it is of great importance that the valve shall be very easy to manipulate, while at the same time capable of making an absolutely tight joint for long periods of time. According to the present invention I provide a construction of valve in which these advantages are obtained.

According to the drawing which illustrates the preferred form of the invention—Figure 1 is a side elevation of a fire extinguisher embodying the present invention; Fig. 2 is a vertical section of the valve in one position; Fig. 3 is a similar section partly in elevation showing the valve in another position; Fig. 4 is a plan of Fig. 2; Fig. 5 is a section on the line 5—5 in Fig. 2; Fig. 6 is an elevation of the valve plunger detached.

Referring to the drawing, let A indicate the fire extinguisher as a whole which comprises the usual cylinder stored with either compressed gas or with substances which are designed to produce gas when the valve is opened.

B is the valve usually arranged at one end of the cylinder and usually constructed to be screwed in the cylinder, as shown. The valve B is best formed with a casing *a* which has a screw-threaded lower end fitting the opening in the cylinder, and a cap *b* which screws into the end of the casing. Within the casing is formed a valve seat *c* and above the valve seat *c* is a valve chamber *d* within which works the valve proper *e*. The latter is formed upon or connected with an operating stem *f* leading through the cap *b* and provided with an operating handle *g*. The valve proper *e* is designed to fit against the seat *c* and for this purpose is preferably provided with a packing *i* of fibrous material which is proof against the action of the gases stored within the cylinder. The valve *i* preferably seats against the pressure and is of the reciprocating type so that the tightness of the closure does not depend upon the precise fit of the parts, as is the case with the plug valves or pet-cocks now employed. The valve stem *f* is somewhat bored throughout its length to form a passage *j* which communicates with the valve chamber *d* through transverse passages *k*, *k*. When the valve leaves its seat the fluid under pressure flows around the valve proper and through the passages *k* into the bore *j* and thence outwardly. The stem *f* hence constitutes the nozzle which directs the stream of fluid to the point intended. The valve is reciprocated in its chamber by a screw-threaded bushing *l* to which the handle *g* is attached either integrally or otherwise. The bushing *l* fits a threaded bore *m* formed in the cap *b*. It is very desirable that the valve should be opened wide with

the minimum movements of the handle *g*. To this end the bushing *l* and cap *b* are formed with quick acting threads. In constructing these parts I prefer to use a quadruple thread as thereby I am enabled to obtain within the limits of the diameter of the parts a complete opening and closing movement of the valve with about one-quarter of a turn of the handle *g*. To connect the valve stem *f* to the bushing *l* any suitable means may be provided, but I prefer to form flat faces *n*, *n* upon the valve stem with corresponding faces *o*, *o* on the interior of the bushing, as best shown in Fig. 5, and to prevent separation of the parts the valve stem may be screw-threaded at its upper end to receive a nut *p* preferably arranged in a recess *q* in the top of the bushing.

An important feature of the invention is the provision of means for packing the valve stem so that when the valve is opened the fluid will not leak around the valve stem and through the bushing. Otherwise the fluid would be wasted and be apt to come in contact with the hands or clothing of the user. To this end I introduce a packing *r* which is annular in form and surrounds the valve stem closely, being compressed between a shoulder *s* formed on the inner side of the casing at the top of the valve chamber *d* and a face *t* formed on the under side of the cap *b*. This packing minimizes or prevents leakage of fluid around the valve stem during the time when the valve is partly, but not wholly, opened. To absolutely prevent the leakage when the valve is fully opened, I construct the upper part of the valve proper with a valve face *u* shown as an annular shoulder forming the upper part of the valve proper, which shoulder is adapted to contact with the packing *r* when the valve is fully opened. In this construction the shoulder and packing constitutes the complemental parts of a valve which is operative when the main valve is opened, the parts thence assuming the position of Fig. 3.

By the present invention it will be seen that a valve is provided which is extremely easy to operate and which may be fully opened by a very short movement of the operating handle. This opening movement is preferably so short as to make the operation of fully opening the valve a practically instantaneous one so that there is practically no opportunity for leakage during the opening movement. At the same time when the valve is fully opened the parts are entirely leak-tight, the only exit for the fluid being through the bore of the valve stem. The valve does not rely for its tightness upon the closeness of fit between the metal surfaces, and is hence capable of operating with minimum friction.

While I have shown one form of the invention I do not wish to limit it thereto as various changes may be made therein without departing from the invention.

What I claim is:—

1. A valve for fire extinguishers or the like comprising a casing having a seat at its lower end, a valve chamber above said seat, a valve proper in said chamber, a valve stem having a passage through it communicating with said valve chamber, a packing surrounding and fitting snugly to said valve stem, a cap screwing directly into said casing, said casing and cap having shoulders between which said packing is to be pressed, and said cap having a screwthreaded bore through which said valve stem extends, a bushing threaded in said bore, said bushing and valve stem being connected to turn together and a handle connected to said bushing.

2. A valve for fire extinguishers or the like comprising a casing having a seat at its lower end, a valve chamber above said seat, a valve proper in said chamber, a valve stem having a passage through it communicating with said valve chamber, a packing surrounding and fitting snugly to said valve stem, a cap screwing directly into said casing, said casing and cap having shoulders between which said packing is to be pressed, and said cap having a screw-threaded bore through which said valve stem extends, a bushing threaded in said bore, the threads of said bushing and cap being plural and of steep pitch, said bushing and valve stem being connected to turn together and a handle connected to said bushing.

3. A valve for fire extinguishers or the like, comprising a casing having a raised seat at its lower end, a valve chamber above said seat, a valve proper in said chamber, a compression disk thereon adapted to engage said seat, a valve stem having a passage through it communicating with said valve chamber, a packing surrounding and fitting snugly to said valve stem, a cap screwing directly into said casing, said casing and cap having shoulders between which said packing is to be pressed, said cap having a bore with multiple quick acting screw threads, a bushing screw-threaded in said bore, said valve stem passing through said bushing and being held therein against turning relatively thereto, and a handle for said bushing.

4. A valve for fire extinguishers or the like comprising a casing having a seat at its lower end, a valve chamber above said seat, a valve proper in said chamber, a valve stem having a passage through it communicating with said valve chamber, a packing surrounding and fitting snugly to said valve stem and constituting a valve seat, and said stem carrying a supplemental valve member contacting and making a tight connection with said seat when the valve is open, a cap screwing directly into said said casing, said

casing and cap having shoulders between which said packing is to be pressed, said cap having a bore with multiple quick acting screw threads, a bushing screw-threaded in said bore, said valve stem passing through said bushing and being held therein against turning relatively thereto, and a handle for said bushing

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

MAXIMILIAN CHARLES SCHWEINERT.

Witnesses:
EUGENE V. MYERS,
FRED WHITE.