No. 697,097. Patented Apr. 8, 1902.

A. MAYER.

AUTOMATIC VALVE FOR STEAM FIRE ENGINES, &c.

(Application filed Nov. 29, 1901.)

(No Model.)

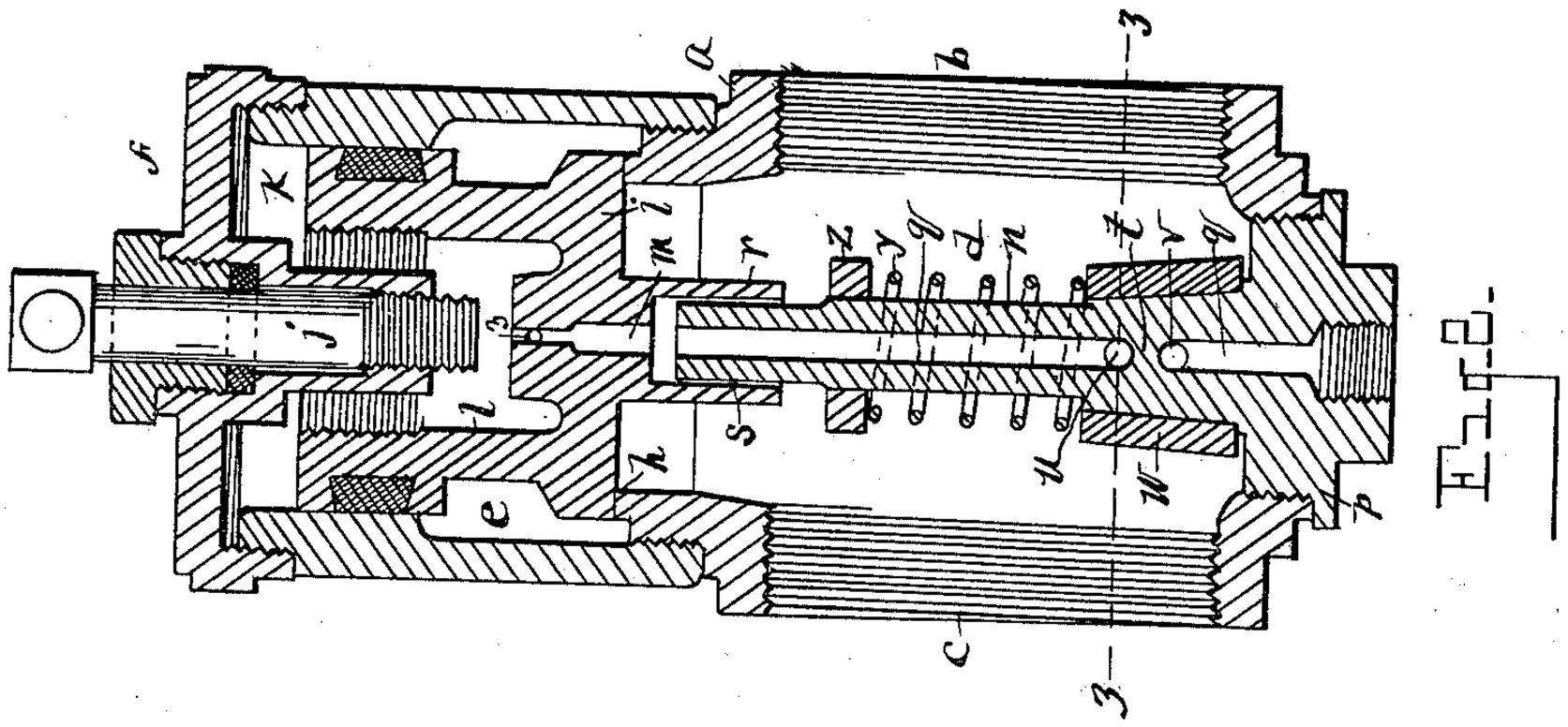

Fig. 2.

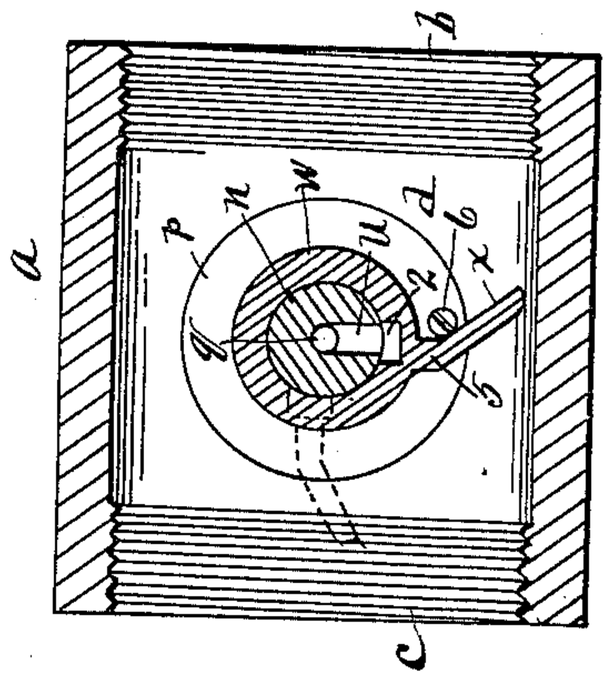

Fig. 5.

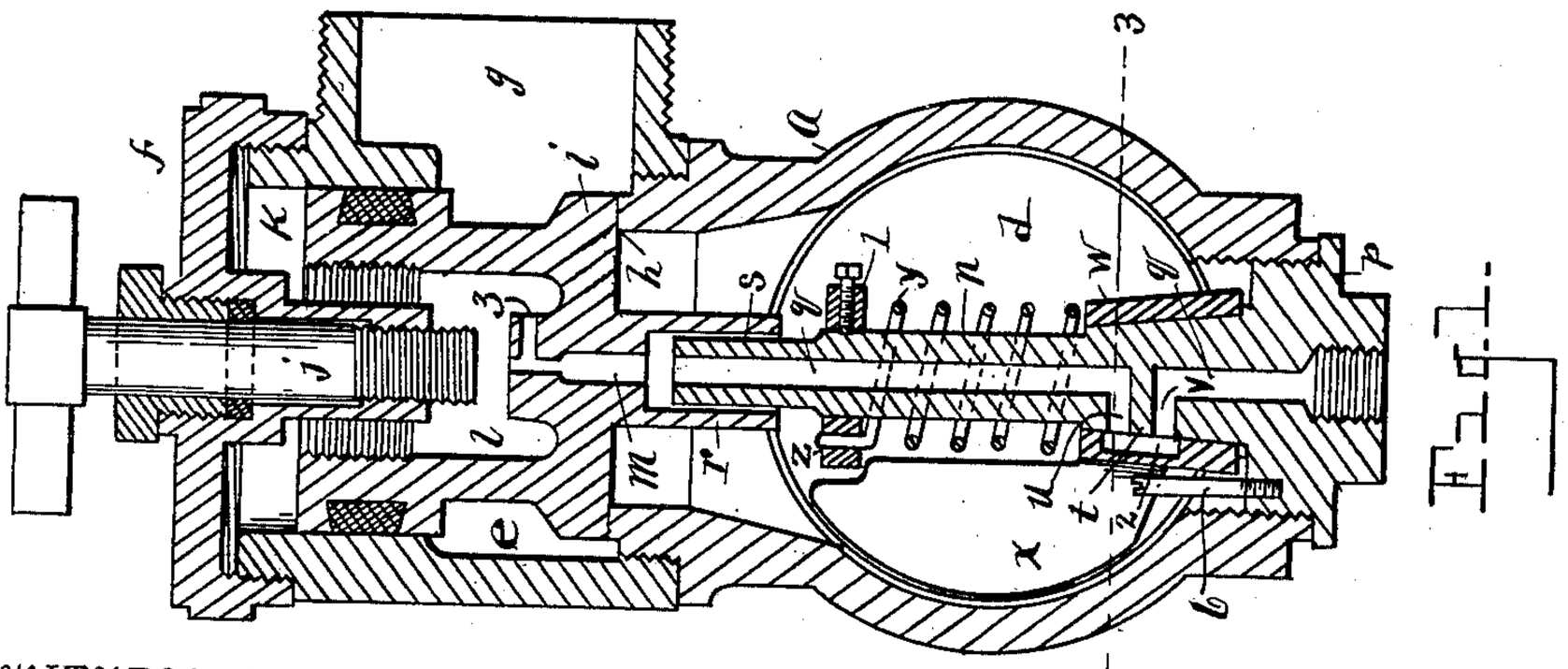

Fig. 4.

WITNESSES.

O. B. Barringer.

J. M. Poland

INVENTOR.

Alvarado Mayer

By Irwell S. Wright

His Attorney

UNITED STATES PATENT OFFICE.

ALVARADO MAYER, OF DETROIT, MICHIGAN.

AUTOMATIC VALVE FOR STEAM FIRE-ENGINES, &c.

SPECIFICATION forming part of Letters Patent No. 697,097, dated April 8, 1902.

Application filed November 29, 1901. Serial No. 83,963. (No model.)

To all whom it may concern:

Be it known that I, ALVARADO MAYER, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Automatic Valves for Steam Fire-Engines, &c.; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object a valve for steam fire-engines and for hydrants; and it consists of the construction, combination, and arrangement of devices hereinafter described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a view in vertical section, showing the wing in normal position. Fig. 2 is a view in vertical section at right angles to Fig. 1. Fig. 3 is a view in cross-section on the line 3 3, Figs. 1 and 2.

My invention relates to that class of valves for use with steam fire-engines wherein the water-pressure operates a relief-valve to permit the water passing through the relief-valve and to return to the suction of the pump or engine, as when the nozzle of the hose connected with the valve is closed. To this end in certain of its features my present invention is an improvement upon a valve of this nature embodied in United States Letters Patent No. 398,841, granted to me March 5, 1889.

In carrying out my invention, *a* represents the valve-case, *b* being the inlet-opening of the case and *c* the outlet-opening thereof. The chamber *d* of the valve-case, with the openings *b* and *c*, forms a horizontal waterway therethrough, to be connected with the engine or pump and to the hose in the usual manner. At the top of the waterway the case is provided with a chamber *e*, communicable with the chamber *d*, the chamber *e* being closed with a cap *f*. At one side of the chamber *e* is a return-opening *g* to connect with the customary return-pipe to the suction of the pump. A valve-seat *h* is formed in the base of the chamber *e*, and *i* is a relief-valve to seat thereupon, said valve controlling the passage of water from the chamber *d* through the return-opening *g*. A screw-stem *j* passes through the cap *f* and has a threaded engagement therein, by which the extent of the movement of the relief-valve is governed. The relief-valve is provided with an upwardly-extended portion *k*, having a water-tight engagement in the upper portion of the case, as shown, the upper portion of said valve being of wider diameter than the lower portion thereof. The valve *i* is constructed with a chamber *l*, opening through the upper portion *k* of the valve into the portion of the chamber *e* above the valve. The lower portion of the valve is formed with an orifice *m*, leading from the chamber *l* through the valve, whereby the chambers *l* and *d* may communicate the one with the other. Within the chamber *d* is a fixed stem *n*, which may be supported therein in any suitable manner, as by a support *p*, having a threaded connection with the case. This stem is constructed with a channel *q*, opening upward therethrough, the upper end of said stem preferably entering a sleeve *r* of the valve *i* and spaced therefrom, as shown at *s*, sufficient to permit the passage of water upward between the sleeve and the upper portion of the stem. The channel *q* has a diaphragm *t* located therein, the wall of the stem being formed with lateral channels *u* and *v* above and below said diaphragm. About the lower end of the stem is a hub *w*, carrying a wing *x*, the pressure of the water entering the case moving said wing around in line with the waterway, as indicated in Fig. 3. A spring *y* exerts its tension upon said wing to restore the wing to normal position when the pressure of the water is released. Any desired tension may be given to the spring in any suitable manner, as by a collar *z* upon the stem *m*, said collar engaged with one end of the spring and provided with a set-screw, (indicated by the numeral 1.) The hub *w* is provided with a chamber 2, communicable with the chambers *u v* when in normal position and whereby open communication may be afforded through the entire stem *m*. When, however, the wing is thrown around out of normal position, obviously the communication of the channels *u v* is cut off.

The operation of the device is as follows: When the water is permitted to enter the chamber *d*, the wing *x* is thrown about into line with the waterway *b d c*, cutting off the communication of the channel *q* through the stem *m*. At the same time water passes upward through the channel *s* and through the channel *m* into the chamber *l* to the top of the valve *i*, seating said valve. The moment the water ceases to flow through the said waterway, as when the nozzle of the hose is shut off, the pressure raises the valve, whereby the water passes from the chamber *d* through the opening *g* and back to the suction of the pump. When the water is permitted to flow again through the said waterway, the pressure of the water that has risen through the chamber *l* closes the valve *i*. When the wing *x* is restored to normal position, the water from the chamber *l* drains off through the channels *m* and *q* to the outlet end of the channel *q* and is discharged to the ground. It will be observed that the working parts of the device consist of the wing upon the stem *n* with the valve *i*. When the water has wasted through the channel *q* to the ground, the valve *i* is open, which is its normal position, the valve remaining in open position until the waterway is again open, so that the water can flow upon the top of the valve and close the valve. Should the adjusting-screw *j* be set too close to the adjacent portion of the valve, so as to close the upper end of the opening *m*, still I provide for the admission of the water into the chamber *l* by a branch opening 3, communicating with the channel *m*. It will be observed that the valve is forced to and from its seat by water-pressure. The moment the water ceases to flow through said waterway the force of the water behind the wing is the same as that in front thereof, so that the spring *y* will restore said wing to normal position. The waste-opening *q* is made larger than the upper end of the opening *m* to the top of the valve. The upper portion *k* of the valve forms the piston of the valve. When the engine is at work and the water is passing through the waterway, it also passes up through the valve upon the enlarged portion or piston of the valve, whereby the pressure thereupon will seat the valve and hold the valve seated until the pressure is relieved by the wasting away of the water upon the valve in the manner described. The water passing through the valve returns, as already noted, to the suction-pump until the hose is opened and the pressure upon the valve is removed.

It will be seen that the valve is automatic in its operation and that the wing swings around behind the stem in open position entirely out of the way. The wing is preferably constructed with a slight offset, as shown at 5, whereby the water-pressure will more effectually exert its force against the wing. A post 6 forms a stop for the wing when in normal position.

What I claim is—

1. A valve embodying a valve-case provided with a waterway therethrough having in combination therewith a valve opened by water-pressure seating above said waterway, an aperture leading through said valve to admit water-pressure thereupon to seat the valve, a stem within the case provided with a channel-opening through both ends thereof, an oscillatory spring closing device upon said stem actuated in one direction by water-pressure to open and close communication through said stem.

2. A valve embodying a valve-case provided with a lower and with an upper chamber communicable the one with the other a valve in the upper chamber controlling said communication, an aperture leading from the upper chamber, a stem in the lower chamber provided with a channel-opening through both ends thereof, a channel leading through said valve, to admit water upon the top of the valve, an oscillatory device upon said stem actuated by water-pressure to close communication through said stem, and means to return said wing to normal position and open communication through said stem.

3. A valve embodying a valve-case provided with a waterway therethrough having in combination therewith a valve opened by water-pressure seating above said waterway an aperture leading from the case above the valve-seat, an aperture leading through said valve, a channel-stem and an oscillatory wing provided with a hub upon said stem, said stem provided with a diaphragm intermediate of the extremities of the channel therewithin, orifices above and below said diaphragm communicating with the channel and leading through the side of the stem, the hub of the wing provided with a chamber to register with said orifices in the stem when the wing is in closed position and to cut off the communication of said channels when the wing is in open position.

4. In combination a valve-case provided with a waterway therethrough and with an aperture above the waterway, a relief-valve actuated by water-pressure to control communication of said waterway through said aperture, means to admit water-pressure above said valve, a stem provided with a waste-channel to carry off the water from above the valve, and an oscillatory self-closing wing provided with a hub upon said stem to control the passage of water through said channel, said wing actuated by water-pressure to close said channel.

5. In combination a valve-case provided with a waterway therethrough and with an aperture above the waterway, a relief-valve actuated by water-pressure to control communication of said waterway through said ap-

erture, means to admit water-pressure above said valve, a stem provided with a waste-channel to carry off the water from above the valve, and an oscillatory self-closing wing provided with a hub upon said stem to control the passage of water through said channel, said wing actuated by water-pressure to close said channel, said wing arranged to swing by water-pressure out of normal position and into position behind said stem.

In testimony whereof I sign this specification in the presence of two witnesses.

ALVARADO MAYER.

Witnesses:
N. S. WRIGHT,
J. M. POLAND.