

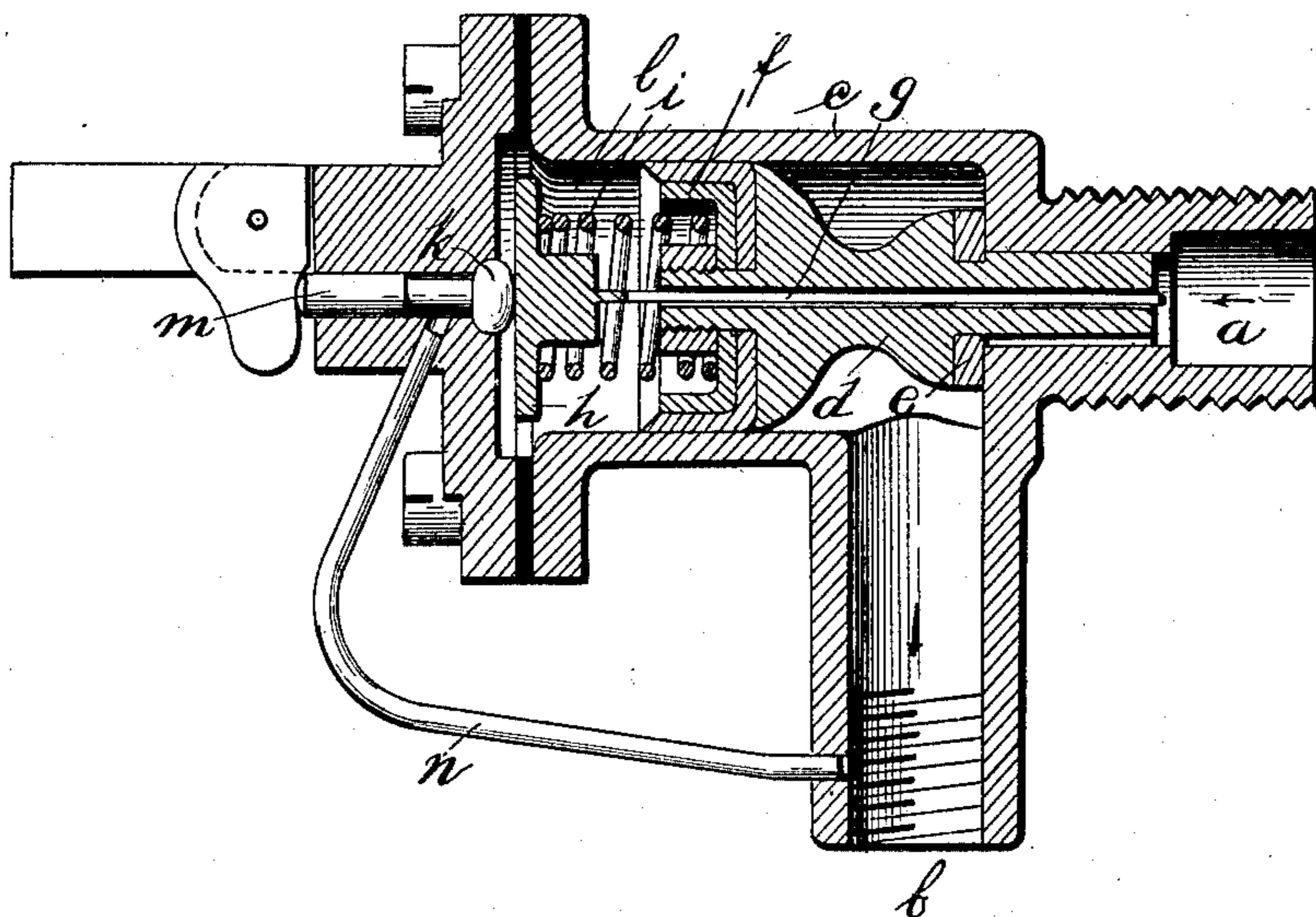
No. 711,349.

Patented Oct. 14, 1902.

E. SCHLAEPFER.
SELF CLOSING VALVE.

(Application filed June 9, 1902.)

(No Model.)



WITNESSES:

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UNITED STATES PATENT OFFICE.

EDOUARD SCHLAEPFER, OF LAUSANNE, SWITZERLAND.

SELF-CLOSING VALVE.

SPECIFICATION forming part of Letters Patent No. 711,349, dated October 14, 1902.

Application filed June 9, 1902. Serial No. 110,830. (No model.)

To all whom it may concern:

Be it known that I, EDOUARD SCHLAEPFER, a citizen of the Republic of Switzerland, residing at Lausanne, Switzerland, have invented certain new and useful Improvements in Self-Closing Valves; and I do hereby 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.

This invention relates to self-closing valves having a drilled inlet-valve opening toward the interior of the valve-casing and a counter-pressure chamber situated behind the same, from which chamber a relief-passage closed by a relief-valve opening from the outside runs outward, the reclosing of the raised relief-valve thus insuring the tendency of the inlet-valve when open to press strongly against its seat.

In the accompanying drawing a form of the invention is illustrated, the self-closing valve being represented in section.

a is the inlet, and *b* the outlet, of the valve-casing *c*, which contains the inlet-valve *d*, provided with a packing-ring *e* and at the opposite end with a sleeve-piston *f*. The cross-sectional area of the piston *f* is greater than that of the inlet-opening controlled by the valve. The inlet-valve *d* has an axial channel through which a spindle *g* is inserted. On one end of this spindle is the plate *h*, which is held in permanent contact with the relief-valve *k* by means of a spiral spring *i*. A conduit *n*, controlled by the valve *k*, leads to the outlet *b*. The spindle *g* does not fit tightly in the bore of the valve, but has some play therein, leaving an annular passage, so that liquid under pressure can pass from the inlet *a* into the space *l* behind the piston.

The action of the self-closing valve is as follows: In the condition of rest the liquid under pressure acts as well directly on the front end of the inlet-valve as through the bore of the same on the face of the piston *f*, which is turned away from the inlet *a*, so that in consequence of the excess of pressure on the piston *f* due to its greater area the inlet-valve remains closed. If the valve-rod *m* be now pressed in order to open the relief-valve *k*, the counter-pressure chamber *l* will be emptied through the pipe *n* into the outlet

b, as more liquid can flow away in a given time through this pipe by reason of its greater capacity than can enter into the counter-pressure chamber *l* through the bore of the inlet-valve *d*. In consequence of this the inlet-valve *d* is forced from its seat under the pressure of the liquid acting directly on the front end thereof until the opposite end of the inlet-valve strikes against the plate *h*, which rests on the relief-valve *k*, and the liquid under pressure can flow away through the outlet *b*.

In consequence of the inlet-valve in its open position having under the influence of the liquid under pressure a strong tendency to press the relief-valve onto its seat the reclosing of the same is assured as soon as pressure is removed from the relief-valve rod *m*, as the counter-pressure chamber fills again gradually with liquid which enters through the bore of the inlet-valve *d*, forcing the valve to its seat.

It is important that the relief-valve should reliably close again, as the counter-pressure chamber otherwise could not fill with liquid, and consequently the closing of the inlet *a* by the inlet-valve would not be effected.

By the reciprocating action of the inlet-valve *d* on the spindle *g*, connected with the plate *h*, in connection wherewith the spring *i* acts to prevent the spindle from becoming fixed in the bore of the inlet-valve, this bore is kept clean, so that a stoppage of the same by any impurities in the liquid under pressure is prevented as far as possible. This is important, for the reason that in the event of any stoppage of this boring taking place the liquid would act only insufficiently or not at all on the piston *f* to effect the closing of the inlet-valve, and the latter would not close tightly.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. A valve comprising a casing provided with ingress and egress openings, a main valve in the forward portion of the casing and seated upon the ingress-opening and having an axial channel therethrough, a plunger-stem loosely disposed within and guided by said channel, a plunger head or plate carried upon the rear

end of said stem, a relief-channel leading from the interior of the casing at the rear of the valve to the egress-opening, a relief-valve controlling the relief-channel, means for holding the plunger-head in pressure contact with the relief-valve thereby to close the same, and an exteriorly-operable plunger whereby the relief-valve may be opened.

2. A valve comprising a casing provided with ingress and egress openings, a main valve controlling the ingress-opening and of larger cross-sectional area at the rear than at the forward end, an axial channel through said valve communicating between the ingress-opening and a counter-pressure chamber in the valve-casing at the rear of the main valve, a relief-channel communicating between the counter-pressure chamber and the egress-opening and of larger capacity than the first-named channel, a relief-valve controlling the relief-channel and held normally seated by a spring-actuated plate mounted within the counter-pressure chamber, and an exteriorly-operable plunger whereby the relief-valve may be unseated.

3. A valve comprising a casing provided with ingress and egress openings, a main valve controlling an ingress-opening and of larger cross-sectional area at the rear than at the forward end, an axial channel through said valve communicating between the ingress-opening and a counter-pressure chamber in the valve-casing to the rear of the main valve, a relief-channel communicating between the counter-pressure chamber and the egress-opening of larger capacity than the axial channel, a relief-valve controlling said relief-channel and held normally seated by a spring-actuated plate carried by a stem guided for longitudinally-reciprocal movement within the axial channel of the valve, and an exteriorly-operable plunger whereby the relief-valve may be unseated and the plunger-stem reciprocated within the axial channel.

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

EDOUARD SCHLAEPFER.

Witnesses:

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