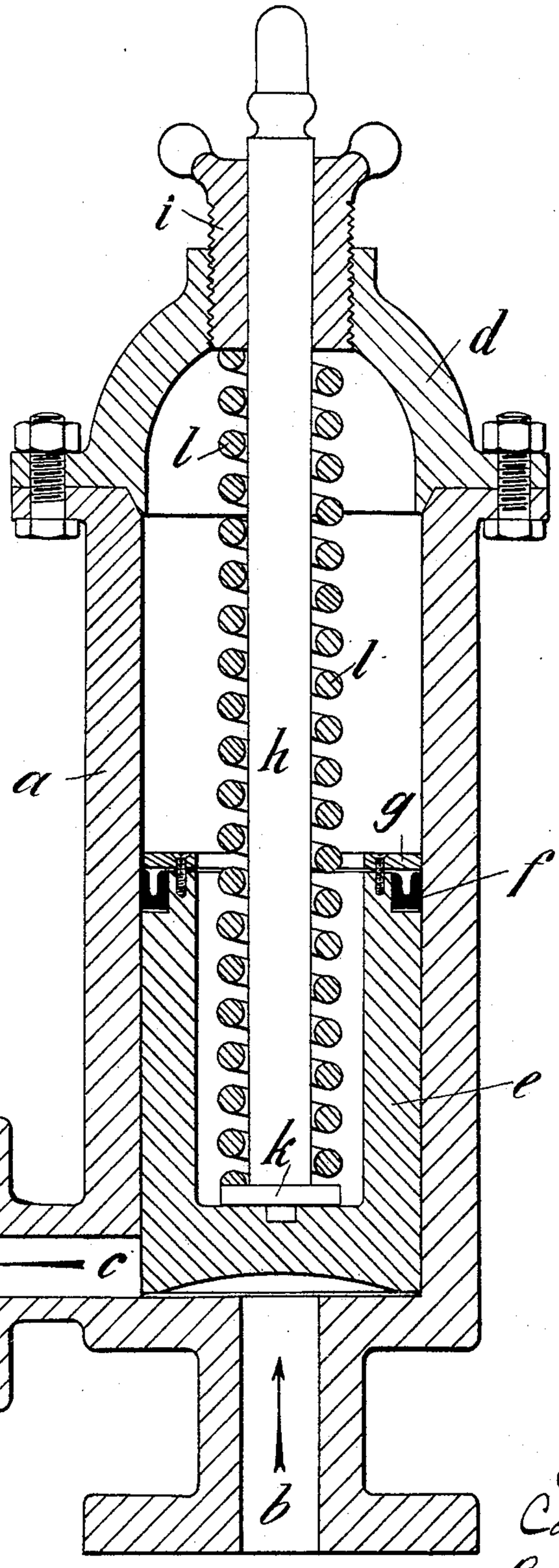
No. 611,823. Patented Oct. 4, 1898.

C. STEIER.

CHAMBER FOR PUMPS.

(Application filed Oct. 15, 1897.)

(No Model.)



Witnesses.
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UNITED STATES PATENT OFFICE.

CARL STEIER, OF NEUMARKT, GERMANY.

CHAMBER FOR PUMPS.

SPECIFICATION forming part of Letters Patent No. 611,823, dated October 4, 1898.

Application filed October 15, 1897. Serial No. 655,254. (No model.)

To all whom it may concern:

Be it known that I, CARL STEIER, a subject of the German Emperor, and a resident of Neumarkt, Germany, have invented an Improved Air-Chamber for Pumps and the Like, of which the following is a full and clear specification.

This invention relates to an improved air-chamber for pumps and the like which performs the dual office of air-chamber and "back-stroke" valve.

The accompanying drawing shows a vertical section.

a is a cylinder or chamber having the inlet-opening *b* and an outlet-opening *c* and also a cover *d*, tightly bolted over *a*. Within the cylinder *a* is a piston *e*, which is made thoroughly air-tight by the packing *f* and rings *g*, firmly screwed thereto. A spindle *h* runs from the bottom of the piston *e* and through the stuffing-box *i*, provided in cover *d* of cylinder *a*. The spindle *h* carries at its lower end a flange *k*, against which presses one end of a spiral spring *l*, surrounding the spindle *h*, the other end of the spring pressing against the end of the stuffing-box *i*, thus keeping *e* pressed against the bottom of the cylinder *a*.

Compared with hitherto-known air-chambers, in which only the elasticity of the cushion of air therein is available, the new apparatus secures an easy working of the pump and absence of shock. On one hand, the liquid entering by *b* opens the outlet *c* gradually and without shock by raising the piston *e*, and, on the other hand, the piston *e* is forced back by the spring *l*, thereby closing the outlet *c*, and thus acting as a back-stroke or return valve.

One of the advantages of the present construction is the arrangement of the spring *l*, which can be removed or exchanged without interference with the working. Another advantage is that when the liquid enters the air-chamber in the first instance the piston acted on by the spring tends to force the fluid out at *c*, whereas in air-chambers as at present made the chamber must be filled with liquid before this takes place. Further, the piston *e*, acting also as a back-stroke or return valve, prevents the entrance of "false" air, by which I mean air absorbed by the water before being pumped and which during pumping is set free and escapes between the piston and the pump-cylinder.

Having thus described my invention, I declare that what I claim, and desire to secure by Letters Patent, is—

1. In a device of the class described, the combination with a casing *a* having an inlet *b* and an outlet *c*, of a spring-depressed plunger or piston *e* normally closing the outlet *c* but adapted to yield under fluid-pressure in the inlet *b* so as to permit flow from the passage *b* to the passage *c*, substantially as shown and described.

2. In a device of the class described, the combination with a casing *a* having an inlet *b* and an outlet *c* arranged at an angle one to the other, of an annular valve-seat surrounding the inlet *b* at its outlet and a valve, plunger or piston which when seated on the annular valve-seat will close the outlet against backflow and against inflow until lifted from the seat by incoming pressure, substantially as shown and described.

3. In a device of the class described, the combination with a casing *a* having an inlet *b* and an outlet *c*, of an annular valve-seat surrounding the inlet *b*, a valve, plunger or piston, adapted to coact with the valve-seat of the inlet *b* so as to close the same and at the same time close the outlet *c* against back pressure, and means for keeping the valve, plunger or piston normally in contact with its seat, substantially as shown and described.

4. In a device of the class described, the combination with a casing *a* having an inlet *b* and an outlet *c*, of an annular valve-seat surrounding the inlet *b*, a valve, plunger or piston, adapted to coact with the valve-seat of the inlet *b* so as to close the same and at the same time close the outlet *c* against back pressure, and a spring for keeping the valve, plunger or piston normally in contact with its seat, substantially as shown and described.

5. In a device of the class described, the combination with a casing *a* having an inlet *b* and an outlet *c*, of an annular valve-seat surrounding the inlet *b*, a valve, plunger or piston, adapted to coact with the valve-seat of the inlet *b* so as to close the same and at the same time close the outlet *c* against back pressure, a packing *f*, and a spring for keeping the valve, plunger or piston normally in

contact with its seat, substantially as shown and described.

6. In a device of the class described, the combination with a casing having an inlet and an outlet at an angle one to the other, of an annular valve-seat surrounding the inlet, and a valve plunger or piston normally seated upon such valve-seat of such form as to receive the back pressure from the outlet upon its side, substantially as shown and described.

Signed at Nuremberg, Bavaria, this 7th day of July, 1897.

CARL STEIER.

Witnesses:
JOSEF GOETZ,
MICHAEL SPIEGEL.