

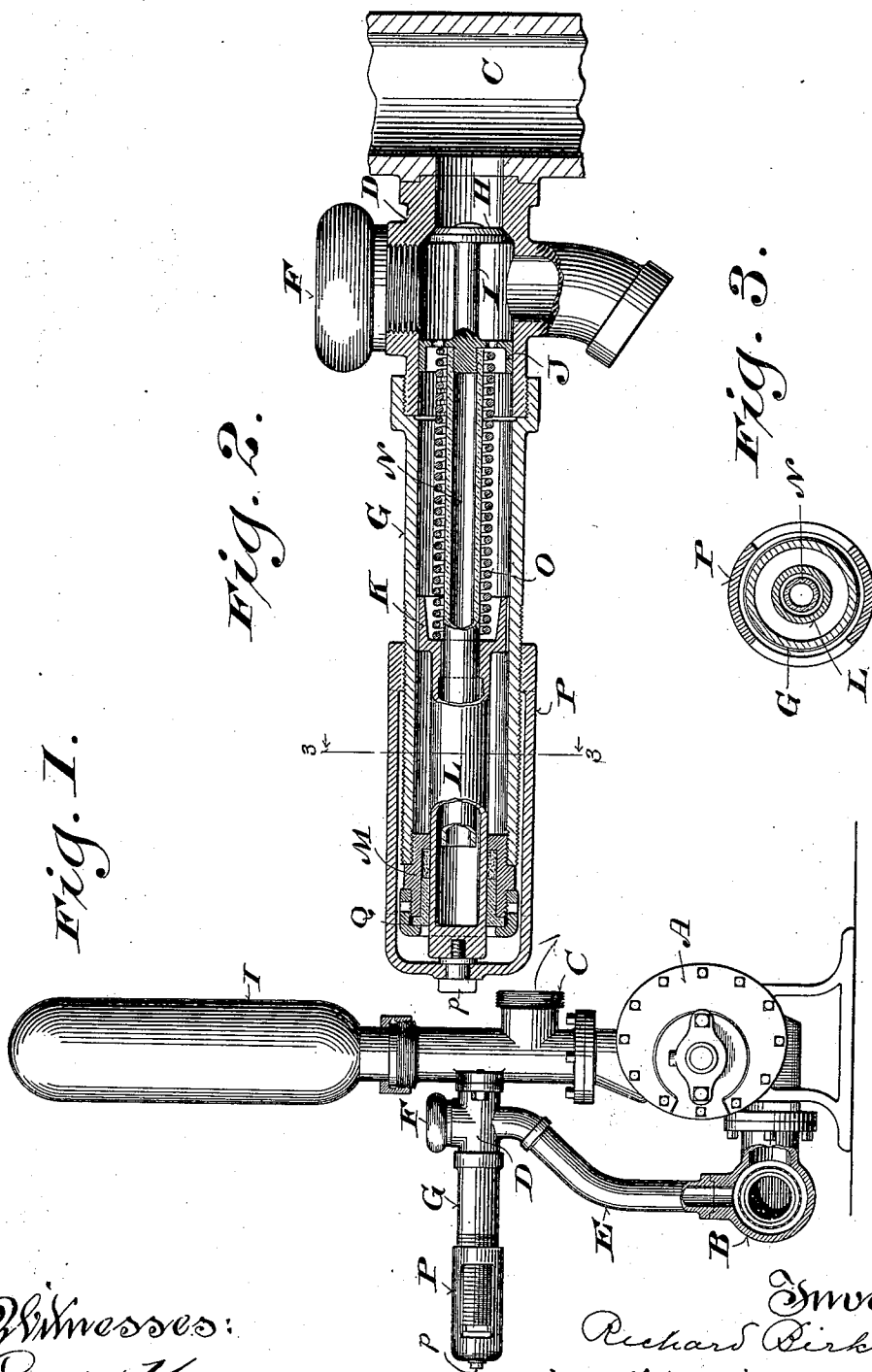
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R. BIRKHOLOZ.
PRESSURE REGULATING DEVICE FOR PUMPS.

APPLICATION FILED JULY 27, 1900.

NO MODEL.



Witnesses:
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UNITED STATES PATENT OFFICE.

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PRESSURE-REGULATING DEVICE FOR PUMPS.

SPECIFICATION forming part of Letters Patent No. 722,443, dated March 10, 1903.

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the pipe E with a clean-out opening, which is closed by a screw plug or cap F, and opposite its connection with the discharge-pipe C a spring case or barrel G is attached thereto by a screw-threaded or other suitable coupling which admits of the easy detachment of the parts.

H is a valve which has a seat in the opening or passage from the valve-chamber D into the discharge-pipe C and is adapted to open away from said discharge-pipe. It is formed or provided with a stem I and a piston or plunger J, which is fitted and guided in the branch of the valve-case opposite that which is attached to the discharge-pipe C.

K is a spring presser or follower movably fitted in the spring-case G and formed or provided with a tubular stem L, which projects outwardly through and is guided in a stuffing-box M in the outer end of said spring-case.

N is a tubular extension of the valve-stem, formed with or attached to the piston J and projecting into the tubular stem L, which serves as a guide therefor.

O is a helical spring surrounding the valve-stem N and bearing at one end against the plunger J and at the other end against the adjustable presser K. The spring-case G is externally threaded, and upon it is fitted a long sleeve-nut P, which is swiveled at its outer end to the protruding end of the tubular stem L by a shouldered screw *p*, between the shoulder of which and the end of said stem a washer is interposed, as shown in Fig. 2.

Holes are made through the plunger J, as shown, or grooves are formed in its periphery to allow the beer or other liquid to pass into and out of the spring-case G. Similar holes or grooves are formed in the spring-presser K to allow the beer or other liquid to pass freely by said presser from one end of the spring-case into the other. A groove is formed or clearance left between the tubular stem L and the valve-stem N to allow the liquid to pass freely between the inner end of the spring-case and said tubular stem, and thus permit of the free adjustment of the spring-presser K. Openings are made in the sides of the sleeve-nut P, as shown in Figs. 1 and 3, to admit of the insertion of a spanner-wrench for turning the gland retaining and adjusting ring Q on the stuffing-box M.

By the construction and arrangement of parts hereinbefore described a long spring, which is necessary for the wide range of adjustment and pressure required, is provided for without unduly extending the length of the device.

My improved regulating device, as hereinbefore described, operates as follows: When the filters are renewed or supplied with fresh material, the spring O is allowed to expand, and its tension is decreased by screwing the sleeve-nut P away from the valve-case D, and thereby correspondingly withdrawing the spring-presser K. The pump being operated at a certain fixed rate of speed and designed

to produce a certain maximum pressure for a given rate of discharge, when the tension of the spring O is reduced the valve H will be opened by the discharge-pressure acting thereon, and a part of the beer or liquid will flow from the discharge-pipe C back through the by-pass into the suction-pipe of the pump. The pressure by which the beer or liquid is forced through the filters will thus be reduced, and excessive pressure for racking on the delivery side of the filters, due to the diminished obstruction to the flow through the filters, will be avoided. As the filters become clogged with impurities caught and retained in the filtering material and the flow of beer or liquid through them is correspondingly retarded the tension of the spring O is increased by screwing the sleeve-nut P toward the valve-case D. Greater resistance to the opening of the regulating-valve H being thus afforded, greater pressure will be produced and maintained in the discharge-pipe C, and the beer or liquid will be forced against the increased resistance through the filters and delivered therefrom at the desired pressure and rate of flow. The piston or plunger J on the valve-stem acts as a check to the sudden movement of the valve and prevents clapping or jarring of the valve when it is slightly opened.

As absolute cleanliness is of prime importance in the manufacture of beer, provision for access to and easily cleansing all parts of apparatus used in connection with such manufacture is indispensable. It will be observed that in the construction of my regulating device as herein shown and described the by-pass may be easily and thoroughly cleaned by removing the screw plug or cap F and inserting a flexible brush through the clean-out opening in the valve-case, and the spring-case G, with the regulating-valve H and its connections, may be easily removed and the various parts easily separated and cleaned by simply unscrewing the spring-case from the valve-case.

Various changes in minor details of construction and arrangement of parts may be made without affecting the operation of the device and without departing from the spirit and intended scope of my invention.

I claim—

1. The combination with a pump of a by-pass connecting the discharge with the suction side of the pump and comprising a pipe and a valve-case which joins said pipe at an angle and has a clean-out opening opposite and in line with said pipe, a plug or cap for closing said opening, and a regulating-valve controlling the passage of liquid through said by-pass, substantially as and for the purposes described.

2. The combination with a pump of a by-pass connecting the discharge with the suction side of the pump and comprising a pipe and valve-case which joins said pipe at an angle and has a clean-out opening opposite and in line with said pipe, a plug or cap for

closingsaid opening, a spring-case detachably secured to said valve-case opposite its connection with the discharge-pipe of the pump, a valve controlling communication between the valve-chamber and the discharge-pipe of the pump and having a stem projecting into and guided in said spring-case, and an adjustable spring contained in said spring-case and tending to close said valve, substantially as and for the purposes set forth.

3. The combination with a pump of a by-pass connecting the discharge and suction sides of the pump, a spring-case, a valve controlling said by-pass and having a stem projecting into said spring-case, said valve being normally exposed on one side only to the discharge-pressure which tends to open it, an adjustable spring-presser having a tubular stem which receives and guides the valve-stem, and which projects through and is guided in a stuffing-box in the outer end of said spring-case, a spring interposed between said presser and an abutment on the valve-stem, and tending to close said valve against

the discharge-pressure and means connecting the protruding end of the presser-stem and spring-case for adjusting the tension of said spring, substantially as and for the purposes set forth.

4. The combination with a pump, of a by-pass connecting the discharge and suction sides of the pump, an externally-threaded spring-case, a spring-presser having a tubular stem projecting through a stuffing-box in said spring-case, a valve controlling said by-pass and having a stem guided in the tubular stem of said spring-presser, a spring interposed between said presser and an abutment on the valve-stem, and a sleeve-nut fitted on said spring-case and swiveled to the protruding end of the presser-stem, substantially as and for the purposes set forth.

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

RICHARD BIRKHOLZ.

Witnesses:

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CHAS. L. GOSS.