

(No Model.)

C. P. HIGGINS.

APPARATUS FOR AUTOMATICALLY INTENSIFYING AND EQUALIZING
PRESSURE.

No. 536,430.

Patented Mar. 26, 1895.

Fig. 1.

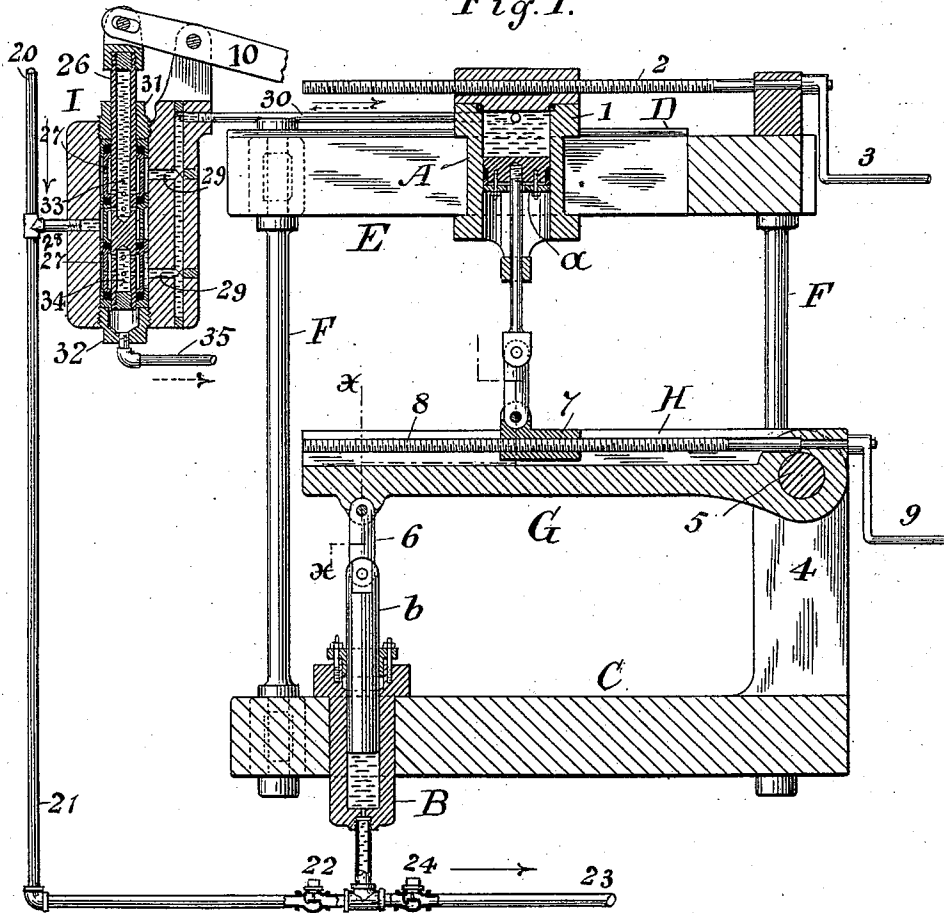


Fig. 3.

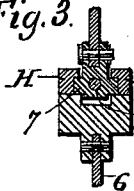
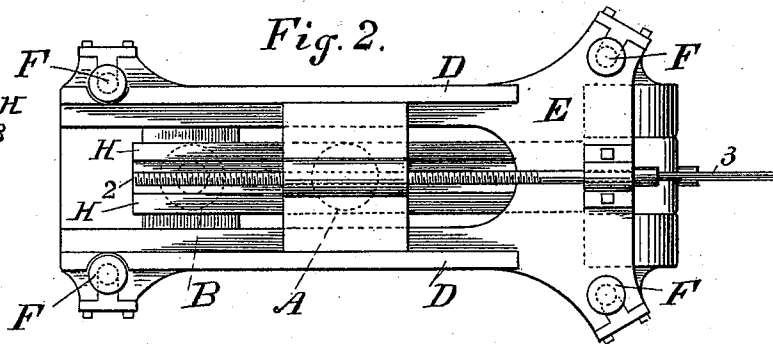


Fig. 2.



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APPARATUS FOR AUTOMATICALLY INTENSIFYING AND EQUALIZING PRESSURE.

SPECIFICATION forming part of Letters Patent No. 536,430, dated March 26, 1895.

Application filed March 3, 1893. Serial No. 464,507. (No model.)

To all whom it may concern:

Be it known that I, CAMPBELL P. HIGGINS, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Apparatus for Automatically Intensifying and Equalizing Pressure, of which the following is a specification.

This invention relates to an improved apparatus embodying the principle of operation described by me in a separate patent application filed simultaneously herewith, Serial No. 464,508, wherein a body of fluid is automatically supplied and maintained at a given ratio of pressure or intensity above that of another body of fluid, irrespective of the rate at which the intensified body of fluid is consumed.

The invention consists of certain mechanical means embodied in such apparatus, whereby the ratio of pressure of the one body of fluid to the other can be predetermined and adjusted at will preparatory to or during the automatic operation; and in order to enable others skilled in the art to which my invention appertains to understand and use the same, I will proceed to describe its construction, explain its operation and point out in the appended claim its novel characteristics.

Referring to the accompanying drawings, Figure 1, represents a sectional elevation of an apparatus embodying my invention; Fig. 2, a plan view of Fig. 1; and Fig. 3, a cross-sectional detail view taken on the line $x-x$, Fig. 1.

A, represents the motive cylinder, and B, the compression cylinder of the apparatus, respectively provided with a piston a , and a plunger b . The cylinder B, is mounted stationarily in the bed frame C, while the cylinder A, is mounted in guides D, in the upper frame E, supported by suitable standards F, upon said bed frame C. The cylinder A, is provided with a suitable cross-head 1, adapted to fit and slide freely on the guides D, D; and to the upper part of said cross-head composing the cylinder head, is fitted a screw 2, which may be revolved by a suitable crank 3, or otherwise, to adjust the position of the cylinder A, upon the guides D.

Mounted upon the bed-frame C, in the supports 4, there is a lever beam G, fulcrumed in said supports at 5, connected at its free ex-

tremity by link 6, to the plunger b , of the cylinder B. The lever beam G, is provided with parallel guides H, within which is fitted an adjustable cross-head 7 (see Fig. 3), the position of which may be determined by means of a screw 8, rotated by a crank 9, or other device. The screws 2, and 8, may be mechanically connected so as to insure their simultaneous operation.

The cylinders A, and B, are single-acting, so that when pressure is introduced to A, the piston a , and plunger b , are caused to descend, while by the eduction of such pressure in cylinder A, the feed pressure to cylinder B, will cause the said plunger b , and piston a , to rise.

The distributing valve I, is provided to control the induction and eduction of pressure to cylinder A, and said valve I, is operated by means of a lever 10, suitably connected to any source of motion automatic or otherwise; preferably, such as to reverse said valve at each termination of stroke of the piston a .

The distributing valve I, is constructed of a central reciprocating plunger 26, and a stationary perforated cage or cylindric seat 27, having an inlet 28, and outlets 29, communicating with the upper end of the cylinder A, through pipe 30. The cage 27, is composed of separate sections having suitable packings interposed between them to separate the inlet and outlet passages or perforations in the cage opposite to the respective ports 28, 29, 29. The sections are secured firmly together by means of the clamping nuts 31, 32, at the ends of the valve cylinder. The valve plunger 26, has two chambers 33, 34, in its respective ends. The chamber 33, and its openings form the connecting passage between ports 28 and port 29, when the plunger is raised as illustrated; and the chamber 34 with its openings forms when the plunger is depressed, a connecting passage between lower port 29, and the discharge pipe 35. By such arrangement, the one connection of passageways is severed before the other is opened during the operation of the plunger 26.

The distributing valve I, receives its supply from the constant pressure pipe 20. Connected with the pipe 20, or with the same source from which it is supplied, the pipe 21, furnishes the feed to the compression cylin-

der B, said pipe 21, being provided with a suitable check valve 22. The delivery pipe 23, of said cylinder B, is also provided with a suitable check valve 24.

5 In the operation of the apparatus, and starting from the position illustrated, the one body of fluid in pipe 20, supplied from a suitable compressor, enters through valve I, into
10 cylinder A, depressing the piston *a*, beam G, and plunger *b*, thereby compressing the fluid in cylinder B, to a greater degree of pressure or intensity than that in cylinder A, by reason of differentiation of diameters between piston
15 *a*, and plunger *b*. If the cross-heads 1, and 7, were shifted to a position wherein the vertical axis of the cylinder A, coincides with that of cylinder B, the ratio of the increase in pressure effected by the operation of the
20 apparatus would obviously be in direct proportion to the ratio of the respective areas of piston *a*, and plunger *b*. By shifting the cross-head 1, at variable distances from the position of coincidence aforesaid, the ratio
25 between the pressures of the motive fluid and the compressed fluid delivered from the ap-

paratus, is accordingly predetermined at will and then kept automatically constant in the operation of the machine, and a constant working pressure is maintained in pipe 23, actuating whatever hydraulic or other working apparatus it is connected to, irrespective
30 of the rate at which the water or other fluid is consumed.

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

In an apparatus for increasing fluid-pressure, the combination of a compression-cylinder; a lever fulcrumed at one end and pivoted to the plunger of said cylinder; and a motive-
40 cylinder of larger diameter than the compression-cylinder, adjustable to and from said fulcrum and compression-cylinder longitudinally of the lever, and having its piston connected to said lever, substantially as set forth. 45

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Witnesses:

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