

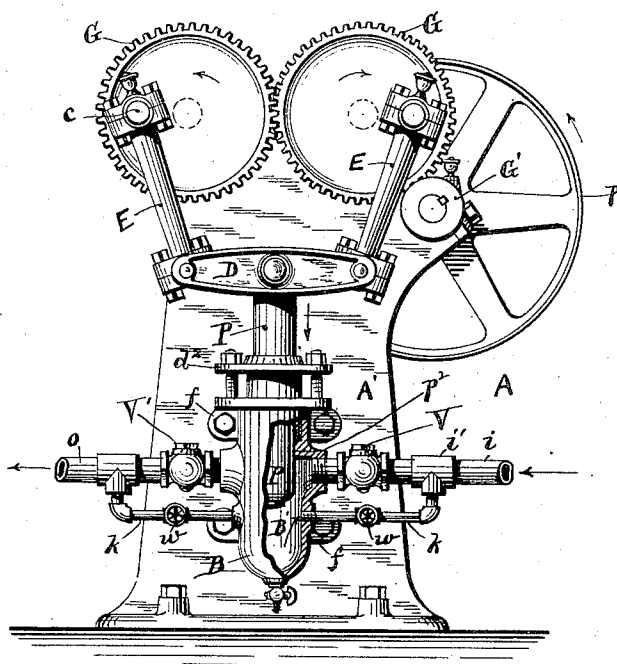
(No Model.)

A. F. NAGLE.

FORCE PUMP.

No. 313,879.

Patented Mar. 17, 1885.



WITNESSES

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UNITED STATES PATENT OFFICE.

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FORCE-PUMP.

SPECIFICATION forming part of Letters Patent No. 313,879, dated March 17, 1885.

Application filed August 30, 1884. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS F. NAGLE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Force-Pumps; 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, reference being had to the accompanying drawing, and to letters or figures of reference marked thereon, which form a part of this specification.

My present invention relates to pumps for feeding water to boilers, &c.; and it consists, essentially, in the combination therewith of a supplemental pipe provided with a regulating valve or cock adapted to connect with the inlet or suction pipe and the pump-barrel, whereby all surplus water in the pump, of the return-stroke, is forced back into the suction.

The object of this invention is to provide a feed-pump with means for regulating the flow of its discharge-water without stopping the pump, and at the same time affording a continuous feed-supply to the boiler, the invention being in no sense the common safety or relief valve (or even an automatic relief-valve) which is applied to steam fire-engines or to the pumping machinery of a water-works system. In these devices the water passes by the pump from the delivery back to the suction, or in some instances the surplus water, after passing from the delivery through the relief-valve, escapes into a waste-pipe, whereas in applicant's device the water passes from the pump to the suction.

In the accompanying drawing the figure represents a front elevation, partly in section, of a single-acting pump embodying my invention.

The following is a description of the invention and the manner of its operation:

Again referring to the drawing, A' designates the frame of a boiler-feed pump to which is secured the barrel B, the latter being provided with the single-acting plunger P, adapted to receive motion by means of the beam D, connected by links E to suitably-mounted spur-gears G, of equal diameter, said gear in

turn engaging with the pinion G' of the driving-shaft.

i and o designate, respectively, suction and delivery pipes, and v v' corresponding check-valves connected with said pipes and barrel, as common. At i', beyond the valve v, a branch pipe, k, leads from the suction-pipe to the chamber B' of the pump. A valve or cock, w, is interposed in the pipe k for the purpose of regulating the quantity of water passing therein. The branch pipe with its valve may enter the suction-pipe i at each end of the valve v, with practically the same advantage as in entering the chamber B' and into the pipe i beyond the check-valve. The corresponding branch pipe and valve shown on the delivery side of the pump are not used unless the pipe o be made the suction, in which case the pipe i serves as the delivery, its (the latter's) valve then being closed.

The invention when applied to a single-acting pump operates as follows, assuming the pump to be in its downward or delivery stroke, (see arrow direction,) the water consequently being forced through the check-valve v' into the exit-pipe o, (the small valve w of that side being closed:) Now, in case the whole volume of water is not required to be used, all such surplus water is by means of the branch pipe k and its regulating valve or cock w forced from the chamber B' back into the suction-pipe i and beyond the check-valve v, all as fully shown. Upon the return of the plunger in its upward or suction stroke water again fills the chamber, and is discharged therefrom, as just described.

It will be observed that the unused water is forced direct from the barrel-chamber back into the suction-pipe.

In forcing feed-water into boilers, particularly those which are required to furnish a regular quantity of steam, it is desirable to maintain therein an unvarying water-line. This I am enabled to do by means of the invention herein described, the valve or cock thereof serving to regulate the quantity of inflowing water. In other words, this invention is for the purpose of adjusting or regulating the delivery of water in a feed-pump having uniform speed, as a belt-driven pump, by forcing or letting the surplus water pass back

again into the suction, whereby a uniform quantity of water is forced into the boiler independently of the pressure.

5 It is obvious that the device, with slight modifications, is adapted to be used in combination with a double-acting force-pump. The invention also admits of regulating the quantity of feed-water without stopping the pump, thereby saving the wear of the belt.

10 As hereinbefore stated, the invention is not a substitute for a relief or safety valve, examples of which may be seen upon fire-engines and water-supply machinery; neither do I claim, broadly, a by-pass connection; but

15 What I do claim, and desire to secure by Letters Patent, is—

In a force-pump, the combination, with the plunger P, operating in the chamber B', of the pipes *i*, and *o*, connected on each side of the chamber B, and having valves *v* and *v'*, and 20 the branch pipes *k*, provided with valves *w*, attached to the pipes *i* and *o* and to the chamber B, as shown and described.

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

AUGUSTUS F. NAGLE.

Witnesses:

ROBERT NUGENT HICKMAN,
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