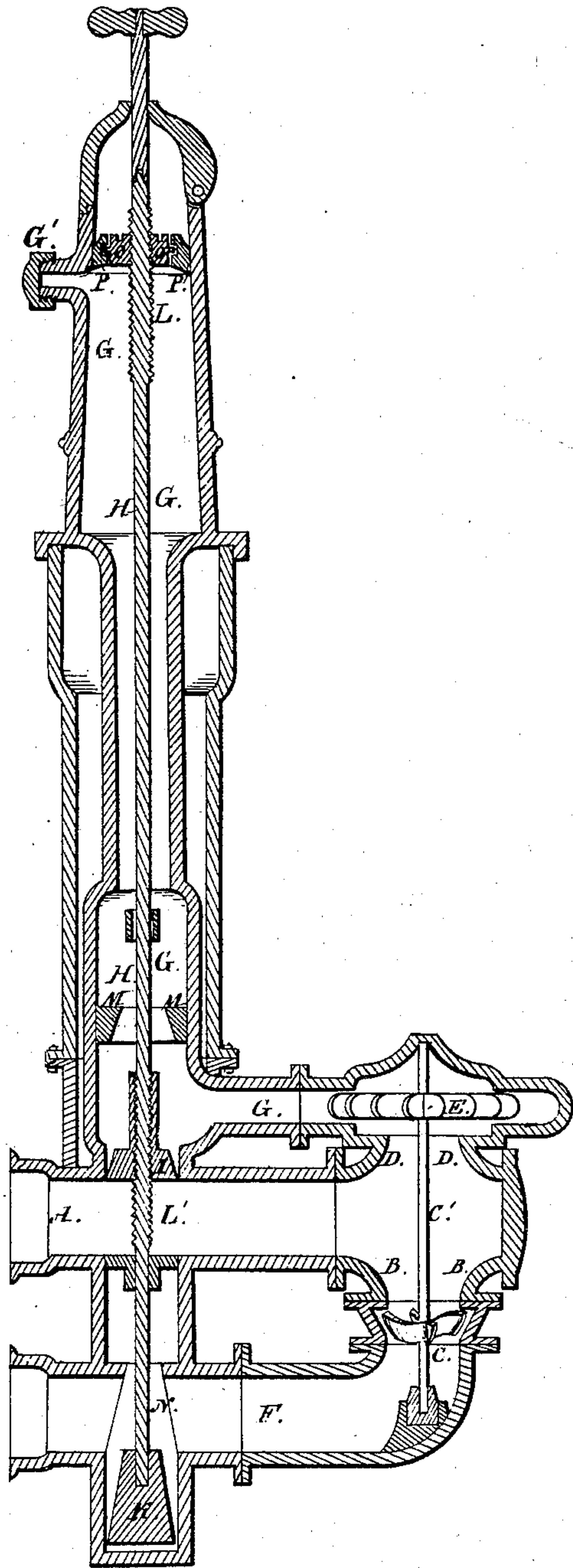


W. W. HARDING.

Combined Fire-Plug and Automatic Pump.

No. 166,203.

Patented Aug. 3, 1875.



Witnesses:

John G. Ford
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WILLIAM W. HARDING, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN COMBINED FIRE-PLUGS AND AUTOMATIC PUMPS.

Specification forming part of Letters Patent No. **166,203**, dated August 3, 1875; application filed June 21, 1875.

To all whom it may concern:

Be it known that I, WILLIAM W. HARDING, of Philadelphia, Pennsylvania, have invented a new and Improved Combined Fire-Plug and Automatic Pump; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings making part hereof.

My invention consists of the combination, with a fire-plug or hydrant, of an automatic rotary motor and force-pump within it, and a rod and check to close or open the supply of water through the motor so as to use or stop the pump at pleasure; also, the combination with a plug or hydrant having within it an automatic force-pump, of a screw-threaded rod to open the ordinary water-passage, alone or separately, or also to open the supply of water to the water-motor of the pump, at will; also, of a combined water-plug or hydrant and an automatic force-pump in its interior, which plug or hydrant can, at will, by means of checks, be used either in the ordinary way, as a simple water-plug, or as a combined plug and force-pump; also, of a single rod having upon its length screw-threads, revolving disk, and checks to close and open the plug and pump, as will be hereafter more fully described.

The drawings represent a longitudinal sectional view of my invention.

A is the principal passage-way leading from the street water-main to my apparatus; B, the water-opening down through the rotary water-wheel C, which latter is connected by shaft C' with the rotary force-pump E; D, a water-passage to conduct a current of water to pump E, which forces it up through the passage-way G; F, an exhaust or escape passage-way for conveying the waste water from rotary wheel C down to the street-sewer; G, a passage-way for the water, to guide it, after leaving the pump, to the nozzle G'. H is a rod or bar, with screw-threads L and L' upon it, to raise and depress the stops I and K on its lower parts. M is a bearing or cushion to receive stop I; N, a cushion, to receive check K. O is a disk containing a female screw, in which the male screw-thread L, of rod H, engages. This disk is fitted by a circumferential shoulder into an annular groove in bearing P, in which

it can revolve, which arrangement of disk and bearing also serves to support rod H.

The operation is as follows:

In the drawing my apparatus is shown opened for operation.

The conduit A is connected with and open to the interior of the street water-main, or other connection with a reservoir, which connection contains water under pressure. The water in great force rushes into passage-way A, and part of it, passing down through opening B, revolves wheel C, after which it passes out through opening F into the street-sewer. As the opening B is not so large as passage A, all of the water cannot thus escape, and part of it is therefore forced up into opening D, through the pump E, into passage G. As the pump is on the same shaft as wheel C it is revolved with great rapidity by the latter, and thus gives a much greater impetus to the water passing through D and G than it would otherwise have, adding to the force of the pressure from the street water-main the full projectile power of the pump E. Under this multiplied power the water is thrown with immense force through the nozzle G' to a great distance. When it is desired to use the ordinary pressure from the street water-main, and to dispense with the additional force of pump E, an ordinary key, with two prongs, is fitted, from the open top of the plug or hydrant, into the holes shown in the top of disk O, and the disk is thus turned round. As the check I is square or prevented from turning by its polygonal shape, the turning of this disk engages the thread L and elevates rod H, which raises check K into place on the cushion N, blocking up the passage-way F, and checking the flow of water through it. This, of course, stops the motor C, and, consequently, pump E. This action also raises check I somewhat, though not so far up as cushion M. The water then, under pressure from the street main only, passes up through the stationary pump E, but principally through the opening left by removal of check I at point R. Now, when it is desired to stop the flow of water altogether, by bringing check I up to the cushion M the double-pronged key is removed, and a single key is fitted to the top of rod H, (as shown,)

and the rod is turned. This does not tend to raise the rod for two reasons: first, because the disk O is fitted so loosely in bearing P as to turn with the rod; and, secondly, the rod is held down by check K, which has been raised as far as it will go. The result, therefore, of turning rod H is simply to make screw-thread L' engage with the thread in check I, which, as this check does not turn round, raises it upward until it reaches its seat in the annular cushion M. The flow of water is thus stopped.

If it is desired to re-open the plug, the actions upon the disk O and rod H with their respective keys are reversed.

By these means water can be automatically forced to a great distance without the aid of auxiliary force from a steam-pump on the outside, and the plug or hydrant can be used either with or without pump E.

The best disposition of passage-ways A B D for the most effectual working of my apparatus is to make passage-way A larger than the aggregate space or cross-sectional area of D and B, and to make opening B larger than opening D. B and F should be of the same size. By these means the passage A will not be subject to temporary exhaustions from the aggregate capacity of B and D being greater, on account of the pump, than A can supply, and a larger body of water will thus pass through the wheel C than is passing through pump E, and a preponderance of power is secured to the motor-wheel C, thus

enabling it to drive the pump more easily and more rapidly than the water would pass through it if this were not the case, and also preventing a neutralization of forces.

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

1. The combination, with a fire-plug or hydrant, of an automatic rotary motor and force-pump within it, and a rod and check to close or open the supply of water through the motor, so as to use or stop the pump at pleasure, substantially as described.

2. The combination, with a plug or hydrant having within it an automatic force-pump, of a screw-threaded rod to open the ordinary water-passage alone or separately, or also to open the supply of water to the water-motor of the pump at will, substantially as and for the purposes described.

3. A combined water-plug or hydrant, and an automatic force-pump in its interior, which plug or hydrant can, at will, by means of checks, be used either in the ordinary way as a simple water-plug, or as a combined plug and force-pump, substantially as described.

4. The combination of rod H, disk O, and checks I and K, to open and close the plug or pump, or both, substantially as described.

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Witnesses:

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JOHN G. FORD.