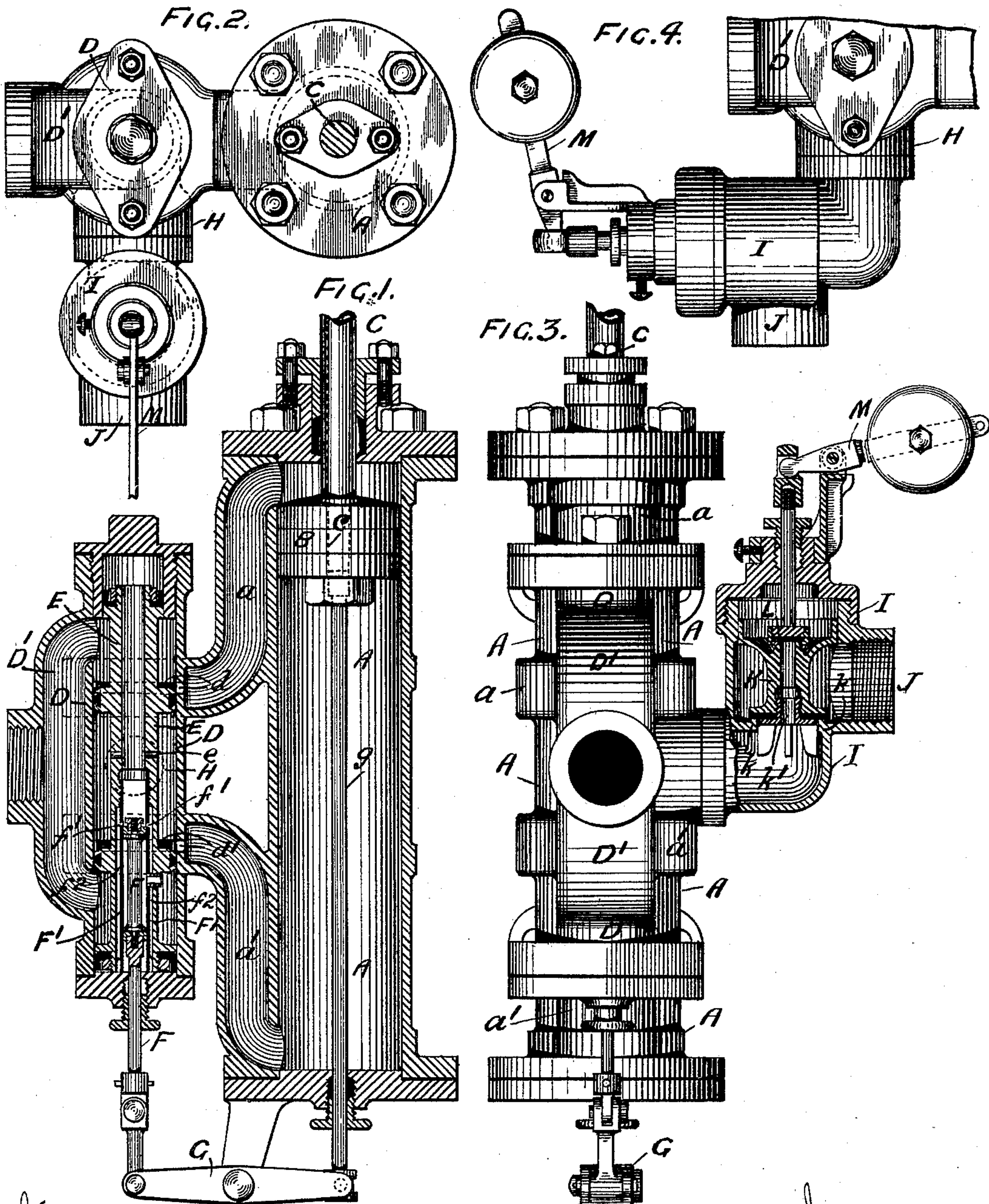


(No Model.)

J. KEITH.
WATER MOTOR.

No. 584,266.

Patented June 8, 1897.



Witnesses
H. van Oldenmeel
J. Alexander

Inventor
James Keith
by *[Signature]*
Attorneys

UNITED STATES PATENT OFFICE.

JAMES KEITH, OF LONDON, ENGLAND.

WATER-MOTOR.

SPECIFICATION forming part of Letters Patent No. 584,266, dated June 8, 1897.

Application filed November 4, 1895. Serial No. 567,924. (No model.) Patented in England December 8, 1893, No. 23,640.

To all whom it may concern:

Be it known that I, JAMES KEITH, gas, hydraulic, heating, and ventilating engineer, a subject of the Queen of the United Kingdom of Great Britain and Ireland, residing at 57 Holborn Viaduct, in the city of London, England, have invented certain new and useful Improvements in Water-Motors, (for which I have obtained Letters Patent in Great Britain, dated December 8, 1893, No. 23,640,) of which the following is a specification.

This invention relates to water-motors, the improved motor being designed to be connected to water-pressure mains for the purpose of obtaining power for operating organ-bellows and for like purposes.

In the accompanying drawings, Figure 1 is a vertical section of the motor, which in this case is designed to work vertically. Fig. 2 is an end elevation, and Fig. 3 is a plan, of same, showing in section the valve for regulating the admission of water to the motor; and Fig. 4 shows in end elevation the position of the water-admission-regulating valve on a motor intended to work horizontally.

As represented in the drawings, the improved motor or water-engine consists of a cylinder A, provided with a piston B and rod C and having a valve-casing D, fitted with a piston-valve E or a slide or other main valve operated by an auxiliary valve F to control admission and exhaust ports through which water under pressure is admitted and exhausted, in order to reciprocate the piston within the cylinder, the piston-rod C being connected in the usual way to operate organ-bellows or other apparatus to which power is to be applied. The main valve E is preferably cylindrical and has fitted within it the auxiliary valve F, which is reciprocated by a double-forked lever G or otherwise from the engine piston-rod C or from a tappet-rod g, as shown, said tappet-rod entering a recess c of suitable length formed in the piston-rod C. The main valve E has ports e formed in it, through which the pressure-water entering the valve-casing D by the inlet H finds its way to the interior and to the upper end of said valve, which is always open to the pressure-water, where, acting on this end of the main valve E, it moves the valve to the position shown in Fig. 1. This opens to the ex-

haust D' the ports d, communicating with the valve-casing D, and the passage a, leading to the upper end of the cylinder A, and at the same time opens the ports d', communicating with the passage A', leading to the lower end of the cylinder A, to the pressure-water, which, acting on the under side of the piston B, sends it to the position shown. During this stroke as the piston B recedes from the tappet-rod g the auxiliary valve F is free to be moved, and the pressure-water confined between the upper end of the valve-casing D and the upper end of the valve F acts on said valve to move it the distance necessary to uncover ports f' in a liner F' in the main valve E. This liner F', which is screwed into the valve E, is of less diameter than that portion of the valve in which it is placed, so as to leave an annular passage f², communicating with the ports f', formed in the liner F', and when the valve F has uncovered the ports f' the pressure-water finds its way through these ports and by way of the annular passages f² to the lower end of the main valve E, where, acting on a greater area than the pressure-water at the upper end, it moves the valve E to the upper end of the casing D. This movement uncovers the ports d' to the exhaust D' and opens the ports d to the pressure-water.

The valve for regulating the admission of water to the motor consists of a casing I, formed with an inlet J, connected to the water-main, the casing I being provided with a loosely-fitting piston-valve K, the lower end of which is adapted by contact with its seat k to shut off communication between the water-main and the motor. The valve K is cored at k' and has its upper end formed as a seat for an auxiliary valve L, actuated by a weighted lever M, pivoted outside of the casing I, the end of this lever being connected to a rod or chain from the bellows of the organ or a moving pressure-indicator.

The action of the admission-valve is as follows: When the air-pressure falls below what is desired, the weighted lever M is free to act on the rod of the valve L and raise said valve, whereupon the water which has previously leaked past the loosely-fitting piston K and has served to keep said piston upon its seat k escapes through the orifice k' to the motor. The pressure-water acting upon the under

side of the piston K now raises the piston and permits the entrance of the pressure-water direct from the main to the motor, where-upon the motor is put into action.

5 Having now described the invention, what I desire to secure and claim by Letters Patent is—

10 In a water-motor for operating organ-bellows, and for like purposes, a distributing-valve composed of a casing, a hollow main valve E having piston-heads and having its upper end open and connecting with one end of the valve-casing, and having also the port *e* communicating with the surrounding
15 space of the casing, the liner F' and an auxil-

iary valve F working in said liner F' which is secured in the interior of the lower end of the main valve, said liner having ports *f'* and being so secured as to form an annular space extending to the lower end of the main valve 20 for the passage of the water thereto, said annular space communicating with the interior of the main valve and the upper space by the ports *f'* in the liner, substantially as described.

Signed at London this 19th day of September, 1895. 25

JAMES KEITH.

Witnesses:

HENRY ROBERT THOMPSON,
GEORGE ALBERT AKERS.