(No Model.)

T. & J. McNEIL & H. MERRIE.

FLUID PRESSURE REGULATOR.

No. 457,056. Patented Aug. 4, 1891.

FIG. 1.

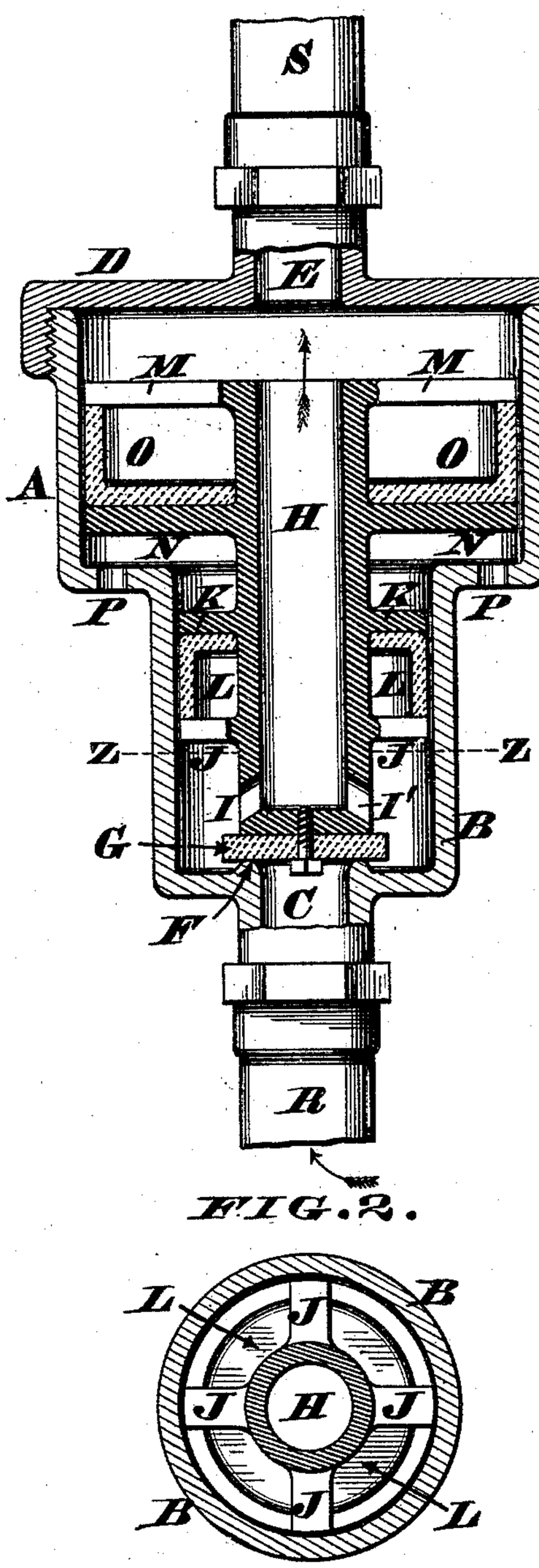
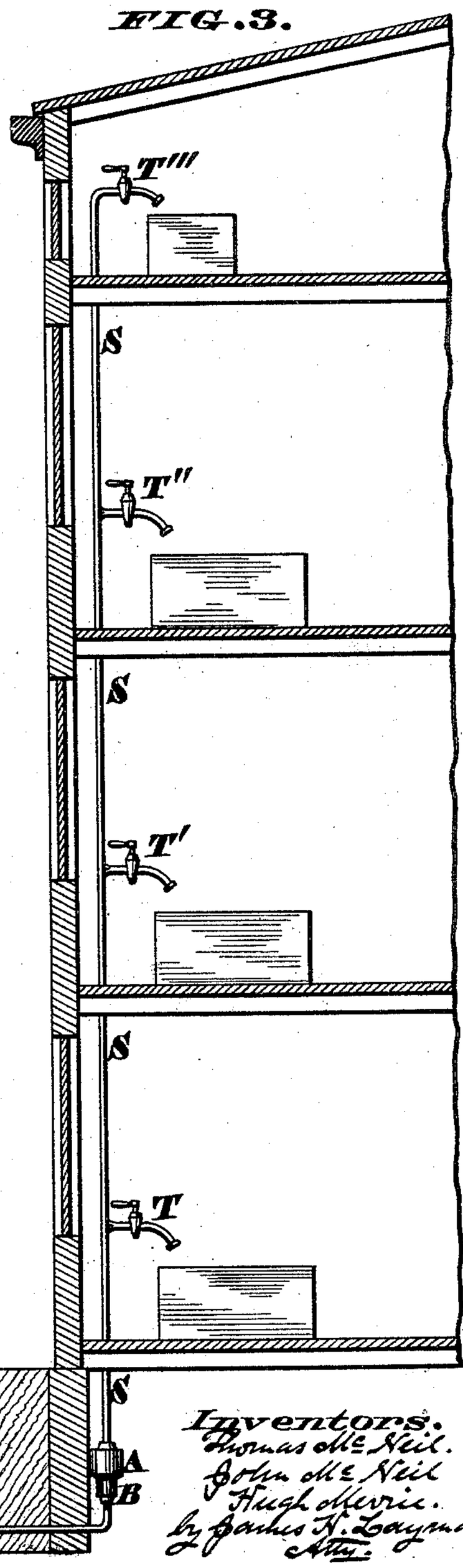


FIG. 2.

FIG. 3.



Attest.
Arthur Moore.
Samuel N. Quinn.

Inventors.
Thomas McNeil.
John McNeil
Hugh Merrie.
by Banks N. Layman
Atty.

UNITED STATES PATENT OFFICE.

THOMAS MCNEIL, JOHN MCNEIL, AND HUGH MERRIE, OF CINCINNATI, OHIO.

FLUID-PRESSURE REGULATOR.

SPECIFICATION forming part of Letters Patent No. 457,056, dated August 4, 1891.

Application filed January 9, 1891. Serial No. 377,219. (No model.)

To all whom it may concern:

Be it known that we, THOMAS MCNEIL, JOHN MCNEIL, and HUGH MERRIE, all citizens of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Fluid-Pressure Regulators; and we do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the annexed drawings, which form part of this specification.

This invention relates to those fluid-pressure regulators which include a pair of communicating cylinders of unequal diameters having an inlet at one end, an outlet at the other end, a seat for a valve to close against, and a hollow water-way that carries said valve, and also a pair of pistons, one for each of said cylinders; and our improvement comprises a novel construction of the pistons proper, the details thereof being hereinafter more fully described, and then pointed out in the claim.

In the annexed drawings, Figure 1 is an axial section of our fluid-pressure regulator, the valve of the same being closed. Fig. 2 is a horizontal section of the device, taken at the line Z Z of the preceding illustration. Fig. 3 shows the method of applying our regulator to the ordinary water-pipes of a building.

A and B represent a pair of communicating cylinders of unequal diameters, the lower or smaller cylinder B having an inlet C, while the upper cylinder A has a cap D screwed or bolted to it, said cap being provided with a discharge or exit E. The lower end of the small cylinder has a raised seat or other appropriate bearing F for a disk-valve G, attached to a hollow water-way H, having near its bottom one or more inlet-ports I I′. Located above the valve G are radial arms J, (more clearly seen in Fig. 2,) and above these arms a disk K is placed, which arms and disks are preferably integral with the water-way H.

L is an inverted cupped packing, so fitted between the arms J and disk K as to expand outwardly by any upward pressure of water within the cylinder B. These parts are duplicated for the upper cylinder, M being a series of radial arms, N a solid disk, and O a cupped packing, which latter is arranged in a reverse manner to the packing L, so as to expand outwardly by any downward pressure of water within cylinder A.

P are holes for draining off any leakage that may occur at either of the packings L or O.

R in Fig. 3 is a pipe attached to the inlet C and communicating with a street-main or other source of supply, and S is a pipe coupled to the exit E and carried up through a building.

T, T′, T″, and T‴ are cocks or other connections attached to pipe S and adapted to deliver water on the different floors or flats of said structure. When the various operative parts of our regulator are in their normal positions, as seen in Fig. 1, the valve G is closed against the seat F and will remain in this condition until either one of the cocks T is opened. As soon, however, as a ventage is thus afforded for the pipe S, the valve G is instantly raised from off its seat, and water then flows into the cylinder B, passes through the ports I I′ into the water-way H, and ascends the exit E and its connection S. The water then finally escapes through the open cock. When sufficient water has been drawn off, the cock is closed, and owing to the excess of pressure that now accumulates upon the piston O N of the larger cylinder A the moving water-way H is forced down until its valve G is again firmly seated on the bearing F, which act automatically cuts off all communication between the inlet R and discharge S.

As soon as valve G is opened the pressure of water within the cylinder B readily and instantly expands the cupped packing L and prevents leakage, which free expansion is due to the fact that said packing is unusually flexible on account of it not being clamped at its center to the disk K. The packing is held in place merely by the radial arms J, which permit the water to press against the entire exposed surface of the cupped device L; but when said valve is closed the upper radial arms M permit the water to expand the other packing O. It will thus be seen that the various arms J M prevent displacement of the respective packings L O and yet permit their

exposed surfaces to be subjected to the full head or pressure of water only when such pressure is necessary to keep the pistons water-tight. Therefore there is no unnecessary wear and tear of said packings or pistons.

We claim as our invention—

The combination, in a fluid-pressure regulator, of a cylinder A, having a discharge E, a cylinder B, of relatively less diameter than the former and communicating therewith, which cylinder B is provided with an inlet C and valve-seat F, and a hollow water-way H, having a valve G at one end and a port I near said valve, said water-way being provided with a pair of disks K N, two sets of radial arms J M, and reversely-cupped packings L O, which arms bear on the outer edges of said cupped packings, in the manner described, and for the purpose stated.

In testimony whereof we affix our signatures in presence of two witnesses.

THOMAS McNEIL.
JOHN McNEIL.
HUGH MERRIE.

Witnesses:
JAMES H. LAYMAN,
SAMUEL M. QUINN.