A. THOMSON.

Dip-Pipe for Gas-Works.

No. 161,298. Patented March 23, 1875.

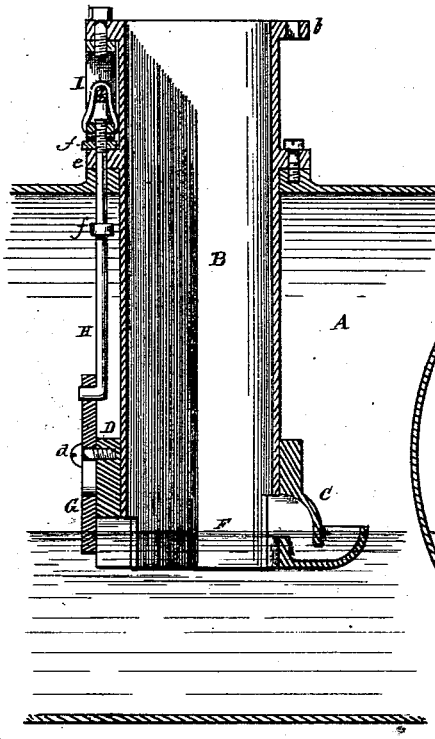
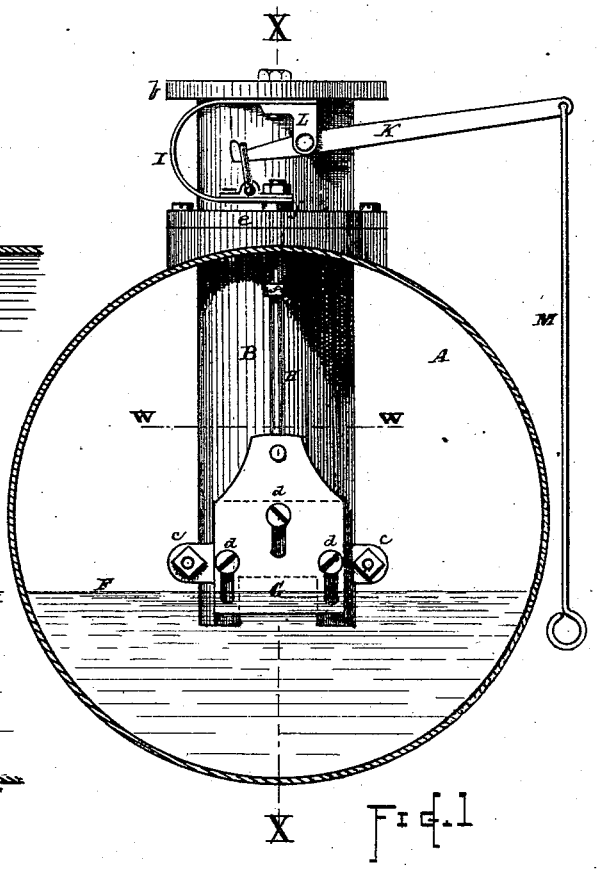


Fig. 2



X Fig. 1

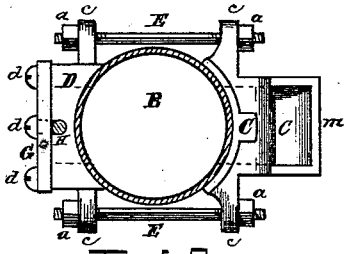


Fig. 3

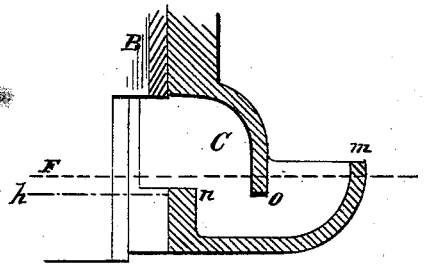


Fig. 4

Witnesses

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ALEXANDER THOMSON, OF WORCESTER, MASSACHUSETTS.

IMPROVEMENT IN DIP-PIPES OF GAS-WORKS.

Specification forming part of Letters Patent No. **161,298**, dated March 23, 1875; application filed January 13, 1874.

To all whom it may concern:

Be it known that I, ALEXANDER THOMSON, of the city and county of Worcester and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Valve Devices for the Hydraulic Dip-Pipes of Gas-Works; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 represents a portion of a hydraulic main, showing a side view of a dip-pipe with my improved valve device applied thereto. Fig. 2 represents a central vertical section of the same at line X X, Fig. 1. Fig. 3 represents a horizontal section of the dip-pipe at line W W, Fig. 1; and Fig. 4 represents, upon a somewhat enlarged scale, a section similar to Fig. 2 of the water-seal cup.

The object of this invention is to provide a valve device for the dip-pipes of gas-works, which, while embracing the advantages of the combined water-seal and hand-valve, shall be cheaper of construction, more readily applicable to the works, and less subject to derangement than those heretofore in use; to this end my invention consists in an improved valve device, constructed as set forth, and arranged on the exterior of the dip-pipe and within the hydraulic main; also in the peculiar construction of the water-seal cup, and in combination and relative arrangement of the valve-operating mechanism, as hereinafter described; also, to the peculiar construction of the water-seal cup or valve, and to the combination and relative arrangement of the gate-valve, and mechanism for operating the same, as hereinafter described.

In the drawings, the part marked A represents a portion of the hydraulic main; and B indicates the dip-pipe through which the gas passes on its way from the retort to the main A. The retort and its stand-pipe may be of ordinary construction, the top of the stand-pipe being connected with the dip-pipe B by an arched bridge-pipe secured to the top flange *b* by bolts or screws. The retorts, stand-pipes, and bridge-pipes are not shown in the drawings, but their position and arrangement in relation to the hydraulic main A may be the same as usual. My improved valve mechanism I arrange upon the exterior lower portion of the dip-pipe B within the hydraulic main A, at the position shown. C indicates the water-seal cup and its support-plate; and D indicates the flat-faced plate or seat for the gate or slide valves. Both of these plates are fitted to the exterior curved surface of the dip-pipe B, and secured in position by being clamped around said pipe by the bolts E E, which pass through the ear-pieces *c c* of the plates, and are provided with nuts *a* at their ends, for tightening and drawing the plates against the pipe. Packing of lead or other material may be used between the plates and surface of the pipe B when required. Openings are formed through the sides of the dip-pipe and plates C D for the passage of the gas, while the lower end of the dip-pipe is closed only by the water within the hydraulic main A, which stands at the level indicated by the line F on the drawings. G indicates the slide or gate, which is slotted and secured to the face of the plate D by bolts or screws *d*, so as to be movable up and down for opening and closing the passage from the interior of the pipe B to the main A. H indicates the gate-rod, hooked to the upper end of the gate G, and extending up through the flange *e* to the exterior of the main A, and having its upper end connected with a spring, I, and linked to the rear end of an actuating-lever, K, fulcrumed to a suitable eye-piece, L, and provided with a hand-rod, M, depending from its front end to a position where it can be conveniently reached by the operator. Small collars *f* are fixed on the rod H, which serve as stops when said rod is raised or depressed to operate the gate G, and with a slight deposit of tar on their surfaces, also serve to close the opening around the rod H, and thus obviate the need of a stuffing-box. The spring I serves to hold the gate G closed, except when drawn up by the lever K, and to quickly close the gate when the lever is released. The water-seal cup C is made with an outer lip, *m*, slightly higher than its inner lip *n*, while a central division or partition, *o*, from above, divides the cup, as indicated, the edge of the partition *o* being somewhat lower than the top edge of the inner lip *n*, and the open-

ing through which the gas passes being above the lips *m n*, and beneath the partition *o*. When the parts are in proper working position the edge of the outer lip *m* is just above the level F of the water in the hydraulic main A, and the edge of the inner lip *n* is just below the surface of the water, the cup being filled. When the pressure of the gas within the retort exceeds the pressure in the hydraulic main A, the water in the end of the dip-pipe B is depressed below the top edge of the lip *n*, (see line *h*,) and the water within the cup is forced out over the outer lip *m*, leaving an open passage for the gas to pass out freely beneath the partition *o*, the lip *m* preventing the water from flowing back into the cup. When the pressure in the retort is sufficiently reduced to permit the water to rise in the end of the dip-pipe B to the level F, it flows over the lip *n*, and by filling the cup C forms a seal or closes the passage. It will thus be seen that the gas is allowed to pass into the hydraulic main A with a very slight excess of pressure in the retort, but that the passage is immediately closed to any backward pressure, so that in case of any accident to the retort, as bursting or removing the lid while in action, the backward escape of gas is prevented. The hand-gate G can be used when desired, or while the retort is new and strong, and there is but little liability of accident, while with old and weakened retorts, or when employing ignorant operatives, the water-seal can be depended upon. The several parts of the valve mechanism are of such size that they can be passed through the manholes in the ordinary hydraulic mains, and can be applied to dip-pipes already in use, if desired. The valves being arranged upon the exterior of the dip-pipe are not liable to become clogged with the pitch or gum which deposits upon the interior of said pipe, consequently the mechanism operates freely, and the works are less subject to accident from the failure of the valves or carelessness of operatives. The water-seal cup may be formed upon the slide or gate G, if desired, or the cup-plate may be arranged to slide as a gate upon the surface of the dip-pipe B, or, if preferred, the gate and water seal can be employed independently. I prefer, however, the construction and arrangement herein shown, as the parts can be cheaply made and applied to dip-pipes now in use at a comparatively small cost.

Having described my improved valve mechanism or dip-pipe attachment, what I claim therein as new, and of my invention, and desire to secure by Letters Patent, is—

1. The combination, with the dip-pipe B, of the water-seal cup C, constructed with an outer lip, *m*, inner lip *n*, and partition *o*, arranged for operation substantially as herein set forth.

2. The combination, with the dip-pipe B, of a sliding gate-valve, G, arranged upon the exterior of said dip-pipe, and within the hydraulic main, substantially as herein set forth.

3. The combination, with the dip-pipe B, of the water-seal cup C, gate G, gate-rod H having collars *f*, lever K, and spring I, all constructed and arranged for operation substantially as and for the purposes set forth.

ALEXANDER THOMSON.

Witnesses:

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CHAS. K. HARDY.