

(No Model.)

F. W. & A. F. HOOD.

PISTON WATER METER.

No. 318,476.

Patented May 26, 1885.

Fig. 1.

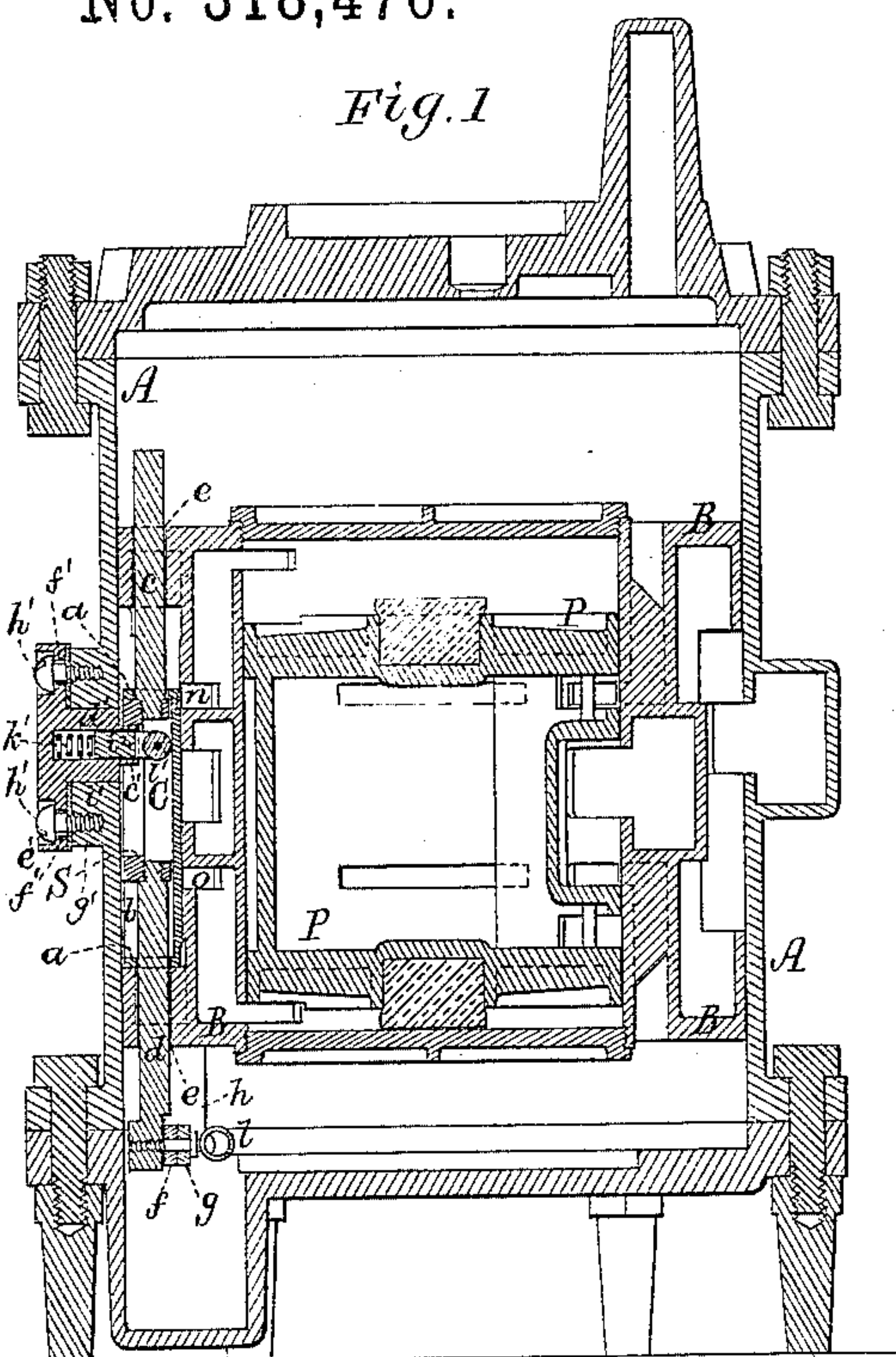


Fig. 2.

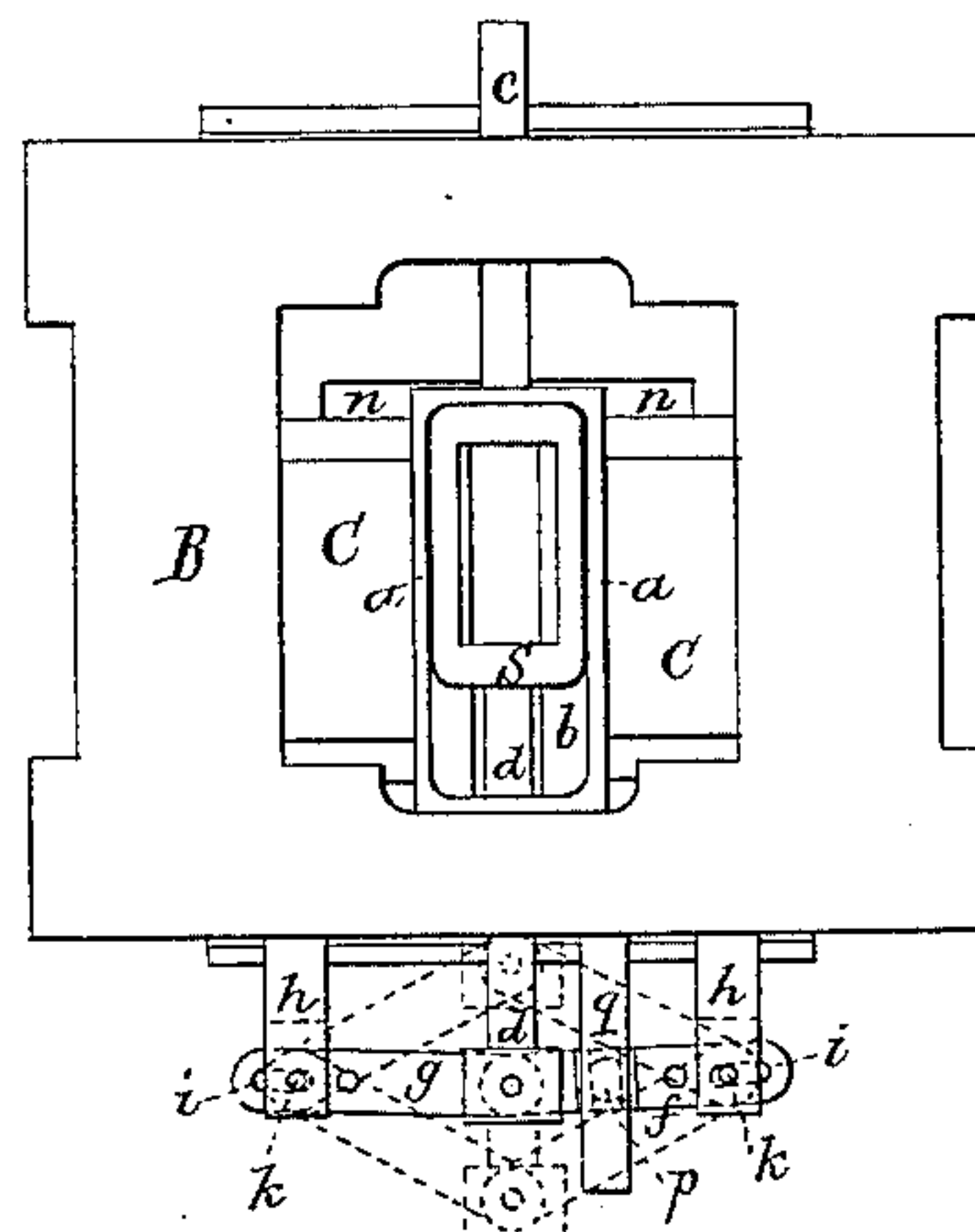


Fig. 3.

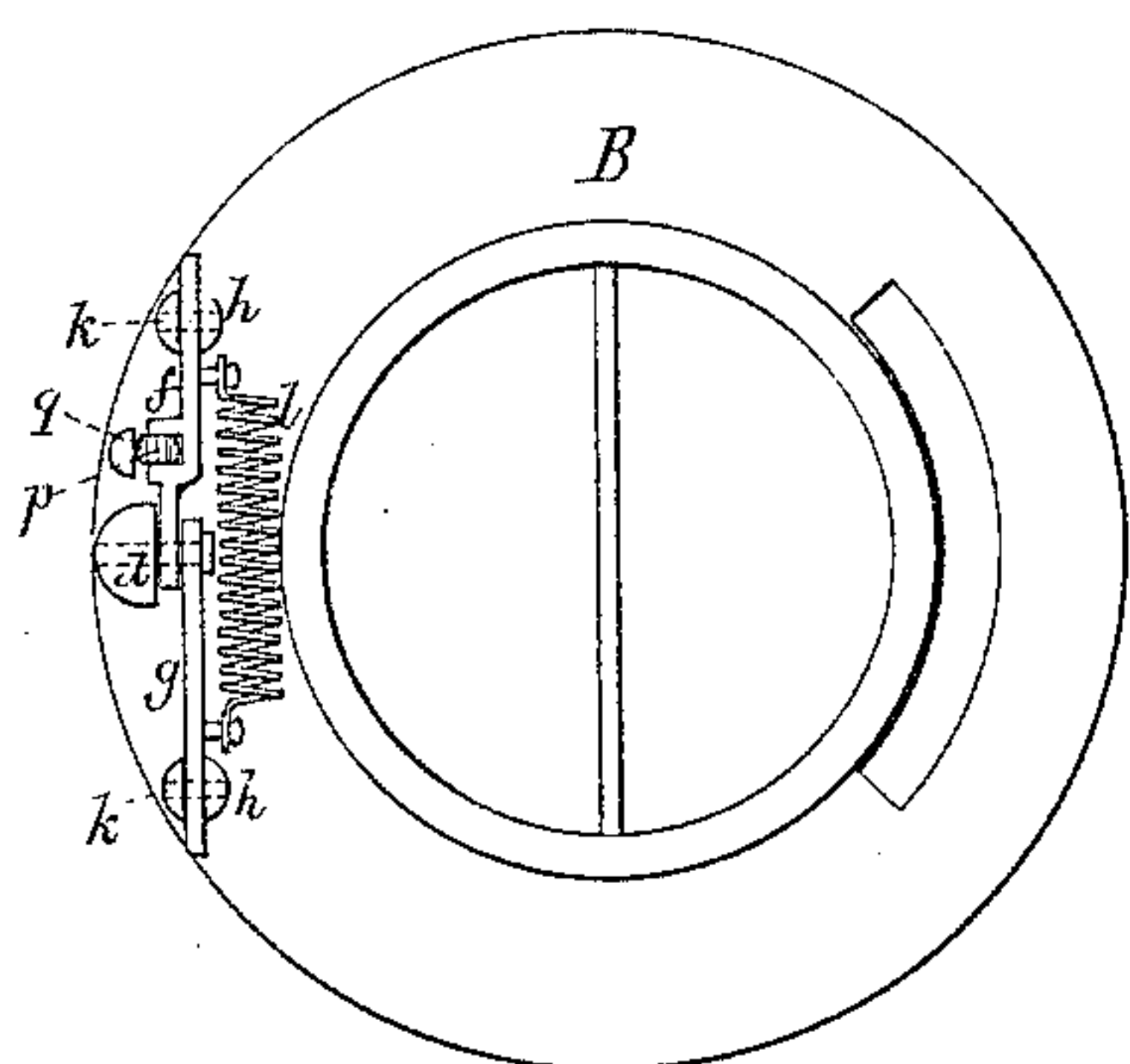


Fig. 4.

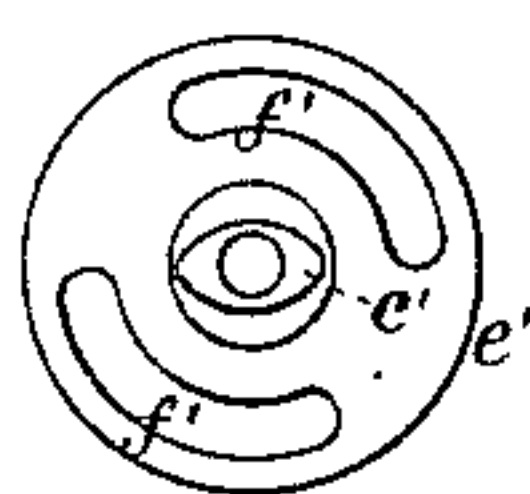


Fig. 5.



Witnesses.

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UNITED STATES PATENT OFFICE.

FREEMAN WESTON HOOD AND ARTHUR FRANCIS HOOD, OF BOSTON, MASSACHUSETTS, ASSIGNORS, BY MESNE ASSIGNMENTS, TO FREEMAN W. HOOD, OF SAME PLACE.

PISTON WATER-METER.

SPECIFICATION forming part of Letters Patent No. 318,476, dated May 26, 1885.

Application filed March 16, 1885. (No model.)

To all whom it may concern:

Be it known that we, FREEMAN WESTON HOOD and ARTHUR FRANCIS HOOD, of Boston, in the county of Suffolk, of the Commonwealth of Massachusetts, have invented a new and useful Improvement in Water-Meters; and we do hereby declare the same to be described in the following specification, and represented in the accompanying drawings, of which—

10 Figure 1 is a longitudinal section of a meter provided with our invention, the nature of which is defined in the claims hereinafter presented. Fig. 2 is a front elevation, and Fig. 3 an end view of the piston and its appliances appertaining to our improvement. Fig. 4 is 15 an inner end view, and Fig. 5 a side view of the duplex cam c' and its operative spindle and slotted disk.

Our invention relates specially to the water-meter described in No. 9,379 of reissues of United States patents.

In Fig. 1, A denotes the meter case or shell, and B the piston, to move rectilinearly within such shell, P being the main valve within the 25 piston. The auxiliary or concave valve of the piston is shown at C as applied thereto in the ordinary way, except that it is not provided as represented in such patent with any rod attached directly to it, and extending from it 30 through and to slide in the heads of the piston, and being for the purpose of moving the valve first in one and next in the opposite direction by being carried against the heads of the shell or case alternately. This valve is provided at 35 its middle with an extension, a , in which is a rectangular recess, b , within which is a rectangular slide, S, having guide-rods c and d projecting from its opposite ends, in line with each other, through holes e in the heads of 40 the piston. To the outer end of one of the said rods two toggles, f g , are pivoted at their inner ends, such toggles being also pivoted near their outer ends to two posts, h h , extended from the next adjacent end of the piston, and arranged as represented. In each toggle is a 45 slot, i , to receive the pin k , which connects the toggle with the post. Furthermore, a spiral spring, l , is fastened at its ends to the two toggles, and extends from one to the other of

them, as represented. Into the slide S there 50 projects a duplex cam, formed as shown at c' , in Figs. 4 and 5. It extends from a short spindle, d' , projecting from a milled head, e' . The spindle turns in a cylindrical hole or bearing, i' , arranged in the shell at the middle of 55 one side thereof. The head e' has two arcal slots, f' , made through it concentrically with the axis of the spindle, and such head rests against the circular face of a cylindrical boss, g' , extending from the shell A. Headed screws h' 60 go through the slots and screw into the boss, and serve to clamp the head to such boss. By turning the head so as to revolve the spindle the duplex cam will be correspondingly turned within the slide S. This cam, with the slide 65 S and the recess in which the slide is placed, serves to arrest the valve in its reciprocating movements and to determine the extent of each of such movements, each being increased as the obliquity of the cam to the recess in the 70 slide is increased, and diminished as such obliquity is diminished.

In the Patent No. 315,786, dated April 14, 1885, and granted to the aforesaid Freeman W. Hood, there is described the said duplex 75 cam, its spindle, and slotted head, and there is shown their application to the meter-shell and the valve of the main piston, the cam in such case being extended within a rectangular recess in the valve. In our present im- 80 provement it will be seen that this cam is within a rectangular recess in the slide S, and that such slide is within the rectangular recess in the valve, and is provided with the slide or guide rods c and d , and with the tog- 85 gles and spring applied to one of such rods and to posts projecting from the main piston. We would observe, therefore, that the recessed extension of the auxiliary valve of the piston, in combination with the duplex cam and its 90 spindle, slotted head, and its set-screw constitute the subject of a claim in said Freeman W. Hood's application for a patent.

In carrying out our present improvement we have combined with them the said slide S 95 and its appliances—viz., the slide or guide rods, the toggles and spring—and have placed the slide within the rectangular recess of the

valve, and have the cam within the recess of the slide. The duplex cam and its spindle are bored axially to receive a slide, i^2 , and a spiral spring, k' , for forcing the slide endwise toward the bottom of the recess in the valve-extension, the said slide being provided with a roller, l , to bear against such bottom. The spring and slide and roller serve to force the valve up to its seat. One of the toggles is furnished with a friction-roller, p , arranged in an ear extending from one side of the toggle. This roller at its periphery bears against the side of a post, q , extended from the head of the piston, all being as represented. Such post and friction-roller are to prevent the spring from crowding laterally the next adjacent guide-rod of the slide S, so as to cause such rod to bear with too much friction in the passage in which it slides.

Having thus described mechanical devices we have added to the meter patented, as hereinbefore mentioned, we will now proceed to explain their object and mode of action.

In the operation of the meter it sometimes happens that during a part of the stroke of the piston the auxiliary valve will be carried directly over and caused to cover both of the ports $n o$. Should the draft of water through the meter be then stopped by shutting the cock of the supply or eduction pipe leading from the meter-case, and should the main valve from any cause cover its ports, the meter will not operate on the cock being opened. In this case, however, the pressure through the meter is equalized, there being no water-pressure on the auxiliary valve to bind it upon its seat.

When the valve is working, the contractive force of the spring of the toggles is insufficient to move the valve against the force or

pressure of water against it to press it upon its seat; but as soon as the valve is relieved of this water-pressure, as it will be when it and the main valve cover their ports, the said spring will be free to act and will cause the toggles to move and force the auxiliary valve in a direction to uncover one of its ports, in which case the meter will operate at once on the cock of the supply-pipe being opened.

We claim—

1. The combination, with the meter-piston and its auxiliary valve having the recessed extension, as described, and with the duplex cam provided with mechanism for operating it, as set forth, of the chambered slide S, arranged within the recess of such extension, the guide-rods of such slide, and the toggles and their spring applied to one of such guide-rods and to posts extending from the piston, the said duplex cam being within and to operate with the slide, as set forth.

2. The combination, with the duplex cam and its spindle, and with the auxiliary valve of the piston, of the slide i^2 , its operative spring k' , and friction-roller, the latter bearing against the bottom of the recess of the extension of the valve, and all being to operate substantially as set forth.

3. The combination, with the piston and its auxiliary valve, and with the slide S, its guide-rods, toggles, and their spring, of the friction-roller P, applied to one of said toggles, and the post q , extended from the piston, all being substantially as set forth.

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Witnesses:

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