W. TAYLOR.

VALVE OPERATING MECHANISM.

APPLICATION FILED DEC. 15, 1916.

1,253,109.

Patented Jan. 8, 1918.

2 SHEETS—SHEET 1.

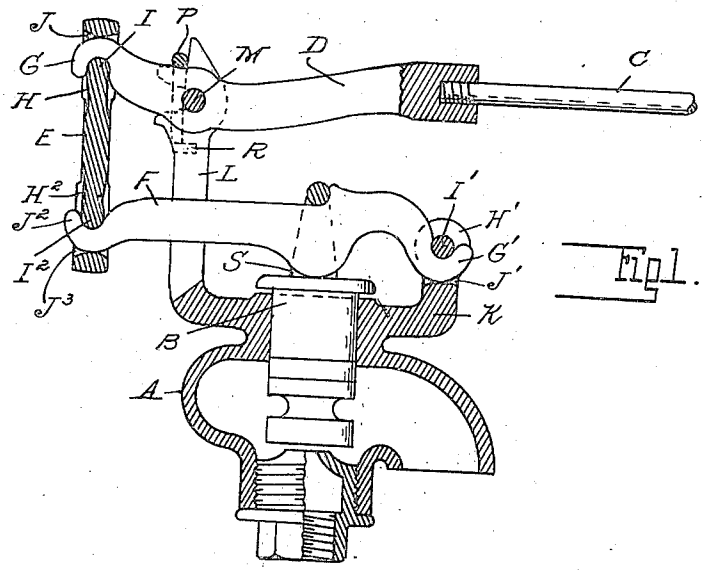


Fig. 1.

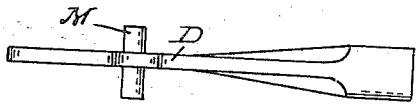


Fig. 2.

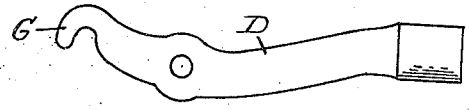


Fig. 3.

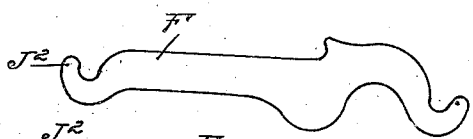


Fig. 4.

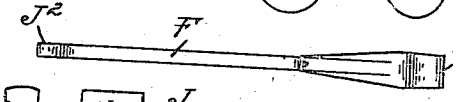


Fig. 5.

Fig. 6.

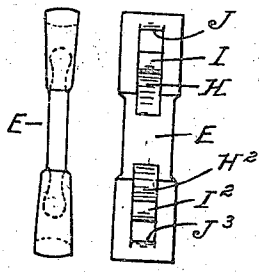


Fig. 7.

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2 SHEETS—SHEET 2.

Fig. 7.

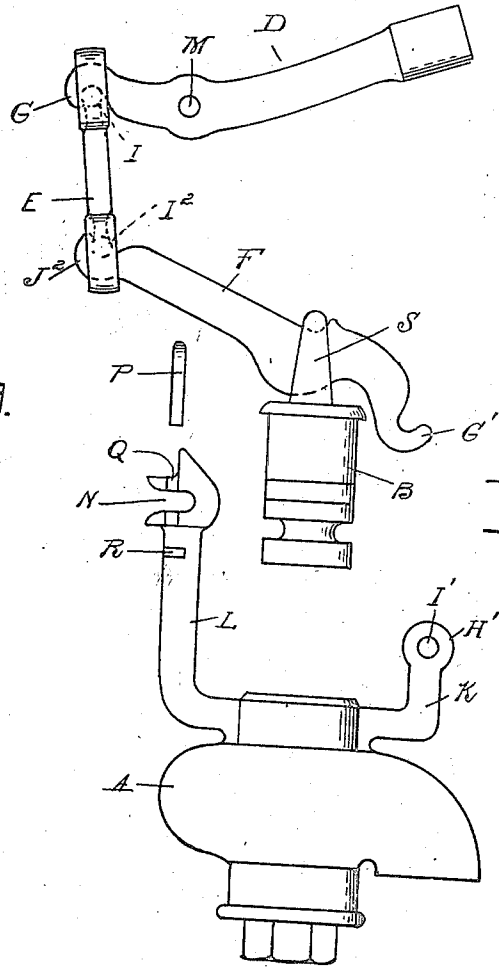
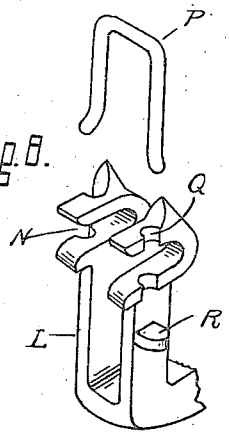


Fig. 8.



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UNITED STATES PATENT OFFICE.

WILLIAM TAYLOR, OF FORD CITY, ONTARIO, CANADA, ASSIGNOR TO W. A. CASE & SON MANUFACTURING COMPANY, OF BUFFALO, NEW YORK, A CORPORATION OF NEW YORK.

VALVE-OPERATING MECHANISM.

1,253,109. Specification of Letters Patent. Patented Jan. 8, 1918.

Application filed December 15, 1916. Serial No. 137,197.

To all whom it may concern:

Be it known that I, WILLIAM TAYLOR, a subject of the King of Great Britain and Ireland, residing at Ford City, in the Province of Ontario and Dominion of Canada, have invented certain new and useful Improvements in Valve-Operating Mechanism, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to valve operating mechanism more particularly designed for use in connection with flushing tanks for the float control of the water inlet valve. It is usual in such constructions to provide a compound lever mechanism by which the power of the float is applied directly to the valve and as heretofore constructed the various elements of the compound lever are connected through detachable pivot pins. Inasmuch, however, as the device is constantly exposed to water, the pivots become corroded so as to interfere with free operation; and furthermore, on account of this corrosion it is difficult to remove the pins where repairs are necessary. It is the object of the present invention to obtain a construction of compound lever in which all of the elements are readily engageable and disengageable at any time, and are also so constructed as to preclude accidental disengagement. To this end the invention comprises the novel construction as hereinafter set forth.

In the drawings:

Figure 1 is a sectional side elevation of a valve controlled by my improved operating mechanism;

Figs. 2 and 3 are respectively a plan view and side elevation of one of the elements of the compound lever;

Figs. 4 and 5 are similar views of another element, and Figs. 6 and 7 are views of a third element;

Fig. 8 is a perspective view of one of the fulcrum arms, showing the means of detachably securing the lever thereto;

Fig. 9 is a side elevation, showing the manner of engaging and disengaging the lever.

A is the casing of a water inlet valve of any suitable construction, and B is the valve vertically adjustably secured in the casing A. C is the float-arm which is connected to a lever member D, which in turn is connected by a link E with a lever member F for directly engaging the valve, thereby constituting a compound lever system.

To permit of easily assembling and disassembling these parts and to maintain the same operative at all times, I have dispensed with the usual detachable pivot pins, and have provided an engagement of the following construction: G is a hooked bearing formed at the end of one member, which is adapted to be inserted in a bifurcation H of the adjacent member and to engage a cross-pin or pivot bearing I, preferably integral with the bifurcated member. Spaced from the pin I is a bearing J for also engaging the hook G, and the arrangement is such that by turning the two members at an angle to each other which is abnormal to their operative positions, the hook may be engaged with the pivot pin, while in operative position it is held by the bearing J from disengagement from the pin I. As specifically shown, the member F has a hooked end G′ for engaging a bifurcation H′ of a fulcrum arm K, preferably integral with the casing A. The arm is provided with an integral cross-pin I′ with which the hook G′ is engaged, and a bearing J′ for holding the hook in engagement with the pin. At the opposite end of the member F is a similar hook J^2 for engaging a bifurcation H^2 at one end of the member E and also engaging the pin or pivot bearing I^2 and opposed bearing J^3. The opposite end of the member E has as above stated the bifurcation H, pin or pivot bearing I and opposed bearing J engaged by the hook G upon the member D.

The fulcrum bearing for the member D is formed by an arm L, preferably integral with the casing A and bifurcated to receive the member D. The fulcrum pin M is preferably integral with the member D and extends upon opposite sides thereof, and this pin is engaged with the bifurcated arm L through a lateral entrance slot N. To hold the pin in engagement a spring clip P is engaged with grooves Q in the opposite side of the bifurcation, so as to extend across the entrance slot and hold the pin from disengagement. There is also a lug R upon the bifurcated arm for engaging the end of the spring clip P to hold the same in normal position.

With the construction as described, when the parts are in normal working position, as

illustrated in Fig. 1, the angular movement permitted to the several elements is not sufficient to disengage any one of the hooks from their coöperating pins. On the other hand, when it is desired to assemble the parts they may be readily engaged with each other by arranging them at an abnormal angle. Thus the members F, E and D when detached from the fulcrum arms K and L may be readily arranged at an angle for engagement with each other. When thus engaged, the member F may be inserted through the slotted shank S of the valve B, and the hooked end G' may then be engaged with the bifurcation and pivot I' of the fulcrum arm K. The valve B is then adjusted downward to its seat, after which the fulcrum pin M may be laterally engaged through the entrance slot N with the bifurcated fulcrum arm L, and the clip P is then placed in position to hold said pin from disengagement. The angular movement of the float-arm C during normal operation of the device is insufficient to adjust the elements D, E and F to a position where they will disengage from each other, and furthermore, such an adjustment is prevented by the limit of movement imposed by the fulcrum bracket L. Thus the mechanism is just as secure as where the elements are connected by pivots and eyes. Whenever it is desired to disassemble the parts all that is required is the removal of the clip P, whereupon the lever elements may be moved to an angle where they will be disengagable from each other.

What I claim as my invention is:

1. A compound lever mechanism, comprising a plurality of elements, means for limiting the angular movement of said elements in normal operation, and coöperating engaging portions on the adjacent elements engageable upon an abnormal angular movement of said elements and retained from disengagement during normal angular movement.

2. In a valve operating mechanism, the combination with the movable valve member, of a compound lever for controlling the same, comprising a plurality of separately-fulcrumed lever elements and a link having a normally limited angular movement, and means for engaging and disengaging said elements and link only when in abnormal angular relation.

3. In a valve operating mechanism, the combination with a movable valve member, of a lever for operating the same, a fulcrum for said lever, and means for engaging said lever with said fulcrum when in abnormal angular relation only by a movement transverse of the axis of said fulcrum and for retaining said lever in engagement with its fulcrum in normal angular relation.

4. In a valve operating mechanism, the combination with a movable valve member, of a compound lever for controlling the same comprising a plurality of linked lever elements and fulcrums therefor, means for engaging said elements with their linkage when in abnormal angular relation, said means preventing disengagement when in normal angular relation, and a detachable connection between one of the elements and its fulcrum permitting the abnormal angular relation.

5. In a valve operating mechanism, a compound lever comprising a plurality of elements linked to each other, the engagement between adjacent elements comprising a fulcrum-pin on the one and a hook on the other engageable when in abnormal angular relation and restrained from disengagement when in normal angular relation, and means for normally limiting the angular movement.

6. In a valve operating mechanism, the combination with a movable valve and a stationary casing therefor, of a plurality of fulcrum arms on said casing, a compound lever having a plurality of elements respectively fulcrumed upon said fulcrum arms and a connecting link, the engagement between the lever elements and the link comprising a hook on the one, a fulcrum-pin on the other and a bearing for normally holding the hook in engagement with said fulcrum-pin, said hook being disengageable from said pin when the elements are arranged in an abnormal angular relation, and a detachable engagement between one of the elements and its fulcrum for permitting an abnormal angular relation.

7. In a valve operating mechanism, the combination with a movable valve member and a stationary casing therefor, of fulcrum arms mounted on said casing, a lever fulcrumed on one of said fulcrum-arms directly engaging said movable valve member, a lever fulcrumed upon the other fulcrum-arm, a link connecting said levers, and means for detachably connecting said lever elements and link, comprising a hook on one member, a pin on the other member, and a bearing for holding said hook in engagement with said pin when said members are in normal angular relation and permitting disengagement of the hook from the pin when in abnormal angular relation.

8. A valve operating mechanism, comprising a movable valve member, a stationary casing therefor, a plurality of fulcrum-arms projecting from said casing, a compound lever having one element engageable with one of said fulcrum-arms and with said movable valve member, another element engageable with the other of said fulcrum-arms and a link for connecting said elements, the engagement between said elements and link comprising a hook on the one, a pin on the

other and a bearing for holding said hook normally in engagement with said pin, permitting of disengagement when in abnormal angular relation, and a clip for detachably securing one of said elements to its fulcrum and thereby limiting the angular movement of the other elements.

9. In a valve operating mechanism, the combination with the movable valve member, of a plurality of fulcrumed lever elements for operating said valve member having normally a limited angular movement and normally held in assembled relation, and means for permitting assembling and disassembling of said lever elements only when in abnormal angular relation.

In testimony whereof I affix my signature.

WILLIAM TAYLOR.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."