

(No Model.)

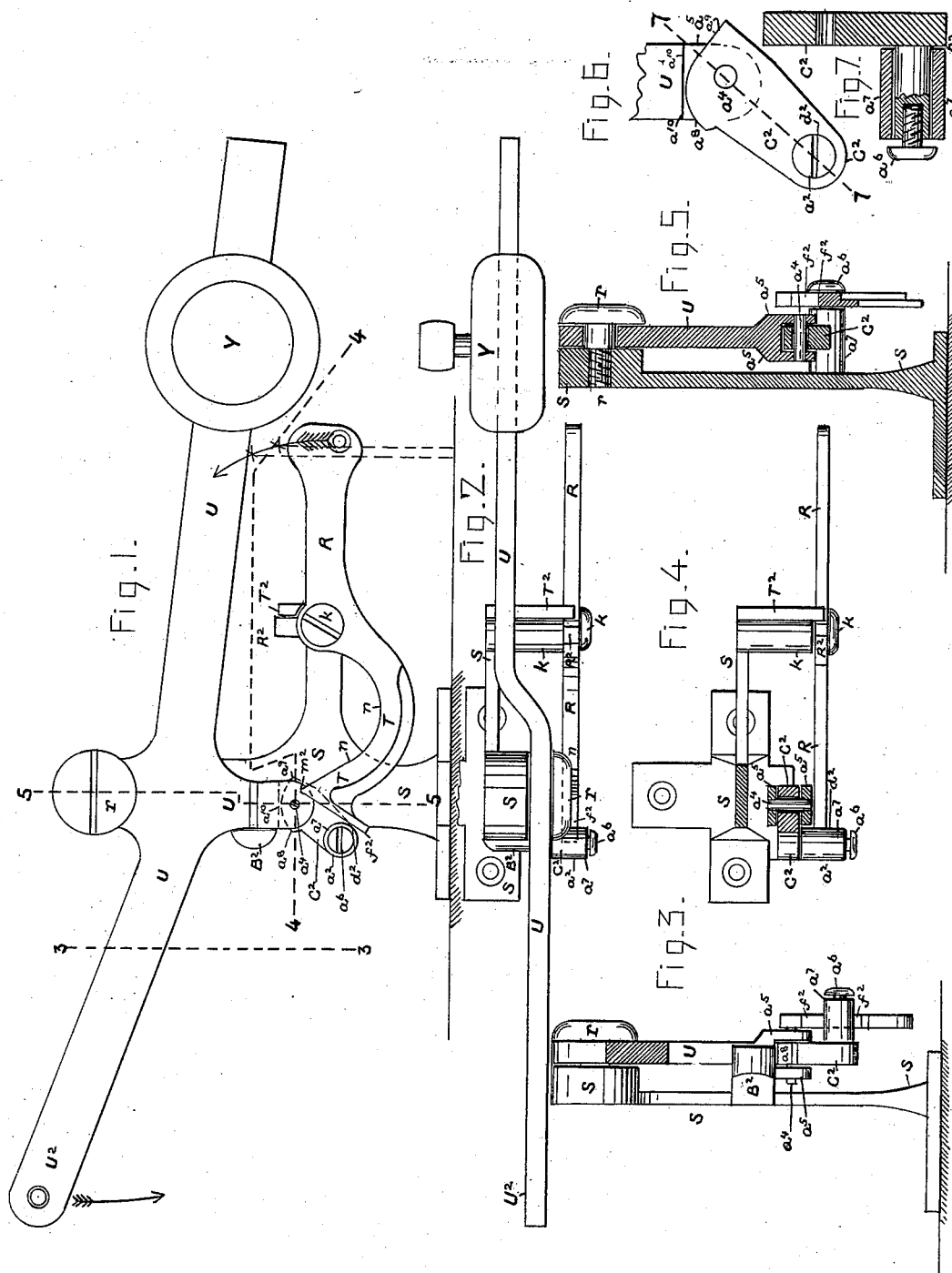
2 Sheets—Sheet 1.

W. SCOTT.

OPERATING LEVER FOR VALVES, &c.

No. 384,087.

Patented June 5, 1888.



WITNESSES.

*Edward Hamilton.*  
*Chas. D. Freeman.*

INVENTOR.

*William Scott.*  
*by his Attorneys,*  
*Brown Bros.,*

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Fig. 8.

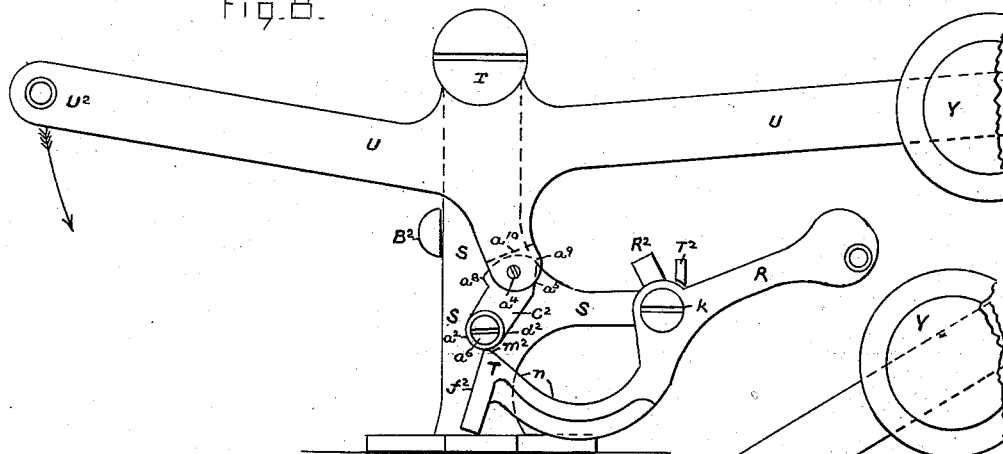


Fig. 9.

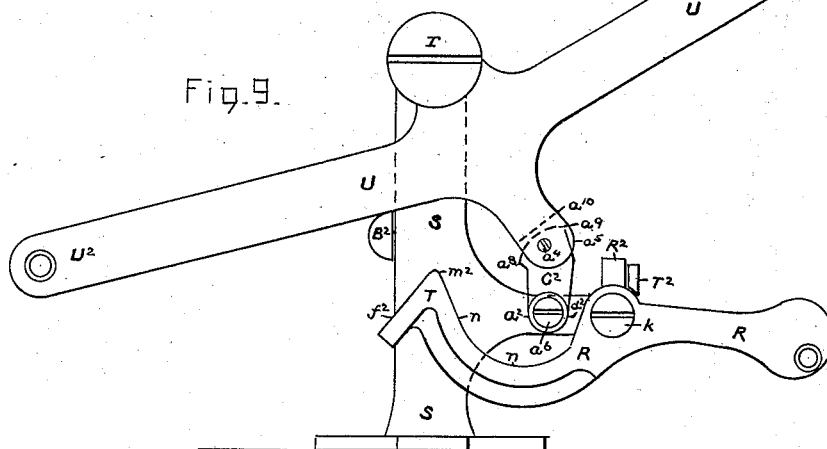
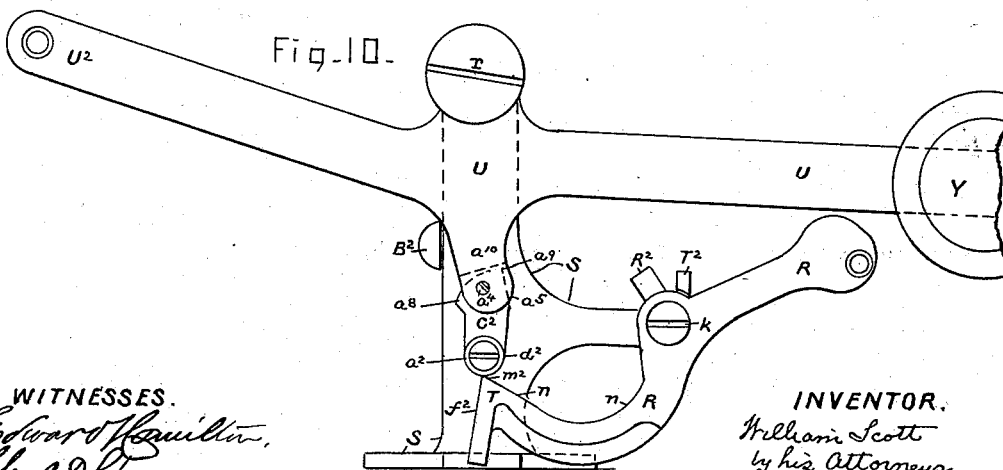


Fig. 10.



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# UNITED STATES PATENT OFFICE.

WILLIAM SCOTT, OF MALDEN, MASSACHUSETTS.

## OPERATING-LEVER FOR VALVES, &c.

SPECIFICATION forming part of Letters Patent No. 384,087, dated June 5, 1888.

Application filed February 13, 1888. Serial No. 263,886. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM SCOTT, of the city of Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Operating-Levers for Valves, &c., of which the following is a full, clear, and exact description.

This invention relates to levers more particularly designed for operating-valves of water-closet and other tanks, although, as will be obvious from the description hereinafter given, the levers are applicable to other purposes, and therefore it is not intended to limit the invention in this regard.

The invention more especially relates to the class of operating-levers shown and described in Letters Patent of United States issued to me, reissue dated October 20, 1885, No. 10,653; originals dated December 1, 1885, and Nos. 331,556, 331,557, and 331,558, to which reference is hereby had.

The invention consists of two reciprocating levers, one of which is suitably adapted to be used as an operating-lever, and the other is suitably connected to the valve or other contrivance to be operated in combination with a swinging toe-piece dependent from the operating-lever, and which is adapted to abut on it in two directions at an angle to each other and in each position of abutment has a bearing and working face to work on, and to escape from a bearing and working face of valve-lever in each direction of the reciprocating motion of the operating-lever, and all so as to secure a reciprocating motion of the valve-lever in each direction of the reciprocating motion of the operating-lever, substantially as hereinafter described.

In the drawings, forming part of this specification, Figure 1 is a side elevation of the lever contrivance of this invention, showing it in its normal position. Fig. 2 is a plan view. Fig. 3 is an end elevation and vertical section, line 3 3, Fig. 1. Fig. 4 is a horizontal section, line 4 4, Fig. 1. Fig. 5 is a vertical section, line 5 5, Fig. 1. Fig. 6 is a view in detail, and Fig. 7 is a section, line 7 7, Fig. 6, as hereinafter appears. Figs. 8, 9, and 10 are severally side elevations illustrating different positions of the lever hereinafter described.

In the drawings, R and U are respectively the valve and operating levers of the lever

contrivance of this invention and turn on separate horizontal fulcra, *k* and *r*, of a common stand or upright, S. This stand S is of suitable construction for the purpose for which the levers are used—as, for instance, for opening and closing a valve (not shown) of a water-closet tank, (not shown,) as fully shown and described in the Letters Patent referred to. The valve (not shown) is connected to one of the ends of the valve-lever R, and the operating-lever U at one end, U<sup>2</sup>, is suitably and as well known connected for being operated, and at the other end it has a weight, Y, arranged for adjustment. Each lever R U swings in a vertical plane, and the operating-lever U is above the valve-lever R, and otherwise, all except as hereinafter described and constituting this invention, is well known and therefore needs no particular description herein.

The operating-lever U in its normal position, Figs. 1, 2, 3, 4, and 5, rests against the vertical face of a stop, B<sup>2</sup>, of the stand S, suitably located therefor, and it is swung in one direction by forcing its operating end U<sup>2</sup> downward against its weighted end, (the upper edge of the stop B<sup>2</sup> determining the extent of such swing,) and in the other and opposite direction to return it to its normal position from the action of its applied weight, as stated.

T<sup>2</sup> is a stop of the stand S, suitably located to limit the swing of the valve-lever in either direction, and co-operating in one direction—that is, in the downward movement of its end connected to valve—with a radial projecting lug, R<sup>2</sup>, of the valve-lever.

Each lever R U has a nose projection, T and C<sup>2</sup>, respectively. The nose T of valve-lever R has bearing and working faces *f*<sup>2</sup> and *n*, and the nose C<sup>2</sup> of the operating-lever U has bearing and working faces *d*<sup>2</sup> and *a*<sup>2</sup> to bear and work when the operating-lever U is swung in one direction—that is, in its direction of swing produced by forcing down its operating end U<sup>2</sup>, the face *d*<sup>2</sup> of the nose C<sup>2</sup> of the operating-lever U on the face *f*<sup>2</sup> of the nose T of the valve-lever R—and when the operating-lever is swung in the other and opposite direction—that is, in its direction of swing produced from the action of its weighted end to return it to its normal position, the face *a*<sup>2</sup> of the nose C<sup>2</sup> of the operating-lever on the face *n* of the nose T of the valve-lever—and in each instance for said faces

so working to escape from each other and leave the valve-lever free to return in the one instance to a rest by its lug  $R^2$  against the stop  $T^2$  of the stand  $S$ , and in the other instance to a rest by the bearing and working face  $f^2$  of its nose  $T$  against the bearing and working face  $d^2$  of the nose  $C^2$  of the operating-lever, which lever, and also the valve-lever, in that instance, are in their respective normal positions.

The nose  $C^2$  of the operating-lever is a swinging and dependent toe-piece, hung and swinging at its upper end portion upon a horizontal pin,  $a^4$ , of and between two vertical ear-pieces,  $a^5$ , of the lever, and at its lower end portion it carries a horizontal projection,  $a^6$ , preferably provided with a friction-roller,  $a^7$ , which directly makes the bearing and working faces  $d^2$   $a^2$  of the lever  $U$  and crosses horizontally the vertical plane of the bearing and working faces  $f^2$   $n$  of the valve-lever which meet at a more or less acute angle having its apex  $m^2$  uppermost.

The upper end of the dependent toe  $C^2$  has two faces,  $a^8$   $a^9$ , at an angle to each other and located for separate abutment against a face,  $a^{10}$ , of the operating-lever  $U$ , and this face  $a^{10}$  is opposite to and above the faces  $a^8$   $a^9$ , and said face  $a^{10}$  of the lever  $U$  and said abutment-faces  $a^8$   $a^9$  therefor of dependent toe  $C^2$  are situated in relation (the face  $a^{10}$  to the faces  $a^8$   $a^9$ , and the faces  $a^8$   $a^9$  as to each other) for the face  $a^9$  of the toe to be in abutment on the face  $a^{10}$  of the lever when the lever is on its return movement and the face  $a^8$  of the toe is at a bearing and at work on the working and bearing face  $n$  of the valve-lever to raise the valve-connected end of said lever, and to be out of abutment at all other times, and for the faces  $a^8$   $a^{10}$  of dependent toe and its carrying-lever  $U$  to be in abutment on each other when the lever is on its swing from its normal position, and either for the whole or for a portion, preferably the latter, of the then travel of the bearing and working face  $d^2$  of the dependent toe  $C^2$  over the bearing and working face  $f^2$  of the nose  $T$  of valve-lever.

In the normal position of the levers  $R$   $U$  the dependent toe  $C^2$  of the operating-lever rests by its face  $d^2$  against the face  $f^2$  of the valve-lever, and the toe at this rest is at a vertical angle of inclination, and one more or less parallel to the vertical angle of direction of said face  $f^2$  of the valve-lever, and preferably the abutment-face  $a^8$  of the dependent toe  $C^2$  is out of contact with the abutment-face  $a^{10}$  of the operating-lever. Now on depressing the end  $U^2$  of the operating-lever its toe  $C^2$ , by its face  $d^2$  resting on the face  $f^2$  of the nose  $T$  of valve-lever, rides up on said face, the toe  $C^2$  as it so rides up swinging on its center-pin  $a^4$ , and finally coming to an abutment by its face  $a^8$  on the face  $a^{10}$  of the operating-lever  $U$ , on which, continuing the swing of the operating-lever, the end of the valve-lever carrying the toe  $T$  is depressed. This raises its opposite and valve-connected end until the working-faces  $d^2$

$f^2$  of the noses of operating and valve levers escape from each other at the apex  $m^2$  of the working-faces  $f^2$   $n$  of the valve-lever; the depending toe-piece of operating-lever is then left free to swing and the valve-lever to return, coming to a rest by its lug  $R^2$  against the stop  $T^2$  of the stand  $S$ , and the swing of the operating-lever is then arrested by the abutment thereof against the upper edge of the stop  $B^2$  of the stand  $S$ .

Fig. 8 illustrates the position of the operating and valve levers at the point of escape at their working-faces  $f^2$   $n$  from each other, and Fig. 9 the position of operating and valve levers after the escape of their said working-faces and the valve-lever has swung to a rest against the stop  $T^2$  and the operating-lever to a rest against the upper edge of stop  $B^2$  of stand. Now on releasing operating-lever for its return to its normal position, Fig. 1, its swinging toe, then being free from contact with the valve-lever, comes to a rest by its bearing and working face  $a^2$  against the bearing and working face  $n$  of the valve-lever, which forces the toe into an abutment by its face  $a^2$  against the face  $a^{10}$  of the operating-lever, on which, continuing the swing of the operating-lever, the toe  $C^2$  then rides up the working-face  $n$  of the valve-lever, depressing the nose end of said lever and raising its other end until the then working-faces  $a^2$   $n$  of the noses of operating and valve levers escaping from each other at the apex  $m^2$  of the working-faces  $n$   $f^2$  of the valve-lever, the dependent toe or nose  $C^2$  is left free to swing and the valve-lever to return to its normal position with the dependent toe at rest by its face  $d^2$  on its face  $f^2$  and the operating-lever at rest against the vertical face of its stop  $B^2$  on the stand.

Fig. 10 illustrates the positions of operating and valve levers when their working-faces  $a^2$   $n$  are about to escape from each other, as just above described.

In the operation of the levers the one upon the other, as described, the operating-lever in one direction of its movement works by one face,  $d^2$ , against the face  $f^2$  of valve-lever and then escapes therefrom, leaving the valve-lever free to return, and in the other direction of its movement it works by its face  $a^2$  on the face  $n$  of the valve-lever, and the face  $a^2$  is opposite horizontally to the face  $d^2$ , by which it is worked on the valve-lever in its previous movement and then escapes therefrom, leaving the valve-lever again free to return. This, as is obvious on the movement of the operating-lever in each direction of its reciprocation, secures a reciprocating motion of the valve-lever, and consequently two separate and distinct operations of the device or contrivance to which the valve-lever is connected are secured for one reciprocating motion of the operating-lever; or, in other words, if connected to a valve an opening and a closing, followed by another opening and a closing of the valve, form one operation or reciprocation of the operating-lever.

The angle of direction of the abutment-faces  $a^8 a^9$  of the swinging and dependent toe  $C^2$  of the operating-lever relatively to each other and to the direction of the abutment-face  $a^{10}$ , therefor of the operating-lever, preferably for the purposes of a valve to a water-closet tank, is such as to secure a greater length of swing of the valve-lever on the return movement than on the forward movement of the operating-lever, thus effecting in the supply of water from the tank to the closet what is known as "preliminary" and "after" washes of the bowl. The angle of direction of the abutment-faces  $a^8 a^9$  of the dependent toe  $C^2$ , as well as the direction of the abutment-face  $a^{10}$  of the operating-lever therefor, obviously may be varied relatively considered so as to secure equal or unequal movements of the valve-lever from a given reciprocating movement of the operating-lever, and the invention is not to be limited in these respects.

The bearing and working face  $n$  of the valve-lever, and on which the face  $a^2$  of dependent nose  $C^2$  of the operating-lever bears and works in the return movement of the operating-le-

ver preferably, in order to render the ride of the parts more easy and free, is made more or less curving, Figs. 1, 8, 9, and 10.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

In combination, a reciprocating and operating lever,  $U$ , having an abutment-face,  $a^9$ , and a swinging and dependent toe,  $C^2$ , with abutment-faces  $a^8 a^9$  at an angle to each other for said abutment-face  $a^{10}$ , and with bearing and working faces  $d^2$  and  $a^2$ , a lever,  $R$ , having bearing and working faces  $f^2 n$  at an angle to each other to be acted upon by the bearing and working faces  $d^2 a^2$  of the operating-lever  $U$ , and fixed stops to arrest the movement of said levers, substantially as described, for the purpose specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM SCOTT.

Witnesses:

ALBERT W. BROWN,  
FRANCES M. BROWN.