(No Model.) 2 Sheets—Sheet 1.

H. SUTCLIFFE.

WATER CLOSET AND APPARATUS CONNECTED THEREWITH.

No. 533,567. Patented Feb. 5, 1895.

Fig. 1,

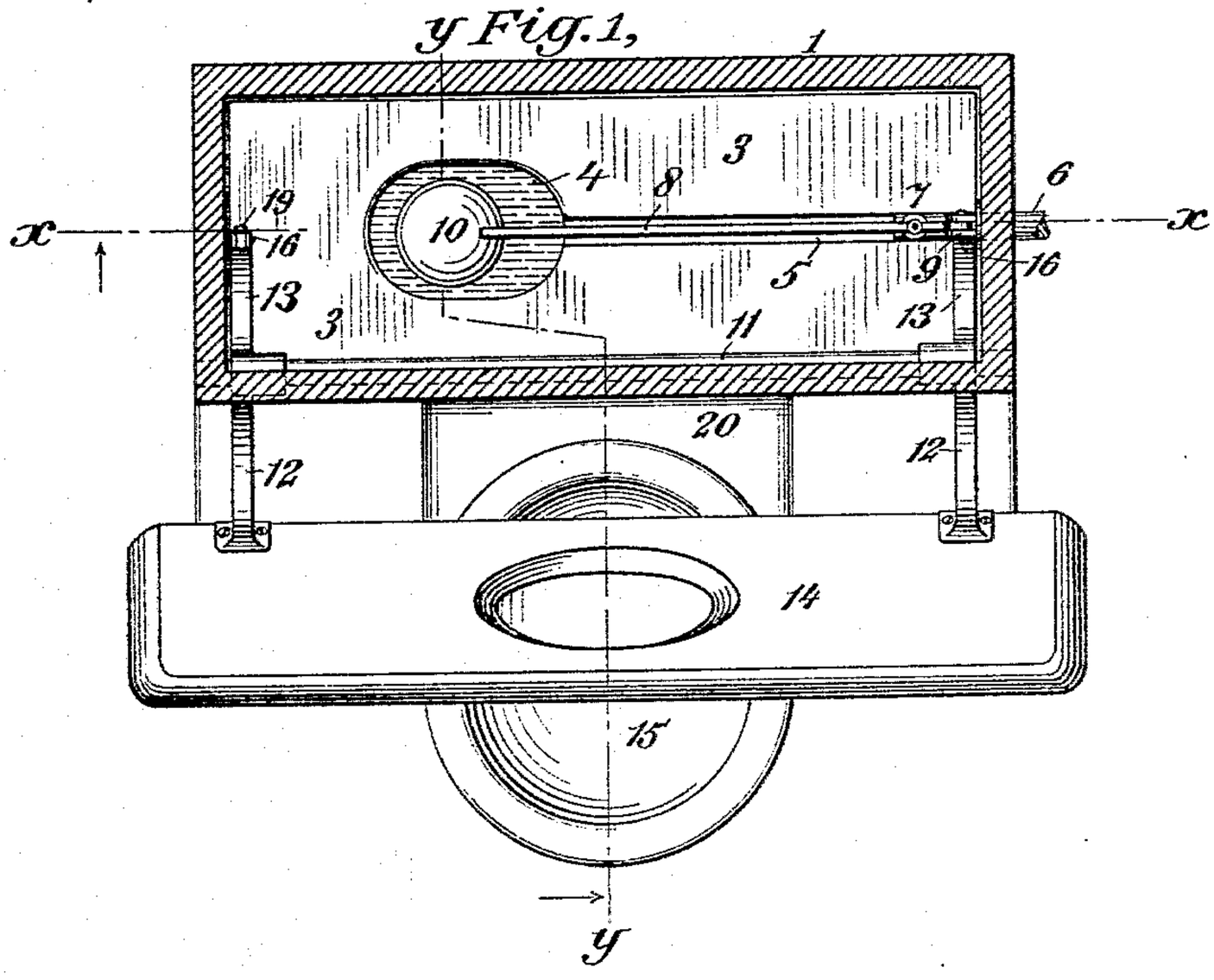
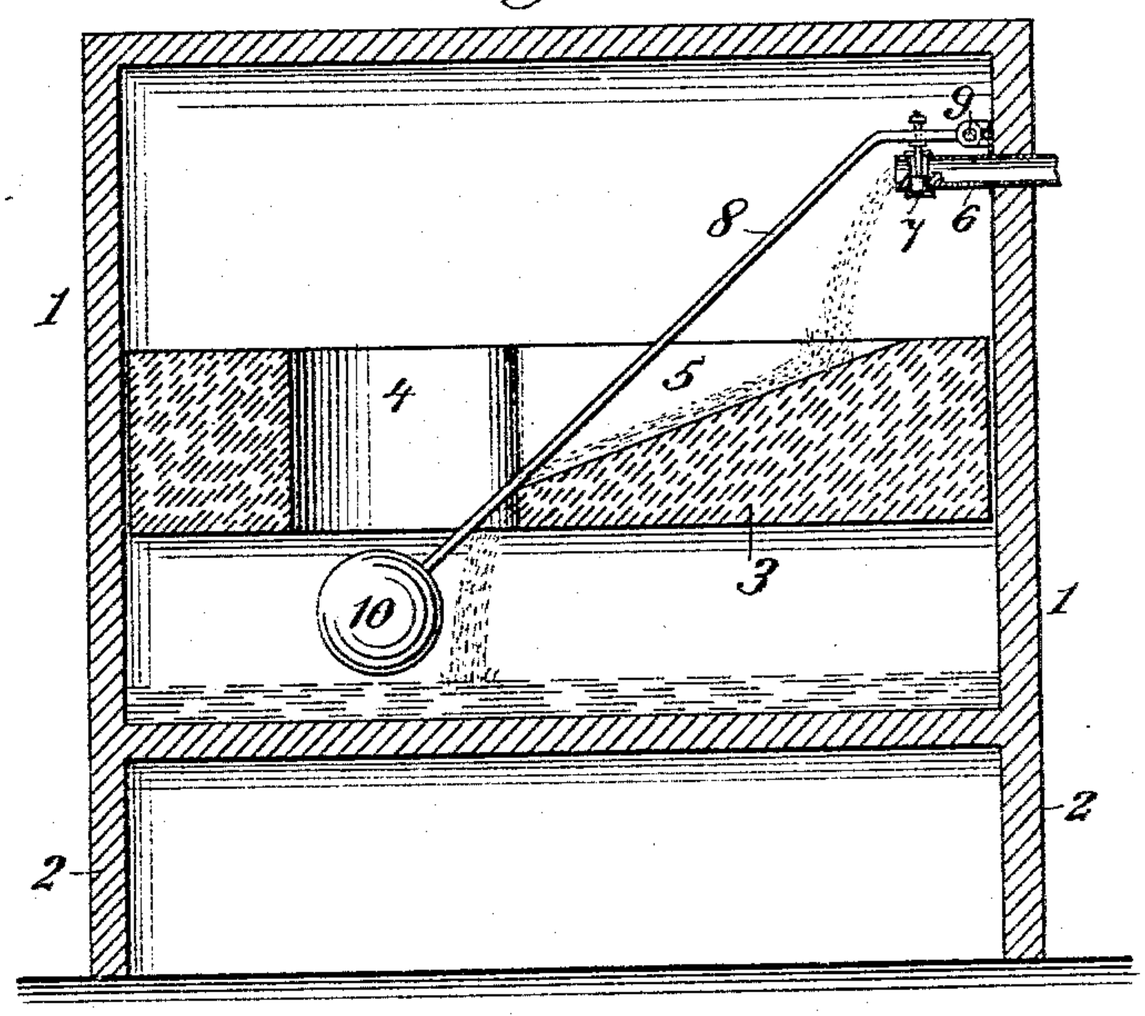


Fig. 2,



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3,

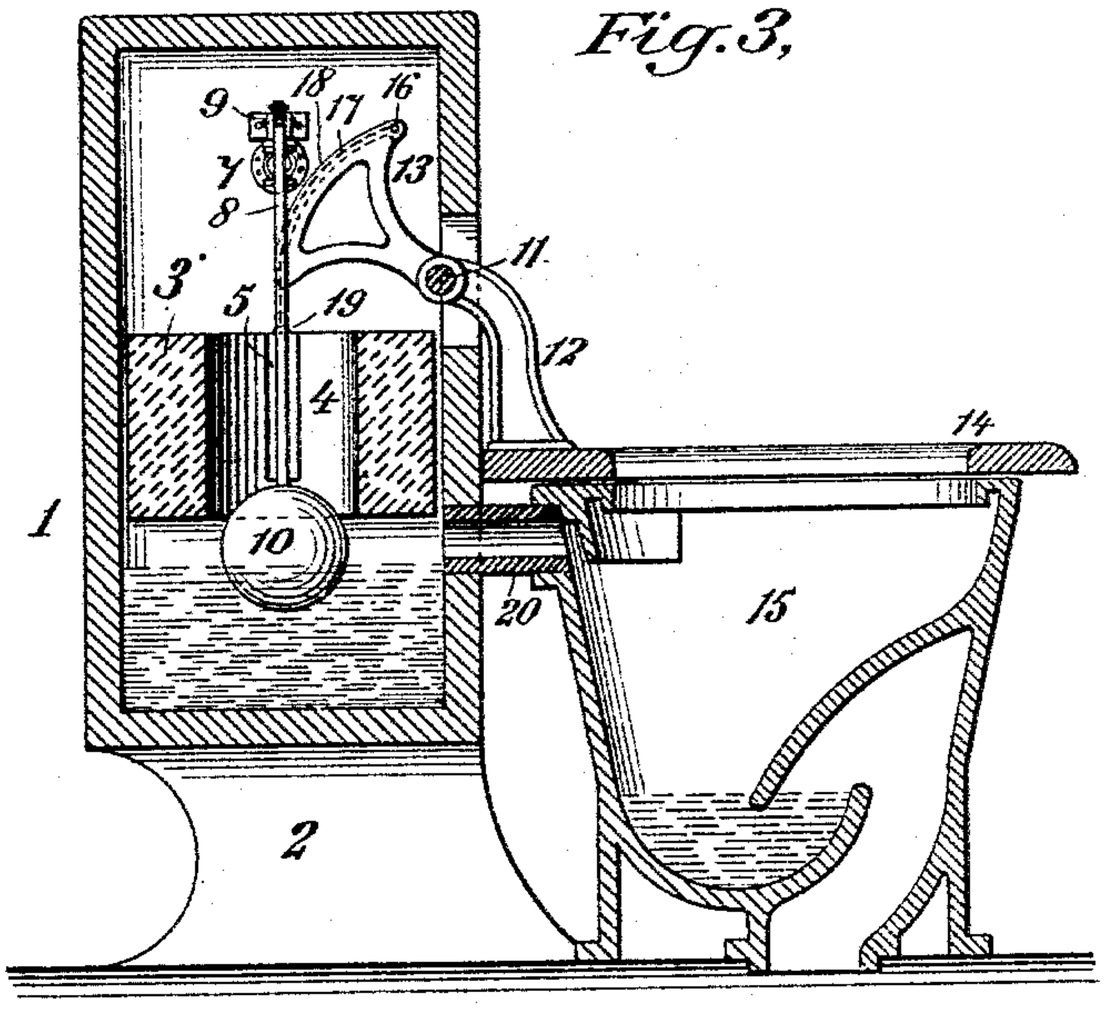
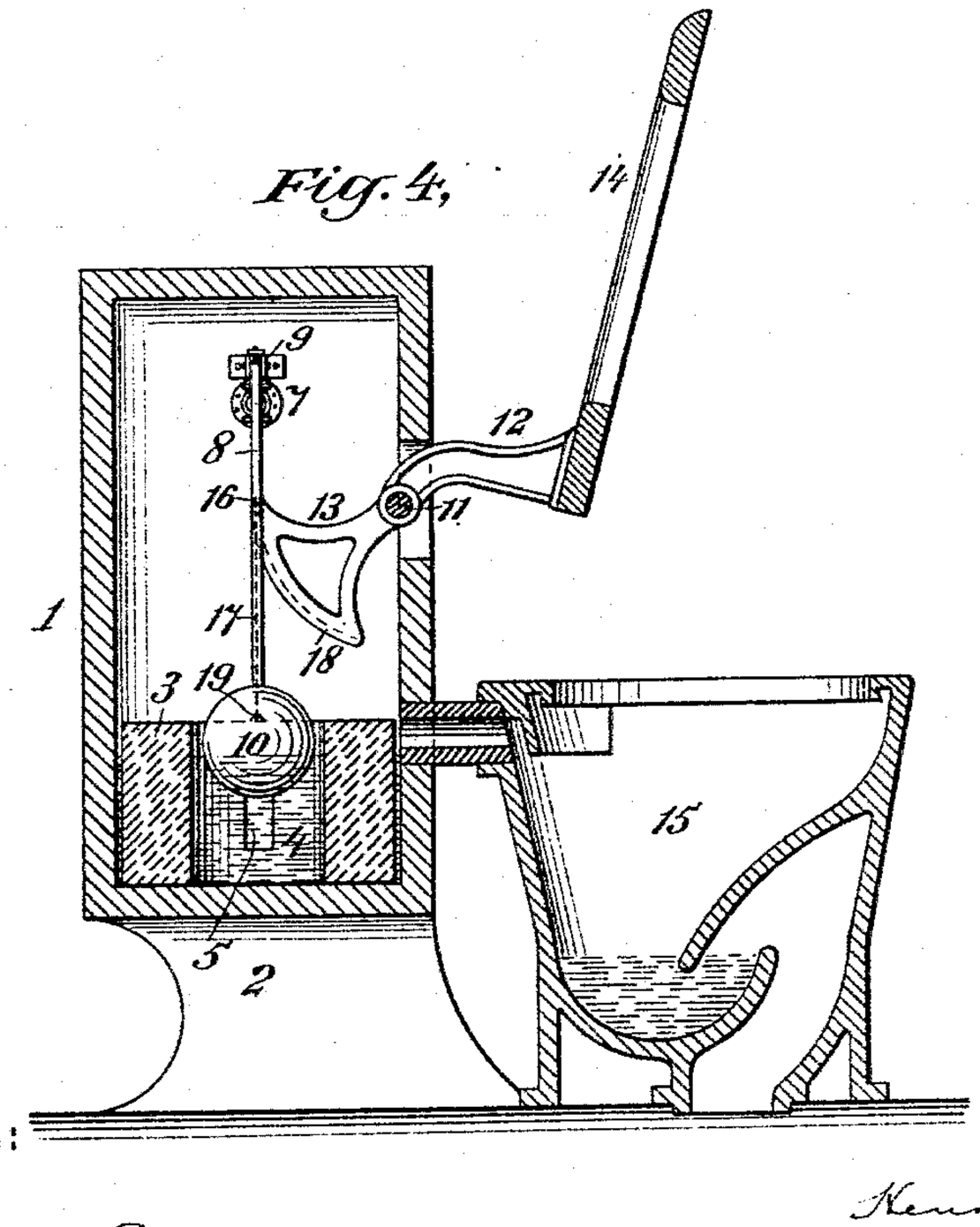


Fig. 4,



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UNITED STATES PATENT OFFICE.

HENRY SUTCLIFFE, OF HALIFAX, ENGLAND.

WATER-CLOSET AND APPARATUS CONNECTED THEREWITH.

SPECIFICATION forming part of Letters Patent No. 533,567, dated February 5, 1895.

Application filed February 26, 1894. Serial No. 501,480. (No model. Patented in England February 4, 1893, No. 2,479.

To all whom it may concern:

Be it known that I, HENRY SUTCLIFFE, a subject of the Queen of England, and a resident of Halifax, in the county of York, England, have invented certain new and useful Improvements in Water-Closets and Apparatus Connected Therewith, of which the following is a specification.

I have obtained a British patent for this invention, the same being dated February 4, 1893, and numbered 2,479.

My invention relates more particularly to that class of water closet apparatus in which the bowl or basin is automatically flushed on removal of the pressure from the seat, and has for its main objects to provide a simple, durable and efficient construction wherein this action may take place.

To these main ends my invention consists in certain features of construction and combinations of devices, all as will be hereinafter more fully described and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a top plan view of an apparatus embodying my improvements, the seat being shown in its raised position, and the cistern being shown in section. Fig. 2 is a longitudinal vertical section in a plane represented by the line *x*, *x* at Fig. 1, and with the displacer or plunger raised and the ball tap opened. Fig. 3 is a vertical section taken at the line *y*, *y* of Fig. 1, but with the seat in its depressed position; and Fig. 4 is a vertical section taken at the line *y*, *y* of Fig. 1, with the seat in its raised position.

In the several views the same parts will be found designated by the same numerals of reference.

1 represents a tank or cistern which is preferably closed at the top and which is provided with legs or standards 2 that rest upon the floor of a room or apartment. The cistern is preferably rectangular in cross section and oblong in shape and contains a loosely fitting displacer or plunger 3 of similar contour and composed preferably, though not essentially, of burnt clay. Said plunger is provided with an opening 4 which extends vertically therethrough, and leading to said opening from one end of the plunger is a downwardly inclined passageway or channel 5. Through one end of the cistern extends a supply pipe 6 connected to any suitable source of water supply and provided within the cistern with a valve or tap 7, to which is connected one end of an arm or lever 8, pivoted at 9 to a bracket secured to the cistern and bearing at its opposite end a ball float 10 adapted to the opening 4 which constitutes a ball float chamber.

Pivoted at 11 at the front side of the cistern and at each end thereof is a lever 12, one arm of which projects within the cistern and is made in the form of a sector 13. The other end or arm of the lever is arranged exteriorly of the cistern and projecting downwardly is attached to the seat 14 of the closet 15. To the upper end of each sector 13 is connected at 16 one end of a strap, chain or other flexible connection 17 adapted to a guiding and retaining groove 18 in the face of the sector, the opposite end of the flexible connection being attached to the upper side of the plunger, as indicated at 19.

Extending from the front wall of the cistern at a suitable height from its bottom is a horizontal supply pipe or conduit 20, which at its outer end is connected to the bowl or basin of the water closet and in communication with the flushing rim thereof.

Figs. 1 and 4 show the relative arrangement of the parts when the closet is in a condition of disuse. From these views it will be observed that the float chamber 4 contains a body of water sufficient to maintain the float at its highest point, and hence to keep the tap or supply cock closed. Upon pulling down the seat for use of the closet the levers 12 are vibrated and the plunger raised to the position shown at Fig. 3. During this action the water in the float chamber disperses and distributes itself over the bottom of the tank, as illustrated at Fig. 2, thus permitting the float to descend and causing the supply tap to open, whereupon the water will flow from the supply pipe down upon and through the channel 5 and through the float chamber 4 to the bottom of the cistern to raise the level of the water therein to a height about even with the lower side of the basin supply pipe 20, as indicated at Fig. 3. During the rise of the

water at this time the float is gradually lifted, and when the level of the water reaches that indicated at Fig. 3, the ball will have been raised to such a point as that its arm or lever will effect the closing of the supply tap, thus automatically measuring off at the bottom of the cistern a given supply of water for subsequent flushing purposes. This portion of the cistern may be designated as the charge-chamber. Upon removal of the pressure from the seat the weight of the plunger causes it to descend and through the connections described the seat is simultaneously raised. During the descent of the plunger it forces out nearly all of the water from the bottom of the cistern through the pipe or conduit 20 and into the bowl to properly flush and cleanse the same, but at this time a portion of the water in the charge-chamber at the bottom of the cistern passes up into or is retained by the float chamber in the plunger to keep the float up in its closed position so as to prevent the opening of the supply tap during and after the descent of the plunger.

From the foregoing description it will be observed that when the apparatus is not in use the plunger rests upon the bottom of the cistern; that the seat is in a raised position; and that the ball tap is held closed by the water in the float chamber; also that when the seat is pulled down for use the plunger is simultaneously lifted, the ball tap opened, and the charge chamber filled up to the level indicated at Fig. 3 and then automatically closed; and also that when the pressure is removed from the seat the superior weight of the plunger causes it to descend and in descending to raise the seat and at the same time drive water from the charge chamber, arranged below the plane of the inlet to the bowl, into the closet proper, and with such force as to insure a thorough flushing and scouring of every part of the bowl and trap.

The plunger or displacer may of course be made of some other material or substance than burnt clay, but I have thus far used the same in practice and find it desirable and effective.

The water closet proper may of course be of any desired construction, shape or design.

In this apparatus there is no over-head cistern and the usual unpleasant noise incident to such an arrangement is fully obviated. There is no valve excepting the ball-tap, which is under complete control for supplying the charge on each occasion of usage, and the usual unsightly pipes, handles, wires or chains are also dispensed with. In practice the apparatus works silently, and with the greatest possible efficiency. It is ornamental and compact in appearance and sanitary and simple in construction, besides being most economical as to first and subsequent cost, and it is so constructed that it is neither adapted to be tampered with nor likely to get out of order during use.

Although I have shown my invention relating to the cistern proper connected to the seat of the closet in such a manner as to work in conjunction therewith and prefer such an arrangement for obvious reasons, yet I do not wish to be limited entirely to an apparatus in which the plunger or displacer is connected to the seat, as it may be disconnected or operated independently, the gist of one part of my invention consisting in forcing the water out of the cistern by displacement, and it will be seen that for this purpose the displacer may be actuated by a hand lever.

Various changes in detail construction and arrangement may be made without departing from my several improvements.

I disclaim over-head cisterns, as well as cisterns in which the flushing water is discharged by siphonic action, and I desire the following claims to be construed accordingly.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a cistern having a charge chamber at the bottom thereof and a horizontal outlet pipe above said charge chamber, of a plunger adapted to eject all of the flushing water from said charge chamber by displacement and force the same through said pipe directly into the upper part of a water closet bowl located alongside of said cistern, and with its receiving point in substantial alignment with said pipe and above the plane of the charge chamber, substantially as set forth and shown.

2. The combination with a floor cistern having a closed bottom and an outlet or delivery only above its bottom, the space between the bottom and the outlet forming a charge-chamber, of a suitable source of supply to said charge-chamber, a plunger or displacer acting upon its descent to force the contents of said charge-chamber up and through said elevated outlet, and means for automatically stopping the supply when the charge-chamber has been filled, before descent of the plunger or displacer, and for also stopping the supply after the descent of the plunger or displacer and while it occupies the charge-chamber; substantially as set forth.

3. The combination with a floor cistern having an outlet only above its bottom, and a charge-chamber below said outlet, of a ball-operated tap adapted to close the water-supply at or below the level of said outlet, and an independent plunger or displacer acting upon its descent to force the contents of said charge-chamber up and through said elevated outlet; substantially as set forth.

4. The combination with a cistern having a charge chamber, of a water closet bowl connected to said charge chamber, a plunger or displacer in said cistern, and a water closet seat operatively connected to said plunger or displacer; the construction and arrangement being such that when the seat is turned down the plunger or displacer is raised, and that when the pressure on the seat is removed the plunger or displacer descends and forces the

water from the charge chamber into the water closet bowl, substantially as set forth and shown.

5. The combination with a cistern having a charge chamber, and an outlet above the same of a water closet bowl connected to said outlet of the charge chamber, a plunger or displacer within said cistern, adapted to descend into said charge chamber and expel the water therefrom into the bowl, a water closet seat, and a lever and chain connection between said plunger and said water closet seat, substantially as set forth and shown.

6. The combination with a cistern having a charge chamber, of a water closet bowl connected to said charge chamber, a pair of levers pivoted to said cistern, a water closet seat attached to the outer arms of said levers, and a plunger or displacer within said cistern connected by flexible connections to the inner arms of said levers, substantially as set forth and shown.

7. The combination with a cistern having a charge chamber, of a water closet bowl connected to said charge chamber, a pair of levers pivoted to said cistern and having their inner arms of arc shape, a water closet seat attached to the outer arms of said levers, and a plunger or displacer arranged within said cistern and connected by chains or similar means to the inner ends of said levers, substantially as set forth and shown.

8. The combination with a cistern having a charge chamber and an outlet arranged above the same, of a ball tap, a water closet bowl connected to said outlet, a plunger or displacer within said cistern, and a water closet seat operatively connected to said plunger or displacer; the construction and arrangement being such that when the seat is turned down the plunger or displacer is raised, and that when the pressure on the seat is removed the plunger or displacer descends and forces the water from the charge chamber into the water closet bowl, substantially as set forth and shown.

9. The combination with a cistern having a charge chamber and an outlet above the same, of a ball tap, a plunger or displacer having a ball chamber extending therethrough, a water closet bowl connected to said outlet, and a water closet seat operatively connected to said plunger or displacer, substantially as set forth and shown.

10. The combination with a cistern having a ball tap, a charge chamber, an outlet above the same, and a plunger or displacer formed or provided with a ball chamber and a passageway leading thereto, a water closet bowl connected to said outlet, a pair of levers pivoted to said cistern, a water closet seat attached to the outer arms of said levers, and flexible connections secured to the inner arms of said levers and to the said plunger or displacer, substantially as set forth and shown.

11. In a cistern and water closet connected together alongside of each other and arranged both to be supported upon the floor, the combination of a charge chamber in said cistern, a lateral outlet above the same connected with the means for flushing said water closet, a plunger for forcing out the water from said charge chamber and into the water closet bowl, and a water closet seat connected to said plunger, the whole operating substantially in the manner herein described.

Signed at Halifax, in the county of York, England, this 13th day of February, A. D. 1894.

HENRY SUTCLIFFE.

Witnesses:
MILFORD SHAW,
BROWNLOW JOHN WAIGHT.