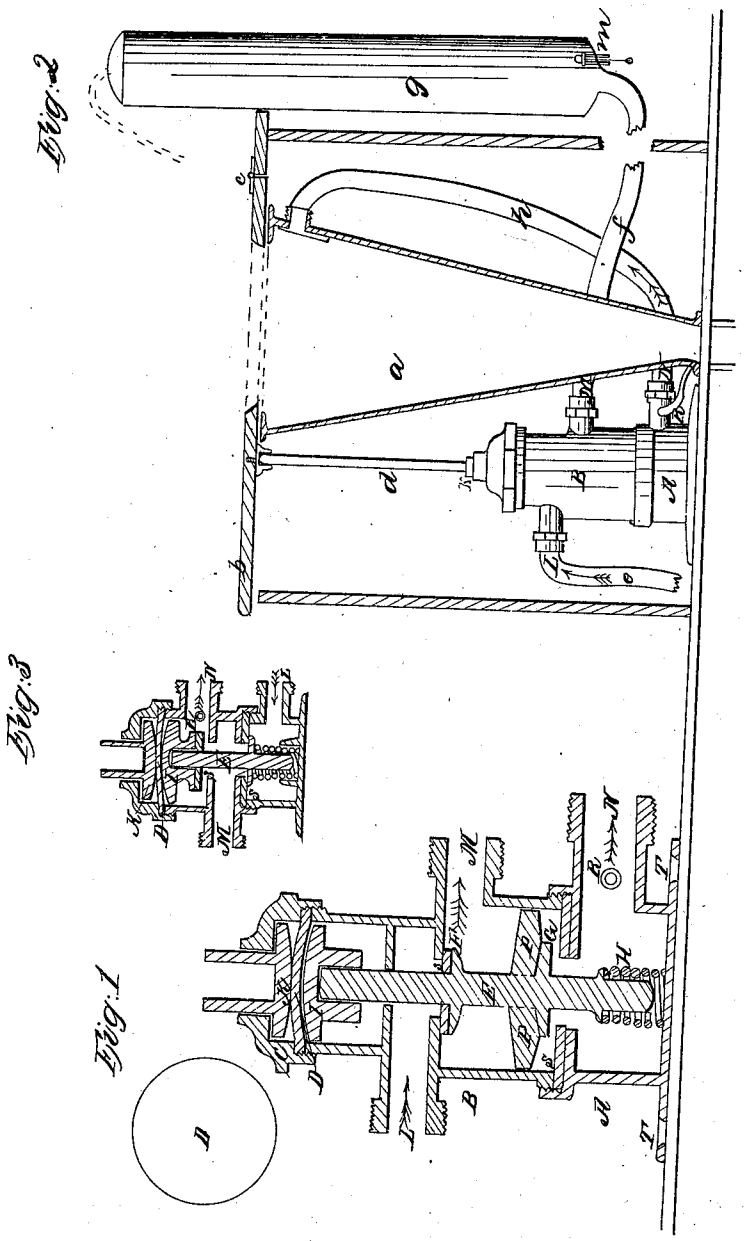
F. H. BARTHOLOMEW.

WATER CLOSET.

No. 10,531. Patented Feb. 14, 1854.



UNITED STATES PATENT OFFICE.

F. H. BARTHOLOMEW, OF NEW YORK, N. Y.

WATER-CLOSET.

Specification of Letters Patent No. 10,531, dated February 14, 1854.

To all whom it may concern:

Be it known that I, FREDERICK H. BARTHOLOMEW, of the city, county, and State of New York, have invented new and Improved Attachments or Fixtures for Water-Closets, Urinals, &c., for Properly Controlling the Supply of Water Used Therefor; and I do hereby declare the following to be a full and particular description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, like letters indicating like parts, which drawings form a part of this specification, and in which—

Figure 1 is a vertical section through the center of one of my closet cocks. Fig. 2 shows the plan of arrangement of the cock, water-chamber pipes, hopper or basin, &c., and a perspective view of the cock; Fig. 3, another modification of double valve cock.

In the use of water-closets of the ordinary constructions, it has been found that being used by many careless persons, care is not properly taken by the users to turn on and off the water each time used, to keep the basin clean and pure, some of whom neglect to turn on the water, while others, and particularly children, will leave the closet neglecting to let on or shut off the water, thus, as has been found, causing great waste of water, and which in buildings where water is supplied for such purposes from tanks on the upper part of the building, or, raised by pumping up, the waste of or too great use of water is a serious inconvenience, particularly in Hotels, &c., where much water is required, and in New York and other cities where many of the streets have sewers large quantities of water is discharged through water closets directly into the sewers and thus wasted unnoticed and almost undiscoverable by the persons having charge of the water works department, police, &c. And an objection to some closets constructed so as to be operated by the seat, is that so much action or motion of the seat is required to operate the cock, &c., as to be a serious objection. In others, an objection has been that the packing used about the valve stem where the stem extends through from the inner to the outer part of the cook would become untight, wear loose, or leak upon the floor and which when upon an upper floor is a serious detriment, besides which if the packing were too tight the proper action of the stem and valve would be prevented. Another objection has been in the use of the turning valve, or key or plug cock, that when it should wear and become leaky it would leak on the floor; and an objection with many cocks used for water-closets is that the impure air and injurious substances, sand, grit, &c., which in such places get in contact with, and corrode and injure the fixture, soon rendering them leaky and imperfect and liable to work stiff and stick fast.

To obviate these and other objections is the object of my improvements.

Fig. 1 is a sectional drawing of one of my double valve self-acting cocks.

A is foot part of it which is fastened to the floor with the discharge way N and waste way R. This is fastened to the floor by screws in the flange at T, T.

B is the upper part of the body of the cock, screwed into the foot part, A, having the receiving water way L and the water way M through which, M, the water passes into and out from the water chamber *g*, Fig. 2, having a valve seat between L and M, also between M and N in a reversed order. S, S, leather washers.

E is a stem on which are the two valves, G shutting downward and F shutting upward.

P, P, are three or more arms or bearings or wings (guides) extending from the stem to keep it in proper position.

H is a spiral spring around the stem which acts to hold valve F against the seat and shut off the supply, and said spring also holds the seat *b*, Fig. 2, up about one-eighth of an inch from the upright board on which the seat rests when set upon.

I and K are thimbles or sockets with the head rounded and placed in a reversed position, one of which, I, sets on the end of the stem E; the other, K, extends through the cap or nut C, and receives the upright rod *d*, Fig. 2.

C is the cap screwed onto the top of the cock. Between the thimbles I, K, is a disk of or diaphragm of rubber packing, or other

suitable substance (I prefer the vulcanized rubber or packing pure) of about one-eighth of an inch thick. This disk is screwed down onto by the cap C covering the top of the body of the cock perfectly tight and at the same time is so flexible or yielding as to allow the action upward of the spring H, or the downward pressure upon the thimble or socket K, to open and shut the valves F, and G, alternately. This diaphragm or disk D is not liable to wear, allows of free action of the stem and valves without the friction which the use of packing about the stem (instead of a disk) would produce. The spring being placed under the disk and in the water channel no dirt, acid, or impure air, can corrode or affect it. It will also be seen that (the cap C and nuts, or couplings on L, M, and N, being screwed tight and the pipe for waste way R, being soldered tight), the wearing of the valve F, G, or bending of the stem E, or breaking of spring H, can not cause a leak onto the floor, but if the cock becomes leaky, it leaks only into the basin, or waste pipe. It will also be seen that the spring H keeps the supply valve F always shut except when held down or open by pressure upon the stem E, and also that by the slight action of about one-eighth of an inch upon the thimble K, the valves F and G, are alternately opened and shut, a motion required upon the seat scarcely perceptible. When repair to the cock is required the valves and spring are easily got at by unscrewing the upper part of the cock B from the footpart A.

Fig. 2 shows the plan of attaching the cock to the hopper or basin and the water chamber and the method by which it is operated. A, B, is the cock in perspective. *e* is the supply or service pipe connected with the head of water, at the tank on the house or otherwise supplied. *f* is a pipe connecting the outlet of the cock M with the water chamber *g*. *h* is a pipe connecting the discharge way of cock N, with the basin or hopper *a*. R is a small waste pipe descending from the cock or discharge pipe N or *h* for the purpose of discharging water that may remain above it after using the water-closet to avoid freezing and keep the water chamber charged with air when used as an air vessel. *d* is a rod extending from the thimble K in cock up to the seat *b* having a thimble on the upper end to keep it from forcing into the wood. *b* is that part which is set upon and is hinged by hinge *c*, and has an action of about one-eighth of an inch. The chamber *g* should vary in capacity of strength and size in proportion to the head or force of the water supplied through the receiving pipe *e*, and also in proportion to the quantity of water desired to be used each time used; for the Croton water pressure a piece of five-inch diameter soil pipe (lead) four or five feet long is used; a copper vessel or of wood strong bound will do. This water chamber if used as an air vessel that is having no opening into it except through the pipe *f* may in that case be placed under the seat or in any required position above or below the basin, but below the water tank or supply. These chambers are sometimes provided with a pipe (usually small waste pipe) inserted at the top of the chamber as shown by dotted lines *k* and terminating into the hopper or into a urinal, or when the supply tank is elevated but little above the water-closet the pipe is extended upward above the tank or surface of the supply. When the chanber is not used as an air vessel, that is when it has a pipe extending from the upper part, it (the chamber) must be elevated above the basin. I have used a valve opening inward and inserted into the chamber as shown at *m*, which is for the purpose of admitting air into the chamber and keeping it charged with air in case the water should not all run out or in case the air should be in any way expelled or discharged. I have not thus far found it necessary to employ the valve *m*, as the water chamber *g* being usually placed above the closet near the ceiling thus a descent is formed from the water chamber through the pipes *f*, and (R), and allowing water to drain off and leaving an air communication between the soil pipe or basin and the water chamber whereby to keep the water chamber filled with air. The air valve *m* may be inserted in any other part of the water chamber, but I have used the valve only in the lower end, where the valve leather would be kept wet and tight. An air cock may be placed at the upper part of the water chamber to let in the air and keep it charged.

The operation of the water-closet as the cock, water chamber, &c., is arranged is as follows: Upon sitting upon the seat *b* the weight of the occupant acting through rod *d* presses down the valve G, Fig. 1, onto its seat and at same time opens valve F, making a communication between the main or supply and the water chamber through pipe *e* into and out of the cock, through pipe *f* and when the water chamber *g* is an air-tight vessel, the chamber will take the supply of water till the air in the chamber becomes so compressed or contracted as to equal and balance the pressure of the head of water into the chamber, the air being compressed in proportion to the head of the supply, the compressed air thus stopping the supply of water even while the supply valve F remains open, so that only a limited quantity of water is used, however long the valve F is held open, no water being discharged into the hopper while the person is on the seat. Upon the removal of the pressure upon the seat or cock the spring H throws the valve

F up to its seat shutting off the supply and at the same time opening the discharge valve G, making a clear communication between the water chamber *g* through pipe *f*, and into and out of the cock, and through pipe *h* into the hopper *a* and the compressed air in the water chamber *g* drives out the water into the hopper with a force proportioned to the head of the supply tank or reservoir, which discharge of water takes place only upon the removal of the person from the seat. If the water chamber has an air pipe in it, it will fill with water, and the discharge into the basin or hopper will be with a force proportioned to the elevations of the water chamber *g* above the closet. The cock may be operated by being placed under a step, instead of under the seat, or by being so attached to the seat, lid or to the door of the water closet, as that the raising of the lid over the seat or the opening and closing of the entrance door will operate the cock.

Fig. 3 shows another modification in section, of a three way cock (double valve) having the supply valve held tight by the force of the water together with the spring, in which the valves on the stem are placed in a reverse order to that in Fig. 1, L being the induction way, N, the discharge way into the hopper, and M, the part or way which connects with the water chamber *g* through pipe *f* Fig. 2, the water flowing upward through the cock instead of downward as in Fig. 1.

I have tried various plans or modifications of double valve three-way cocks, one of which was so constructed as that the induction or supply valve (F, Fig. 1), shut downward instead of upward. I prefer the construction of Fig. 1, in which the supply valve F is shut against the head or flow of water by the action of the spring H, whereby the concussion on water-ram (which attaches to the use of valves shut by the action of the water, or by plug cocks, is overcome by my improvement and for which a patent has been granted to me.

I am aware of the publication and use of several combinations of water closet fixtures in England, and in this country, while in none of which have (what I consider) important and desirable improvements, accomplished by me, been attained or even attempted heretofore, of which I am aware, including Jordan's and Shenton's improvements.

The improvements embraced in my invention and combination which are not to be found in any heretofore known, to so great a degree even if at all I would state as follows: A very small (almost imperceptible) action or depression of the seat is required (say $\frac{1}{8}$th of one inch) to sufficiently operate the double valves. The cock is arranged under the seat (and the air chamber may also be) so as to be out of sight, take up no useful space, and may thus be covered with saw dust, &c., to prevent freezing. In case the valve should become leaky it cannot leak onto the floor, but only through the waste pipe or into the basin. By the use of the diaphragm or disk D the valves work freely, producing little or no wear or friction. The action of the pressure upon the rod is perpendicular and direct upon the top and center of the cock valve without the intervention of levers, wires, cranks, &c. The spring for operating the valve is shut up away from the action of urine or gas or other corroding causes, and kept washed with pure water. The employment of the diaphragm D obviates the use of packing about the valve stem, and the construction is such as that the valves are not likely to work stiff or stick fast in consequence of long disuse or of corrosion or of expansion and contraction of the metal to which plug or key cocks are liable. This combination is much more simple in construction and cheaper than the cistern service-boss ball and cock, &c., kind known to the trade.

The spring H may be so regulated or of such strength as a child or a heavy person on the seat will operate the valves properly.

Having thus described my invention and improvements, I do not claim the use of the chamber *g* when combined with the supply pipe, or hydraulic main and the basin, by means of the common three way plug turning cock, operated by the seat, as such combination has been before used in the water closet of Jordan, nor do I claim the puppet valve cock with two valves and three ways, new in itself; but—

I claim—

1. A three way cock with parts constructed and combined in the following manner, viz: Having one principal chamber through which the water always passes whether being received or discharged, two openings into which chamber being governed by two valves operated by one stem, so that when one is opened the other is closed by the same action of the stem, the third way being without a valve—when these are combined with a second chamber for the accommodation of a short continuation of the valve stem, through which the cock is operated and one of the ways is placed between the principal chamber and the stem chamber as described.

2. Placing such a cock as described above under the seat, or where it may be out of the way, and may be operated by a single rod when said cock is connected by a tube with a chamber *g'* for the reception and discharge of water under pressure.

3. I claim in combination with the double valve an eduction way R employable for

the double purpose of wasting out the water remaining in the pipes above the cock when not in actual use and through means of which, or whereby a communication is provided with chamber *g* for the purpose of keeping it charged with air, by means of valve *m*, or otherwise, at the same time that the saw way R is closed by valve A against the escape of water from the chamber *g* while the seat is depressed.

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Witnesses:
F. M. BARTHOLOMEW,
I. H. BARTHOLOMEW.