BARTHOLOMEW'S IMPROVEMENT IN WATER CLOSETS.

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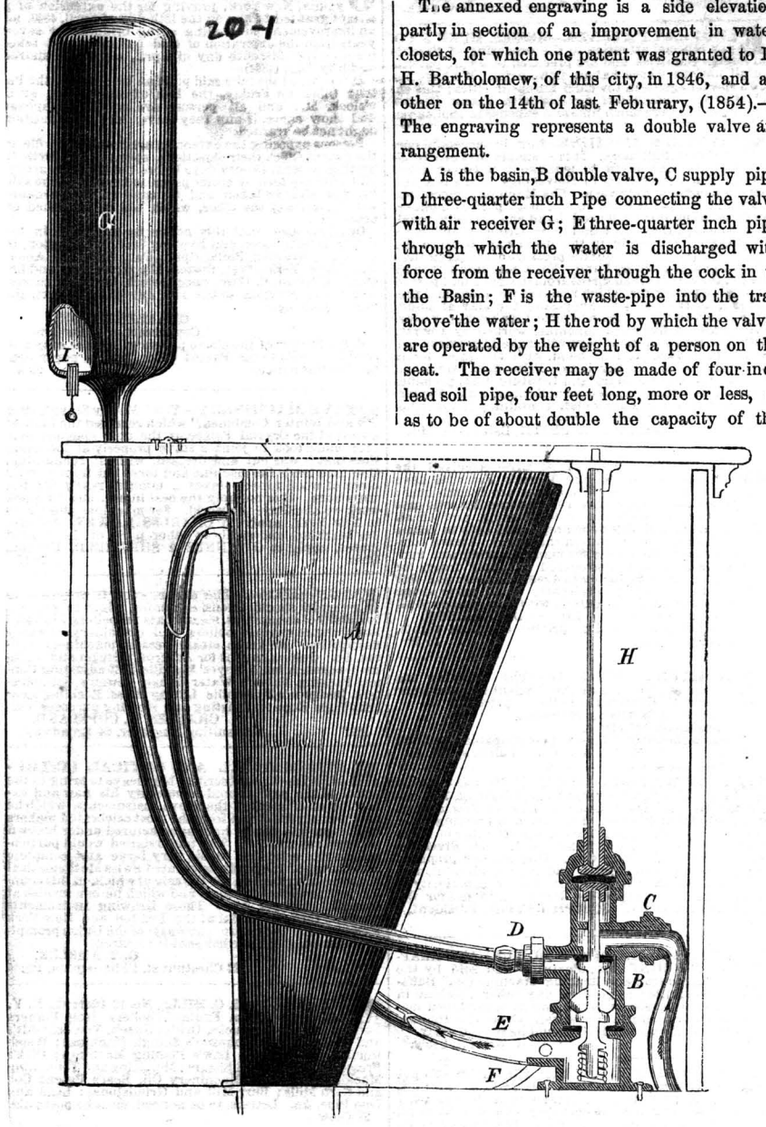

The annexed engraving is a side elevation partly in section of an improvement in water closets, for which one patent was granted to F. H. Bartholomew, of this city, in 1846, and an other on the 14th of last February, (1854).—The engraving represents a double valve arrangement.

A is the basin, B double valve, C supply pipe D three-quarter inch Pipe connecting the valve with air receiver G; E three-quarter inch pipe through which the water is discharged with force from the receiver through the cock in to the Basin; F is the waste-pipe into the trap above the water; H the rod by which the valves are operated by the weight of a person on the seat. The receiver may be made of four inch lead soil pipe, four feet long, more or less, so as to be of about double the capacity of the quantity of water desired to be used each time. I is a valve opening inwards, in G, for the purpose of admitting air into the chamber, and keeping it charged with the same, in case the water should not all run out, or in case the air should from any cause be expelled. This valve may be inserted in any other part of the air chamber, but it seldom requires to be used.—This double cock is designed to avoid the great waste of water which attends the use of most kinds of cocks, and is a desirable article in all places where the economical use of water is desideratum. These cocks consume a limited quantity of water each time the closet is used, taking no more water whether the seat is set upon one hour or one minute, no water being thrown into the basin while the seat is set upon.

When the valve is pressed down by the seat, the water passes from the supply pipe C through D, into the chamber G, until the air in it becomes so compressed as to balance the pressure of water in the supply pipe when the inlet flow of water will cease, however long the upper conical valve may be left open. No water is therefore discharged into A while a person is seated, but upon the removal of pressure from the seat, the upper valve, by the spring on the stem below, is forced up into its seat, and then communication is opened between the pipe D, and the one E, leading into H. The pressure of the air in G, therefore forces the water into A, and thus, the quantity of water for washing out is always graduated by the supply pressure, for the purpose set forth.

By the use of this valve and receiver, the use and expense of the cistern, service-box, valves, cranks, ball and ball cock, overflow-pipe, levers, &c. are avoided—the whole of this fixture (except the receiver) being placed under the seat out of sight, making a cheap and simple, arrangement. The water cannot overflow, there being no opening for it except into the waste tube or into the basin, and consequently should the valve become leaky, it cannot wet the floor, but must leak only into the discharge-pipe, keeping the floor dry. One-Service pipe will supply any desired number of these double valves, and not prevent a proper force of water throughout other parts of the building.

Water Wheels---The Turbine---Article 2.

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[The annexed is an essay on the turbine water wheel, by James B. Conger, of Jackson, Tenn., a practical millwright of great experience and scientific attainments, an inventor and patentee, and who has devoted much attention to the subject. It is divided into a series of chapters, which will be continued through several numbers, some of which will be illustrated by diagrams.]

MECHANICS—WATER AT REST.—1 In mechanics, all matter may be considered as continually under the operation of forces, which if mutual and in opposite directions, maintain it in equilibrio, but if a portion of the force acting in any direction on a body at rest be removed the body will then tend to move in an opposite direction to, and with a force equal to the force removed.

2 The term *force* is applied to every cause which impresses on matter a motion, or tendency to motion. Action and re-action are equal in degree and opposite in direction, there can be no force acting in one direction without an equal force acting in an opposite direction, or rather the same force acts in opposite directions. Hence force may be termed that which causes matter to tend, to separate, or approximate.

3 MATTER IN MOTION.—The indifference of matter to a state of motion or rest, is termed inertia. It is a consequence of this principle that one body when struck by another exerts an effort of resistance to the impulsion whilst acquiring a portion of the motion of the striking body; and while in motion exerts an equal effort to having its motion arrested. By this same principle, a body having received an impulse must move uniformly in a right line, if not opposed by any obstacle, for there can be no reason why the body should deviate to one side rather than the other, nor that its motion should be accelerated rather than retarded. It is likewise a consequence of inertia that a body while in motion opposes a change in its direction while being deflected by a force and deviates from a right line a distance equal to that which an equal force would have caused it to move from a state of rest in an equal portion of time.

4. These two principles, force and inertia, originate, carry on, and terminate all mechanical operations, both in nature and art, the worlds are governed and regulated by them, and mechanicians know of no other principles by which operations are effected.

5. Motion is the act of changing the place of bodies, the passing of a body from one place to another, or the change of distance between bodies. Space being infinite, motion can be relative only. Bodies on the earth may move as relates to the earth, the earth move as relates to the sun, the sun move as relates to the stars, and they move as relates to each other, but if there was but one body in space, it could not be said to move. Hence a body in motion is not effected by that motion, only so far as it brings it under the influence of some other body, and the influence will be the same whether it move, or be at rest, and the other moves.

6. If, while a body is moving in space, it be acted on by an incessant force tending to draw it to a point, perpendicular to its line of direction, the body will describe a curve around the point. And if the force be such as to generate an equal velocity in the body, if at rest, by acting on it through a space equal to half the distance from the body to the point to which it tends, or arrest its motion if directly opposed to it through the same space, the curve will be a circle. And in all cases of circular motion, the force required to compel the body to leave a direct line and describe a circle, will equal that which would bring the body to rest by directly opposing its motion through a distance equal to half the radius of the circle.

This resistance to a change of direction is called centrifugal force, and the force which compels the body to describe a curve is called centripetal force.