(No Model.)

H. H. MITCHELL.

APPARATUS FOR FLUSHING SEWERS.

No. 389,712. Patented Sept. 18, 1888.

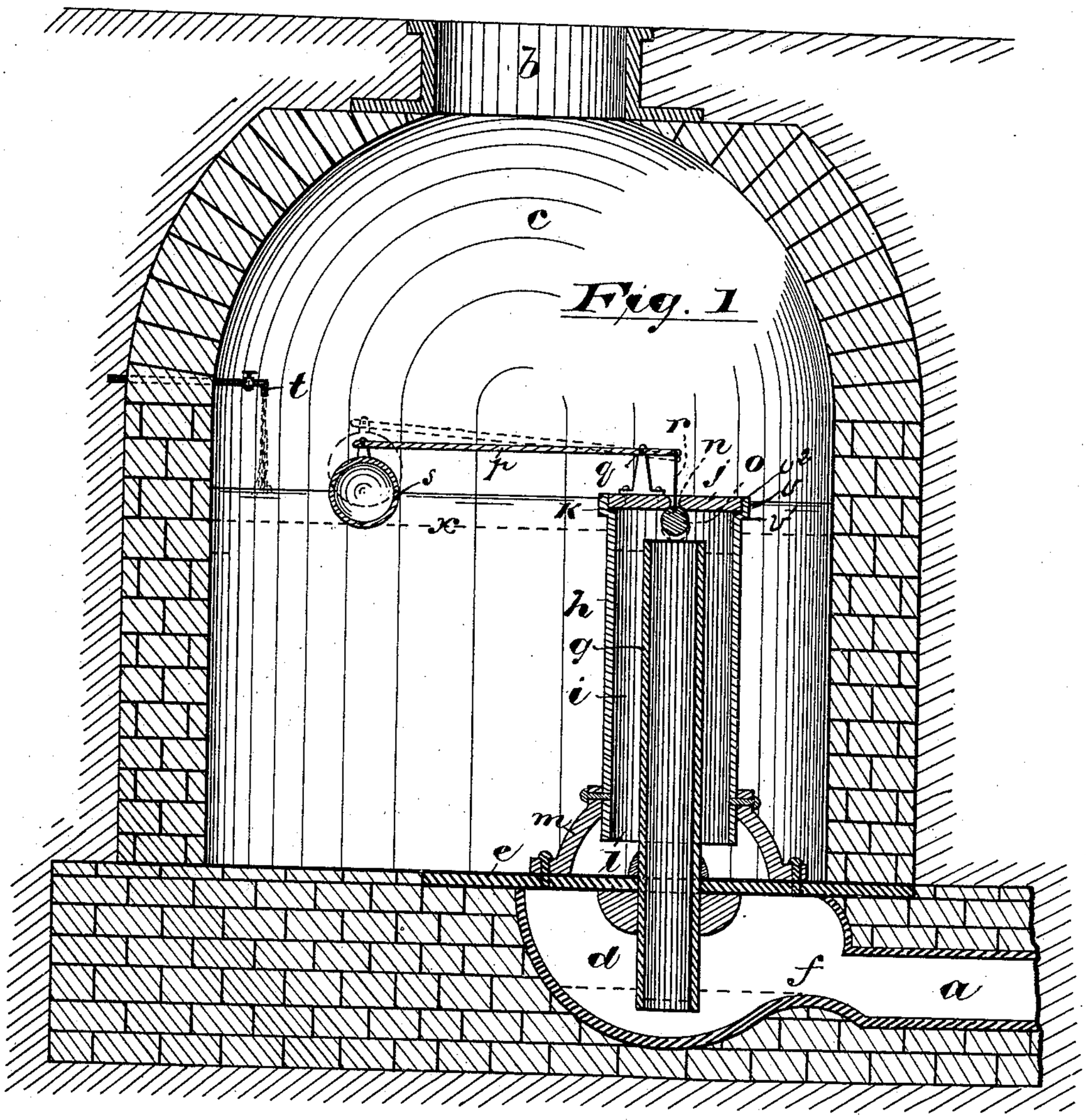

Fig. 1

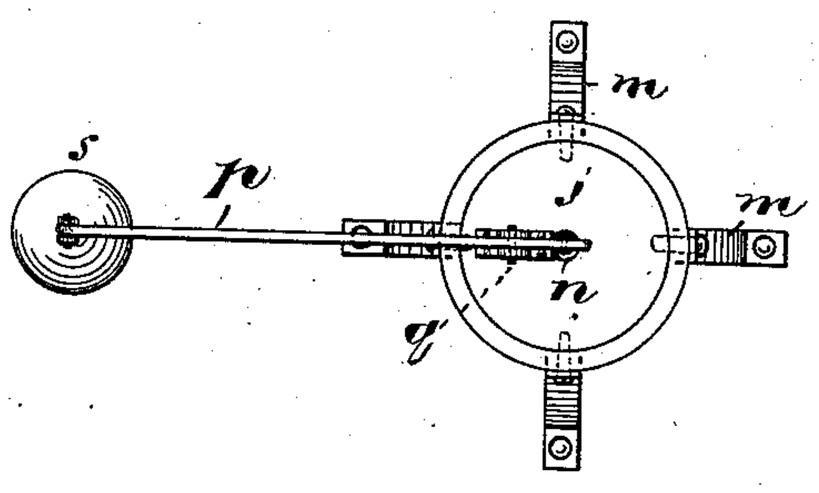

Fig. 2

WITNESSES:

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INVENTOR:

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BY Drake & ATT'YS.

UNITED STATES PATENT OFFICE.

HORACE H. MITCHELL, OF NEWARK, NEW JERSEY, ASSIGNOR OF ONE-HALF TO CARROLL P. BASSETT, OF SAME PLACE.

APPARATUS FOR FLUSHING SEWERS.

SPECIFICATION forming part of Letters Patent No. 389,712, dated September 18, 1888.

Application filed April 25, 1888. Serial No. 271,812. (No model.)

To all whom it may concern:

Be it known that I, HORACE H. MITCHELL, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Devices for Flushing Sewers, Drains, &c.; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of this invention is to more effectively cleanse sewers, drains, &c., from sediment, which tends to clog the same, and to do so by automatically and periodically flushing the sewer or drain to reduce the cost of construction; to avoid the use of a series of pipes or siphons for conducting the water to the top of the main siphon; to cause the valve which allows the compressed air to escape when the water is at a certain limit to remain always above and away from the water, so that it cannot be clogged or obstructed by floating matter, which would tend to interfere with a proper working thereof; to secure a greater durability, and otherwise to secure a more simple and effective flushing apparatus; and it consists in the arrangements and combinations of parts thereof, substantially as will be hereinafter set forth, and finally embodied in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the several figures, Figure 1 is a central longitudinal section of the improved device. Fig. 2 is a plan of an automatic valve thereof adapted to allow the escape of air when the water rises to a certain height within the water-chamber.

In said drawings, *a* indicates a branch drain or water-passage leading to a sewer or main drain.

b is an ordinary man-hole leading to a vaulted chamber, *c*, in which the improved flushing apparatus is arranged. Below said chamber *c* the branch passage *a* terminates in a chamber, *d*, which is separated from said chamber *c* by a suitable plate or flooring, *e*, adapted to prevent the premature leakage of water from the upper chamber, *c*, into the branch drain. The said lower chamber, *d*, is adapted to retain a certain amount of water at the bottom thereof in any suitable manner—preferably by forming a raised partition, *f*, partially separating said chamber from the drain.

Passing through the plate *e* is a stand-pipe, *g*, which extends through the flooring *e* and down into the water held at the bottom of the chamber *d*. The said pipe extends upward quite a distance into said chamber *c*, and around the same is arranged a larger stand-pipe, *h*, which at its upper end lies a little above the upper extremity of the inner of the smaller stand-pipes, a passage, *i*, being formed between the pipes, which admits of the water flowing upward therethrough and into the upper end of the smaller pipe.

The cover *j*, by means of which the larger stand-pipe is closed at its upper end, is removably secured upon said pipe *h* to allow access to the interior of the stand-pipe, and is suitably packed, as at *k*, forming a tight joint impervious to air.

The outer stand-pipe is suitably held away from the flooring *e*, or is open at its lower end, as at *l*, to allow the entrance of water from the upper chamber, *c*, to the stand-pipe *g*. The said outer stand-pipe is preferably held away from the flooring *e* by legs *m*, although the said pipe may have simple perforations at its lower end of sufficient size to allow a copious flow of water therethrough.

By the construction of the pipes thus described a siphon is formed, which under some conditions, hereinafter specified, will draw the water from the water-chamber *c* into the drain *a* at a very rapid rate and serve to flush the said drain and sewer connected therewith.

At the upper part of the stand-pipe *h* is arranged a valve adapted to open automatically when the water is rising or becoming of a sufficient quantity in the chamber *c* to flow through the sewer or drain in a sufficient volume and

with sufficient force to remove the sediment therefrom. The said valve is constructed as indicated in the drawings, in which the cover *j* is shown to be perforated, as at *n*, to form an air-passage, the said passage being closed by a ball, which may be of rubber and adapted to form an impervious joint with the seat therefor, formed at the lower side of the cover around said perforation, the seat being slightly funnel-shaped to provide a suitable bearing-surface for said ball. The said ball is held on the under side of the cover by means of a lever, *p*, and a connection, *r*, which extends through the said perforation in the cover to said lever. Said lever is fulcrumed on a post carried by the cover *j*, as at *q*, and extends laterally from the stand-pipe, as shown in Fig. 1, where it is weighted down with a hollow float, *s*, the said float being so fixed or secured to the lever as that the water causes the same to rise before the said water rises to the level of the top of the stand-pipe or cover *j*. Thus floating matter is never allowed to come in contact with the valve at the cover, which would interfere with a proper engagement of the ball with its seat. The pipes *h* and *g* are straight pipes, and I am thus enabled to use common drain-pipe, such as are commonly found in the market. The upper end of the outer stand-pipe is provided with a "hub" or "bell," *v*, into which the cover is seated, the shoulder *v'* serving to hold the cover up and the flange v^2 to prevent lateral displacement and to receive the packing. By means of the bell or hub of the stand-pipe and the packing the cover is held thereon with sufficient firmness to overcome the movement that would be caused by the continued action of the lever. The said weights *s* are preferably hollow and adapted to form a float, so that when the water rises into engagement therewith it will lower the ball from engagement with the cover and open the air-passage *n*.

It will of course be understood that the valve may be of any other construction than that specified—as, for example, in lieu of the ball any other form of valve may be employed.

The water which is to serve in flushing the sewer may be obtained from a water-pipe, *t*. The said water is kept or may be kept running continuously, so that as the water is emptied from the chamber it may again immediately accumulate therein.

In operating the device in accordance with my invention, the parts being arranged substantially as described, and the valve being closed, the water entering through the pipe *t* rises in the chamber *c* until it arrives at a point and engages the float *s*. As it rises it will be evident that the air confined in the stand-pipes will be brought under a certain amount of pressure, and thus when the water rises to the dotted line indicated at *x*, at a point where it engages the float *s*, above the upper end of the inner stand-pipe, it will then lie a little below the level of the inner stand-pipe, because of such air-pressure, as indicated. When the water engages the float and raises the same and opens the valve, the air-pressure within the stand-pipes is immediately removed and the water (instead of trickling from the pipe into the sewer *a* in a quantity equal to the amount entering through the pipe) rushes up to its normal level above the inner stand-pipe and immediately passes out therethrough in a copious quantity, siphoning the water off at a very rapid rate. The body of water lying in the chamber *c* serves to flush the sewer *a* and remove therefrom the sediment, which would otherwise tend to clog or fill up the same.

Having thus described the invention, what I claim as new is—

1. In a flushing apparatus, the combination, with inner and outer stand-pipes, of a cover, *j*, carrying a fulcrum and perforated, a lever arranged on said fulcrum, a float, a ball for stoppering the perforation, and a connection for holding said ball to said lever, substantially as and for the purposes set forth.

2. In a flushing apparatus, the combination, with chambers *c d*, the latter partially separated from the drain by a partition, *f*, of a plate or flooring, *e*, an inner straight pipe, *g*, extending through said flooring, an outer straight pipe raised from said flooring, a separable cover, *j*, having a valve opening or perforation therein, a lever, and a float lying away from said stand-pipe below the level of the extremity thereof, substantially as and for the purposes set forth.

3. In a flushing apparatus, in combination with the inner and outer stand-pipes, a cover providing a valve-seat, a valve, a lever, and a float, the said float lying below the level of said valved cover to come in contact with the water before the latter covers said cover, substantially as and for the purposes set forth.

4. In combination with the inner and outer pipes, *g* and *h*, a separable cover provided with a stud, a lever fulcrumed on said stud, a float at one end of said lever, and a valve engaging the under side of the cover, and a connection extending from said valve to said lever, substantially as and for the purposes set forth.

5. The combination, with an inner stand-pipe of a flushing apparatus, of an outer stand-pipe provided with a bell at the top, a valved cover seated in said bell, and a float for opening said valve automatically, substantially as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 23d day of April, 1888.

HORACE H. MITCHELL.

Witnesses:
O. DRAKE,
E. L. SHERMAN.