

(No Model.)

2 Sheets—Sheet 1.

C. W. DURHAM.  
House Drainage Apparatus.

No. 235,754.

Patented Dec. 21, 1880.

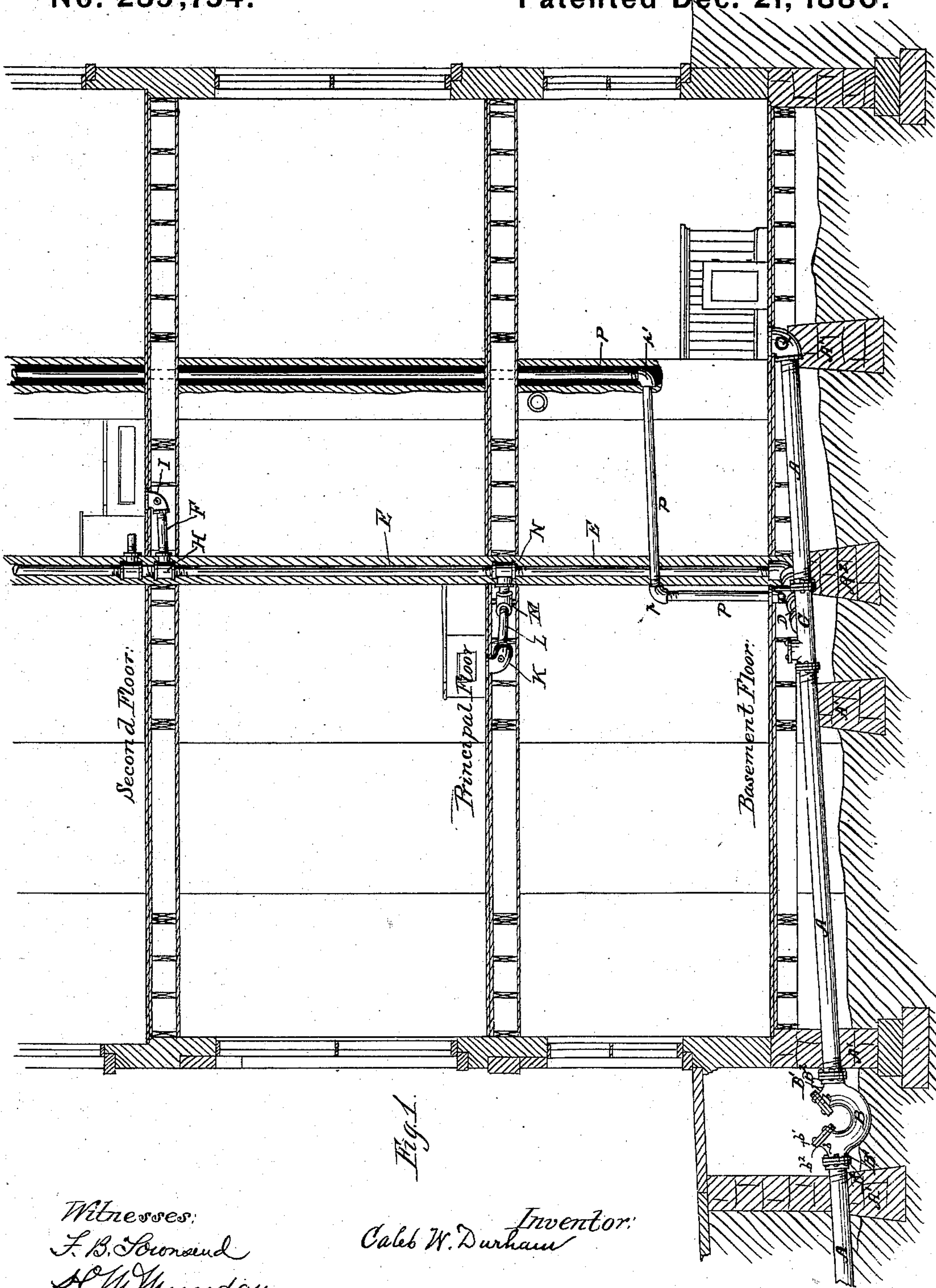


Fig. 1.

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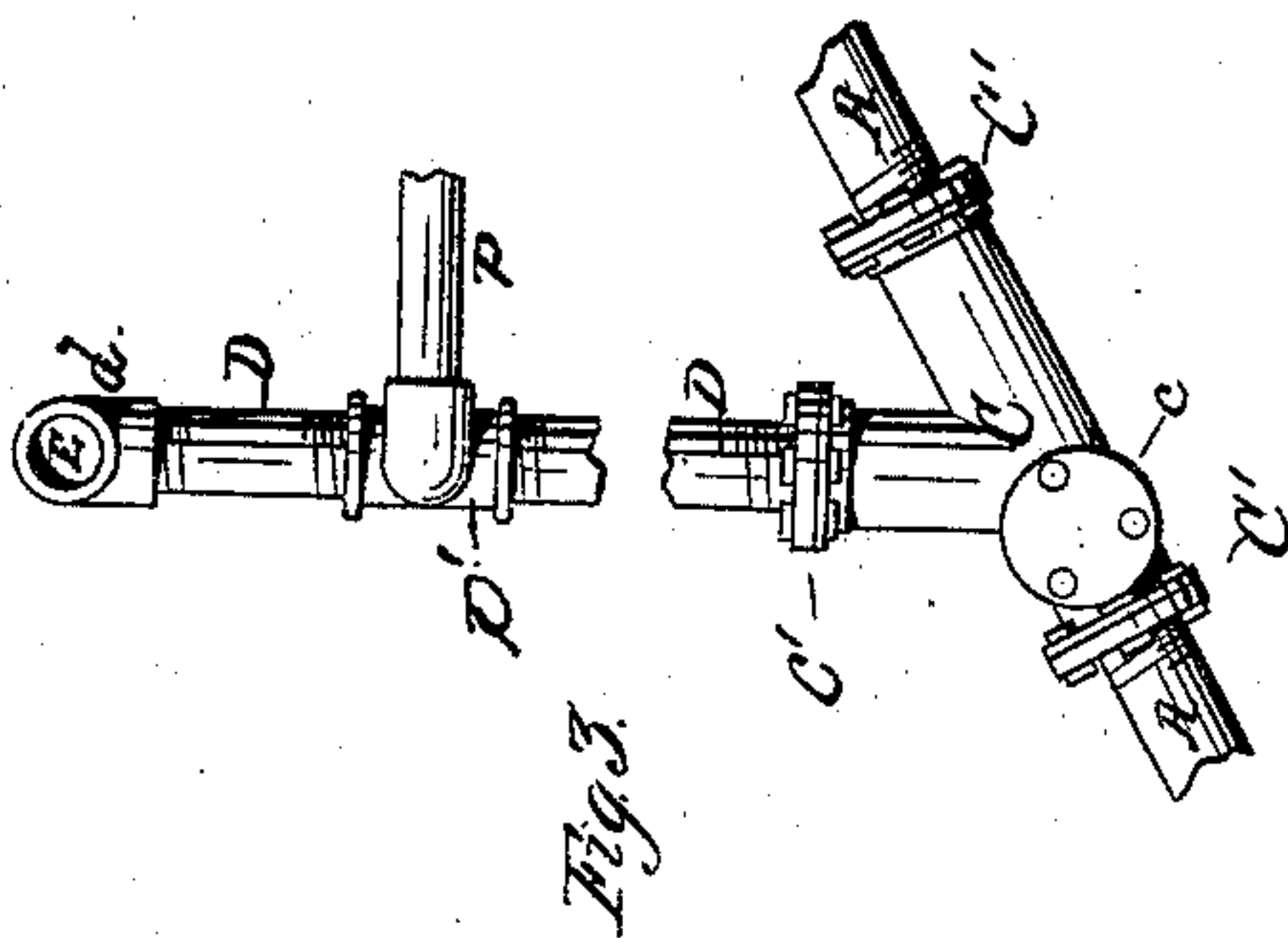
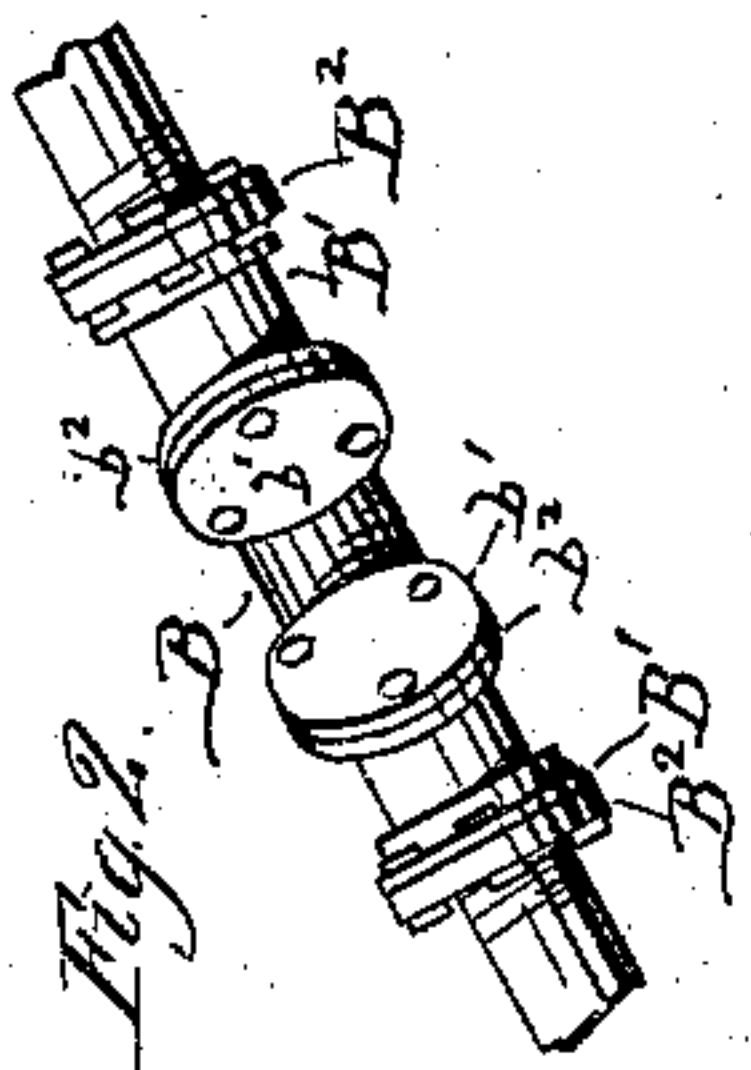
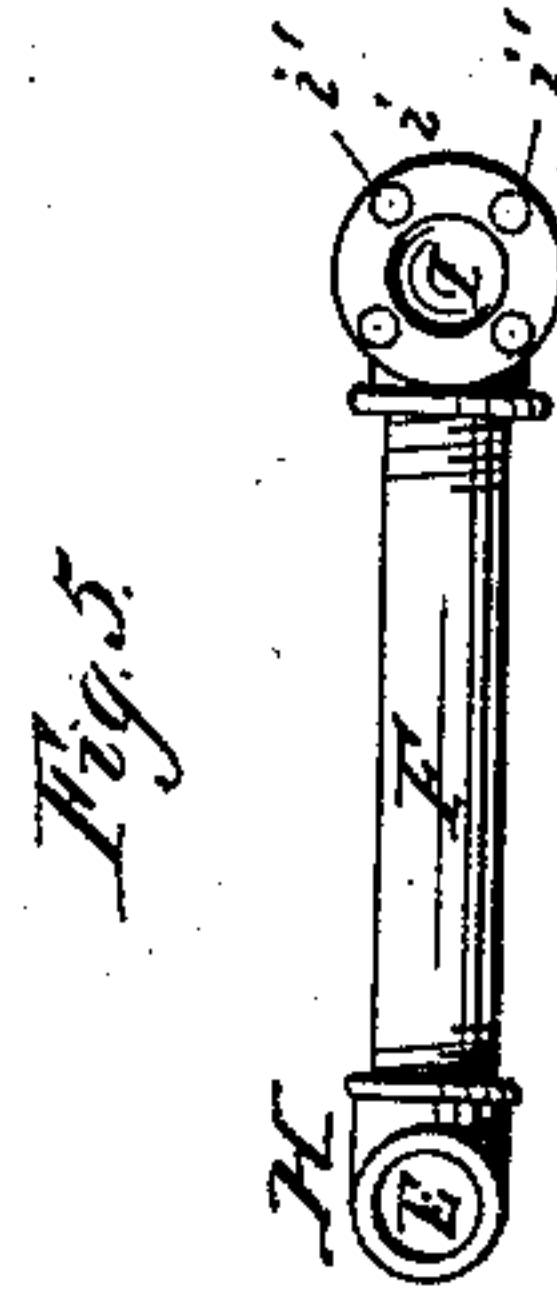
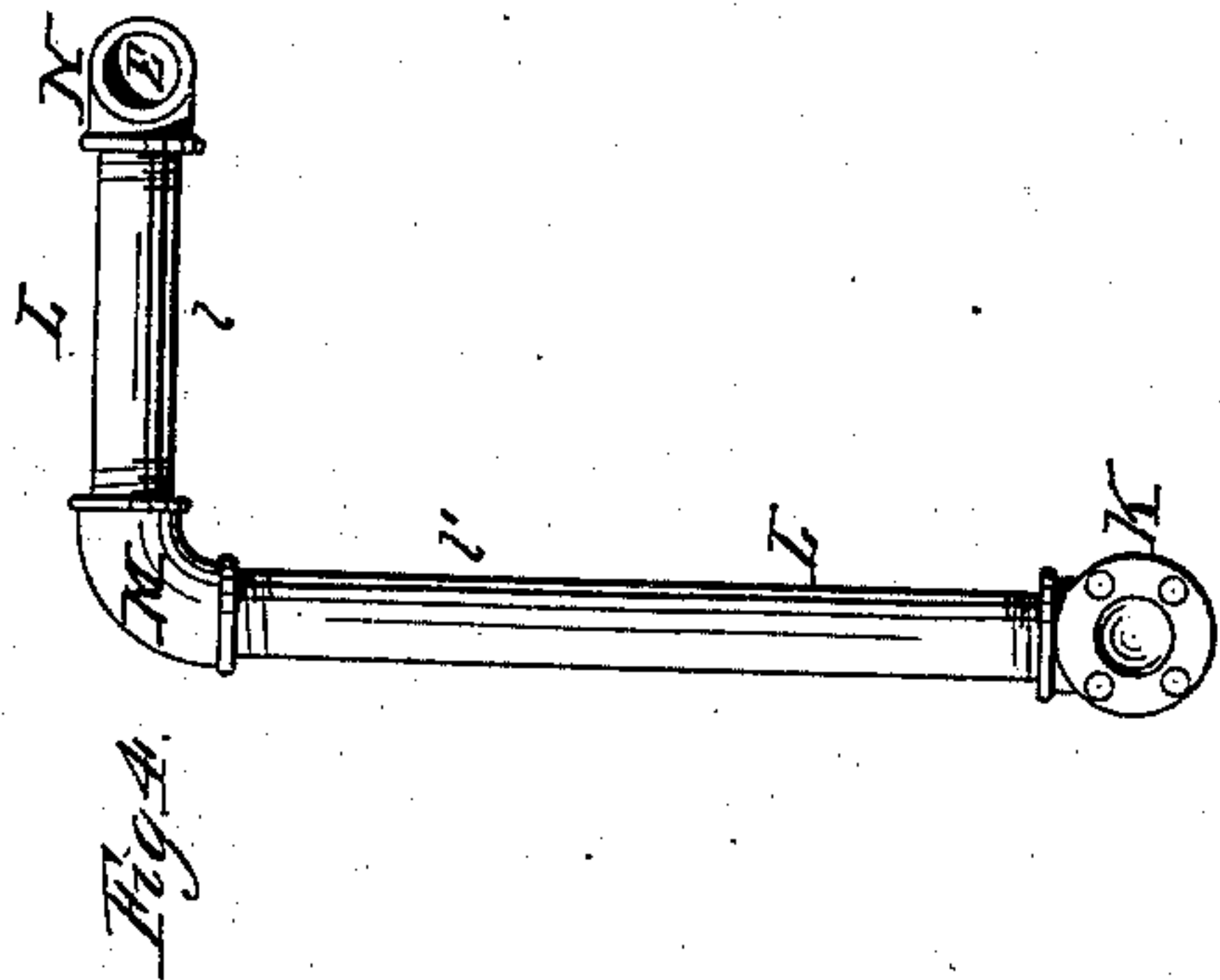
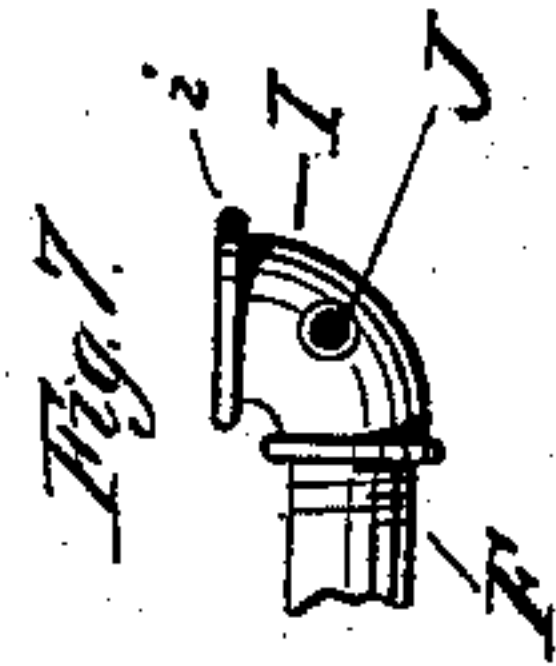
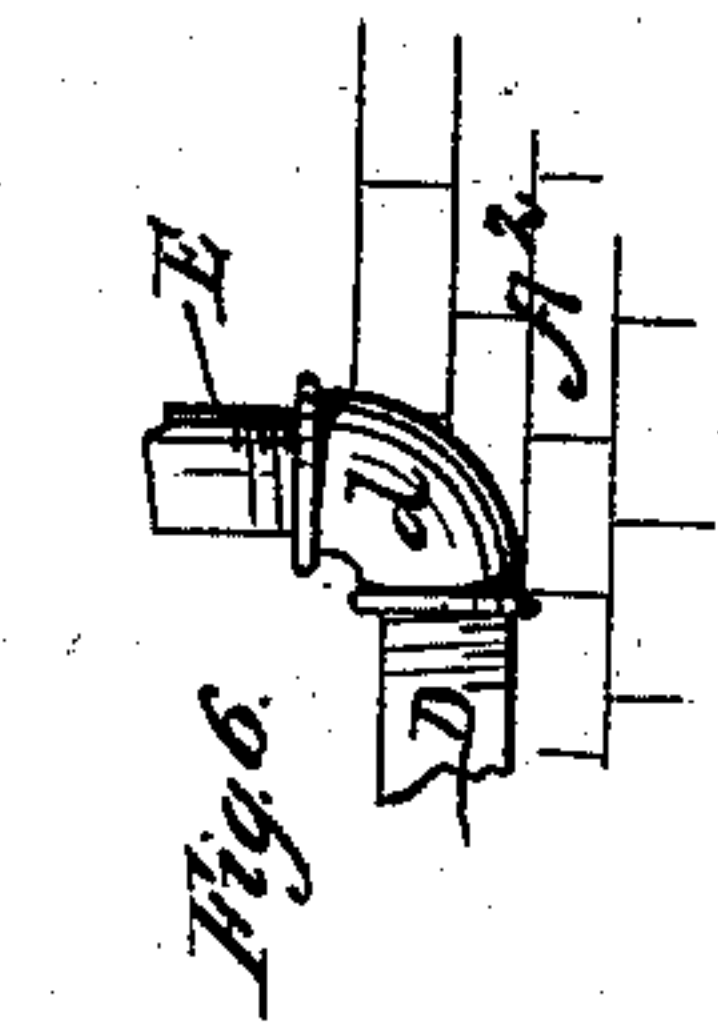
(No Model.)

2 Sheets—Sheet 2.

C. W. DURHAM.  
House Drainage Apparatus.

No. 235,754.

Patented Dec. 21, 1880.



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# UNITED STATES PATENT OFFICE.

CALEB W. DURHAM, OF CHICAGO, ILLINOIS.

## HOUSE-DRAINAGE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 235,754, dated December 21, 1880.

Application filed April 3, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, CALEB W. DURHAM, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Drainage Apparatus for Houses and Other Buildings, of which the following is a specification.

My invention relates to improvements in drains for buildings; and it consists in the manner, hereinafter more fully described, of constructing, supporting, and mounting the different drains, pipes, water-closets, and other fittings of the entire drainage system of a building so that the settling or sinking of the different walls, floors, or parts of the building will not occasion the loosening of joints, or the breaking, bending, disarranging, or tearing asunder of any part of the entire apparatus; and it also consists in the particular form, arrangement, and construction of different parts of the apparatus, hereinafter described.

Heretofore the main drains of buildings which connect with the sewer have been made of ordinary tile and laid in the earth under the building, and the vertical soil-pipes have usually been made of cast-iron or lead pipe. If of cast-iron (and this kind were perhaps preferable) the pipe was made in sections, the top end of each section being provided with an enlargement or bell, in which the lower end of the next section rested, forming a joint, which was made more or less tight by the use of solder, cement, packing, &c. It was necessary, of course, to secure and brace pipes constructed in this way, of cast-iron or ordinary lead pipes, to the walls and floors and other parts of the building in order to give them the necessary support; and the water-closets, &c., were each independently supported on the different floors or parts of the building, and connected with the soil-pipe by means of an ordinary lead pipe provided with a trap, and having the common soldered or calked joint both with the soil-pipe and with the water-closet. A very serious objection to this kind of drainage system is that the least rocking or settling of any floor, wall, or part of the building upon which a water-closet is supported or to which a section of the soil-pipe is secured is liable to cause a loosening or tearing asunder of joints or a breaking or disarranging of parts

of the apparatus, thus allowing the noxious gases to escape into the building, and the repair of such damage is often a matter of great difficulty and expense, as frequently the ruptured part will be found buried in some almost inaccessible part of the building; and besides this, owing to faults almost unavoidably incident to such a construction, it frequently happens that even when the work is new many of the joints are not perfectly tight, thus allowing the gaseous and liquid matters in the drains and pipes to escape or exude and cling to the sides of the pipe or run into the earth, and become a source for continually impregnating the whole building with deadly vapors.

It is the object of my invention to overcome these difficulties and to provide a perfect drainage system for buildings, and one which will not be affected by the rocking or rolling of the different parts of the building. This result I accomplish by providing supports independent of the building for the drains and soil-pipes, making the drains and soil-pipes of such material and strength that they will stand alone and require no bracing or support from the walls or other parts of the building, and by supporting the water-closets located near the soil-pipe from the soil-pipe itself, and by providing a rigid iron branch pipe to connect the water-closet with the soil-pipe, the end of which is provided with a fitting for the water-closet, and by providing the branch pipe in cases where the water-closet is located at too great a distance from the soil-pipe with a flexible joint instead of a rigid connection with the soil-pipe, in which case the end of the branch pipe is supported on some part of the building. In this the whole drainage system is entirely independent of the building, excepting as to certain water-closets located at a distance from the soil-pipe, and through these depend for their support upon the building. Still they are in no way attached to the building, but to the end of the branch pipe, which in this case is made flexible, and thus the settling of any part of the building can in no way affect any part of the apparatus.

In the accompanying drawings, which form part of this specification, Figure 1 represents a side view of a device embodying my invention as applied to a building, the parts of the



building shown, however, being on a somewhat reduced scale from that of the apparatus. Fig. 2 is a plan view of the running trap. Fig. 3 is a plan view of the Y and of the branch drain. Fig. 4 is a plan view of the flexible water-closet branch pipe. Fig. 5 is a plan view of the rigid water-closet branch pipe. Fig. 6 is a side view of the elbow and lower extremity of the soil-pipe. Fig. 7 is a side view of one of the water-closet fittings.

Like letters of reference indicate like parts wherever used.

In said drawings, A represents a main waste-pipe, which connects with the sewer in the street. It is placed in an inclined position, the better to secure the carrying off of all the matter, and rests upon pillars of masonry A' beneath the floor of the basement or cellar of the building. This waste-pipe may be made either of wrought or cast iron pipe, and the different sections should be joined together with some kind of close or tight joints, in order to prevent any leakage or escape of gases. If wrought-iron pipe is used the different sections or nipples are united with the ordinary screw or steam-fitting joint.

B is a running trap located in the drain A, preferably outside of the building, for the purpose of sealing the house-drainage from the sewer or preventing the gases from the sewer entering the same. This trap is made of cast-iron, and in the form of little more than a half circle or ring, its extremities or horns being provided with two hand-holes, b b, so located as to afford easy access not only to the trap but also to the drain-pipe itself on each side of the trap.

b' is a plate or cap, secured by means of screws or bolts to the flange b'', for the purpose of closing the hand-holes. Instead of the cap b', the hand-holes may be provided with ordinary screw-plugs. The ends B' of the trap are provided with flanges B'', for the purpose of making a flange-joint with sections of the drain-pipe A. The trap may, however, be provided with means for forming other suitable kinds of joints than flange-joints.

C is a three-way section or Y in the drain A, used to connect the branch drain D with the main drain, and each of its three ends are provided with flanges C', or other suitable joint, for connection with sections of the drain-pipes. This Y is provided with a hand-hole, c, at the angle of the Y, for the purpose of cleaning the same out, thus giving access to all three branches of the same. The branch drain D is also placed in a somewhat inclined position, and its end is provided with an elbow, d, which rests upon a firm support of masonry, A''. The lower end of the soil-pipe E is screwed into this elbow, and the soil-pipe is supported thereby directly upon the masonry. The soil-pipe E is made of wrought-iron pipe, the sections of the same being secured together by means of screw-joints.

F is a short iron branch pipe, connected with

the soil-pipe by means of the T or three-way section H, into which the same is screwed firmly, forming a perfectly rigid connection.

I is a cast water-closet fitting, made in the form of an elbow, screwed firmly to the end of the branch pipe F, upon which the same rests as its support, without any connection whatever with any part of the building. i is the top or flange of the fitting I, provided with screw or bolt holes i', for the purpose of securing the base of the water-closet to the same.

J is a boss or hole in the fitting I for the insertion of a waste or other pipe from the wash-bowl or bath-tub, &c. The branch pipe F should be inclined somewhat from a horizontal position, and may be made of a straight piece of pipe without a trap of any kind.

K is a water-closet fitting similar to the one already described, but located at considerable distance from the soil pipe E—say, ten or twenty feet—or so far that it is not practicable to support it upon the end of a rigid branch pipe, in which case I employ a flexible branch pipe, L, made in two sections, l l', united together through the elbow M, by means of screw joints or connections, so that the section l', to the outer surface end of which the water-closet fitting K is secured, is flexible or adjustable vertically, by turning upon the pipe l, so that if the part of the building upon which the fitting K or the flexible end of the branch pipe is supported settles, it will have no other effect than to slightly turn the screw-joint of the elbow M. The short section l' of the branch pipe is connected rigidly with the soil-pipe by means of the T or connection N.

If it is desired to connect another water-closet with the soil-pipe by means of the same branch pipe L, another flexible section may be joined thereto by adding another elbow and placing the first water-closet at or near the elbow, and the second at the end of the added section, so that each will have a flexible connection with each other and with the soil-pipe. The soil-pipe rests upon its own separate foundation, and extends up in the partition of the building, and is not supported or attached to it or any part of it in any way.

P' is a T-connection, provided for the purpose of connecting a ventilating-pipe from the drain-trap of the bath-tub with the soil-pipe, where one is used.

P is a ventilating-pipe, connecting with a hot-air flue or running up the inside of a chimney of the building. It is provided with elbows p and p', and connected with the branch-drain D by means of the T-connection P'. Q is a similar water-closet fitting secured to the end of the main drain A.

Of course the branch drain D may be dispensed with and the soil-pipe connected with the main drain A; or more than one branch drain may be used in large buildings, where it is necessary to employ several soil-pipes.

By means of the ventilating shaft or pipe P being connected with a hot-air flue a continu-



ous current of air is caused to circulate downward through the soil and water-closet pipes and upward through the ventilating-shaft.

The soil-pipe is carried to the roof of the building, and its top remains open, while the ventilating-shaft extends somewhat higher, to the top of the chimney, and this alone will be sufficient to produce a current in the pipes, even if the flue is not heated; and if a fire is made once a day, so that the ventilating-shaft becomes once heated, actual experiment has shown that, being surrounded with the brick-work of the chimney or flue, it will retain its heat, so as to produce a very decided current for forty-eight hours.

I claim—

1. The drainage apparatus for buildings, consisting of a main drain connected with a rigid soil-pipe, supports therefor independent of the building, and rigid and flexible branch pipes, substantially as specified.

2. The combination, with the drain, of the vertical soil-pipe and a support therefor independent of the building, substantially as specified.

3. The combination, with the rigid soil-pipe and an independent support therefor, of the rigid branch pipe upon which the water-closet

fitting is supported and secured, substantially as and for the purpose specified.

4. The combination of the rigid soil-pipe with the flexible branch pipe, the same consisting of two sections, *l* and *l'*, united together by means of the elbow *M*, for the purpose of providing against injury of the apparatus by settling of the part of the building upon which the outer or free end of said branch pipe rests, substantially as specified.

5. The combination of the cast water-closet fitting, provided with a flange for the reception of the water-closet, with a rigid branch pipe, substantially as specified.

6. The cast running trap or water-seal *B*, provided with hand-holes *b*, one at each of its extremities or horns, so as to provide easy access both to the trap and drain, substantially as specified.

7. The combination of the cast water-closet fitting, provided with a flange for the reception of the water-closet, with a flexible branch pipe, substantially as specified.

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