

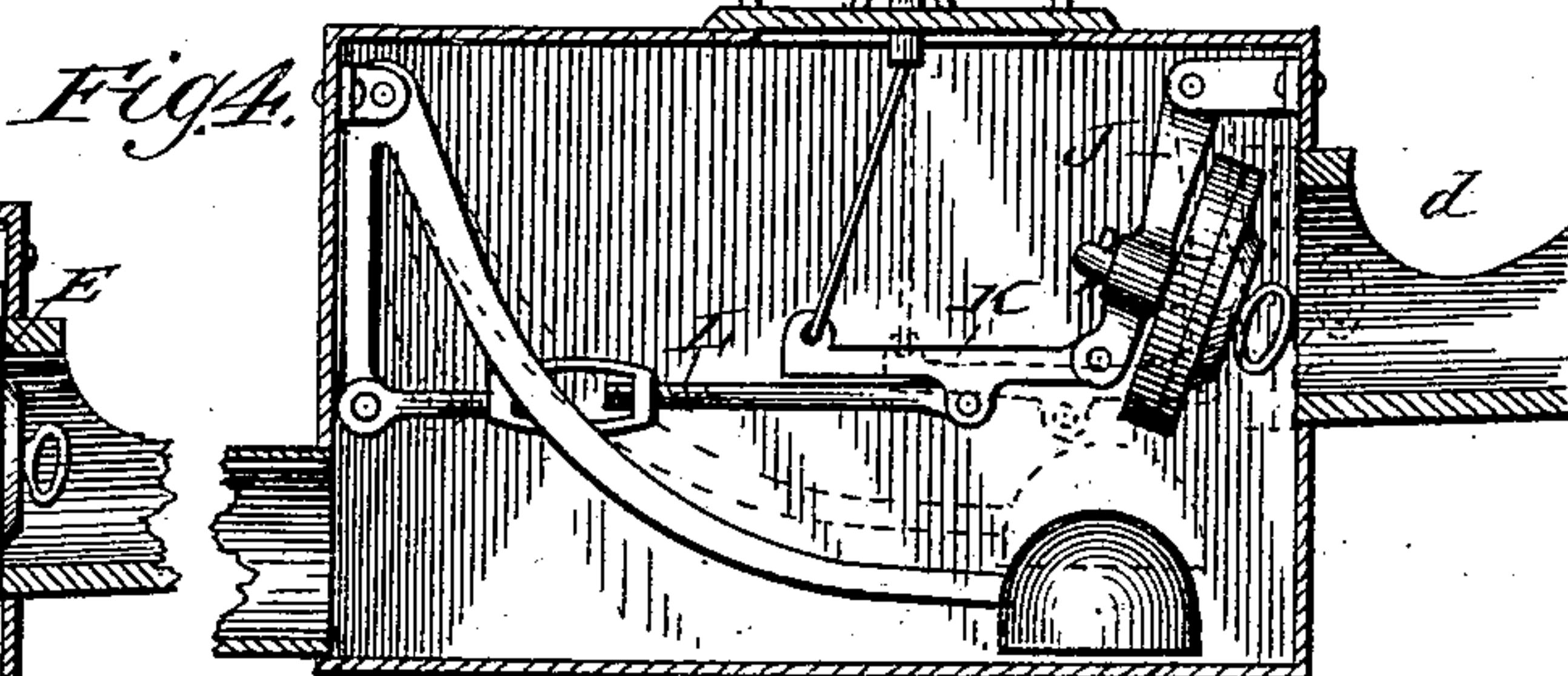
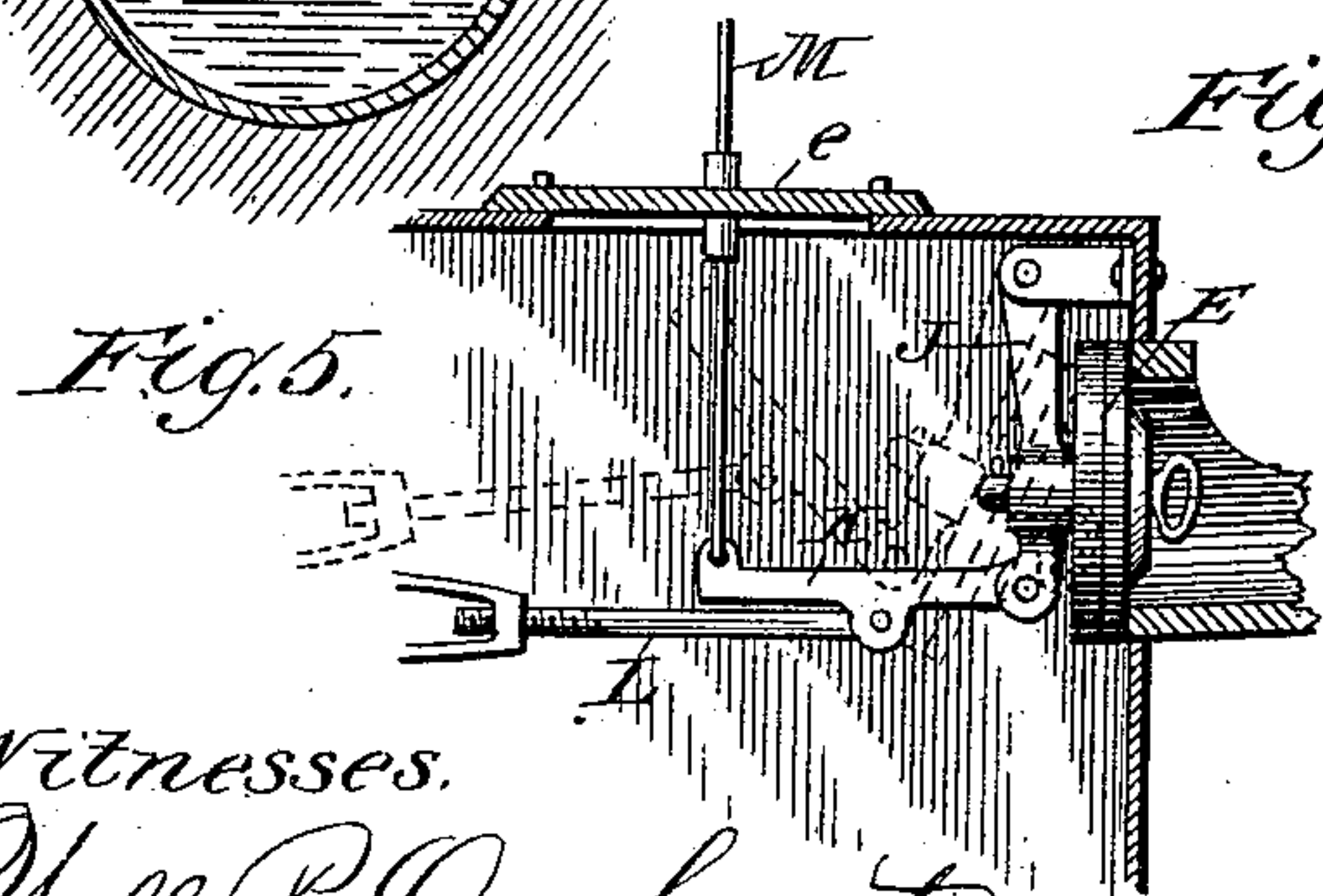
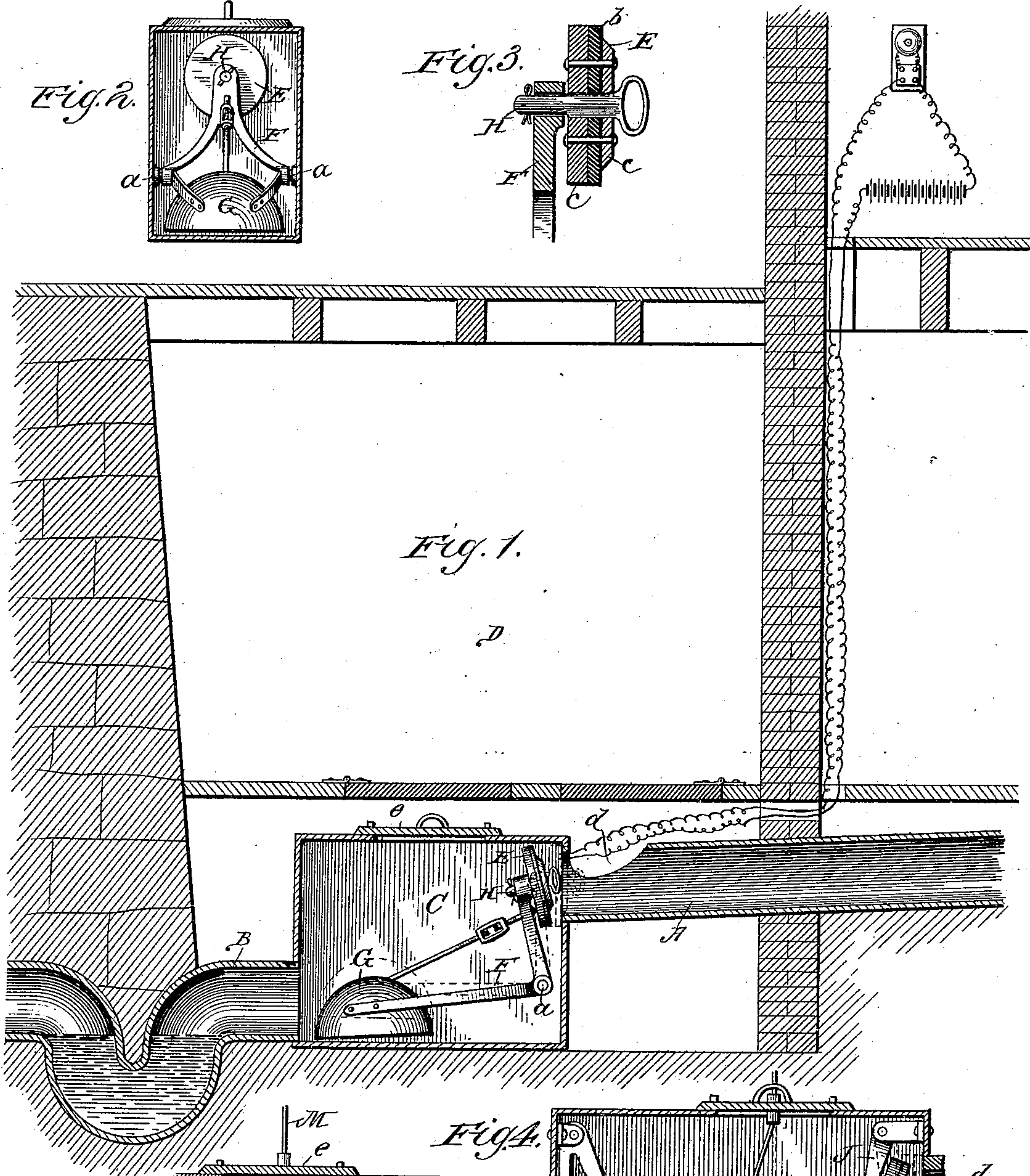
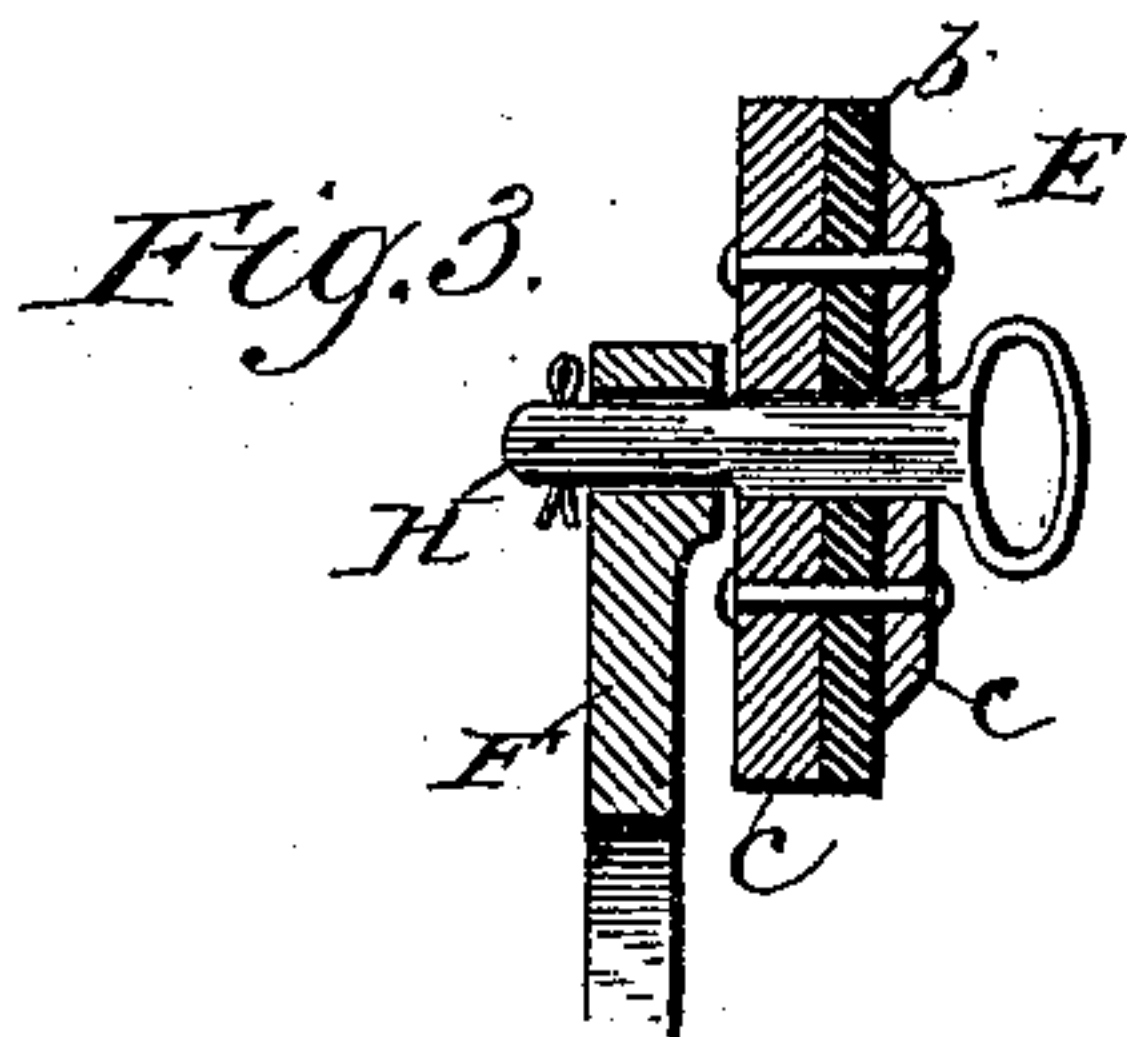
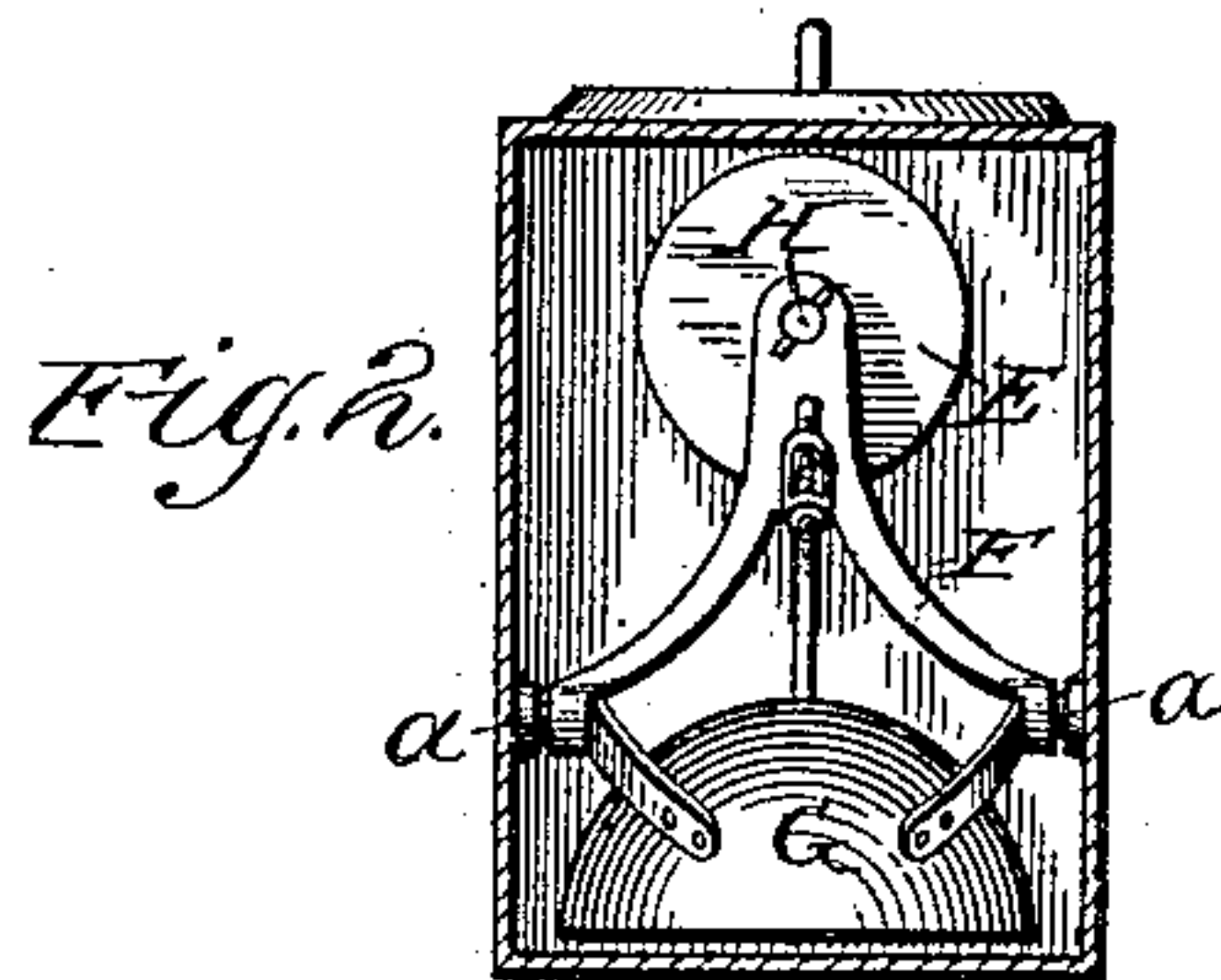
(No Model.)

J. H. CLARK.

SEWER.

No. 356,448.

Patented Jan. 25, 1887.



Witnesses.

Hall B. Guohundro.
W. W. Elliott

Inventor.

By James H. Clark
Jno. G. Elliott

Atty.

UNITED STATES PATENT OFFICE.

JAMES H. CLARK, OF CHICAGO, ILLINOIS.

SEWER.

SPECIFICATION forming part of Letters Patent No. 356,448, dated January 25, 1887.

Application filed September 21, 1885. Serial No. 177,664. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. CLARK, a citizen of the United States, residing in Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Sewers, of which the following is a specification.

This invention relates to improvements in sewers in which a hinged valve has been employed to cut off communication between a house drain-pipe and the sewer-pipe, to prevent backwater from the sewer-pipe entering the house drain-pipe in case of a set-back from the sewer.

Prior to this invention, and in my patent No. 325,820, issued September 8, 1885, a valve has been automatically operated to cut off communication between the house drain-pipe and sewer-pipe; but in this and all other valves, so far as I am at present advised, it is necessary, after the valve has been closed, in order to re-establish communication between the house drain and sewer pipes, to reopen and set the valves by hand; but it is obvious that by such construction the valve might be closed and remain so long after the set-back has subsided, thereby endangering the overflow of the house drain-pipe and its connection by reason of their continued use after the discharge end of the drain-pipe has been closed by the valve; also, in devices of this class, the valve has heretofore been rigid as regards an axial rotation thereof, which construction is objectionable, for the reason that dirt, sand, pieces of rag, and other foreign substances often adhere to and lodge between the valve and its seat upon the house drain-pipe, and thereby prevent the effectual closing or seating of the valve to an extent rendering the device inoperative and necessitating the opening of the valve and removal of said substances by hand.

An object of this invention is to have a valve automatically operated to both cut off and re-establish connection between the house drain-pipe and the sewer-pipe, whereby the valve, after being closed by reason of a set-back from the sewer, will be automatically reopened immediately the set-back has subsided.

A further object is to provide a valve capable of a rotation on its own axis, whereby

any dirt or other foreign substance adhering to or lodging between the valve and its seat may be removed by a series of axial rotations or twists of the valve upon its seat.

I attain these objects by devices illustrated in the accompanying drawings, in which—

Figure 1 represents a vertical section through a portion of a house and the adjacent street, showing a device embodying my invention forming a connection between the house drain and sewer pipe; Fig. 2, a transverse vertical section through the valve-box; Fig. 3, a central vertical section through the valve, showing its construction; Fig. 4, a vertical section through a valve-box containing a modification of my device shown in side elevation; Fig. 5, a similar but detail view of this modification, with dotted lines indicating the valve in open position to clean the box.

In carrying out my invention, I prefer to connect the discharge end of a house drain-pipe, A, and the receiving end of a sewer-pipe, B, by means of a suitably-constructed box or casing, C, located at some convenient point in the house-sewerage system, but preferably at or near the bottom of a well, D, provided for its reception under the sidewalk or pavement contiguous to the building. In this box or casing C is located the device for automatically cutting off and re-establishing communication between the house drain and sewer pipes, consisting of a valve, E, axially pivoted on one end of a bifurcated bell-crank lever, F, the said lever being pivoted to the side walls of the casing at a, and having secured to and connecting its other ends a float, G, for the purpose hereinafter described.

The bell-crank lever is bifurcated, as shown, for the purpose of increasing its strength and promoting its resistance to lateral strains from a sudden or violent closing of the valve, by reason of the increased breadth of its pivot-bearings, and such construction serves to insure the effectual and perfect seating of the valve; but it would be no departure from my invention, instead of bifurcating the lever, to form the said lever of a single bar or arm and pivot it near the center of the valve-box to a suitable projection formed thereon.

The float G, secured to the bifurcated ends of the lever, is of the ordinary form and con-

struction common in such devices, but of sufficient size to subserve the double purpose of a float, and operating to seat and unseat the valve, for the purpose hereinafter described.

5 The opposite end of the lever terminates in an eye, through which loosely projects one end of a spindle, H, forming an axial support or bearing for the valve E. The opposite end of this spindle terminates in a loop or handle
10 for operating the valve. That portion of the spindle which projects through the eye in the lever is circular in cross-section; but that portion between the bearing and the handle on the end of the spindle is square in cross-section, and on this squared portion is secured
15 the valve, composed of a gasket, b, of leather or rubber, rigidly held between two metallic disks, c c. This construction of the valve permits a rotation thereof upon its own axis, so
20 that any dirt, sand, piece of rag, or other foreign substance which may adhere to or lodge between the valve and its seat may be effectually removed by a series of axial oscillations or reverse twists of the said valve upon its seat.
25 For convenience of operating this twist-valve an opening, d, is provided in the drain-pipe A near its point of juncture with the valve-box, through which the hand of the operator is passed to take hold of and operate the said
30 valve, while at the same time forcing it upon its seat.

The bell-crank lever is so pivoted with relation to the discharge end of the house drain-pipe that when the float is elevated by a set-
35 back from the sewer the valve will seat upon and effectually close the end of said drain-pipe; but immediately upon receding of the backwater the gravity of the float will overcome the weight of the valve, unseat it, and re-establish communication between the drain and
40 sewer pipes.

It is sometimes desirable to increase and decrease the length of throw of the valve, in order to vary the time of its closing after back-
45 water has set in, and to this end the upper end of the upright arm of the bell-crank is connected with the float by a screw-threaded rod on which there is a swivel-connection, which if tightened decreases the distance in a direct
50 line between the float and the valve, and vice versa, by springing the opposing arms of the bell-crank toward or from each other, all of which will be fully understood by bearing in mind that the float normally rests upon the
55 bottom of the box; but it may here be observed that my invention is not limited to the particular adjusting device herein shown and described, for various other mechanical means (not necessary to be illustrated) may be em-
60 ployed to the same end.

If desirable, the valve-box and drain-pipe may be confined beneath a flooring for protection, and in such case the flooring would be provided with suitably-located trap-doors to
65 facilitate access to the pipe and box, as clearly illustrated in Fig. 1; and to further this end

the valve-box is preferably formed with a removable cover, e, secured upon the box in any convenient and well-known manner.

To give warning to the occupants of the 70 building immediately a set-back has occurred an electric bell is located at any desired part of the building, with wires connecting with two poles of a battery, the free ends of which wires pass through the opening d in the drain-pipe 75 and project slightly beyond the end of said pipe in such manner that when the valve is seated the metal disk on the face of the valve, serves to complete the circuit and sound the alarm, all as set forth in my patent hereinbe- 80 fore referred to.

In operation, when a set-back occurs in the sewer, the water will rush into the valve-box and acting upon the float elevate it, thereby seating the valve and closing the end of the 85 house drain-pipe, and effectually preventing any of the backwater from entering the house drain-pipe or its connections.

Should dirt, sand, pieces of rag, or other foreign substances adhere to or become lodged 90 between the valve and its seat, thereby preventing the perfect seating of the valve, the operator, who has been notified by the ringing of the alarm-bell, may, by inserting his hand through the opening d in the drain-pipe and 95 giving the valve a series of axial oscillations or reverse twists, dislodge any such obstructions and properly seat the valve.

After the backwater has subsided, the gravity of the float will overcome the weight of 100 the valve and unseat it, thereby opening the end of the drain-pipe and re-establishing the connection between said pipe and the sewer-pipe.

Fig. 4 represents a modification of my in- 105 vention, in which the twist-valve is loosely journaled in a link, J, at or near the center thereof, said link being hinged at its upper end to a fixed stud and pivoted at its lower end to a lever, K, which lever is pivoted 110 about the center of its length to one end of a rod, L, having the swivel-connection before referred to, the opposite end of which rod is in turn pivoted to one arm of a bell-crank, to the free arm of which is secured the float for 115 operating the valve.

It is sometimes desirable to unseat the valve against the weight of the float alone, or against the weight of the float and backwater, and to this end I have provided a cord or ca- 120 ble, M, connected to the free end of lever K, and passing through a suitable opening in the box-cover to some convenient point for manipulation by the operator, and when so operated the valve and its several connections will as- 125 sume the position illustrated by dotted lines in Fig. 5.

Although the operation of the two valves is identical, the last-described manipulation cannot take place in the preferred construc- 130 tion. However, such manipulation is of no special importance and may readily be dis-

pensed with, in which case lever K and rod L (shown in the modification) would be dispensed with and their place supplied by a single rod connecting the end of link J with the crank-arm.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A valve, a drain-pipe, and a seat thereon for said valve, in combination with a float and a lever-connection between the float and valve, provided with an axial support for the valve, substantially as described.

2. A valve, a drain-pipe, and a seat thereon for said valve, in combination with a float, a bell-crank connection between said valve and float, and an axial support for said valve, substantially as described.

3. In a sewer, a drain-pipe and a valve-seat

thereon, in combination with the lever supporting the valve and a pivot-connection between said lever and valve, whereby the valve is seated and unseated, but may also have an axial rotation, substantially as described.

4. The drain-pipe, the valve-seat thereon, and a lever supporting the valve, in combination with a spindle-connection between the valve and lever, said spindle being rigidly connected with the valve, and having a bearing in the lever and terminating in a handle, whereby the valve may be rotated and advanced toward and from its seat, substantially as described.

JAMES H. CLARK.

Witnesses:

W. W. ELLIOTT,

WILL R. OMOHUNDRO.