

No. 638,321.

Patented Dec. 5, 1899.

B. O. CLARK.

SUBIRRIGATION SYSTEM AND VALVE.

(Application filed June 29, 1897. Renewed May 16, 1899.)

(No Model.)

Fig. 1.

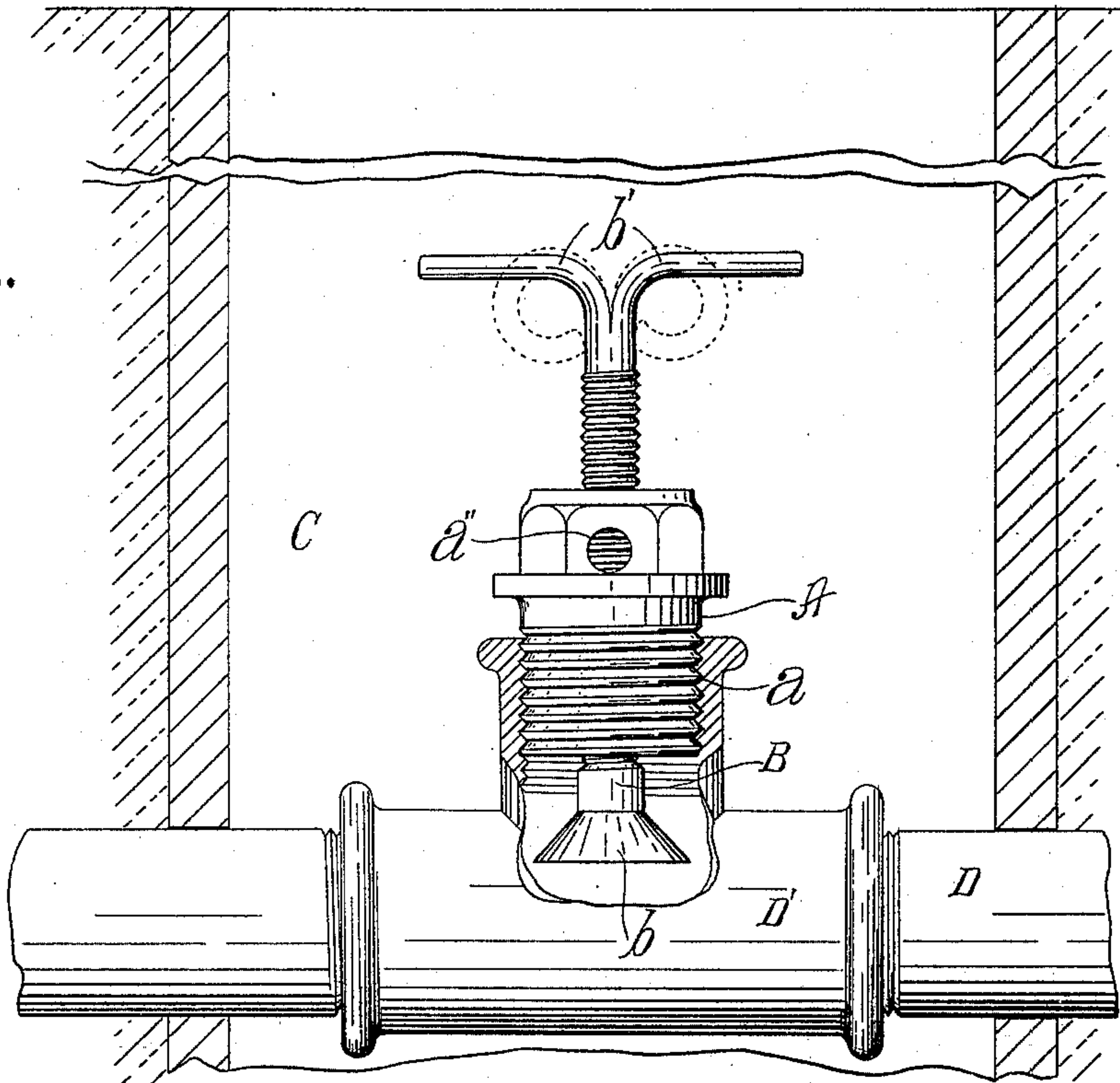


Fig. 3.

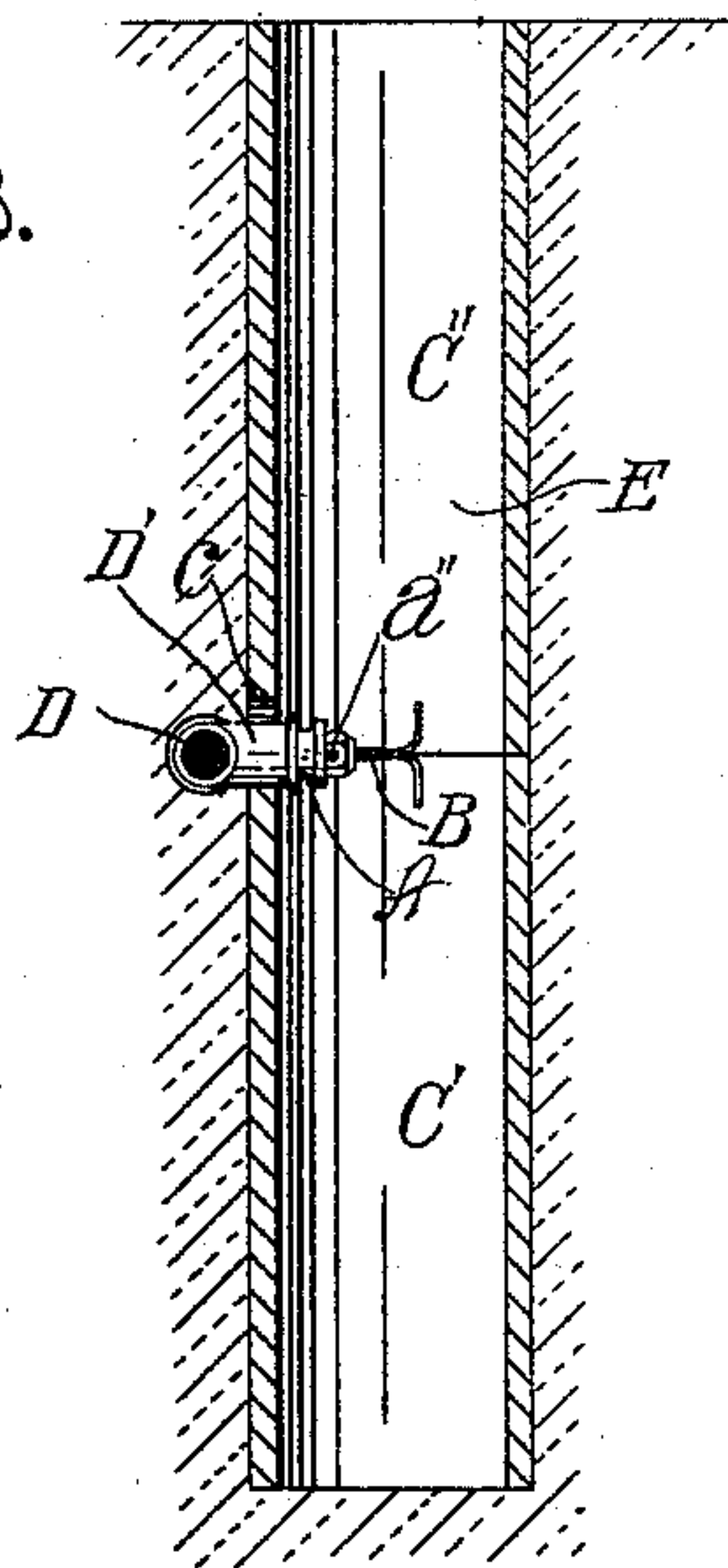
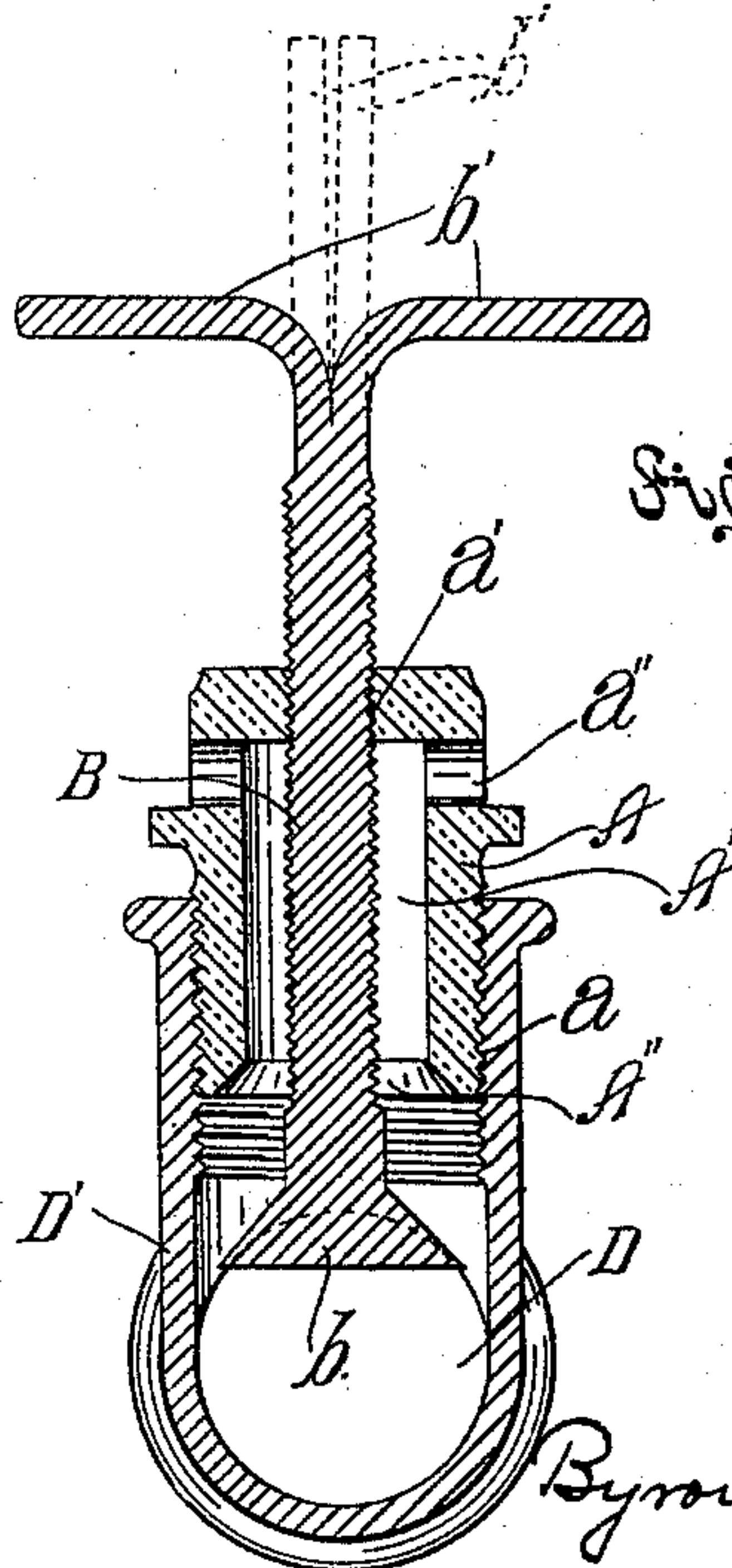


Fig. 2.



Witnesses

Harry Fingman.
C. A. Derby

Inventor

Byron O. Clark
by Townsend Bros.
his attys.

UNITED STATES PATENT OFFICE.

BYRON O. CLARK, OF PASADENA, CALIFORNIA.

SUBIRRIGATION SYSTEM AND VALVE.

SPECIFICATION forming part of Letters Patent No. 638,321, dated December 5, 1899.

Application filed June 29, 1897. Renewed May 16, 1899. Serial No. 717,054. (No model.)

To all whom it may concern:

Be it known that I, BYRON O. CLARK, a citizen of the United States, formerly residing at Pasadena, in the county of Los Angeles and State of California, now residing at Honolulu, Hawaii, have invented a new and useful Subirrigation System and Valve, of which the following is a specification.

The object of my invention is to produce a neat, cheap, simple, and effective valve which will be particularly suitable for use in subirrigation systems such as that disclosed in Patent No. 496,187, issued to me April 25, 1893.

The installation of a subirrigation plant is a matter of considerable expense; and one especial object of my invention is to provide a valve which will be of minimum cheapness and yet will effectively perform the work required of it.

The digging of the trenches within which to place the distributing-pipes for subirrigation plants has been a matter of considerable expense owing to the depth at which it is desirable to allow the water to escape from the pipe to saturate the soil. This should be about two feet below the surface. Heretofore it has been deemed necessary to lay the pipe at least two feet deep solely for the purpose of getting the water low enough in the ground, the cultivating and plowing not requiring that it be placed more than one foot below the surface to be out of the way. A trench one foot in depth can easily be plowed out and at slight expense; but to deepen the trench to two feet requires that two or three spade depths of soil be removed by hand, and in most soils the cost of removing this extra foot of dirt amounts to at least ten dollars per acre.

Another object of my invention is to provide means whereby the mains may be placed just far enough below the surface of the soil to escape the plow or cultivator and to deliver the water to the soil at any desired depth, whereby a great deal of expense of digging deep trenches is avoided.

My invention comprises the various features of construction whereby I combine simplicity and cheapness with effectiveness.

The accompanying drawings illustrate my invention.

Figure 1 is a fragmental sectional view

illustrating my improved valve in position in a distributing-pipe. In this view the valve is shown open to allow water to flow out through the perforations provided therefor. Fig. 2 is a sectional view of the valve and the distributing-pipe. Fig. 3 shows my improved means of delivering the water at any required depth, irrespective of the depth at which the main may be placed.

In the drawings, A represents the body of the valve, which is in the shape of a hollow plug provided around its lower portion with screw-threads *a* and having an axially-arranged screw-threaded passage *a'* provided in the top of the body. Water-passages *a''* lead outward from the chamber *A'* of the valve at a point above the screw-threads *a*, and the plug or valve-body is provided at its open end with a valve-seat *A''*.

Within the valve-body is arranged the valve-stem B, which is screwed through the top of the valve-body and is provided at its lower end with a valve-head *b*, adapted to seat within the valve-seat *A''* and close the lower end or bore of the plug below the perforations *a''* when desired.

In order to provide a valve which is extremely cheap in construction, I cast the valve-stem B and the valve *b* from brass or some malleable metal and cast its upper portion in two limbs *b'*, as shown in the drawings. When these limbs are cast, they are slightly separated from each other, as indicated in dotted lines in Fig. 2. The two limbs are smaller in diameter than the main body of the valve-stem, and such stem is screw-threaded and the valve-head is turned integral therewith. Then the screw-threaded portion of the valve-stem is screwed upward from beneath through the top of the valve-plug, and the two limbs *b'* are bent outward, as shown in the drawings, to serve as a handle whereby the valve may be operated. They may, if desired, be formed into loops, as indicated in dotted lines in Fig. 1, to give greater strength.

In practice the valve-body is cast in one piece, and the lower part thereof and the opening in the cap are screw-threaded and the valve-seat turned at one setting. The valve-stem and valve are screw-threaded and turned into shape and screwed through the cap and

the limbs *b'* bent out, as shown. Thus the entire valve is composed of but two parts—the plug and the valve and stem.

When the distributing-pipe *D* is laid in the usual manner, it is provided with a *T D'* at each point where it is desired to allow water to escape for the purpose of irrigation. The valve-plug is screwed into the projecting member of the *T*, as shown in the drawings, and the valve is ready for use. Then a length of soil-pipe *C* or any other cheap casing material is placed inclosing the valve in the manner shown in Fig. 1 and the trench filled with earth. When it is desired to allow water to escape from the main, the valve-stem is rotated to open the valve, as indicated in the drawings, and the water flows outward around the valve-stem and out through the openings *a''*, and thus saturates the ground below the surface thereof. The hand may be inserted downward through the casing or soil-pipe to operate the valve, or a suitable key may be provided for this purpose.

I will now describe my improved system whereby I am enabled to place the pipes near the surface of the ground and to deliver the water to the soil at any desired depth.

By means of a plow a trench of a foot or more in depth is provided between the rows of trees to be irrigated, the expense thereof being very slight. Then at each point where it is desired to irrigate a hole is dug and one or more lengths *C'* of soil-pipe or any other suitable conduit is placed upright in the hole to form a well, after which the dirt is filled in about the conduit or casing. Then the main *D*, having a valve for each well, is placed in the trench with a valve projecting horizontally into each well, as shown in Fig.

3. A small portion of the pipe, as at *C*, may be chipped away to seat the *T* and a second length of pipe *C''* placed upon the top of the first length, so that the valve is thus arranged within a well *E*, formed by the two lengths of pipe and open to the ground below the opening *a''*, and water turned from the distributing-pipe through the valve will flow to the bottom of the well and saturate the ground, from which point it will by capillary attraction and filtration saturate the surrounding soil, supplying moisture to the tree-roots without any loss by evaporation. Thus I apply the water at the desired depth and avoid the necessity of laying the distributing-pipes any deeper than is necessary to avoid the tools used in cultivation of the soil, thus saving a large amount of labor which has heretofore been necessary in digging deep trenches for the pipes. Furthermore, by arranging the supply-pipes at one side of the well and arranging the valve projecting horizontally from the pipe into the well the water does not stand

about the pipe, as it does when the water is not conducted to a point below the supply-pipe, and thereby much rusting of the pipe and fittings is avoided.

It will be seen that without departing from the spirit of my invention a second length of pipe may be placed below the length *C*, (shown in Fig. 1,) thus producing a well having the pipe extending through instead of being arranged at one side thereof, as shown in Fig. 3. This, however, is a mere matter of construction, which will be readily understood without illustration herein.

Now, having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A valve for subirrigation comprising a hollow capped plug screw-threaded at its open end and provided with a valve-seat; a discharge-opening leading from the chamber through the wall of the plug below the cap; and an integral valve and stem screwed upward through the screw-threaded opening provided in the cap of the plug, the upper end of the stem being formed in two limbs adapted to be bent apart after the stem is screwed through the cap in order to form a handle whereby to operate the valve.

2. In a subirrigation system, the combination set forth of a pipe arranged below the surface of the ground; a valve arranged to be opened to allow water to escape from the pipe; and a well or conducting-pipe open at the top and leading from the surface of the ground to a point below the pipe and there open to the ground to allow the water to soak into the ground, the valve being arranged to discharge the water from the pipe into the well.

3. In a discharging system, the combination set forth of a pipe; a *T* arranged in the pipe and having its projecting limb turned in a horizontal position; a valve screwed into the *T*; a well leading from the surface of the ground to a point below the pipe and arranged at one side of the pipe with the valve projecting into the well, substantially as and for the purpose set forth.

4. In a subirrigation system, the combination set forth of a pipe; a valve arranged in the pipe; a length of drain-pipe or other casing arranged below the valve to conduct the water therefrom to a point below the pipe; and a length of drain-pipe or other device arranged above the valve to allow convenient access to the valve from the surface of the ground.

BYRON O. CLARK.

Witnesses:

ALFRED I. TOWNSEND,
FRANCIS M. TOWNSEND.