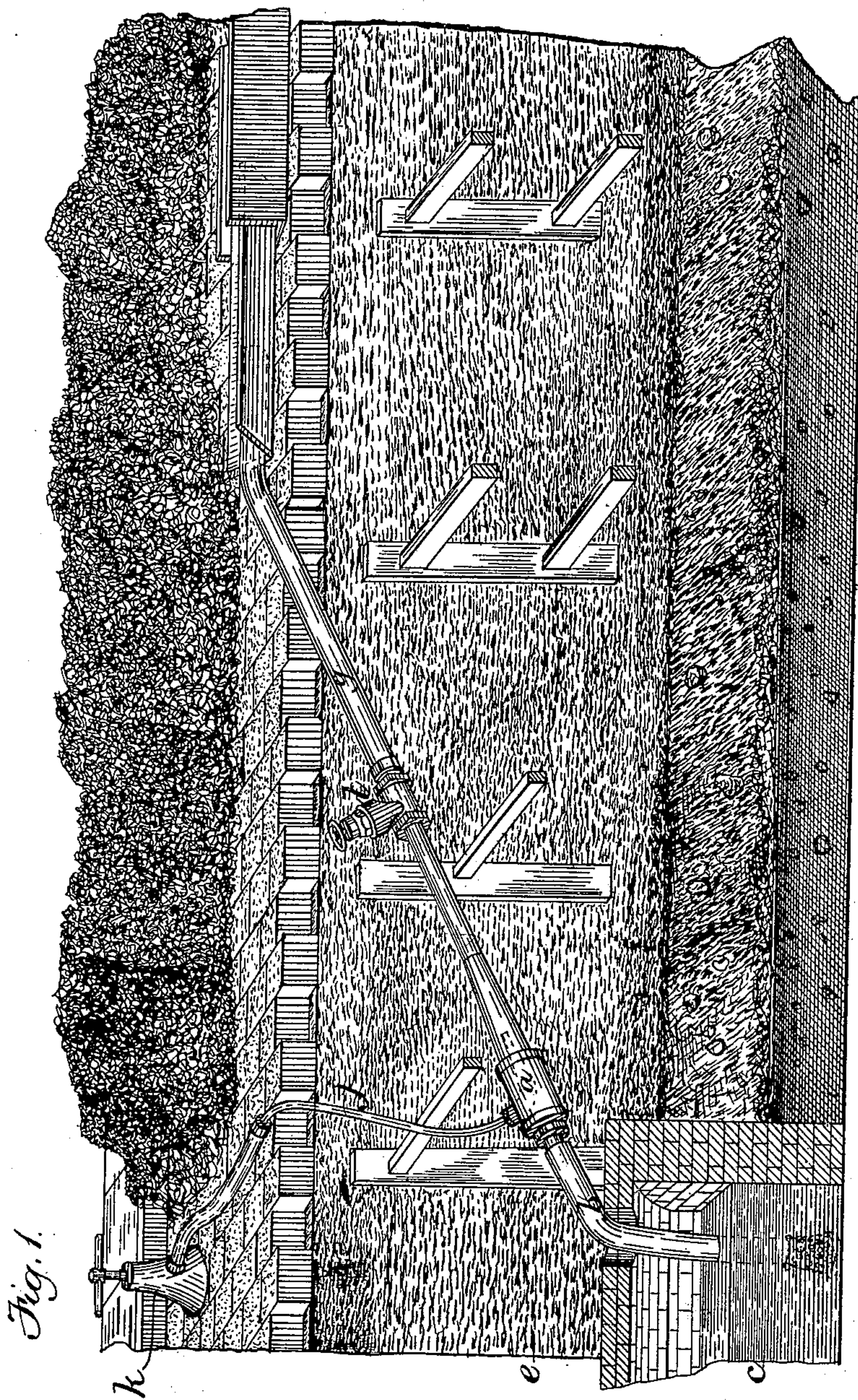
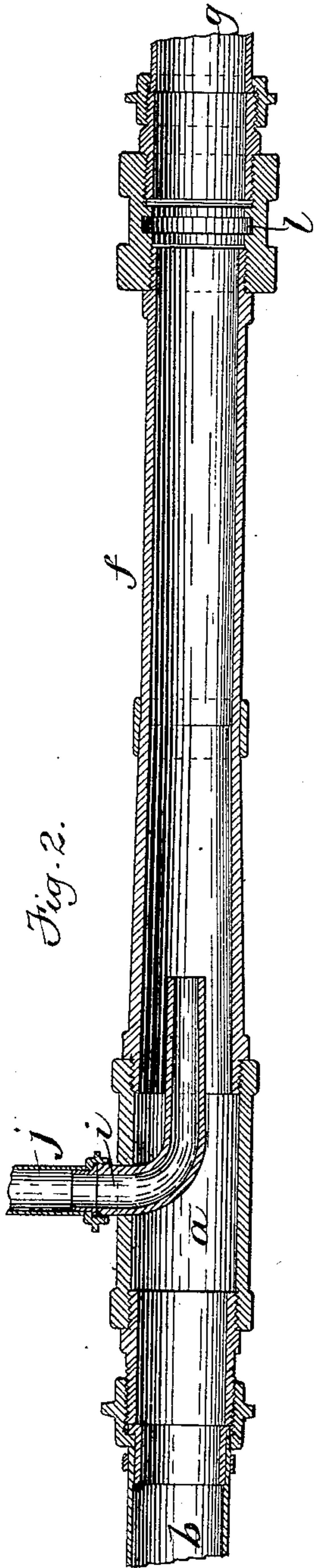


(No Model.)

A. M. GRANGER.
WATER ELEVATING APPARATUS.

No. 329,450.

Patented Nov. 3, 1885.



Witnesses.
H. Brown.
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A. M. Granger
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UNITED STATES PATENT OFFICE.

ALMON M. GRANGER, OF MEDFORD, MASSACHUSETTS.

WATER-ELEVATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 329,450, dated November 3, 1885.

Application filed December 1, 1884. Serial No. 149,228. (No model.)

To all whom it may concern:

Be it known that I, ALMON M. GRANGER, of Medford, in the county of Middlesex and State of Massachusetts, have invented certain
5 Improvements in Water-Elevating Apparatus, of which the following is a specification.

This invention has for its object to enable a stream of water under pressure afforded by a public water-supply system to raise water
10 from trenches or other excavations in streets or other localities where the public water-service is available, the desired result being accomplished by discharging a stream of water under pressure from a hydrant into a conduit
15 communicating with the body of water to be raised, the stream being so directed in the conduit as to induce a flow of water upwardly from the body to be raised, the water thus raised mingling with the impelling-stream and
20 passing away therewith.

The invention consists in the combination, with a water-supply system, of a portable conduit constructed to conduct water upwardly from a trench or excavation, and provided with
25 an internal nozzle having a connection with the water-supply system, and extending along the conduit in the direction in which the water raised from the trench or excavation is to flow.

The invention also consists in the application of a valve or gate placed in said conduit
30 beyond the discharging end of said nozzle, whereby the water may be directed backwardly to flush the conduit and remove obstructions therefrom.

The invention also consists in a chamber or tube having a nozzle entering it, and extending along its interior in the direction of its length, flexible pipes coupled to the opposite
35 ends of said chamber and adapted, respectively, to enter the depressed body of water to be raised and to conduct such water away, and another flexible pipe connected to said nozzle and adapted to be coupled to a hydrant, all of which I will now proceed to describe.

45 Of the accompanying drawings, forming a part of this specification, Figure 1 represents a perspective view of my improved apparatus, whereby the method above outlined may be carried into effect. Fig. 2 represents a longitudinal section of the apparatus.

The same letters of reference indicate the same parts in both the figures.

In carrying out my invention I provide a portable conduit, which is composed of a metal tube, *a*, flexible tube or pipe *b*, connected by a
55 suitable coupling, *a'*, with the tube *a*, and extending downwardly into the body of water *c*, to be raised from a trench or excavation, *e*, and a flexible discharge-pipe, *g*, coupled to the other end of the tube *a*, through which the im-
60 pelling-water and the water raised thereby may be conducted to the point where it is to be discharged; or, if preferred, the pipe *g* may discharge the water into an independent trough or conductor placed in the trench or upon the
65 pavement.

i represents a metallic nozzle, which passes through one side of the tube *a*, and is bent inside the chamber and extends a short distance along the same toward the outer end thereof.
70 The external end of the nozzle *i* is coupled to a flexible pipe or hose, *j*, which is connected with a hydrant, *k*, or other branch of a pipe or main comprising a part of a public water-service system. It will be seen that water
75 under the usual pressure afforded by a public water-supply system, passing through the bent nozzle *i* and discharge-tube *g*, away from the body of water *c* to be raised, will by frictional contact create a partial vacuum in the tube *a*
80 and pipe *b*, and thus induce a flow of water from the body *c* through the pipe *b* into the chamber *a*, the water thus raised mingling with the stream entering through the nozzle *i*, and being carried onward thereby to the point
85 of discharge. In this way water has been raised by the described apparatus to a height of twelve feet from the bottom of an excavation and discharged on the pavement at a distance from the excavation. The nozzle *i* entering
90 the side of the conduit and bent into line therewith enables a stream of water flowing through the conduit to follow a course devoid of abrupt curves, and therefore experience the minimum of resistance from friction on the sides of the
95 conduit.

The described method is principally useful in raising water from trenches which are being dug in streets for sewer-pipes, accumulating from various causes in such trenches, so as to
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greatly impede the progress of the work unless it is removed.

Heretofore hand-pumps have been used for this purpose, one or more men being required to operate each pump.

The above-described apparatus is now in daily use, and raises, at a cost of about two dollars per day for the impelling-stream, a quantity of water which would require the constant labor of from five to six men with two hand-pumps, a large saving being therefore effected. The tube *a* is provided with a gate or valve, *l*, whereby the pipe may be shut off to cause the water to flow backwardly through the pipe *b* to force out any obstructions that may have found lodgment therein. The pipes *a* and *g*, coupled to the opposite ends of the conduit formed by the chamber *a* and pipe *f*, and the pipe *j*, connecting the nozzle *i* with the hydrant, are all flexible and permit the apparatus to be adjusted to various requirements and locations. The flexibility of said pipes also permits the apparatus to be used as a siphon, water being supplied from the hydrant through the nozzle *i* to induce or start the flow through the siphon, the supply from the hydrant then being shut off, if desired, or continued to increase the discharge.

I claim—

1. The combination, with a hydrant, of a flexible hose leading therefrom, a nozzle forming the termination of said hose, a tube into which said nozzle extends, and flexible pipes *b g*, leading into and away from said tube.

2. The combination, with the tube *a*, of the flexible pipe *j*, terminating in a nozzle in said tube, the flexible pipe *b*, leading to said tube, and the pipe *g*, having gate *l* therein, leading from the tube *a* in front of the nozzle.

3. The combination, with a hydrant, of the flexible pipe *j*, leading therefrom, the tube *a*, into the side of which pipe *j* enters and terminates in a nozzle extending axially in the tube, the flexible pipe *g* in front of said nozzle and having a gate-valve therein, and the flexible pipe *b*, entering the reverse end of tube *a*, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 26th day of November, 1884.

ALMON M. GRANGER.

Witnesses:

C. F. BROWN,
R. J. POWERS.