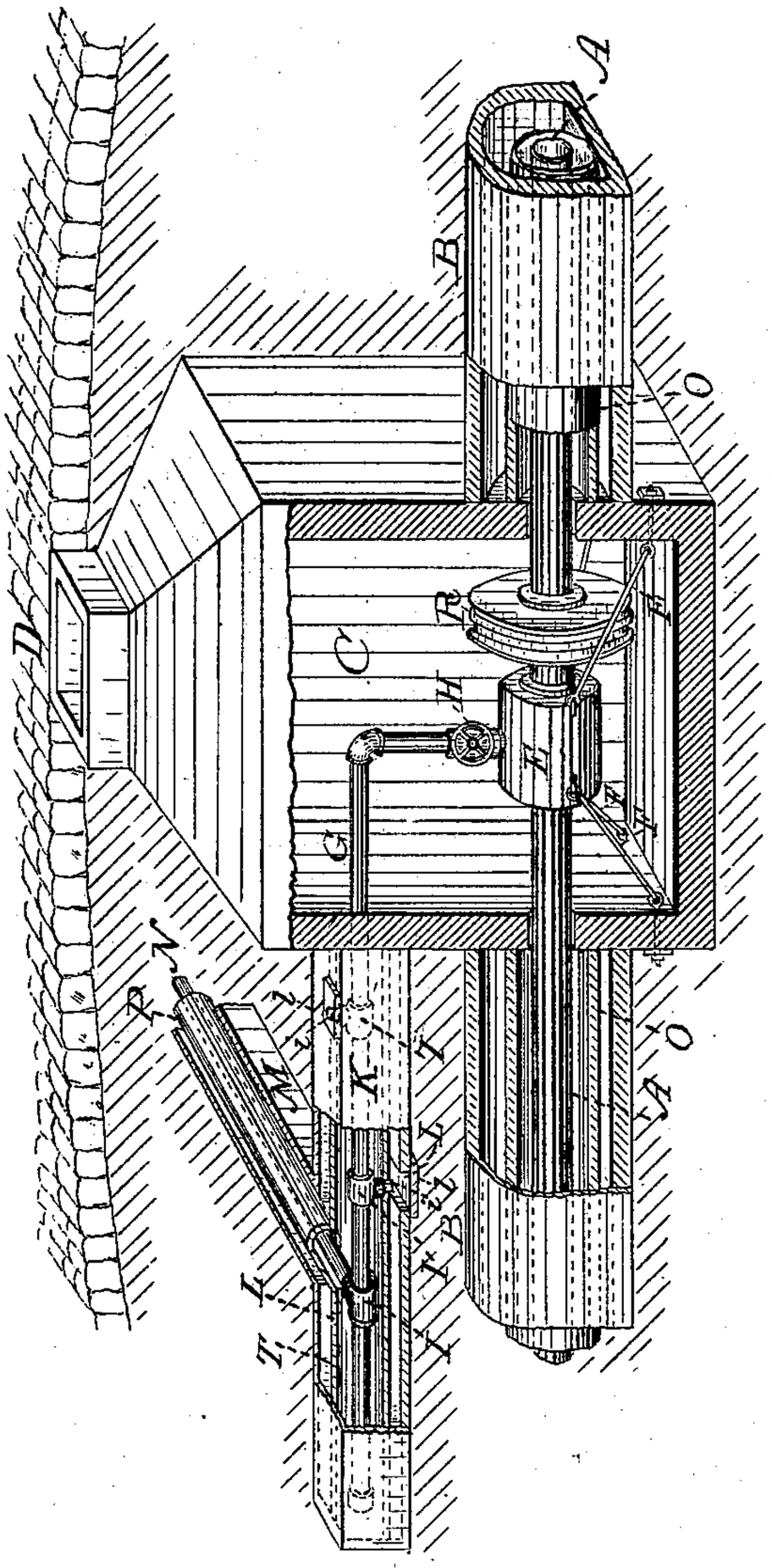
(No Model.)

R. H. BUEL.

HOT WATER OR STEAM MAIN OR PIPE.

No. 256,543. Patented Apr. 18, 1882.



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HOT-WATER OR STEAM MAIN OR PIPE.

SPECIFICATION forming part of Letters Patent No. 256,543, dated April 18, 1882.

Application filed November 16, 1881. (No model.)

To all whom it may concern:

Be it known that I, RICHARD H. BUEL, of the city, county, and State of New York, have invented a new and useful Improvement in Underground Hot-Water or Steam Mains or Pipes, which improvement is fully set forth in the following specification.

In laying underground-mains for the conveyance of steam or hot water it is customary to take off branch and service pipes for the supply of buildings and for other purposes at or near the points where the mains are held immovable, or nearly so, and it is at these points alone that the mains are ordinarily tapped for supplying steam or hot water to buildings, or for other purposes.

The object of my invention is to provide mains which may be tapped at any point, such points generally not being secured so as to be practically immovable. For this purpose I divide the underground-mains used for conveying steam or hot water into conveying-mains and distributing-mains, the character and purpose of which I will now describe.

The conveying-mains are similar to those in ordinary use, fitted with expansion-joints, and secured rigidly at suitable points. I prefer to lay these mains in water-tight boxes, pipes, or trenches, and to provide man-holes, giving access from the street at the points where the expansion-joints are fitted and the mains are held rigidly. At the points rigidly held the distributing-mains are attached and are both carried along in the same direction as the conveying-mains, and also branch therefrom in various directions. The distributing-mains are also laid by preference in water-tight boxes, pipes, or trenches, and differ from the conveying-mains principally in the following particulars: First, the distributing-mains are not continuous, as are the conveying-mains, and one end of each distributing-main being free, no expansion-joints or rigid connections (other than their points of attachment to the conveying-mains) are required for the distributing-mains; second, the distributing-mains are fitted with connections for branch pipes, arranged so as to give a connection for every building along the street or district through which a distributing-main is run, so that connection with every building can be made with even greater ease than obtains in the case of an underground-main used for conveying cold water or gas; third, the water-tight box, trench, or pipe is so constructed that a branch of the same can readily be attached at any point where a service-pipe is run out.

The accompanying drawing will clearly explain the manner in which these two classes of mains are to be laid.

In the drawing, A represents a conveying-main laid in a box or pipe, B, (preferably made water-tight,) the main being covered with insulating material O, which may partly or wholly fill the space between the main A and the interior of the box or pipe B. The main A should be supported at suitable intervals on bearings or rollers in any of the well-known ways.

C is a chamber accessible from the street through the man-hole opening D, and in the chamber C is an expansion-joint, R, of any well known form, and a portion, E, of the main A, which is held immovable, or nearly so, by the anchors F, or by any other suitable means. To this portion E is connected a distributing-main, G, provided with a valve, H, so that this main can be shut off to attach a service-pipe, or for any other purpose. This distributing-main is inclosed in a box or pipe, K, (preferably made water-tight,) and is covered with insulating material T, which may fill partly or wholly the space between the distributing-main G and the interior of the inclosing box or pipe K.

At suitable intervals, as at I, the distributing-main has a connection to which a service-pipe can be attached and run into a building or elsewhere by removing a plug, *i*, or its equivalent. In fitting up this distributing-main G the connections for service-pipes are made at short intervals, so that a service-pipe can be run directly into every building along the street or district through which the distributing-main G passes.

The figure shows the attachment of one service-pipe, N, surrounded by a pipe, box, or trench, M, (preferably made water-tight,) and covered with some insulating-material P. It will be seen that the box or pipe K, surrounding the distributing-main G, has connections L, corresponding to the connections I in the distribut-

ing-main G, and the openings in these connections L (which are closed at points where no service-pipes are attached by caps or plugs *b*) are sufficiently large to allow the service-pipes free movement under changes of temperature.

The distributing-main and service-pipes should be supported at suitable intervals; but as this and other similar matters are well known to persons skilled in pipe-fitting, I have not considered it necessary to describe them at length.

Pipes for conveying steam and hot water laid underground have been in use for many years, and the general principles to be observed in laying them are well understood by skillful pipe-fitters. This invention does not relate to such details, but to a combination of conveying and distributing mains and service-pipes laid for the purposes described in any of the modes which experience shows to be suitable.

It is obvious that by using mains laid in the manner which I have described above service-pipes can be run wherever desired with much greater facility and with less expense than has heretofore been possible. It will be seen further that by running off branch distributing-mains according to the method described above a much larger district can be supplied with steam from a given amount of conveying-main than has heretofore been the case. Generally in a district of a city, town, or village consisting of longitudinal streets and lateral streets at right angles to the former, or approximately so, all the buildings in the district can be satisfactorily supplied with steam or hot water from a system of conveying-mains in every longitudinal street in connection with distributing-mains in every lateral street. In certain districts still greater economy of conveying-mains (which are much more expensive than the distributing-mains on account of their greater size, expansion-joints, rigid connections, and man-hole openings) can be secured.

While I have for the sake of simplicity described and illustrated only a single conveying and distributing main, I do not confine myself to this special arrangement, but include in my system of laying mains those arrangements in which more than one main is laid in each box or pipe; and in general I prefer to make each main—both conveying and distributing—double for the conveyance of steam or hot water to the place of use, and for the return of the condensed steam or cooled water to the building in which the generators are located.

Having now described my said invention, what I claim is—

1. A system of mains or pipes for conveying steam or hot water under ground, comprising conveying and distributing mains, the latter connecting at one end with said conveying-mains and having their other end free, so as to be able to expand throughout their entire length, substantially as described.

2. The combination, with the conveying-mains, of distributing-mains having one end free, so that they can freely expand or contract, and service-pipes led off from said distributing-mains only, substantially as described.

3. In a system of underground mains or pipes, the combination, with the conveying-mains, of distributing-mains having one end free and provided at suitable intervals with connections or means for the ready attachment of service or supply pipes, substantially as described.

4. The combination, with the distributing-mains having one of their ends free, as described, and provided at suitable intervals with connections for service or supply pipes, of an inclosing pipe or box having corresponding connections or openings closed where there are no service-pipes attached by suitable caps or plugs, substantially as and for the purpose set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

RICHARD H. BUEL.

Witnesses:
TAL. DREW,
JOHN MCCLURE.