2 Sheets—Sheet 1.

T. MILLER.

Apparatus for Supplying Steam for Heating and Other Purposes.

No. 216,286. Patented June 10, 1879.

Fig. 1.

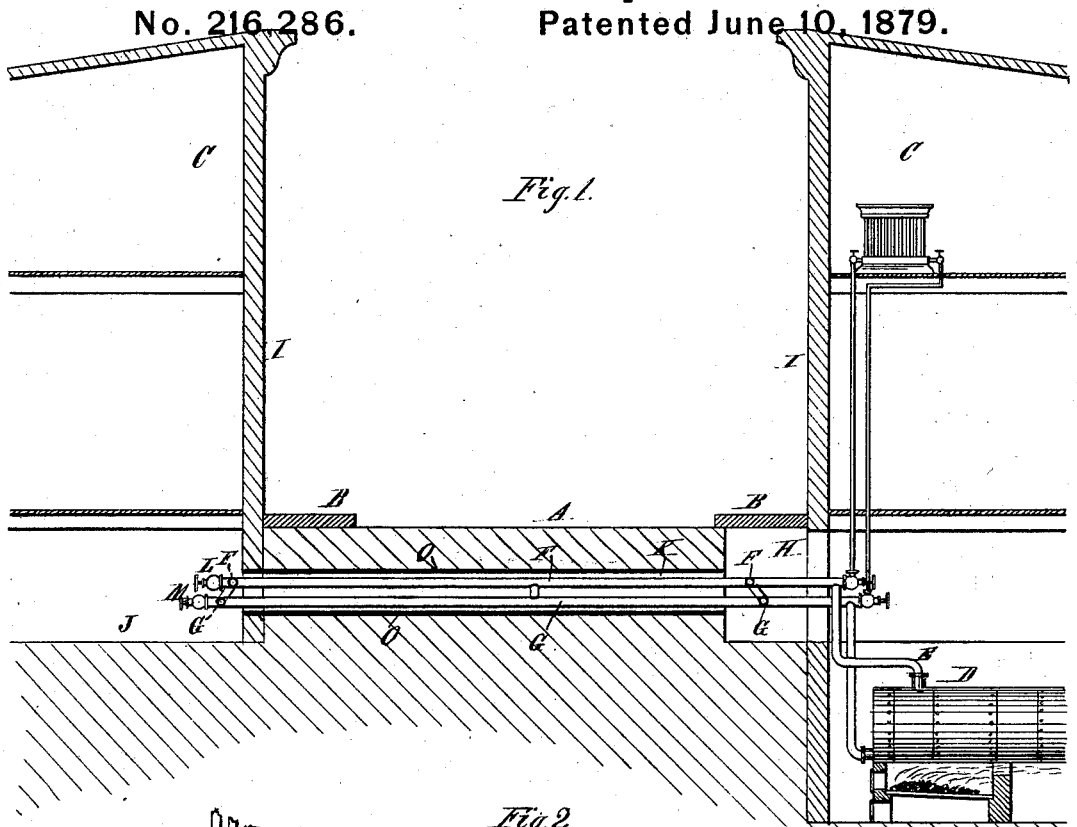

Fig. 2.

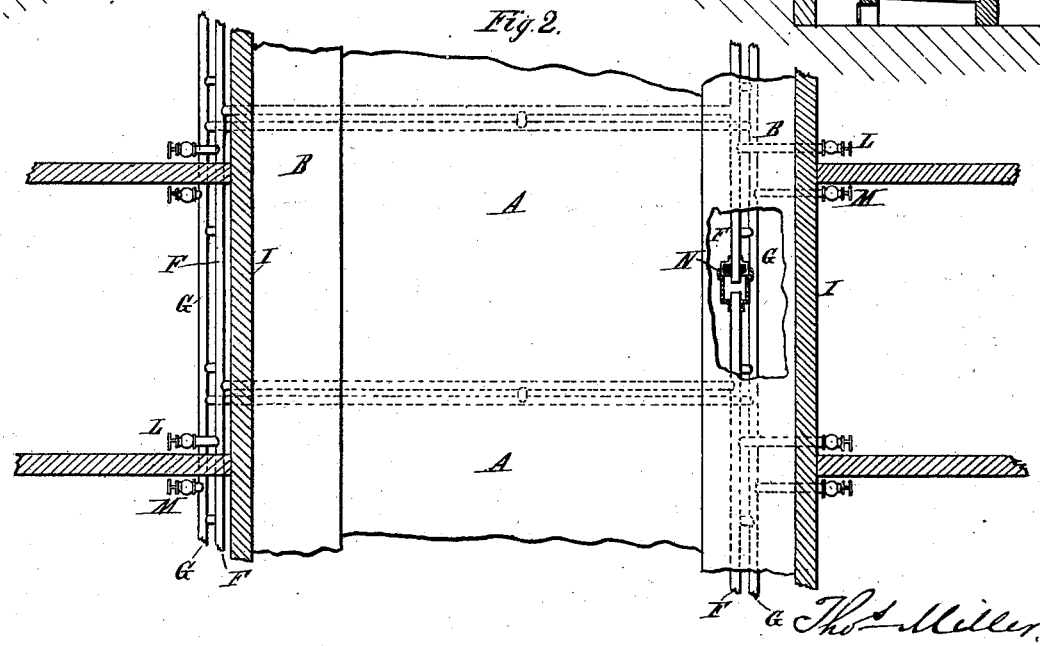

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Fig. 3.

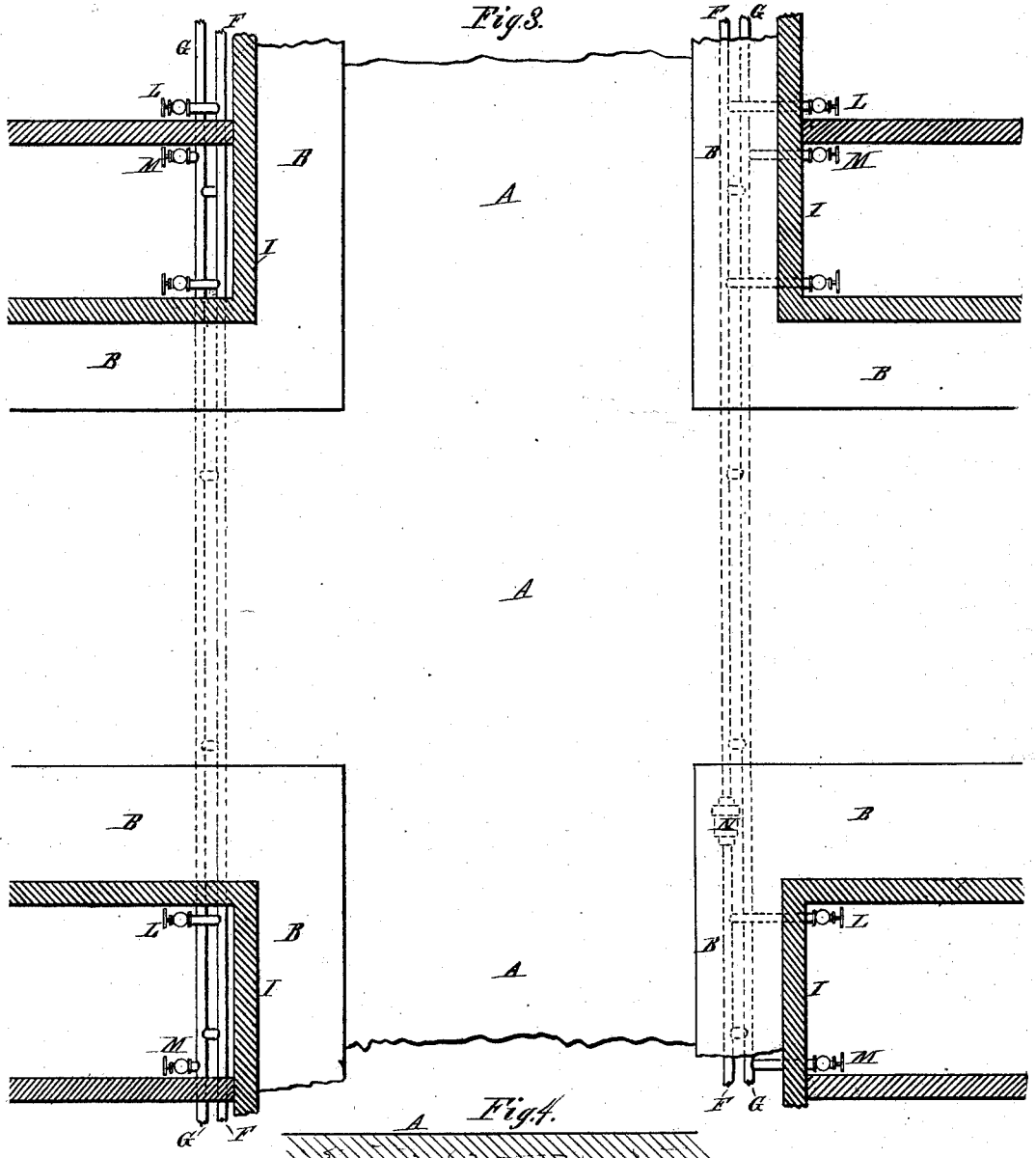
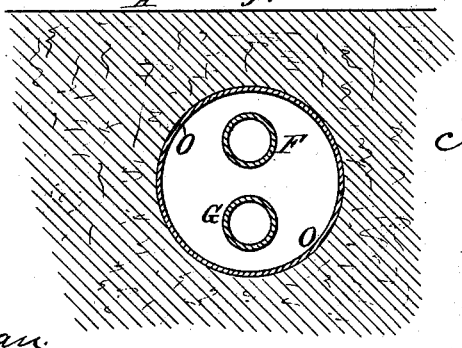


Fig. 4.



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UNITED STATES PATENT OFFICE.

THOMAS MILLER, OF JERSEY CITY, NEW JERSEY.

IMPROVEMENT IN APPARATUS FOR SUPPLYING STEAM FOR HEATING AND OTHER PURPOSES.

Specification forming part of Letters Patent No. **216,286**, dated June 10, 1879; application filed January 23, 1879.

To all whom it may concern:

Be it known that I, THOMAS MILLER, of Jersey City, Hudson county, and State of New Jersey, have invented a new and useful Improvement in Apparatus for Supplying and Distributing Steam for Heating and other Purposes, of which the following is a specification.

This invention relates to apparatus for supplying steam distributed from large generating-stations to different customers throughout a district by means of main and service pipes, through which it is conducted along the way and into the several buildings to the heaters, ranges, and other apparatus in which it is to be used for heating, cooking, power, or other purposes, and also for extinguishing fires.

The invention consists, essentially, of the arrangement of the main and service pipes, hereinafter described, with relation to the houses and streets or roadways, which said arrangement is calculated to greatly lessen both the first cost and the subsequent expense of maintenance as compared with the present arrangement of such apparatus, in which the main pipes for supplying the steam are embedded in the earth beneath the roadway, involving great outlay in the first place, and where access cannot be obtained for alterations or repairs except by first removing the pavement and earth above them, and replacing the same afterward. Moreover, when so covered it is exceedingly difficult to determine the location of a leak, so as to be able to uncover at the right place, and such leaks often exist some time before known, making unnecessary waste and damage, that it is one of the objects of this invention to avoid.

According to this invention the main pipes are located in the excavations of the buildings along the front walls, either inside or outside of the same, preferably the latter, when the earth is excavated beneath the sidewalk, and where they cross streets they are arranged in holes bored through from one cellar or sidewalk vault to another beneath the pavement by well-augers or other suitable devices, without disturbing the roadway or pavement above. Thus the pipes are all arranged where they can be put down and taken up, and where connections can be made with the least cost, and they are at all times subject to observation and inspection, not only in the cellars or excavations of the buildings, but also in the bored holes through the road-beds which they traverse, for the holes therein may be of sufficient size to enable them to be seen clearly when light is thrown in, and to permit them to be readily shoved in when connected in sufficient length to extend from one side of the roadway to the other.

The main pipes will preferably be extended along one side of the street only, and the buildings on the opposite side will be connected by service-pipes traversing the roadway in bored holes the same as the above-described arrangement of the mains under the cross-streets.

Figure 1 is a sectional elevation of buildings and a street, showing the arrangement of pipes in the cellar and sidewalk excavations, and in the bored holes or tunnels traversing the roadways. Fig. 2 is a horizontal section of buildings and plan of a street or roadway, showing the same. Fig. 3 is a horizontal section and plan, showing the continuation of the mains along the street from block to block and across the transverse streets. Fig. 4 is a section of one of the bored holes or tunnels and the pipes.

A represents the roadway, and B the sidewalks, of a street, with buildings, C, to be heated along each side. The boiler D is represented in this case as being located in the sub-cellar of one of the buildings; but it is immaterial where it is placed, except that it be as near as possible to the district to be heated, for economy.

E represents the pipe for supplying the steam from the boiler to the conducting-pipes F, for distribution to the different buildings throughout the district, which pipes, together with the relief-pipes G for the return of the water of condensation to the boilers, I locate and arrange in the vaults H under the sidewalk, outside of the front walls I of the buildings, or in the cellars inside of said walls, according as may be found the most convenient, and as may be arranged with the owners of the premises, from whom the right of so locating and arranging the pipes is to be obtained by purchase or lease. The holes or

tunnels will be curbed with galvanized tubes, O, of thin metal, to protect them from filling up with earth that might be jarred loose by the tramping above, and also to admit of running wires of an annunciator or telegraphic instrument through them for communicating with the engineer from any building or for other purposes. Where these pipes traverse the streets in passing from one block to another they are arranged in holes or tunnels K, bored through the earth below the surface from cellar to cellar without disturbing the surface or interfering with water or gas pipes.

The service-pipes or steam-connections L and reliefs M for the different buildings will be made in the cellars at any suitable place where access can be had, as shown.

The advantages of this plan will be seen at once from the foregoing description to be of considerable importance in comparison with the common arrangement of pipes in steam-heating apparatus. In the first place the cost of digging up the streets and the obstruction to travel will be avoided, for only small holes need to be made through the partition-walls, and through the roadways the necessary holes can be readily bored by means of good-sized well-augers, and the pipes can be shoved through from side to side, being connected in suitable lengths as they are shoved into the holes in cases where a single length is not equal to the breadth of the roadway. In the second place, and of equal importance, is the facility of access at all times to all parts of the pipes for making connections, and for inspection and repairs, without any digging or other disturbance of the streets, curbs, sidewalks, or anything whatever, except the disconnection and removal of some of the pipes. Suitable expansion-joints N will be employed to allow of the expansion and contraction of the pipes.

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

In a steam-distributing apparatus for district service, the pipes for conducting the steam and returning the water located in the cellar or sidewalk excavations of the houses along the streets, and arranged in the relation with said houses and streets, whereby they may cross the streets in holes or tunnels bored or dug from one to another of said excavations under the surface or road-bed, and without digging or cutting the same, said cross-tunnels being larger than the pipes to permit observation and escape of leakage, also removal and replacing of the pipes in repairs.

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