

F. GRINNELL.
HYDRAULIC GAS-MAIN.

No. 175,832.

Patented April 11, 1876.

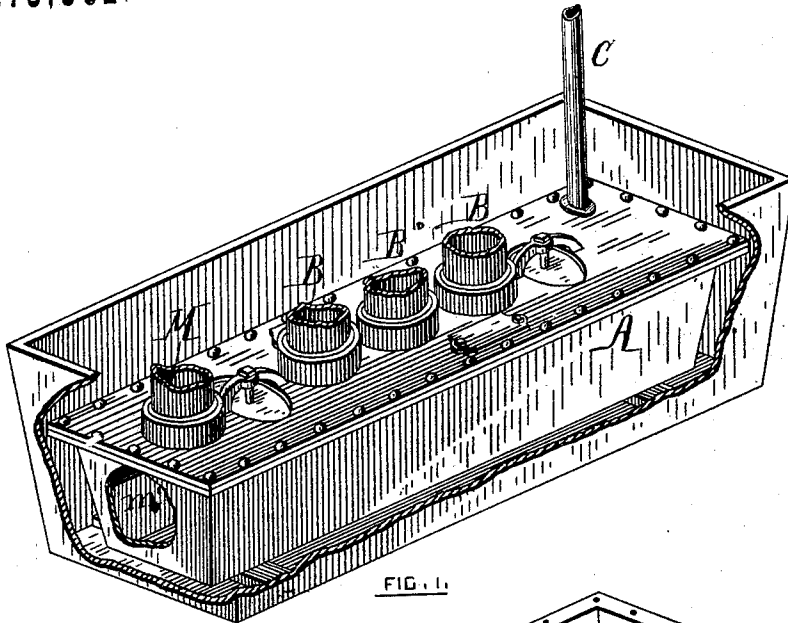


FIG. 1.

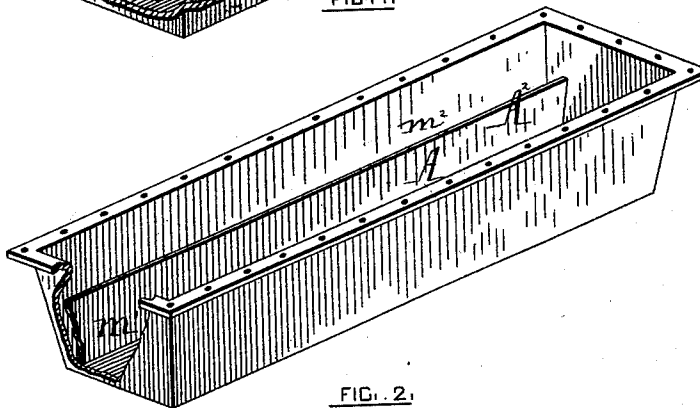


FIG. 2.

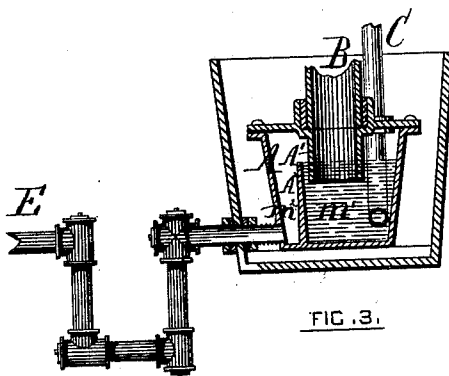


FIG. 3.

WITNESSES.

Abner L. Carter
Chas. C. Stetson

INVENTOR.

Frederick Grinnell
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UNITED STATES PATENT OFFICE.

FREDERICK GRINNELL, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO
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IMPROVEMENT IN HYDRAULIC GAS-MAINS.

Specification forming part of Letters Patent No. **175,832**, dated April 11, 1876; application filed
March 1, 1876.

To all whom it may concern:

Be it known that I, FREDERICK GRINNELL, of the city of Providence, in the State of Rhode Island, have invented certain new and useful Improvements relating to Gas Manufacturing Apparatus, of which the following is a specification:

The invention is intended to apply mainly or entirely to the manufacture of gas from petroleum.

I have modified the construction of that part of gas apparatus which is ordinarily termed the hydraulic main, and have provided the same with a liberal current of water. In the ordinary hydraulic main the water is gradually replaced by tarry liquids, and the fluid in the hydraulic main becomes practically tar. For the ordinary uses of the hydraulic main, simply to form a stop to prevent the return of the gas when the retorts are open, such change of the fluid to tar is not objectionable. But in my apparatus I seek to accomplish, in addition to that end, another important end, which is a practical washing of the gas, sufficient, without further washing, to avoid all risk of smoking. This can only be attained by contact with water. I find it practicable to effect a sufficient washing by means of my hydraulic main, and of the water flowing through the same, so that any further washing may be dispensed with, and to maintain in connection therewith a practically uniform depth of seal, no matter how greatly the supply of water may be accidentally or intentionally varied.

The following is a description of what I consider the best means of carrying out the invention. The accompanying drawings form a part of this specification.

Figure 1 is a perspective view of the entire gas-washing apparatus. Fig. 2 is a perspective view of the main vessel or hydraulic main with the cover removed. Fig. 3 is a cross-section through the apparatus.

Similar letters of reference indicate like parts in all the figures.

A is a chest of iron, corresponding to the ordinary hydraulic main, and which will be hereafter so designated. B B are the standing pipes, which deliver gas from the retorts, not repre-

sented, through the short nozzles or dip-pipes A¹, which are cast in one with the cover of the chest A, or are otherwise tightly connected thereto. A² is a partition, forming an internal compartment, *m*¹, in the chest or main A. It may, if preferred, extend not only along the length, but also across within the chest A, forming in effect an internal box or vessel sufficiently capacious, but not filling the whole area of the base of the chest A. C is a supply-pipe, bringing water from a reservoir at a higher level, not represented. The water entering through the pipe C in a constant stream, flows strongly along near the bottom, and, while agitating the tar at the bottom, adds continually to the water in the compartment *m*¹, and, causing the tarry matters to rise to the top, removes them promptly by causing such matters, with the water, to flow constantly over the edge of the partition A², and fall to the bottom of the other compartment *m*². A liberal discharge-pipe, E, formed with a deep trap, is connected to the compartment *m*² at or near its base. The gas may be taken from the top of the chest or main A in the ordinary manner, represented by the pipe M. The inflowing water keeps the level in the compartment *m*¹ always a little above the top edge of the partition A², and the water-level in the compartment *m*¹ is, by reason of the long line of overflow, practically uniform, however the admission of the water is varied. The construction allows the employment of a discharge-siphon sufficiently large to carry away a large and widely varying quantity of water. The water in the compartment *m*¹ forms a seal on the pipes B in the same manner as the tar in an ordinary hydraulic main seals the corresponding pipes. But the construction insures uniformity of depth of seal, because any surplus water flows off instantly, and the provision for receiving an active current of water and for removing it perfectly, however variable may be the quantity, insures that it shall be water, and not tar, to which the gas is presented in bubbling up from the open lower ends of the dip-pipes. If the large siphon-pipe E were alone relied upon to effect the discharge, and if, as is usual, the inflow is liable to vary in such

case, the water-level, and consequently the depth of seal, would vary widely. The wide overfall or long line of discharge avoids this evil.

Many modifications may be made in the details without departing from the principle of the invention. I can make the compartment m^1 stand practically in the middle of the chest, with an overflow on all sides, thus presenting a still longer line of overflow. Or I can, if desired, in any case make the compartment m^2 , instead of m^1 , in the form of such an isolated box with the water descending into it on all sides.

The contents of the main being water, constantly renewed, the bubbling up of the gas around the lower ends of the nozzles A^1 will present it to the water sufficiently to effect the washing necessary. Such bubbling also aids to agitate and maintain a raw surface of water over the whole top of the compartment m^1 , which will be further effective. The fall-

ing of the water in a thin sheet or stratum on the perpendicular surface of the partition A^2 also presents the water to the gas in an agitated condition.

I claim as my invention—

The hydraulic main and gas-washer described, having, in combination with the main A, gas-passages B M, and water-passages C and E, the partition A^2 , forming a water-compartment, m^1 , of less height than the main, and presenting relatively-clear water in an actively-agitated condition to the dip-pipes, with a uniform depth of seal, as herein specified.

In testimony whereof I have hereunto set my hand this 28th day of February, 1876, in the presence of two subscribing witnesses.

FREDERICK GRINNELL.

Witnesses:

PHILLIPS ABBOTT,
C. C. STETSON.