(No Model.) 2 Sheets—Sheet 1.

W. S. MEAD.

WATER AND OIL GAS BURNER.

No. 345,712. Patented July 20, 1886.

Fig. 1.

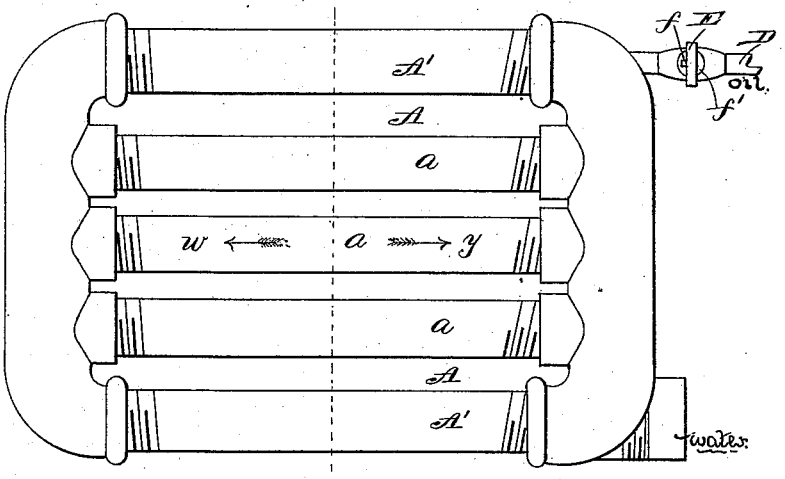


Fig. 2.

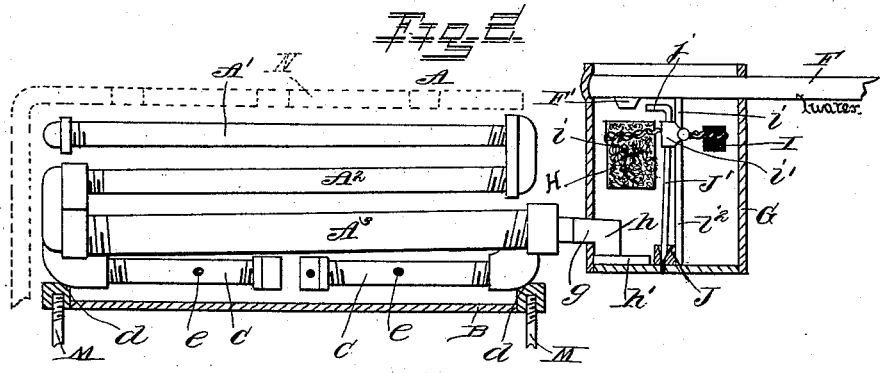
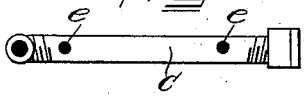


Fig. 3.



WITNESSES.

Howard P. Schmidt

Thos. W. McGill.

INVENTOR.

William S. Mead

By Myers & Co

ATTORNEYS.

(No Model.) 2 Sheets—Sheet 2.

W. S. MEAD.

WATER AND OIL GAS BURNER.

No. 345,712. Patented July 20, 1886.

Fig. 6.

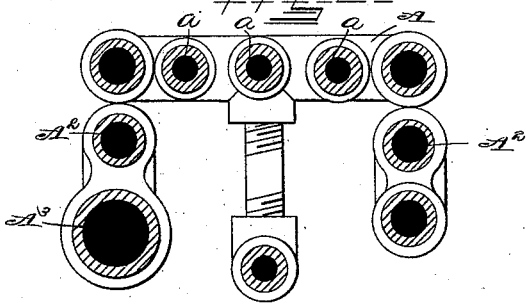


Fig. 9.

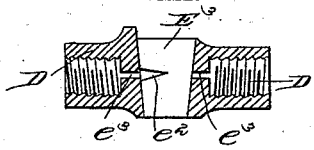


Fig. 5.

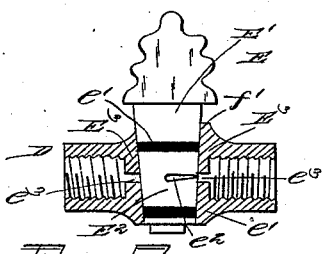
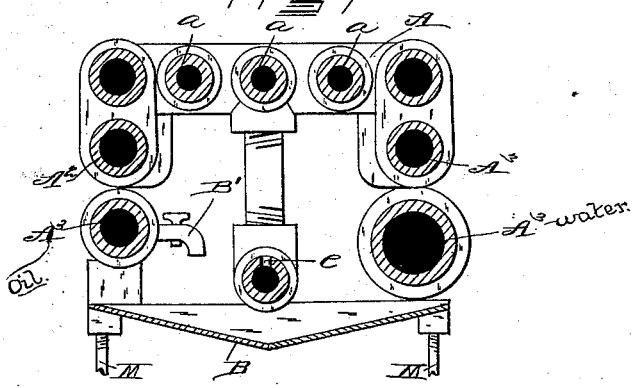


Fig. 7.



WITNESSES.

Howard P. Schmidt.

J. Nota McGill.

INVENTOR

William S. Mead

By Myers & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

WILLIAM S. MEAD, OF PHILADELPHIA, PENNSYLVANIA.

WATER AND OIL GAS BURNER.

SPECIFICATION forming part of Letters Patent No. 345,712, dated July 20, 1886.

Application filed September 2, 1885. Serial No. 175,959. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. MEAD, a citizen of the United States of America, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Water and Oil Gas Burners, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has relation to improvements in apparatus for the manufacture of water-gas or vapor-fuel, the same being adapted for directing or presenting the action of the flame against the low-down pipe-coils of the water and oil reservoir or receptacle or against those high up; to automatically cut off and supply the water; to readily permit of the emptying of the water-tank, as would be desirable in freezing weather, to prevent the freezing of the water therein; to regulate the feeding of the oil, as well as to enable the entire cutting off of the flow, and to prevent the overflowing of the water-tank; and the invention consists of combinations of parts, including their construction, substantially as hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of my improved apparatus for the manufacture of water-gas. Fig. 2 is a sectional elevation of the same, including the automatic water-supply tank, the same also being taken in section. Figs. 3 and 4 are also sectional views of the oil-feeding cock in its entirety, and a detail thereof, respectively. Fig. 5 is a detached side view of a flame-jet pipe; and Figs. 6 and 7 are cross-sectional views of my invention, looking, respectively, in the directions indicated by the arrows *w* and *y*, Fig. 1.

In the organization of my invention I construct the reservoir or receptacle of a frame-like hollow or pipe casting, A, having a number of intermediate longitudinal pipes, *a*, connecting with its ends. The pipes A′ of the frame-like pipes A are connected at one end to a U-shaped bend or arm, to which is also connected a pipe, A^2, which in turn is connected to a bend or elbow, to which is secured the lower pipe, A^3, on each side, the whole forming a zigzag or tortuously-arranged case of pipes to contain, and into which is fed on one side, the oil, as further on explained, while at the other side said pipe-castings are designed to contain, and which are supplied with, water, as also hereinafter described. The lower pipe, A^3, on the side in which the water is fed, as hereinafter explained, is constructed very much larger in diameter than those located above, in order to present a greater surface for generating steam, which prevents puffing and blowing out of the flame. The reservoir or receptacle is supported in a pan, B, of an approximately V shape in cross-section, which shape or construction, however, has no significance as relates to any function that may be derived therefrom, the same being merely adopted for greater convenience in casting the same. In order to retain the reservoir or receptacle steady in said pan, it (the latter) is provided with recesses *d* near each corner, in its rear wall or side, and in the center of the lateral ends, where the perforated pipe is held in its proper place, said recesses preferably projecting or being offset from the same, as shown in Fig. 2. It will be observed that in order to properly support the reservoir or receptacle the pan B is made much higher on one side than on the other, the same being occasioned by the difference in diameter of the two lower pipes A^3. This pan is designed to receive or contain in the start a quantity of oil for combustion, to augment or intensify the heating capacity of the apparatus, the primary source of heat being hereinafter described. To the inner side of the lower pipe, A^3, of the side in which the oil is fed is connected a small cock or faucet, B′, as seen in Fig. 7, the object of which is at the start to supply the pan B with the necessary amount of oil, as above described. The pan is supported upon four threaded rods or feet, M, which are respectively inserted in a coincident threaded orifice provided in each corner of the pan, through which said rods or feet project, which enables the altitude or elevation of the pan to be suitably adjusted in leveling the pan and burner.

C C are the flame or jet pipes, with their longer horizontal sections screwed into their elbows or upturned ends, which are screwed one into the rear part of the frame-like casting A of the reservoir or receptacle, and the other into the forward part thereof, about at

the center, the free ends of said pipes extending inwardly toward each other and capped. These pipes are provided with perforations or jet-apertures *c c* about equidistantly of their ends, through which perforations or apertures the gas is jetted and ignited to generate the flame, which can be directed or presented against either the low-down pipes or those higher up of the reservoir or receptacle by simply turning axially the said horizontal or longer sections in the elbows. This, of course, enables the more thorough application of the heat or flame to any part of the reservoir or receptacle, whereby the generation of the gas is facilitated.

The pipes C may be manipulated or turned axially in any convenient way—as, for instance, by the application of pressure by a suitable implement to the capped ends of said pipes.

The oil feeding or supply pipe D is provided with a cock, E, which is secured so as to turn therein in the usual way, as shown. This cock consists, in detail, of a plug or key, E′, with its slightly-tapered cylindric body E^2 fitted and packed oil-tight in a corresponding transverse tubular seat or socket, E^3, in the pipe D.

In the body E^2 of the plug E′, in its circumference, are provided recesses *e′*, to receive and hold packing, which may be treated in any suitable manner to retain it in place; also, in the circumference of the body E^2 of the plug is a by-pass passage, e^2, which tapers from its enlarged end both in depth and width until its reduced opposite end terminates flush with the circumference, said passage extending about two-thirds way around the plug.

In the seat or socket E^3 are opposite apertures e^3, which are arranged in alignment and in communication with the bore of the pipe D, and with which the by-pass passage e^2 is adapted to register.

When the key or plug E′, which is provided with a pin, *f*, which is adapted to strike against a projection or shoulder, *f′*, of the pipe D, is turned in one direction, so that said pin shall come into contact with said projection or shoulder, the cock will be turned full-way, permitting a full flow of the oil. By reversing the movement of the plug the flow can be gradually reduced until wholly cut off, which latter is effected when the movement of the plug or key is arrested by the pin striking against the opposite side of the shoulder or projection, whereby the feeding of the oil can be regulated as may be desired.

F is the water-supply pipe, which passes through one side into the upper open end of a water-tank, G, its inner end resting and secured (it may be by soldering) in a recess or depression in that side of the tank through which the pipe entered it, as clearly shown in Fig. 2. From the lower side of inner or tank end of the pipe F depends a short discharge pipe or spout, F′, having a central discharge outlet or aperture. The tank G is connected by a jointed or sectional pipe, *g*, with the receptacle A at the water-receiving side, the end of said pipe connecting with the tank having a pendent support, *h*, which in turn has a plate or base, *h′*, fixed or formed upon its lower end, resting upon the bottom of the tank and against the side of the tank, thus securing the pipe *g* as against movement from any cause.

H is a float, which is made of wood or cork, or other suitable light material, and is disposed in the tank G, the same being secured, it may be, to a stout wire, *i*, looped around said float and passed through a block or fixture, *i′*, fastened to an upright, i^2, secured in the tank. This wire is also looped around or passed through a cross pin or pivot in said block or fixture, (thus converting it into a lever,) and thence extended a short distance upon the opposite or rear side of said block, and again looped, this time around and secured to a counter-balance or weight, I. It will be seen that when the water in the tank has risen to a sufficient height, by the buoyancy of which the float shall be lifted into contact with the pendent spout or pipe F′, the water-supply will be automatically cut off, and the tank be thus prevented from overflowing, while when the water has fallen sufficiently low to allow the float to move away from said spout the tank will be again automatically supplied with water, which action of the float is maintained throughout the operations of the apparatus.

J is a tapering or conical valve seated in a corresponding socket or seat in the bottom of the tank, and having a stem or rod, J′, extending up through the block *i′*, the same being twisted or formed with a spiral thread, which passes through a corresponding aperture in said block, to retain it in place as against the valve being lifted from its seat by the action or buoyancy of the water. The upper end of the valve stem or rod is bent into a handle, *j*, as shown, for its convenient manipulation or the turning of the same in lifting the valve from its seat, as would be desired in emptying the tank in freezing weather, to prevent the freezing of the water therein.

The fender N, which consists of a piece of cast metal perforated over its upper surface, in order to admit exit of the flame, is first secured at the lower part of the apparatus, on the side near the oil-pipes, and thence carried up and passed over the top of the burner. Thus arranged, it covers the entire surface of the upper part of the apparatus.

In operation the lower enlarged pipe, A^3, on the side, for the reception of the water, is supplied with a sufficient quantity thereof, and, the faucet regulating the flow of oil having been opened, the oil is allowed to flow out through the cock or faucet B′, secured to the lower oil-pipe, and thus supply the pan with a sufficient amount of oil for ignition, and when the desired amount has been sup-

plied to the pan the flow is stopped, and the pipe on that side of the reservoir or receptacle is then supplied with the oil. During the latter operation the flame proceeding from the ignited oil in the pan is producing steam in the pipes on the side in which the water is fed, and comes in contact with the horizontal tubes above, which are thus rendered red-hot, and the vapor that rises from the warmed side tubes or pipes ascends to the red-hot tubes or pipes above, and thus becomes a fixed gas, and then, in descending, flows out of the apertures of the pipes suspended above the trough.

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

1. An apparatus for the manufacture of water-gas, consisting of a series of pipes tortuously arranged, the lower pipe for reception of the water being larger in diameter than the pipe for the reception of oil, and two apertured or perforated flame-pipes screwed so as to be axially turned into pendent elbows connected about centrally to each end pipe of the reservoir or receptacle, said apertured or perforated flame-pipes being located in a pan V shape in cross-section, said pan supporting the reservoir or receptacle, substantially as shown and described.

2. In an apparatus for the manufacture of water-gas, the combination, with the series of pipes tortuously arranged, the lower pipe for reception of the water being larger in diameter than the pipe for the reception of oil, of the float disposed in the tank secured to a block or fixture fastened to an upright secured in the tank, and the counter-balance or weight connected thereto, the valve seated in the bottom of the tank, and having a handle, the stem or rod of said valve having a spiral thread which passes through a corresponding aperture in the said block or fixture, and the tank supply-pipe having a pendent spout at or near its inner end, substantially as shown and described.

3. In an apparatus for the manufacture of water-gas, the pan V shape in cross-section, supporting at each corner the reservoir or receptacle, and having the apertured or perforated flame-pipes located in the center thereof, said pan being designed also for reception of a sufficient quantity of oil, substantially as shown, and for the purpose specified.

4. In an apparatus for the manufacture of water-gas, the combination, with the pan V shape in cross-section, of the lower pipe for reception of the water, constructed larger in diameter than the other pipes, and the lower pipe for reception of the oil having a cock or faucet, substantially as shown, and for the purpose specified.

5. In an apparatus for the manufacture of water-gas, the pipe-connection between the reservoir or receptacle and the water-supply tank provided with a depending arm within the tank, said arm having a flat piece affixed to its lower end and resting upon the bottom of the tank, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM S. MEAD.

Witnesses:
J. NOTA MCGILL,
HOWARD J. SCHNEIDER.