No. 885,972. PATENTED APR. 28, 1908.

G. S. BENNETT.

STEAM BLAST GAS BURNER.

APPLICATION FILED MAR. 13, 1907.

2 SHEETS—SHEET 1.

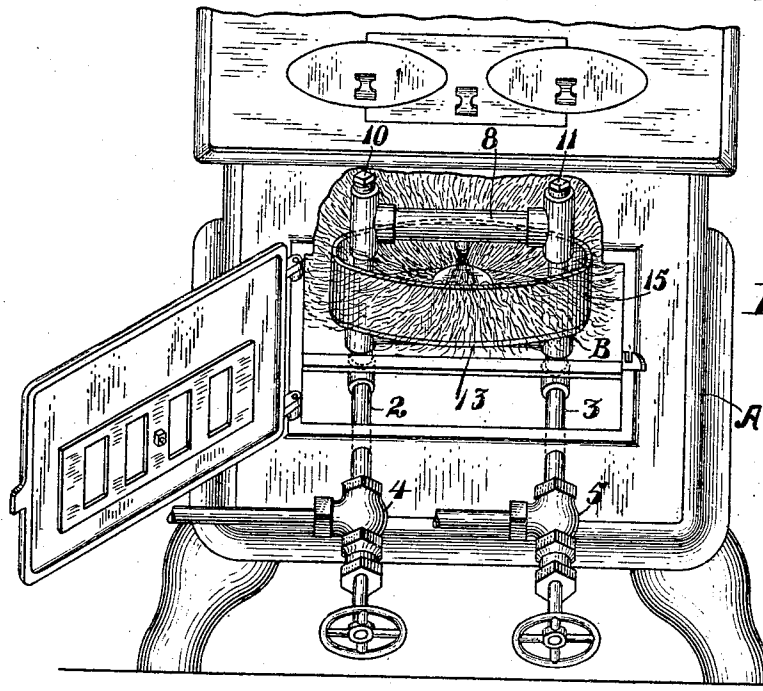


Fig. 1.

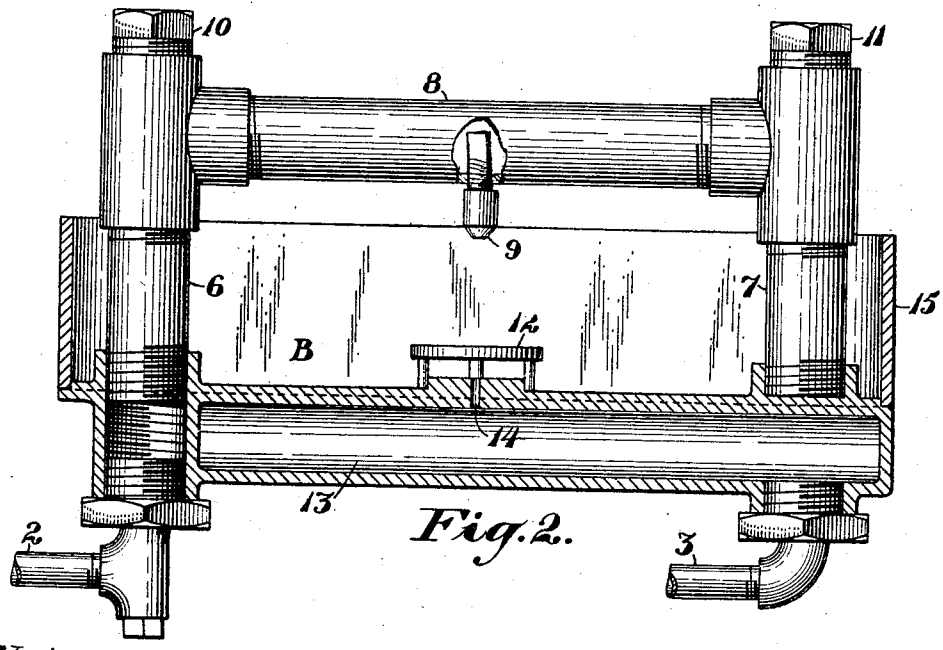


Fig. 2.

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2 SHEETS—SHEET 2.

Fig. 3.

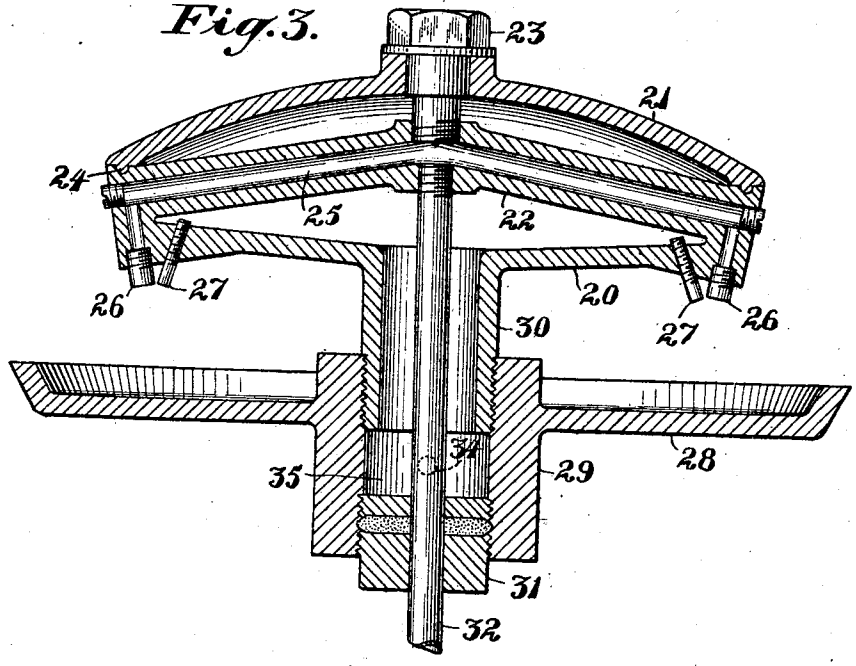
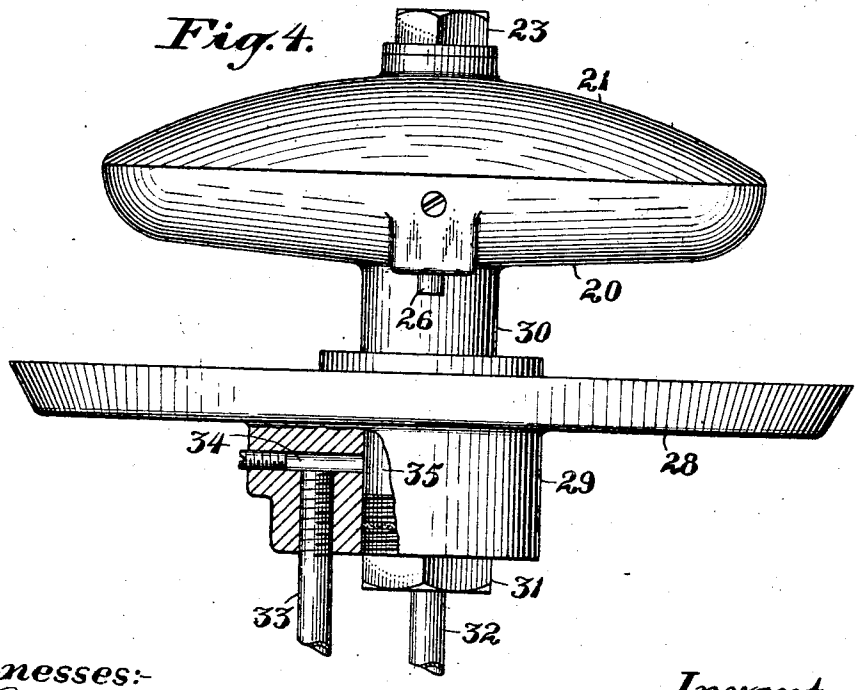


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE S. BENNETT, OF SAN FRANCISCO, CALIFORNIA.

STEAM-BLAST GAS-BURNER.

No. 885,972. Specification of Letters Patent. Patented April 28, 1908.

Application filed March 13, 1907. Serial No. 362,227.

To all whom it may concern:

Be it known that I, GEORGE S. BENNETT, a citizen of the United States, residing in the city and county of San Francisco, State of California, have made certain new and useful Improvements in Steam-Blast Gas-Burners, of which the following is a specification in such full and clear terms as will enable those skilled in the art to which it appertains to construct and use the same.

This invention relates to steam-blast gas-burners used in the ordinary cooking, or other stoves, for replacing wood or coal as fuel.

One of the objects of the invention is to make a burner that will spread the gas flame out in such a manner as to nearly fill the fire box of the ordinary stove, without the consumption of an excessive quantity of gas.

A further object of the invention is to heat the gas before it has escaped from the jet in order to decrease the quantity used, the expanded gas passing the opening under the same pressure at a slower rate than the cold gas.

A further object of the invention is to produce a burner that will supply to the gas flame the proper amount of air to completely burn the gas with a colorless flame, or at least with as clear a flame as it is possible to make.

A further object of the invention is to make a burner that will supply to the steam jet its own steam, the heat from the blaze acting on the iron of which the burner is made to keep the required amount of steam in the pipes at all times.

A further object of the invention is to produce a burner that will have means to cause the flame to be directed upwardly toward the top of the stove.

Other objects of the invention will appear as the description proceeds.

In the drawings, Figure 1 is an end view of a common stove in perspective, the end door being open to show the burner in place. Fig. 2 is a partial section through the base of the burner in a plane parallel to the plane of Fig. 1. Fig. 3 is a vertical section through a modified form of the burner, and Fig. 4 is an elevation of the same looking from the left in Fig. 3.

Like numerals and letters of reference are applied to like parts throughout.

The stove is lettered A and the burner is indicated at B. The burner proper is built around the elliptical base 13 into the bottom of which the pipes 2 and 3 are threaded. The pipe 2 is connected into a T and with any water supply pipe which is under a good pressure such as any city main carries. The pipe 3 is the gas pipe and is connected with any suitable gas main. Each of the above pipes have a valve to cut off the supply of water and gas respectively, said valves being numbered 4 and 5.

The base plate has a cored out portion as shown in Fig. 2 with which the gas pipe connects, and an opening at one end into which the pipe 6 is threaded. This pipe 6 is a short pipe commonly called a "nipple" and it carries at the top a T. This T is provided with a closing plug 10 and into the T is also screwed the pipe 8, and in order to give the pipes some further rigidity a second T is placed on the end of the pipe 8, and a plug 7 is screwed into the second T and also into the base plate 13, enough threads being run on both ends of the plug to turn back and secure the plug in the base plate. This second T is also provided with a plug numbered 11.

In the base plate 13 there is an opening 14 into the gas chamber leading from the pipe 3, and over this opening is placed the baffle plate 12 which stands on short legs. The gas opening is placed directly under the steam jet 9 in the bottom of the pipe 8, and when the steam jet is blowing the current of steam carries air along with it and causes the gas to burn with a flame that is almost colorless, but if no further precautions are taken the flame spreads out badly and to counteract this tendency the ring 15 is provided. This ring is seated on the plate 13 and causes the flame to be directed upwardly toward the top of the stove.

The preferred form of the invention has been shown in the above described figures, but I am aware that modifications of the invention may be made without departing from the scope of the same and one such modification is shown in the figures numered 3 and 4. This form of the invention is more complicated and difficult to cast than the above described form, but the principle is precisely the same in each case.

In the modified form of the invention the base plate of the burner, numbered 28, is provided with pan like sides to direct the flame upwardly, but it is better to make this ring 15 separate as shown in Fig. 1, and in the center of the pan in a boss 29 which has

an opening 35 entirely through it. In the opening 35, at the top thereof is screwed the boss 30 of the steam dome 20, and into the bottom of the opening 35 is screwed the packing 31 around the pipe 32 which latter passes entirely through the pan and up into the steam dome 20 connecting with the gas leader 22 in which the hole 25 has been bored, the ends of said hole being plugged up. Leading from each end of the hole 25 is a passage pointing downwardly in which the tips 26 are screwed. Near the tips 26 and at an angle therewith such as to make the steam discharge across the gas jet are placed the steam jets 27, which lead into the steam dome.

In order to close the steam dome the top 21 is provided, said top being held in place by means of the screw 23 which is threaded into the gas leader 22 said leader being a part of the main casting of the steam dome. The tongue 24 is provided to make a steam tight joint.

It will be noted that each of the burners above described operate on the principle of providing steam to blow the burning gas, and on the principle of heating the gas prior to its use, the gas being heated from the time it passes into the opening 35 until it escapes at the nozzles 26. The water is led into the dome through the pipe 33 which is tapped into the hole 34 in the boss 29.

The method of operation in both cases is the same and is as follows: The gas is turned on and the heat from the smutty flame is great enough to start the steam to rising from the small quantity of water, which is also turned on. As the heat becomes greater the steam continues to rise and blows off through the nozzles, or nozzle, as the case may be. The blowing of the steam is sufficient very shortly to effect a better burning of the gas flame which causes more steam to generate, and in a very short time the blaze is going full force, and it will continue to burn without soot so long as the supply of water is maintained. There is no danger of explosion of the water chamber for the reason that as the pressure increases the steam blows off the faster, the steam tip always being open. It will also be noted in each case that the steam jet extends above the metal of the steam chamber in order to insure against the collection of scale in any way interfering with the operation of the steam tip.

It will be noted that the water supply pipe 6 may be cleaned very easily because the plug 10 is over a T in the base plate in which there is another plug which may be taken out and in that way leave a clear opening to push a rod through, the entire burner not having to be disconnected.

Having thus described my invention in such full and clear terms as will enable those skilled in the art to construct and use the same what I claim and desire to secure by Letters Patent of the United States is as follows:

1. In a steam blast gas burner, the combination of a base plate having a passage for gas and a vertical passage for water therethrough, a steam generator above the base and connected with the water passage therethrough, a downwardly projecting nozzle carried by the steam generator discharging toward the end of the gas passage in the base plate, and gas and water pipes connected with the base plate below the same.

2. In a steam blast gas burner, the combination of a base plate having a passage for gas and a vertical passage for water therethrough, a steam generator threaded into the water passage in the base plate and carried thereby, a downwardly projecting nozzle carried by the steam generator and discharging toward the end of the gas passage in the base plate, and gas and water supply pipes connected to the base plate below the same.

3. In a steam blast gas burner, the combination of a base plate having a passage for gas and a vertical passage for water therethrough, a steam generator carried by the base plate and connected with the water passage therein, a nozzle connected with the steam generator and discharging toward the end of the gas passage in the base plate, an upwardly projecting ring carried by the base plate, and a gas and a water supply pipe connected with the base plate below the same.

4. In a steam blast gas burner, the combination of a base plate having a passage for gas and a vertical passage for water therethrough, a steam generator carried by the base plate and connected with the water passage in the same, a nozzle extending into and through the bottom of the steam generator and discharging toward the end of the gas passage in the base plate, an upwardly projecting ring carried by the base plate, and a gas and a water supply pipe connected to the bottom of the base plate.

5. In a steam blast gas burner, the combination of a base plate having gas and water passages therein and supply pipes connected therewith below the same, a steam generator above the base plate and connected with the water supply, means to direct a jet of steam toward the base plate and the gas escaping therefrom said means extending into and through the bottom of the steam generator, and a gas and a water supply valve in the supply pipes.

6. In a steam blast gas burner, the combination of a base plate having gas and water supply pipes connected therewith, a short vertical nipple screwed into the plate, a horizontal pipe screwed into a T carried by the nipple, and a steam nozzle carried by the

horizontal pipe and adapted to blast steam toward the base plate and toward a jet of gas from an opening in the top of said base plate, substantially as described.

7. In a steam blast gas burner, the combination of a base plate having gas and water supply pipes connected therewith, means to generate steam connected to the top of the plate and extending above the same, means to direct a blast of steam from the steam generator downwardly toward the base plate and toward a burning jet of gas from the gas supply, said means consisting of a nozzle which extends into and above the bottom of the steam generator, and a loose ring carried by the base plate and extending upwardly therefrom and adapted to direct the flame from the burner upwardly, substantially as described.

8. In a gas burner, the combination of gas and water supply pipes, a base plate to which said pipes are connected said plate having a vertical water passage and a gas passage extending from a point near one end to a point in proximity to the water pipe connected to the base and to which the gas supply pipe communicates, means to generate steam connected with the water supply, and means to direct steam from the generator toward the base plate and toward a jet of burning gas from the gas supply, substantially as described.

9. In a steam blast gas burner, the combination of a base plate having a passage for gas and a vertical passage for water therein, gas and water supply pipes connected therewith, said base being elliptical in shape in plan, means to generate steam connected with the water supply, means to direct a steam jet toward the base plate and toward a jet of burning gas from the gas supply, and a baffle plate placed over the opening in the base plate to the gas supply to assist in spreading the flame from the gas jet, substantially as described.

10. In a steam blast gas burner, the combination of a base plate, having water and gas supply pipes connected therewith, said base being elliptical in plan, means to generate steam connected with the water supply, means to direct a steam jet from the steam generator toward the base plate and toward a jet of burning gas from the gas supply, said means extending through and above the bottom of the steam generator whereby scale will be prevented from interfering with the action of the steam jet, and an elliptical ring carried by the base plate and extending upwardly from the same, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of the two subscribing witnesses this 7th day of March A. D. 1907, in the city and county of San Francisco, State of California.

GEORGE S. BENNETT.

Witnesses:
CARLOS P. GRIFFIN,
J. H. WARE.