No. 640,052. Patented Dec. 26, 1899.

# F. WALLACE.

## PORTABLE GLORY HOLE FURNACE.

(No Model.)

(Application filed Mar. 27, 1899.)

Fig. 1.

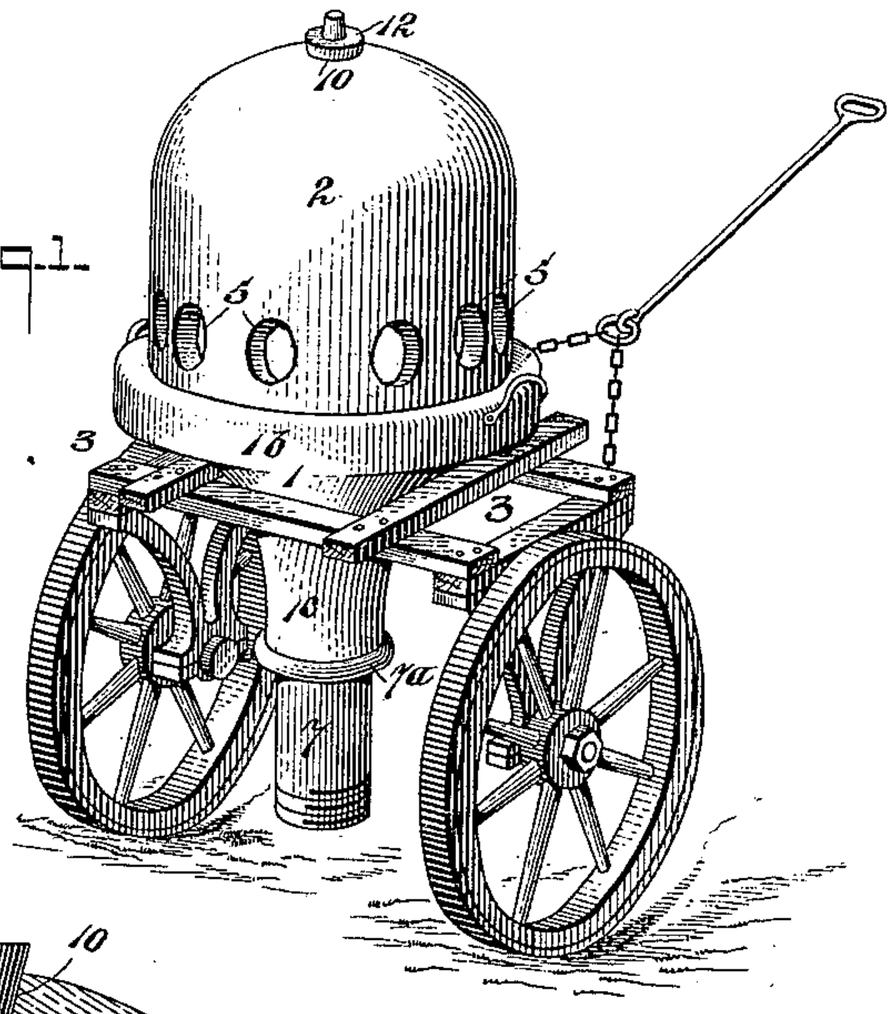



Fig. 2.

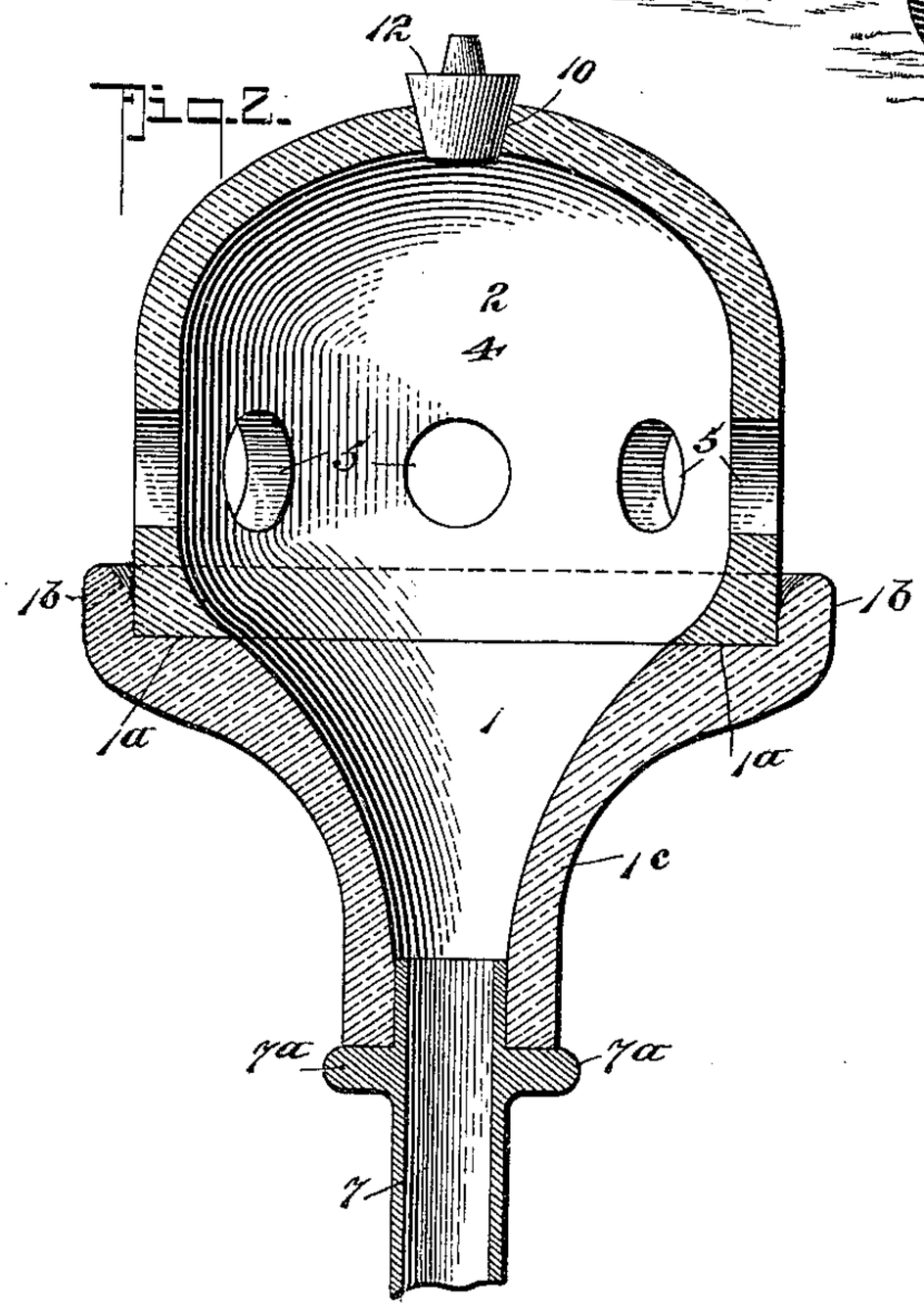
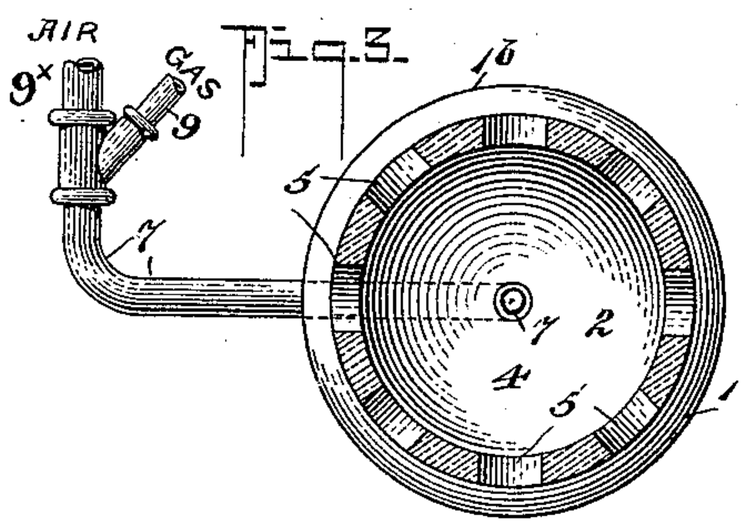



Fig. 3.

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# UNITED STATES PATENT OFFICE.

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## PORTABLE GLORY-HOLE FURNACE.

SPECIFICATION forming part of Letters Patent No. 640,052, dated December 26, 1899.

Application filed March 27, 1899. Serial No. 710,706. (No model.)

*To all whom it may concern:*

Be it known that I, FRANKLIN WALLACE, residing at Martin's Ferry, in the county of Belmont and State of Ohio, have invented a new and Improved Portable Glory-Hole Furnace, of which the following is a specification.

This invention relates to that class of furnaces for glass-finishing commonly called "glory-hole" furnaces, and primarily it seeks to provide a portable furnace of this class, of a very simple and inexpensive character, which can be easily manipulated and which will effectively serve for its intended purposes.

In the use of the common form of glory-hole furnaces the results have not been all that is desired in finishing of glassware for the reason that the smoke is not always entirely consumed and the unburned smoke or products of combustion pass out through the glory-holes and up through the hood or collecting-top into the take-off stack. This waste of combustion product is expensive, and besides materially keeps the flame below the desired heating degree. Furthermore, the construction of the ordinary glory-hole furnaces is such as to make it costly, as well as bulky, it being of a permanent nature, and in consequence makes it necessary that the workmen carry the glassware to be finished to the furnace, which frequently causes a great deal of waste of time. Another and serious objection to the ordinary use of glory-hole furnaces, particularly where natural gas is used as the fuel, is that on account of the non-complete combustion of the air and gas it is impossible to burn gold or other decorative liquid on the glassware on account of "sulfuring," which discolors glass.

My invention comprehends, first, a novel form of glory-hole furnace that can be compactly constructed, which need not weigh over one hundred pounds, and is of a portable nature, whereby it can be readily conveyed to the glass-finisher's bench or table or at such other point where the workman can operate the most conveniently and expeditiously.

Another and essential feature of my invention is to provide a simple arrangement of glory-hole furnace in which the fuel elements will be entirely consumed and the use of the offtake-stack made unnecessary and by which gold or ornamental surfaces can be burned on the ware in practically an instantaneous manner without subjecting the ware, tumblers, or dishes to what is known as the "preliminary" or "mud" burn—*i. e.*, by first applying in the desired design on the ware with a mixture of sulfate of copper, yellow ocher, and starch and heating the same by a slow and increasing heat.

In its subordinate features this invention comprises a novel construction of glory-hole furnace, such as will be first described, and then specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of my improved glory-hole furnace, showing the same mounted on a carriage. Fig. 2 is a vertical section of the same. Fig. 3 is a horizontal section.

In the practical construction of my invention the same comprises, substantially, two parts, a lower funnel-like body 1 and a crown or dome 2, the two parts being made of potters' clay and burned in a retort to withstand the heating necessary for finishing glassware. The bottom or funnel portion 1 has a flat annular bearing-face $1^a$, surrounded by the vertical annular flange $1^b$, said face and flange forming a convenient seat or bearing for the top or crown piece.

When of the ordinary size, my improved furnace weighs about one hundred pounds and has suitable handle portions, whereby it can be conveniently carried from place to place by two men; but when of a heavier size it is mounted on a carriage 3, as indicated in Fig. 1.

The top or crown part of the furnace has a series of horizontally-disposed glory-holes 5 of suitable diameter arranged near the bottom of the said part 2, whereby to provide a combustion-chamber 4 between them and the top or crown of the furnace, the purpose of which will presently appear.

The funnel-like portion 1 terminates in a shank $1^c$, which is adapted to rest upon a flange $7^a$, fixedly held on the end of the supply-pipe 7, with which the gas and air pipes 9 $9^\times$ connect, the discharge end of the said pipe 7 projecting into the funnel-neck, said pipe supplying a mixed supply of air and gas

and discharging it directly into the furnace, toward the center or dome part thereof. To create a forced draft, a blower may be used to fill the air-pipe $9^{\times}$, which injects into the pipe 7, as shown.

In the apex or center the crown portion of the furnace has an opening 10, which is normally held closed by a stopper 12, the function of which will be presently referred to.

In the use of my improved furnace the fire by reason of the force of gas and air through the pipe 7 first strikes the top or crown part of the furnace and then throws back on the side thereof toward the holes where it is wanted, such action of the fire insuring the complete consumption of the smoke under the crown or roof before it can get down to the holes, thus giving a fierce clear heat, and thereby reducing sulfuring to the minimum. By thus consuming all of the fuel products it is obvious that a great saving of fuel is effected, as none of it passes out unconsumed.

By constructing the furnace in the manner described and shown the same can be readily employed for baking gold or other ornamental liquid bands on glass or dish ware without employing the mud process. This I accomplish by creating an intense clear fire within the furnace by mixing an abundant quantity of fresh air with gas and blowing the same with a forced draft with the gas into the furnace. When the furnace is up to white heat, I remove the stopper in the top or crown of the furnace, which lets out all sulfur and other unburned stuff. I avoid the use of the mud process by applying the gold or other composition directly to the ware in the first place and holding the ware with the gold or other ornamentation thereon within sufficient distance of the glory-holes to cause the turpentine and other combustible matter in the mixture to evaporate and the said mixture to dry on the glass, this being done to avoid blistering. After it is dry the glass or other ware is shoved into the hole and kept turning or revolved for about five seconds, more or less. This method of burning on the gold or other ornamental mixtures is a very advantageous one, as the operation can be effected almost instantaneously, whereas in the old method or boiler-heated drying it usually takes from six to eight hours to effect the same result.

From the foregoing, taken in connection with the accompanying drawings, it is thought the advantages of my invention will be readily apparent to those skilled in the art to which it appertains. The same is capable of furnishing a mellow or a fierce heat, as desired. It dispenses with the high stack or chimney and consumes considerably less gas to produce an intense heat than is used in the ordinary form of glory-hole furnace for the same purpose. By its use the heat can be generated quicker, it requiring but fifteen minutes to come up to an operative condition, whereas in the old style of glory-hole furnace it takes two to three hours to get a start.

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

1. A portable glory-hole furnace, comprising a body having an inlet-opening centrally of the bottom thereof, its upper portion terminating in a circular crown, said crown having an outlet in its top, normally held closed by a removable plug, and the said top portion also having a series of horizontally-disposed glory-holes, all being arranged substantially as shown and described.

2. A glory-hole furnace, comprising a lower funnel-like body portion having a central inlet at the bottom and having its upper end terminating in an annular seat; a top member detachably mounted upon the bottom portion, said top member comprising a circular base adapted to fit on the annular seat of the lower body portion and having a circular crown, said crown having an outlet in its top normally held closed by a removable plug, and the circular portion of the said top having a series of horizontally-disposed glory-holes, all being arranged substantially as shown and described.

3. A glory-hole furnace, comprising a lower body portion having a pendent neck; a feed-pipe for supplying air and gas, said pipe having a flanged end penetrating the said neck; a top member detachably mounted on the bottom portion, said top member having a circular crown, said crown having an outlet in its top normally held closed by a removable plug, and said top portion also having a series of horizontally-disposed glory-holes, all being arranged substantially as shown and described.

FRANKLIN WALLACE.

Witnesses:
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