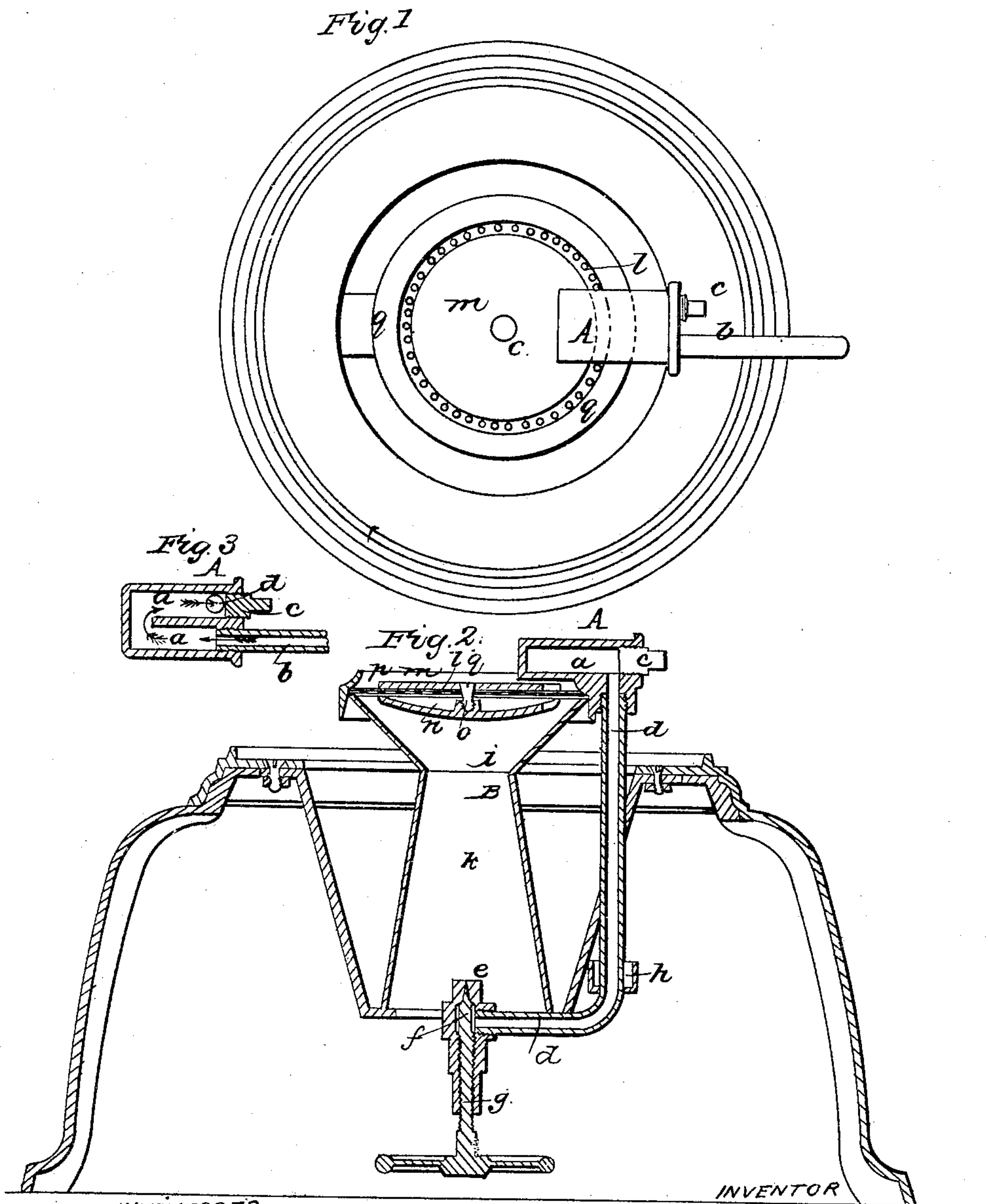


W. BRYENT.  
Aero-vapor Burner.

No. 51,011.

Patented Nov. 21, 1865.



WITNESSES  
Dr. P. Hale Jr  
G. H. Washburn

INVENTOR  
Walter Bryant  
by his attorney.  
W. H. Eddy.

# UNITED STATES PATENT OFFICE.

WALTER BRYENT, OF BOSTON, MASSACHUSETTS.

## AERO-VAPOR BURNER.

Specification forming part of Letters Patent No. 51,011, dated November 21, 1865.

*To all whom it may concern:*

Be it known that I, WALTER BRYENT, of Boston, of the county of Suffolk and State of Massachusetts, have invented an Improved Aero-Vapor Burner or Heating Apparatus; and I do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a top view, and Fig. 2 a vertical and longitudinal section, of it. Fig. 3 is a horizontal section of the vaporizer.

The purpose of the said aero-vapor burner is to generate heat by the combustion of air and the vapor of a hydrocarbon in mixture.

In the drawings, A denotes the vaporizer, which is a double retort containing two chambers, *a a*, arranged alongside of one another and communicating together at their inner ends. A conduit or tube, *b*, opens into the front end of one of these chambers—viz., that marked *a*—such conduit being led from an elevated reservoir containing the hydrocarbon fluid to be vaporized. The outer end of the other chamber has a plug, *c*, screwed into it, and such chamber has a pipe, *d*, leading down from it to a vertical discharging jet, *e*, provided with a conical or needle-pointed valve or stopper, *f*, capable of being raised or lowered by an adjusting-screw, *g*. A cup, *h*, surrounds the pipe *d*, and is to hold alcohol or a fluid which, when inflamed, will serve to heat the vaporizer in order to produce a sufficient amount of the combustible vapor to set the apparatus in action.

Directly over the jet *e* is an air-and-vapor mixer, B, composed of two hollow conic frusta, *i k*, united at their inferior or lesser bases. The larger base of the upper of the frusta is capped by a disseminator—viz., a sheet of wire-gauze—or a foraminous plate, *l*, which is clasped by two metallic plates or disks, *m n*, connected together by a screw, *o*. The said plates are arranged concentrically with the foraminous plate, and one of them is placed on while the other is arranged underneath it, there being an annular space, *p*, between the circumference of each of such disks *m n* and that of the disseminator *l*.

Surrounding the disseminator *l*, and extend-

ing above it, is an annular flame-guard, *q*, which, as it rises up, inclines inward somewhat with respect to the plate. The object of this guard, so inclined and arranged, is to maintain the flame when the burner is in operation off the gauze or foraminous plate in a manner to prevent the flame from burning or destroying it. Thus the guard serves as a protection of the said gauze or plate. The said guard may be a hollow annulus and open into or communicate with the pipes *b d*, in which case it will answer as a vaporizer.

By constructing the vaporizer of two chambers or one continuous bent pipe, as described, provided with mouths for connecting to it the pipes *b d* and the screw-plug *c*, I not only obtain a large vaporizing-surface, but a vaporizer easily cleaned of deposits when made within it by vaporization of the hydrocarbon.

By constructing the mixer of the two conic frusta, arranged as described, I gain a much better admixture of the air and vapor before they pass through the wire-gauze or disseminator than is the case when the mixer is one straight tube of equal diameter throughout; and, furthermore, I am enabled by such a construction of the mixer and the application of a deflector to its disseminator (such deflector being composed of one or more disks, *m n*) to spread the flame out into the form of a tube of large diameter, and thus to use it to better advantage for heating than I could were I to employ the same amount of flame in the form of a solid cylinder.

I do not claim a combination composed not only of an air-and-gas mixer, a vaporizer, and a means of holding a hydrocarbon and conducting it into the vaporizer, but a means of conducting from the vaporizer and into the mixer the combustible vapor produced in and by such vaporizer, as I am aware that such is the composition of the common and well-known aero-vapor burner or heating apparatus.

What I claim as my invention in the above-specified improved aero-vapor burner is as follows:

1. The improved vaporizer as constructed substantially as described—viz., with the two chambers *a a* communicating with each other,



and arranged with respect to their pipes of induction and eduction as specified.

2. The combination and arrangement of one or more deflectors or plates, *m n*, with the air-and-gas mixer, composed of the foraminous plate or wire-gauze disseminator and the tube for conveyance of air and combustible vapor to the disseminator.

3. The arrangement and combination of the annular guard *q* with the air-and-gas mixer and the deflector applied to it, as specified, such guard being made substantially as specified.

WALTER BRYENT.

Witnesses:

R. H. EDDY.

F. P. HALE, Jr.