To all whom it may concern:

Be it known that I, WILLIAM J. D. MAST, a citizen of the United States, residing at Buf-
falo, in the county of Erie and State of New
York, have invented and useful Improv-
ments in Alcohol-Lamps, of which the follow-
ing is a specification.

This invention relates to that class of lamps
which are employed for heating or cooking
purposes, and more especially to lamps of this
kind in which alcohol or a similar volatile
fuel is used.

One of the objects of my invention is to so
construct the lamp that the flame receives
the requisite air supply to prevent smoking
thereof and insure a steady burning of the
lamp.

The invention has the further object to pro-
vide a reducer whereby the size of the flame
may be diminished and which at the same
time affords the necessary supply of air to the
reduced flame to prevent smoking.

In the accompanying drawings, Figure 1 is
a vertical section of my improved lamp, show-
ing the reducer raised therefrom. Fig. 2 is a
top plan view of the lamp with the reducer
removed and a portion of the breast broken
away. Fig. 3 is a horizontal section of the
reducer in line 3 3, Fig. 1. Fig. 4 is a vertical
section of a modified construction of the lamp.

Fig. 5 is a top plan view thereof with a por-
tion of the breast broken away.

Like letters of reference refer to like parts
in the several figures.

A is the hollow body or bowl of the lamp,
which may be spun of sheet metal and which
contains a filling B, of asbestos or other re-
fractory and absorbent material, which is satu-
rated with alcohol or other suitable liquid
fuel. The asbestos filling is covered by a dia-
phragm of fine gauze or wire-netting C, which
confines the asbestos in the bowl. The cen-
tral portion of this gauze covering is raised
in the form of a cone or conoidal protuber-
ance D, which forms the burner of the lamp.

E is an open annular breast or flange, ar-
 ranged at the upper end of the bowl or body
A and surrounding the burner-cone D. This
breast is curved upwardly and inwardly so
as to overhang the outer portion of the gauze
covering, and serves to prevent undue spread-
ing of the flame and at the same time forms
with the opposing burner-cone an annular
flame-space. The breast is provided at its
lower edge with a marginal flange e, which is
bent around a similar flange at the upper end
of the bowl, whereby the breast is secured to
the bowl. In the construction shown in the
drawings the gauze covering is confined in
place by bearing with its edge against the in-
ternal shoulder at the base of the breast; but
it may be held in place in any other suitable
manner. The breast is provided near its up-
per edge with an annular row of air-inlet ap-
ertures f, through which air is supplied to the
upper portion of the flame-space.

G is a guard or ring arranged on the inner
side of the breast opposite the air-apertures f,
whereby the flame is prevented from issuing
through said apertures. This ring is prefer-
ably suspended from the upper edge of the
breast by interlocking lips or flanges formed
on the respective parts, as shown at g in
Fig. 1. The guard-ring is preferably conical
or curved so as to extend upwardly and in-
wardly from the vicinity of the base of the bre-
ast and is provided opposite the air-ap-
ertures of the breast with air slots or passages
h, which are arranged around the circumfer-
ence of the ring and through which air is sup-
plied to the upper portion of the flame.

The guard-ring is separated from the sur-
rounding breast by an intervening air-space or passage
h and the gauze covering C is depressed be-
low the lower edge of the ring, as shown at i.

so as to permit a portion of the air entering
through the apertures of the breast to descend
between the ring and the breast and pass
around the lower edge of the ring into the
flame-space, thereby supplying air to the root
or base of the flame as well as to the upper
portion thereof. By thus furnishing the flame
with an air supply around its base in addition
to the supply near its top the flickering and
 puffing of the flame which occurs when the

flame is supplied with air only near the top
is obviated. The top of the burner-cone is
about on a level with or slightly above the
level of the upper edge of the breast, as shown
in the drawings. The cone thus fills the cen-
tral portion of the space surrounded by the
breast and leaves a comparatively narrow an-
nular flame-space between the same and the breast, thus bringing the inner side, as well as the outer side, of the flame within reach of the air supply and obtaining a practically smokeless combustion.

In the construction of the lamp shown in Figs. 4 and 5 the guard G' is secured at its lower edge between the interlocking flanges of the breast E' and the bowl, instead of being suspended from the breast, and the upper edge of the guard-ring is separated from the breast by an intervening annular space of air passage g'. Whereby air is supplied to the upper portion of the flame. The ring is provided in its base or lower portion with air slots or passages h', through which air is supplied to the base of the flame. In this construction the breast is provided with two annular rows of air-supply apertures f' f", the upper row being arranged opposite the upper air-passage g' and the lower row opposite the lower air-passages h'. The portion of the gauze covering below the air- apertures in the lower portion of the guard-ring is depressed or separated from the bottom of the ring, as in the first-described construction, to permit the air which enters the lower rows of apertures in the breast to pass underneath the ring and mingle with the base portion of the flame.

It will be observed that in both of the constructions described the guard-ring is separated from the perforated diaphragm or covering, so that the incoming air can pass to the annular flame-space which extends upwardly and inwardly between the guard-ring and the raised central portion of the perforated diaphragm. In this passage the air sweeps along and commingles with a comparatively thin annular flame and effects a complete combustion of the fuel. In each construction one or more apertures j in the flame or in the flame-space between the edge of the ring and the breast and the other passage by slots or apertures formed near the opposite edge of the ring.

J represents the flame-reducer, which consists of a removable cap or concave plate made of the proper size to fit snugly over the breast. This cap is provided with a comparatively small flame-aperture j', formed centrally in the cap, so as to permit the flame to issue through it when the reducer is placed upon the lamp, thus diminishing the flame to the size of said aperture.

k is a rim or collar formed around the reducing-aperture on the upper side of the cap and provided in its sides with air-inlet openings or passages k', through which air is supplied to the diminished flame, thereby preventing smoking of the same.

L is an extinguishing-cap adapted to be placed over the collar of the reducing-aperture. This cap is preferably hinged to the reducer and may be provided with a non-conducting handle for manipulating it.

By extending the burner-cone to the top of the breast the further advantage is obtained that the flame is caused to rise through the reducing-aperture to a greater height than when the central portion of the gauze forming the burner is flat or substantially so.

1. The combination with the bowl of a lamp containing an absorbent filling, of an inwardly-extending breast arranged at the top of the bowl and having air-inlet apertures, a perforated diaphragm covering said filling and having a convex central portion which is elevated about the top of the said filling and a guard-ring arranged on the inner side of the breast, trending upwardly and inwardly and separated from the perforated diaphragm by an annular flame-space, substantially as set forth.

2. The combination with the body or bowl of the lamp adapted to contain an absorbent filling and a perforated diaphragm covering said filling, of an open inwardly-extending breast arranged at the top of the bowl and having air-inlet apertures, a guard-ring arranged on the inner side of said breast opposite said air-apertures, and an air-passage arranged at the base of said guard-ring through which the incoming air is permitted to pass around the lower portion of the ring into the flame-space, substantially as set forth.

3. The combination with the bowl of a lamp containing an absorbent filling, of an inwardly-extending breast arranged at the top of the bowl and having air-inlet apertures, a perforated diaphragm covering said filling and having a convex central portion which is raised to about the top of the breast, and a guard-ring arranged on the inner side of the breast, trending upwardly and inwardly at a distance from the convex central portion of the diaphragm and provided at its outer and lower end with an inlet through which air is admitted between the flame-space between the guard-ring and the perforated diaphragm, substantially as set forth.

4. The combination with the body or bowl of the lamp adapted to contain an absorbent filling and a perforated diaphragm covering said filling, of an open inwardly-extending breast arranged at the top of the bowl and having air-inlet apertures and a guard-ring arranged on the inner side of said breast and separated at its side from the breast and at its lower edge from said diaphragm forming an air-passage around the lower edge of the ring, whereby air is supplied to the base of the flame said ring being provided in its upper portion with air-inlet passages, whereby air is supplied to the upper portion of the flame, substantially as set forth.

5. The combination with the body or bowl adapted to contain an absorbent filling and a perforated diaphragm covering said filling, of an open inwardly-extending breast arranged at the top of the bowl and having air-inlet apertures, and a guard-ring arranged on the inner side of the breast and suspended
from the top thereof, and separated at its lower edge from the breast and said diaphragm by an intervening air-passage, substantially as set forth.

WILLIAM J. MAST.

Witnesses:

CARL F. GEYER,
KATHRYN ELMORE.