W. MELAS.

AIR ASPIRATOR.

APPLICATION FILED MAR. 31, 1913.

1,082,815.

Patented Dec. 30, 1913

FIG. II.

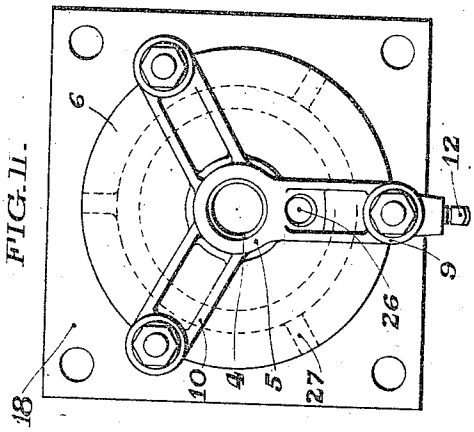


FIG. III.

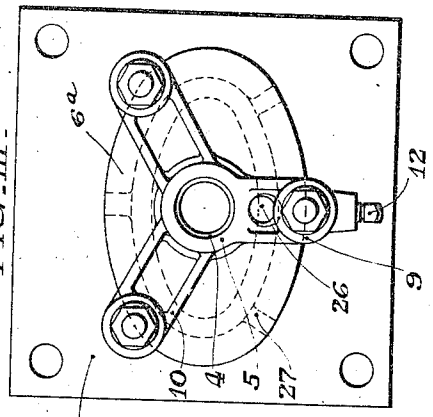


FIG. I.

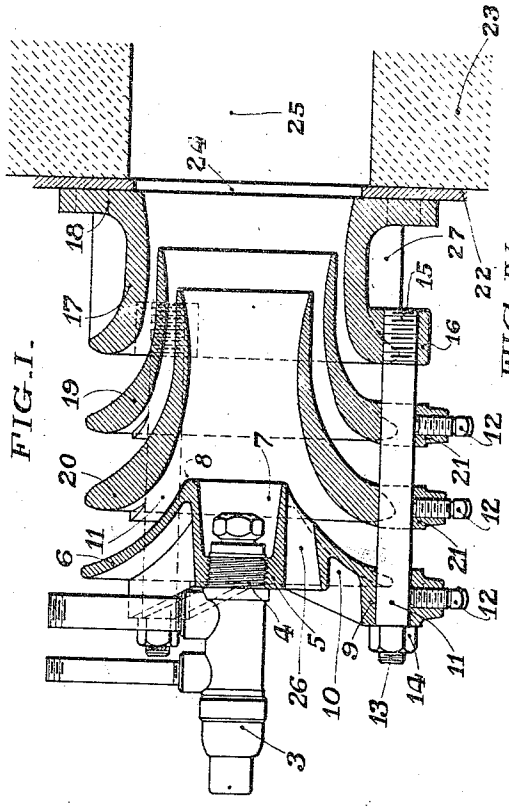
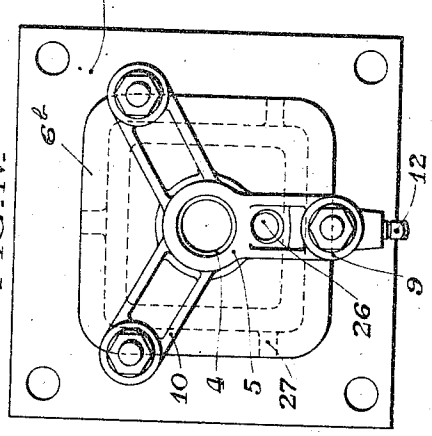


FIG. IV.



Inventor

William Melas

Witnesses

O. M. Boehm

Harry P. Greeves.

UNITED STATES PATENT OFFICE.

WILLIAM MELAS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO DAVID TOWNSEND, OF PHILADELPHIA, PENNSYLVANIA.

AIR-ASPIRATOR.

1,082,815. Specification of Letters Patent. Patented Dec. 30, 1913.

Application filed March 31, 1913. Serial No. 758,071.

To all whom it may concern:

Be it known that I, WILLIAM MELAS, of Philadelphia, in the State of Pennsylvania, a citizen of the United States, have invented a certain new and useful Improvement in Air-Aspirators to be Used in Connection with Oil-Burners, whereof the following is a specification, reference being had to the accompanying drawing.

It is well known that the combustion of fuels can only be sustained by the presence of oxygen, or, as in commercial operations, by the presence of air. This is usually furnished and brought into contact with the fuel by draft or by mechanically operated air handling machinery, such as blowers, fans, etc. Liquid fuel is usually atomized or broken up into a spray of minute globules and, is as such, introduced into the furnace. Whether this atomization is effected by steam, air, or other means has no bearing on my invention; it being only material that a jet issuing from an orifice produces a sucking action, the strength of which depends on the velocity of spray, the angle of spray and other conditions.

It is the purpose of my invention to utilize this inducing or aspiring action of a jet or spray, in this case the spray from an oil burner, to supply the necessary air for combustion, embodying means, whereby the amount of air aspired for combustion can be varied to suit conditions without changing the velocity or volume of spray.

It is furthermore my purpose to control the amount of air aspired by stack action, in case it is to be applied to furnaces which work in combination with a stack. In this case my invention, by proper regulation, will not make use of the full aspiring action of the jet or spray.

It is furthermore my purpose to furnish air for combustion without power consuming mechanical means extraneous to the burner.

It is furthermore my purpose of bringing the air for combustion in intimate contact with the spray before ignition takes place.

It is furthermore my purpose to deliver the air of combustion by means of the jet forcibly injected into the furnace without any mechanical, power consuming means extraneous to the burner and to create and maintain a pressure equal to or slightly higher than the atmosphere in the combustion chamber or furnace.

In the drawing Figure I is a longitudinal sectional view of said aspirator, showing same in connection with a burner. Fig. II is a righthand end view of said aspirator, the members of which are circular in cross section and the burner being removed. Fig. III is a similar view to Fig. II, but showing a modification in which the members are oval in cross section. Fig. IV is a similar view to Fig. II, but showing another modification in which the members are rectangular in cross section.

Referring to the form of my invention shown in Figs. I and II it will be seen, that 3 shows the outlines of a burner, said burner being provided with a screw thread 4 on its inner end and being screwed into the hub 5 of deflector 6. Said hub 5 is cored or bored out in shape of a truncated cone as indicated by 7. The deflector 6 has a concave outer surface joining the truncated opening 7 by a small circular fillet 8 and corresponding approximately to the convex inner surface of the twyer 20. Said deflector has three cylindrical bosses 9 on the circumference equidistant from the axis and parallel thereto, each of said bosses being connected with the deflector by means of two ribs 10 abutting against hub 5 and being bored out for a sliding fit on guide rods 11. One of said bosses has a set screw 12 for the purpose of fixing deflector 6 in any position on guide rod 11 within the range of possible movement. Between one of the pairs of ribs 10 is a peephole 26 for the purpose of observing the conditions in the furnace. Said peephole can be closed with a mica plate or refractory plug if desired. Each of the guide rods 11 is threaded on both ends; the thread 13 corresponding to the thread in check nut 14, which serves the purpose of limiting the outward movement of deflector 6; the thread 15 corresponding to the thread in bosses 16 of inlet base 17. The inlet base 17 has a convex inner surface corresponding approximately to the concave outer surface of the twyer 19 and has also a bottom flange 18, which is shown square in Fig. II but can be of any other shape to suit conditions. The bottom flange 18 can be attached by bolts or other means to furnace plate 22. Said furnace plate has an opening 24 axial

and corresponding with shape of opening in inlet base flange. 23 shows a part of the furnace lining which has an opening 25 axial and corresponding with shape of openings in plate 22 and flange 18. The ribs 27 serve to stiffen the body of 17. Between deflector 6 and inlet base 17 are the twyers 20 and 19. They are tapering in form with concave outer and convex inner surfaces; the concave outer surface of twyer 20 corresponding approximately to the convex inner surface of twyer 19. Each twyer has three bosses or lugs 21 on the circumference in the same relation to the axis as the bosses on deflector 6 and base 17; said lugs being bored out for a sliding fit with rods 11 heretofore described. One of the bosses of each twyer 20 and 19 has a set screw 12, whereby the twyers can be fixed in any position on the guide rod within the range of possible movement. The surfaces of adjacent members are curved in such a way that the parts 6 and 20, 20 and 19 and 19 and 17 can touch each other in an uninterrupted line, thus shutting off the induced air supply between 6 and 20, 20 and 19 or 19 and 17. It is obvious that the whole air supply can be shut off if all four pieces touch each other. It is also obvious that by the means described the air supply can be regulated from a maximum to complete closure, by shifting parts 6, 20 and 19 in the proper relative positions. It is evident, that by the proper manipulation of deflector 6 and twyers 20 and 19 the three available free areas for air induction can be increased to a certain maximum or decreased to nothing collectively; that each of the three areas can be increased to a certain maximum individually or annihilated completely; that the inductive force of the spray can be utilized fully or partially as desired.

In Fig. II the members 6, 20, 19 and 17 are shown to be of circular cross section.

Fig. III is an end view of a modified form of the aspirator aforedescribed, in which the deflector 6^a and the other members corresponding to the members 20, 19 and 17 of Fig. I are of oval cross section.

Fig. IV is an end view of another modification of the aspirator aforedescribed, in which the deflector 6^b and the other members corresponding to the members 20, 19 and 17 of Fig. I are of rectangular cross section.

The description of the form of my invention as shown in Figs. I and II applies also to the modified forms as shown in Figs. III and IV as these forms depart in no way from the form shown in Figs. I and II except that the cross sections of the members aforementioned are oval or rectangular respectively.

The form of my invention shown in Figs. I and II is suitable for use in connection with a burner which produces a cone shaped spray, while the forms shown in Figs. III and IV are adapted for use in connection with a burner producing a flat or fan-shaped spray.

Having thus described my invention, its purpose and usage, I claim:

1. In an air aspirator for oil burners, the combination of a deflector, said deflector having a concaved outer surface tapering toward its inner end and having a concentric hub threaded at its outer end for engagement with an oil discharge nozzle; said hub having a bore flaring inwardly from said threaded end; a plurality of circularly arranged lugs on said deflector, located parallel to the axis of the air aspirator and axially bored; an annular base in axial alinement with said deflector, the inner surface of said base being convex and flaring toward each end; a plurality of circularly arranged lugs on said base, located parallel to the axis of the air aspirator and having threaded axial bores, a flange on said base and means for securing said flange to a furnace wall; a plurality of tapering twyers in axial alinement with and between said deflector and base, the outer surface of each twyer being concave and the inner surface being convex and flaring toward each end, a plurality of circularly arranged lugs on each twyer located parallel to the axis of the air aspirator and axially bored; a plurality of guide rods passing through corresponding lugs in the deflector, twyers and base and having threaded engagement with the lugs on the base, said deflector and twyers being axially adjustable on said guide rods.

2. In an air aspirator for oil burners the combination of a deflector having a peephole, said deflector having a concaved outer surface tapering toward its inner end and a concentric hollow hub, flaring inwardly, with means at its outer end to attach an oil burner thereto; a plurality of circularly arranged lugs on said deflector, located parallel to the axis of the air aspirator and axially bored; an annular base in axial alinement with said deflector, the inner surface of said base being convex and flaring toward each end; a plurality of circularly arranged lugs on said base located parallel to the axis of the air aspirator and having threaded axial bores, said base having means to fasten it to a furnace wall or furnace plate; a plurality of tapering twyers in axial alinement with and between said deflector and base, the outer surface of each twyer being concave and the inner surface being convex and flaring toward each end; a plurality of circularly arranged lugs on each twyer located parallel to the axis of the air aspirator and axially bored; a plurality of guide rods passing through corresponding lugs in the deflector, twyers and base and having threaded engagement with the lugs on the base, said de-

flector and twyers being axially adjustable on said guide rods, and means for fixing said deflector and twyers in position.

3. In an air aspirator for oil burners the combination of an axially adjustable deflector having means to fix it in position and having means to guide it axially, said deflector having a concaved outer surface tapering toward its inner end and a concentric hollow hub, flaring inwardly, with means at its outer end to attach an oil burner thereto; an annular base in axial alinement with said deflector, the inner surface of said base being convex and flaring toward each end, said base having means to fasten it to a furnace wall or furnace plate; a plurality of axially adjustable tapering twyers in axial alinement with and between said deflector and base, having means for guiding them axially and fixing them in any position desired, the outer surface of each twyer being concave and the inner surface being convex and flaring toward each end.

In testimony whereof, I have hereunto signed my name at Philadelphia, Pennsylvania, this twentieth day of March, 1913.

WILLIAM MELAS.

Witnesses:
O. M. Boehm,
Harry P. Greeves.