March 18, 1941. J. HANUS 2,235,706

AIR CONTROLLING AND REGULATING DEVICE

Filed March 14, 1940

Fig. 1.

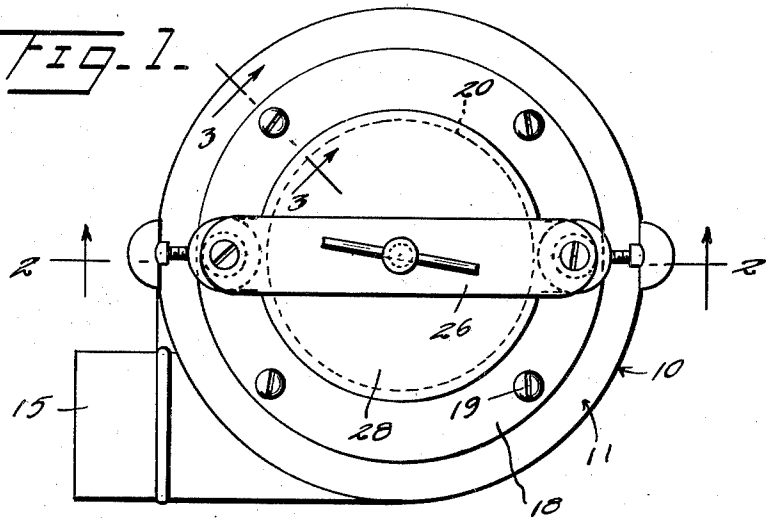


Fig. 2.

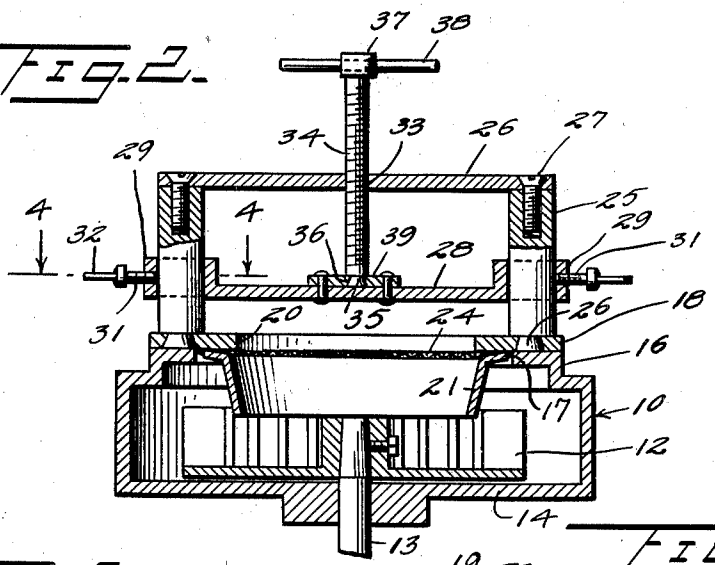


Fig. 4.

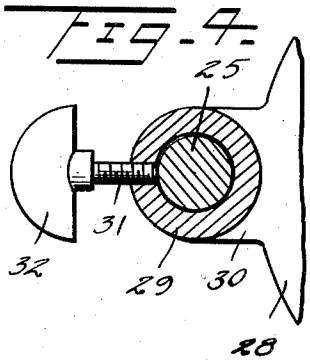
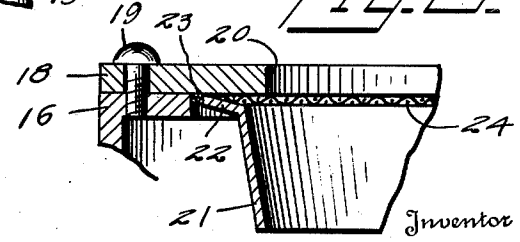


Fig. 3.



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2,235,706

UNITED STATES PATENT OFFICE

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AIR CONTROLLING AND REGULATING DEVICE

John Hanus, Appleton, Wis.

Application March 14, 1940, Serial No. 324,004

5 Claims. (Cl. 230—114)

This invention relates to air controlling or regulating device and is an improvement over the structure embodied in my Patent No. 2,098,144 which issued November 2, 1937, for Air controlling devices for blowers.

An object of this invention is to provide an air controlling or regulating device for an air intake port which communicates with a combustion means and which is so constructed as to provide a cyclonic movement to the incoming air so as to thereby materially assist in the mixture of air with the fuel in the combustion device.

Another object of this invention is to provide a structure of this kind which includes a filtering means for removing dirt or other foreign material from the air before the air enters the combustion device.

A further object of this invention is to provide an adjustable air valve or controlling member with an improved supporting means therefor and means for locking the air valve in adjusted position.

A still further object of this invention is to provide an improved air nozzle of substantially frusto-conical configuration which materially assists in effecting a cyclonic movement to the air passing therethrough.

To the foregoing objects and to others which may hereinafter appear, the invention consists of the novel construction, combination and arrangement of parts as will be more specifically referred to and illustrated in the accompanying drawing wherein are shown embodiments of the invention, but it is to be understood that changes, variations and modifications may be resorted to which fall within the scope of the invention as claimed.

In the drawing:

Figure 1 is a detail side elevation of an air controlling or regulating device constructed according to an embodiment of this invention which is mounted on a blower.

Figure 2 is a sectional view taken on the line 2—2 of Figure 1.

Figure 3 is an enlarged fragmentary sectional view taken on the line 3—3 of Figure 1.

Figure 4 is an enlarged fragmentary sectional view taken on the line 4—4 of Figure 2.

Referring to the drawing, the numeral 10 designates generally a blower structure which is adapted to be connected to a stoker, an oil burner or other combustion device which is provided with an air intake passage or duct for mixing air with the fuel in order to provide the desired mixture for combustion purposes. The blower 10 comprises a housing 11 provided with a fan structure 12 which is mounted on a drive shaft 13 journalled in one wall 14 of the blower. The housing 11 includes an air discharge duct 15 which is adapted to be connected to the combustion means for mixing the air with the vaporized fuel.

The housing 11 includes a side wall 16 opposite from the wall 14 which is provided with an intake port 17 discharging into the center of the fan structure 12.

In order to provide a means whereby the quantity of air entering the intake port 17 may be finely regulated, and in order to provide a means whereby the air entering the intake port 17 is given a cyclonic movement, I have provided an air controlling and regulating means including a base plate 18 which is adapted to be fixed as by fastening devices 19 to the side wall 16 of the blower structure 10. The base plate 18 is provided with an opening or port 20 which is coaxial with the intake port 17. The base plate 18 on the inner side thereof is provided with a frusto-conical nozzle or air guiding member 21 which has the apex thereof disposed in a position for discharge within the blade structure 12. The air nozzle or guiding member 21 is provided at the base thereof with an annular flange 22 which is adapted to be fixed as by soldering or welding 23 to the inner face of the plate 18.

An air filtering member 24 in the form of a screen which is of substantially disc-shape is interposed between the flange 22 and the inner face of the base plate 18 and is clamped between the flange 22 and the plate 18 so as to firmly hold the filtering member 24 across the opening 20. A pair of combined valve supporting and guiding posts 25 are fixedly secured to the base plate 18, being provided at their inner ends with reduced portions 26 which are fixed to the plate 18. These posts or combined guiding and supporting members 25 are diametrically disposed with respect to the plate 18 and a connecting bar 26 engages the outer ends of the posts 25. The connecting bar 26 is secured as by fastening devices 27 to the supporting posts 25.

A valve or air regulating plate 28 of substantially disc-shape is disposed in confronting relation to the base plate 18 and is substantially larger in diameter than the diameter of the intake opening or port 20 of the plate 18. The valve member 28 is provided with a pair of diametrically opposed sleeves 29 which are connected to the valve member 28 by ears or extensions 30. The sleeves 29 slidably engage the sup-

porting and guiding posts 25 and in order to provide a means whereby the sleeves 29 may be locked in adjusted position on the posts 25, I have provided set screws 31 which are threaded through the sleeves 29 and engage the posts 25.

The set screws 31 at their outer ends are provided with a head 32 so that these set screws may be loosened or tightened without use of a tool. The connecting bar 26 at the center thereof is provided with a threaded opening 33, and a threaded valve adjusting shaft 34 engages through the opening 33. The shaft 34 at its inner end is swivelly connected to the center of the valve member 28 and in the present instance, the shaft 34 is provided with a reduced upset portion 35 which engages through an opening 36 formed in a plate 39 fixed to the valve member 28.

The outer end of the shaft 34 is provided with a right angularly disposed head 37 through which a handle bar 38 engages. The shaft 34 is adapted to be rotated by means of the handle structure 38 so as to thereby move the valve member 28 toward or away from the base plate 18.

In the use and operation of this air controlling means, the base plate 18 is adapted to be fixed to the air intake side of the blower structure 10 with the nozzle or guiding means 21 projecting inwardly of the intake port 17. The locking members 31 are initially loosened so that the valve member 28 may be adjusted relative to the intake port 20 in the base plate 18. The valve member 28 is adjusted by rotating the shaft 34 in the desired direction and when the valve member 28 has been properly adjusted it may be locked in its adjusted position by turning the set screws 31 so that these set screws will tightly engage the supporting and guiding post 25. The air entering the intake port 20 and passing through the filter member 24 must first pass about the periphery or marginal edges of the valve member 28 and in passing about the marginal edges of the valve member 28, the air is given a cyclonic movement which movement will continue as the air passes through the filter member 24 and enters the blower housing 11.

With an air controlling or regulating device of this kind which is constructed in the form of an attachment for an air intake, duct or port, the quantity of air may be very finely regulated and in addition thereto, the velocity of the incoming air may also be controlled through the adjustment of the valve member 28. When the valve member 28 has been adjusted to the desired degree, it may be set or locked in its properly adjusted position by the set screws 31.

It will, of course, be understood that the air regulating means hereinbefore described may be connected to any desired point in an air suction duct, the mounting of the air controlling device on the blower structure being only one example of the mounting of this device. Through the provision of the disc-shaped valve member, the air entering the intake port 20 of the base plate 18 will enter in the form of a cone, the center of which will have a partial vacuum due to the fact that the valve member 28 is in the center of the cone-shaped column of air.

The formation of this partial vacuum in the column of air will materially assist in the mixing of the air with the vaporized fuel or gases and will thus materially assist in the complete combustion of the fuel.

While I have shown two guide posts 25 for the valve member 28, it will be understood that the number of these combined guide and supporting posts 25 may be increased for large units so as to properly support and guide the plate 28.

What I claim is:

1. An air controlling device comprising a base plate provided with an axial opening, a frusto-conical nozzle disposed on one side of said plate, a flange carried by the base of said nozzle, means securing said flange to said plate, a perforate filter element interposed between said flange and said plate, a disc-shaped valve member, guide members fixed to said plate and extending from the opposite side thereof, a supporting bar fixed to the outer ends of said guide members and provided with a threaded opening coaxial with the axis of said plate opening, sleeves carried by said valve member slidably engaging said guide members, a threaded valve member adjusting shaft engaging through said threaded opening, and means swivelly securing said shaft to said valve member.

2. An air controlling device comprising a base plate provided with an axial opening, a frusto-conical nozzle disposed on one side of said plate, a flange carried by the base of said nozzle, means securing said base flange to said plate, a flat perforate filter element interposed between said flange and said plate and extending across said opening, an adjustable disc-shaped valve member disposed on the opposite side of said plate, means for adjusting said valve member relative to the said opposite side of said plate and means securing said valve member in adjusted position relative to said plate with the inner face of said valve member parallel with the said opposite side of said plate, said valve member having a diameter substantially greater than the diameter of said opening.

3. An air controlling device comprising a base plate provided with an axial opening, a frusto-conical nozzle disposed on one side of said plate, a flange carried by the base of said nozzle, means securing said flange to said plate, a perforate filter element interposed between said flange and said plate, a disc-shaped valve member, guide members fixed to said plate and extending from the opposite side thereof, a supporting bar fixed to the outer ends of said guide members and provided with a threaded opening coaxial with the axis of said plate opening, sleeves carried by said valve member slidably engaging said guide members, a threaded valve member adjusting shaft engaging through said threaded opening, means swivelly securing said shaft to said valve members and threaded locking members carried by said sleeves and engageable with said guide members for locking said valve member in adjusted position relative to said plate.

4. An attachment for a fluid suction means for effecting cyclonic movement to the fluid, comprising a base plate, a tapered nozzle at one side of said plate, means securing the base of said nozzle to one side of said plate, said plate having an opening coaxial with said nozzle, a flat screen disposed across said opening and interposed between said base and plate, a disc-shaped valve member having a diameter substantially greater than the diameter of said opening and opposing the other side of said plate, means supporting said valve member for movement relative to the said other side of said plate, means for adjusting said valve member relative to the said other side of said plate, and means for locking said valve member in adjusted position.

5. An attachment for an air intake port for effecting cyclonic movement to the air comprising a base plate provided with an axial opening, a frusto-conical member at one side of said plate about said opening, a flange carried by the base of said frusto-conical member, means securing said flange to said plate, a disc-shaped screen across said opening and having the marginal portions thereof interposed between said flange and said plate, a pair of guide posts fixed to said plate and extending from the opposite side thereof, a disc-shaped valve member, a pair of diametrically disposed sleeves fixed to said valve member and slidable on said guide posts, a connecting bar, means securing said bar to the outer ends of said posts, a threaded shaft engaging through said bar, means swivelly securing one end of said bar to the center of said valve member, a handle fixed to the other end of said shaft, and threaded locking means carried by said sleeves engageable with said posts to lock said valve member in adjusted position.

JOHN HANUS.