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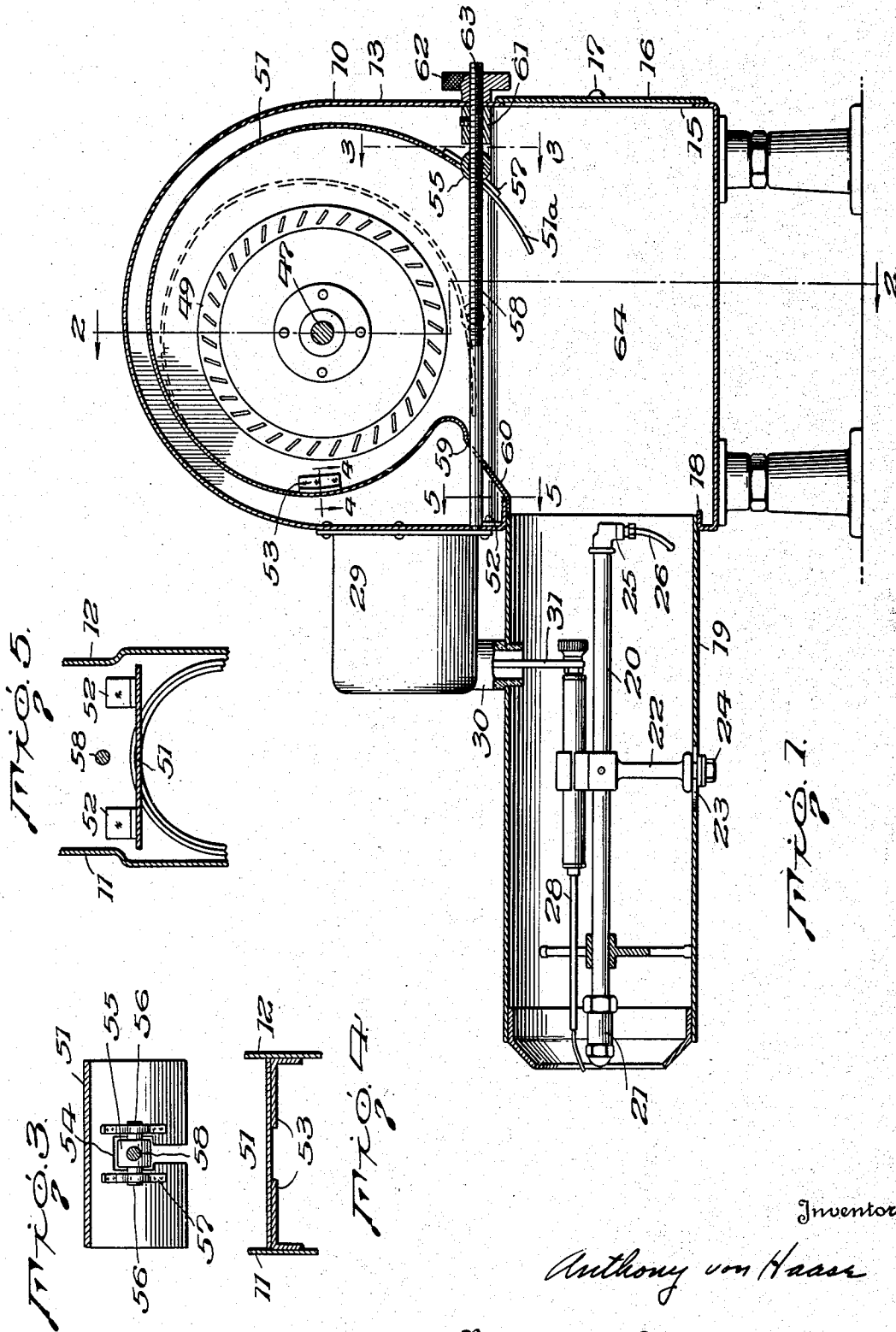
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2,215,281

OIL BURNING APPARATUS

Filed Dec. 28, 1939

2 Sheets-Sheet 1



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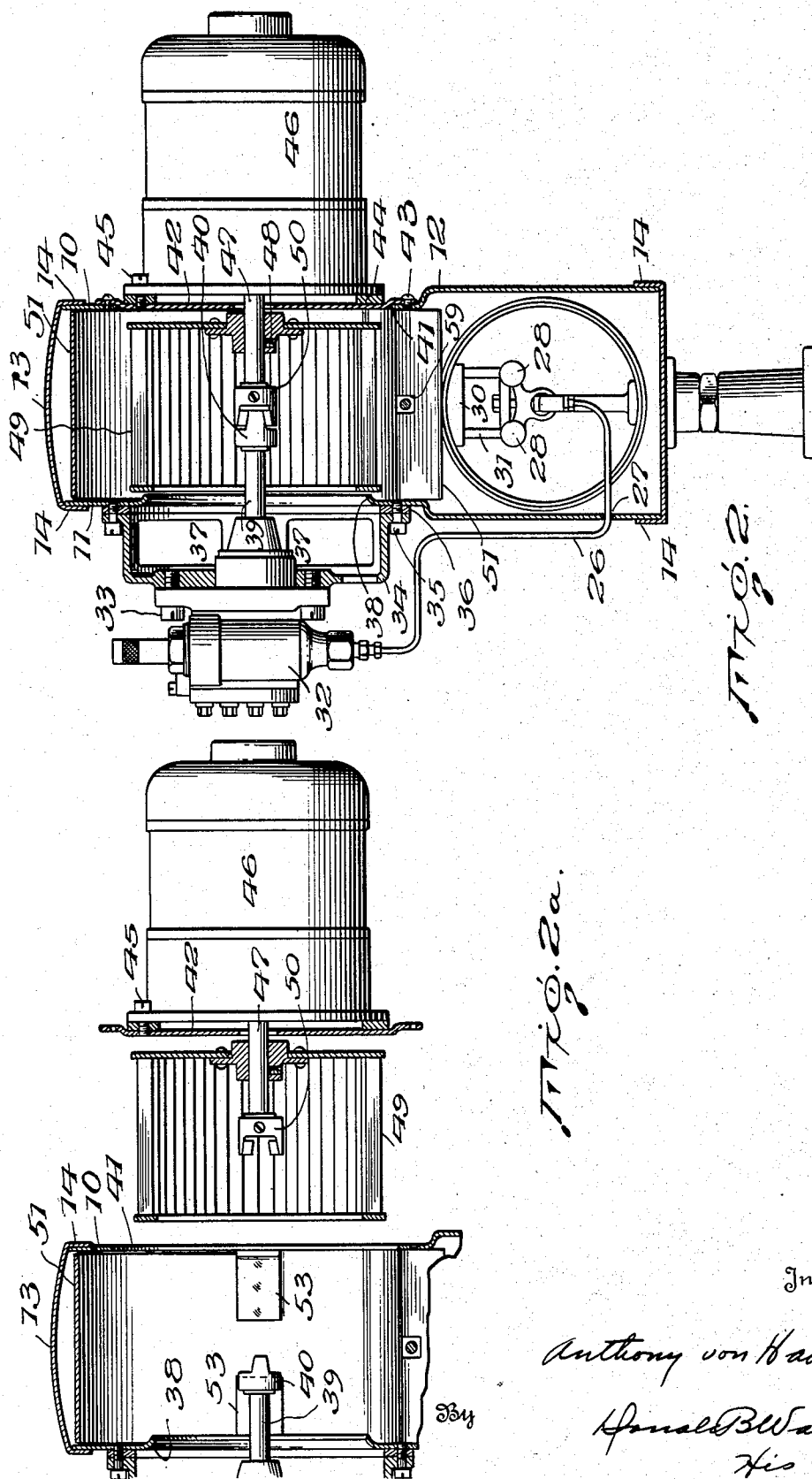


Fig. 2a.

Fig. 2.

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## UNITED STATES PATENT OFFICE

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## OIL BURNING APPARATUS

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2 Claims. (Cl. 230—114)

This invention relates to oil burning apparatus, particularly oil burning apparatus of the pressure atomizing type.

Oil burning apparatus of the pressure atomizing type embody a casing member which houses a fan for supplying air through a blast tube for supporting combustion. In such apparatus the fan plenum chamber is fixed and of a definite contour, and the usual practice is to provide an air gate or shutter at the casing inlet for controlling the air intake. In these constructions, it is necessary to provide different size casings and fans in order to have burners of different capacities, although the burners are of the same general design.

One of the objects of the present invention is to provide an oil burning apparatus of such construction that it is only necessary to change the size of the fan in order to provide for burners of different capacities.

Another object is to provide an oil burning apparatus with a fan housing having a plenum chamber scroll which may be adjusted at will to satisfy desired conditions of air flow and to provide for the interchangeability of fans of different diameters.

Another object is to provide an oil burning apparatus with new and improved means for controlling the flow of combustion supporting air at the outlet side of the fan member.

A further object is to provide an oil burning apparatus of new and improved construction which is economical to manufacture and easy to service.

With the above and other objects in view which will be apparent from the following description, the present invention consists in certain features of construction and combinations of parts to be hereinafter described with reference to the accompanying drawings and then claimed.

In the drawings which illustrate a suitable embodiment of the invention:

Figure 1 is a longitudinal vertical section taken through the oil burning apparatus;

Figure 2 is a transverse vertical section taken substantially on the line 2—2 of Figure 1,

Fig. 2a is a fragmentary view showing the motor-fan assembly and casing in dis-assembled relation, and

Figures 3, 4 and 5 are sections taken substantially on the lines 3—3, 4—4 and 5—5 of Figure 1.

Referring to the accompanying drawings in which like numerals refer to like parts throughout the several views, the oil burning apparatus includes a casing 10 comprised of sheet metal side members 11 and 12 and a sheet metal peripheral member 13 having flanges 14 which are welded or otherwise suitably secured to the side

members 11 and 12, as shown in Figure 2, to form the enclosure.

The peripheral member 13 is provided, at the one side, with an opening 15 which is closed by a cover plate 16 secured thereto by screws 17, and, at the other side, with a flanged opening 18 to receive a blast tube 19 which may be mounted therein in any suitable manner. It is to be noted that the openings 15 and 18 are at the bottom portion of the casing 10.

Mounted within the blast tube 19 is an oil tube 20 having a nozzle 21 at its outer end adjacent the open end of the blast tube. The oil tube 20 is supported by means of a collared support 22 extending through an elongated slot 23 in the blast tube and provided with a nut 24. The slot 23 provides a means whereby the oil tube 20 may be moved longitudinally within the blast tube 19 to properly position the nozzle 21 with respect to the open discharge end of the blast tube. The oil tube 20 is provided at its right end, as viewed in Figure 1, with a fitting 25 to which a supply conduit 26 is connected, the conduit extending out through an opening 27 in the side member 11, as seen in Figure 2.

Ignition is provided for by means of spark electrodes 28 carried by the support 22 above the oil tube 20. A transformer 29 is secured to the peripheral member 13 above the blast tube 19 and is provided with an insulator 30 extending into the blast tube, the terminals of the spark electrodes 28 being connected to the transformer 29 by means of conductor elements 31 extending into the insulator 30.

Fuel oil for combustion is supplied under pressure by means of an oil pump 32 connected with the conduit 26. The oil pump as here shown is secured by screws 33 to an annular member 34 which in turn is secured by screws 35 to a reinforcing ring 36, the ring being preferably welded to the side member 11 of the casing 10, as shown in Figure 2.

The annular member 34 is provided with air openings 37, and the side member 11 is provided with an aperture 38 within the ring 36. The drive shaft 39 for the pump 32 projects into the interior of the casing 10 through the aperture 38. Secured to the end of the shaft 39 is a U-shaped coupling member 40.

The side member 12 is formed with a large aperture 41 coaxial with the aperture 38, which is closed by a plate member 42 secured by screws 43 to the side member 12. A reinforcing ring 44 is welded to the member 42 and secured to it by means of screws 45 in a motor 46.

The shaft 47 of the motor 46 projects into the interior of the casing 10 through an opening 48 in the plate member 42. Removably secured to the shaft 47 by means of screw 49 is 60

a fan 49 of the center intake type. The other U-shaped coupling element 50 is secured to the end of the shaft 47 in interfitting relation with the element 40, as shown in Figure 2. The motor 46 thus drives the fan 49 and through the intermediary of the coupling comprised of elements 40 and 50, also drives the pump 32, the fan drawing in air through the opening 38.

By removing the screws 43, the motor 46, plate member 42 and fan 49 can be removed, the fan being withdrawn through the aperture 41, Figure 2a showing how this is accomplished.

The present invention has to do with the interior of the fan or plenum chamber, and, particularly, the scroll 51. In constructions heretofore known, the scroll of plenum chamber has always been a fixed member and formed an integral part of the casing. For a certain capacity oil burner the fan size was fixed and the scroll was correlated with that fan size, and for an oil burner of different capacity it was necessary to have a fan of different size, and in such case a different casing was necessary in which the scroll had to be correlated with that fan size. Obviously, therefore, in order for a manufacturer to merchandize a series of oil burners of varying capacities it was necessary to have a different casing for each capacity burner. In accordance with the present invention the necessity of providing a number of different casings for a series of different capacity burners has been obviated by providing the scroll 51 which will now be described in detail.

Referring to Figure 1, the scroll 51 is comprised of a sheet of spring metal mounted between the side members 11 and 12. The right end of the scroll 51, as viewed in Figure 1, is welded or otherwise suitably secured to angle members 52, or other suitable means, secured to the peripheral member 13 adjacent the blast tube 10, as shown in Figures 1 and 5. It then extends at an angle toward the fan 49 for a short distance and then upwardly in an arcuate shape to approximately the horizontal plane of the motor shaft 47 where it is welded to supporting brackets 53, or other suitable means, secured to the side members 11 and 12, as shown in Figures 1 and 4. These angular and arcuate portions are what may be termed the cut-off. From the supporting brackets 53, the scroll 51 extends around the fan 49 in curvilinear shape and terminates in a free end 51a, in spaced relation with respect to the secured end, below the fan 49.

The free end 51a is formed with a slot 54 which receives a cylindrical member 55 provided with shaft like extensions 56 extending beyond the edges of the slot 54 at the outer side of the scroll, as shown in Figures 1 and 3. The member 55 is rotatably held in position by strip-like bearing elements 57 surrounding the extensions 56 and welded to the scroll 51. Threadably extending through the cylindrical member 54 is a screw 58. The left end of the screw 58, as viewed in Figure 1, extends through an opening 59 in the angular portion 60 of the scroll 51 and abuts the left wall of the peripheral member 13, and the opposite end of the screw 58 extends through the right wall of the peripheral member 13. In order to prevent longitudinal travel of the screw 58 it is provided with a thrust collar 61 secured hereto to abut the inner surface of the right wall of member 13. The portion of the screw 58 extending through the member 13 is provided with a locking nut 62 threaded there-

on, and the end of the screw 58 is provided with slot 63.

It is to be noted that the scroll 51 is unsupported between the brackets 53 and screw 58, and accordingly, being of spring material, is free to flex. With the locking nut 62 threaded away from the peripheral member 13, the screw 58 may be rotated by inserting a screw driver in the slot 63 to move the free end 51a of the scroll from the position shown in solid outline in Figure 1 to the position shown in broken outline and vice versa. This of course flexes the scroll 51.

It will be noted that the scroll 51 in the latter position substantially closes the outlet of the fan into the chamber 64 therebelow which communicates with the blast tube 10.

The fan outlet is defined by the two side members 11 and 12, the angle portion 60 and the free end 51a of the scroll 51 and it will thus be observed that by being able to move the free end 51a of the scroll a fan outlet of variable size is provided, and the size of this outlet can be varied at will by rotating the screw 58, and, moreover, that the shape of the scroll 51 may be varied at will.

Many advantages flow from this construction. One advantage is that in a particular burner construction the installation or service man is enabled to obtain a much closer and more positive air adjustment setting than in constructions wherein the air control shutter or gate is at the intake side of the fan.

Another advantage is that it is not necessary for the manufacturer to manufacture and stock a number of different size casings in order to merchandize a line of burners of different capacities, because the casing will accommodate fans of different sizes and all that is necessary to be done to adapt the casing from one size fan to another is to adjust the screw 58 and thereby move the scroll 51 to the position suitable for the fan in question.

It is to be understood that various changes may be made in the construction shown and described without departing from the spirit and scope of the invention, as set forth in the appended claims.

What I claim is:

1. In an oil burning apparatus, an air supply casing having spaced apart walls, a curved scroll member within said casing and having a rigid cut-off portion and a resilient portion terminating in a free end spaced from said cut-off portion, a fan member within said scroll member and spaced therefrom, a rotatable element carried by said free end and having a threaded opening therein, and a longitudinally immovable screw member threaded in said opening for moving said flexible portion relative to said fan member to vary the curvature thereof.

2. In an oil burning apparatus, an air supply casing having spaced apart walls, a curved scroll member within said casing and having a rigid cut-off portion and a resilient portion terminating in a free end spaced from said cut-off portion, a fan member within said scroll member and spaced therefrom, a rotatable element carried by said free end and having a threaded opening therein, and a longitudinally immovable screw member threaded in said opening for moving said flexible portion relative to said fan member to vary the curvature thereof, said screw member extending through a wall of said casing for access exteriorly of said casing.

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