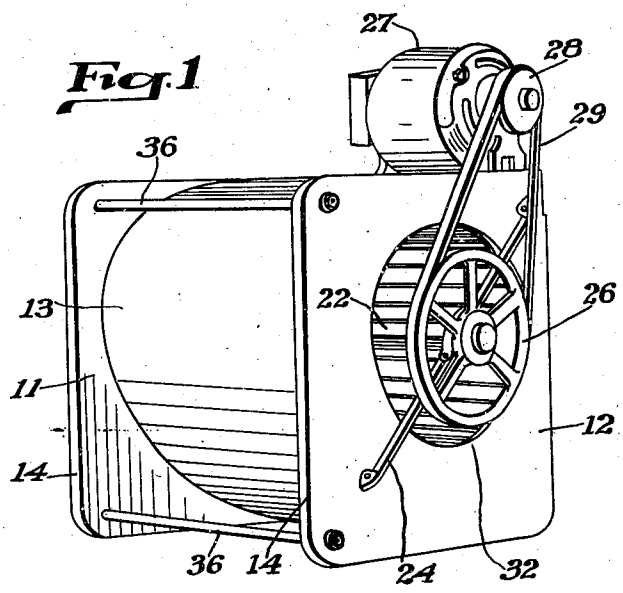
Sept. 20, 1949. G. L. SCHWARZ 2,482,519

SQUARE SIDED BLOWER

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Fig. 1



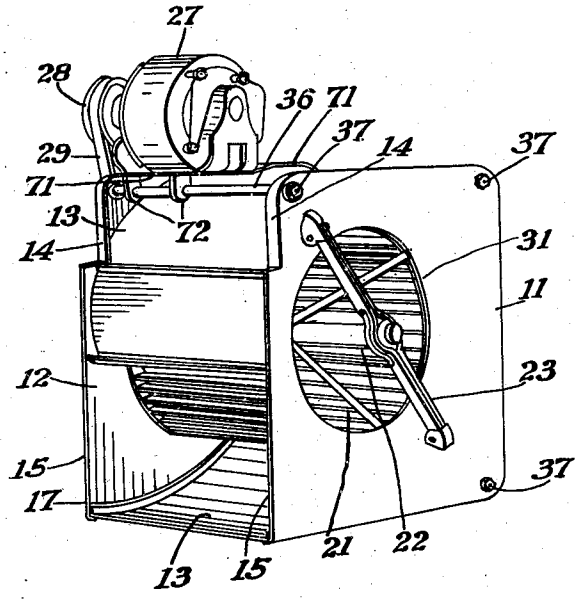


Fig. 2

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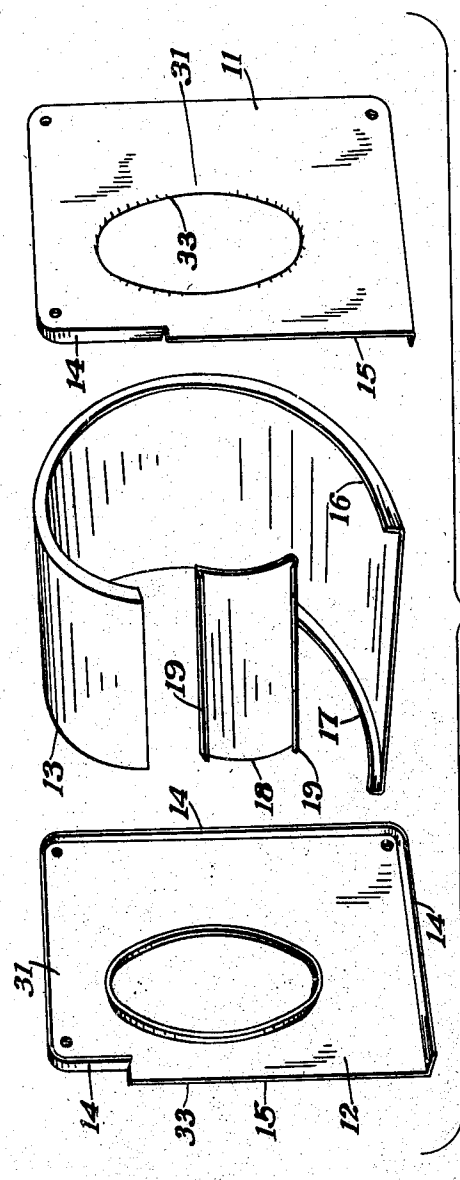


Fig. 3

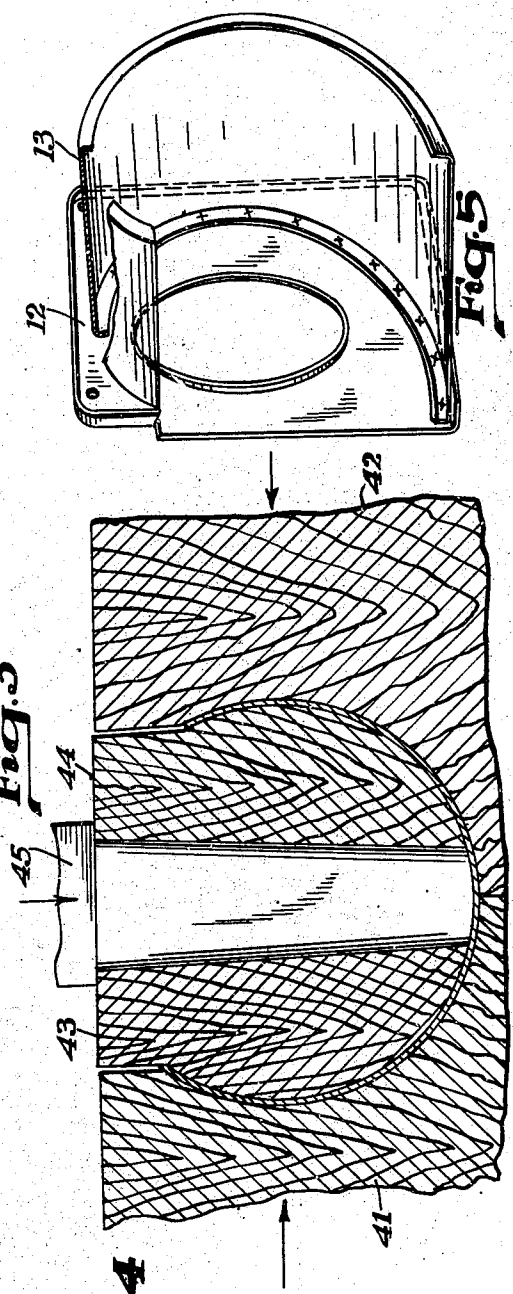


Fig. 5

Fig. 4

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SQUARE SIDED BLOWER

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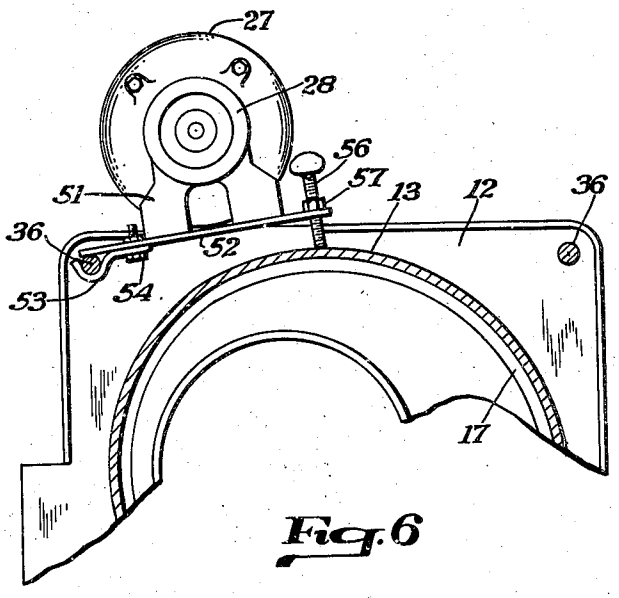


Fig. 6

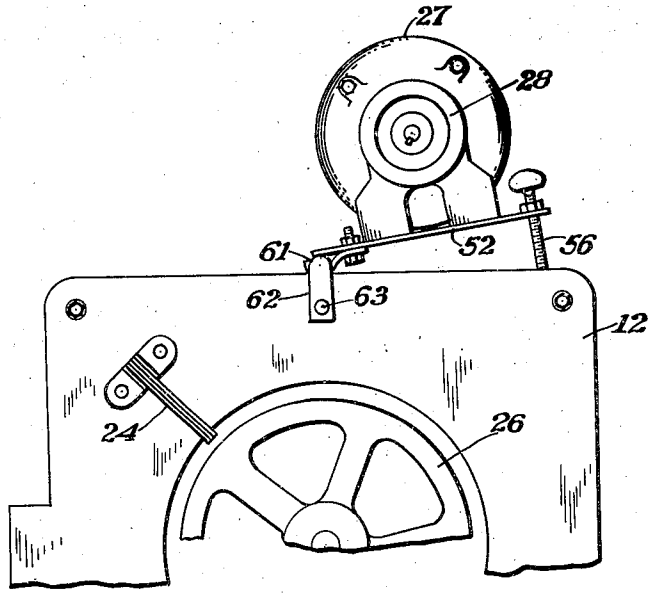


Fig. 7

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Patented Sept. 20, 1949 2,482,519

UNITED STATES PATENT OFFICE

2,482,519

SQUARE SIDED BLOWER

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Application July 19, 1947, Serial No. 762,188

6 Claims. (Cl. 230—133)

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This invention relates to centrifugal fans or blowers, and to driving arrangements therefor. More particularly, the invention is directed to the provision of a blower which is adapted to installation with equal facility with its discharge orifice in various orientations, and with means for mounting a drive motor thereon which may easily be adapted to various positions of the blower.

The invention is also directed to a blower casing which is simple to fabricate and may be formed for various characteristics such as pressure and volume of discharge without the use of a multiplicity of special dies, and to a method of fabricating the casing.

Among the objects of the invention are to provide a more versatile blower and motor assembly and a more flexible and economical method of production of blowers than have been known heretofore.

Referring to the drawings:

Fig. 1 is a perspective elevation view of one form of the invention;

Fig. 2 is a perspective elevation view taken from the opposite direction from Fig. 1;

Fig. 3 is a perspective exploded view of the components of the blower casing;

Fig. 4 is a sectional view of a forming die assembly illustrating a step in the preferred method of making the scroll;

Fig. 5 is a perspective view illustrating the assembly of the casing;

Fig. 6 is a partial elevation view, with parts in section, illustrating one form of motor mounting; and

Fig. 7 is a partial elevation view illustrating a second form of motor mounting.

The present application is a continuation-in-part of my copending application, Serial No. D-121,849, filed September 5, 1945.

Referring to Figs. 1 and 2, a blower according to the invention comprises rectangular end plates 11 and 12, which are mirror images of each other, and a scroll 13 extending between the end plates and welded to them. The end plates are flanged inwardly at 14 on three edges and a part of the fourth edge, the unflanged portion 15 forming part of the outlet of the blower. The scroll may be of any form calculated for the desired characteristics, ordinarily an Archimedean spiral, and is formed with inwardly-directed flanges 16 and 17 which are preferably spot-welded to the end plates. The outer end of the spiral engages the flange 14 at one corner of the end plates to form one side of the outlet. An arched cutoff plate 18 formed with flanges 19 along its straight edges is welded with one edge against the inner end of the spiral, its other edge constituting the other edge of the outlet. This cutoff plate may be proportioned as necessary to secure the desired size of outlet.

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An impeller 21 is mounted on a shaft 22 supported in bearing brackets 23 and 24 secured to the end plates 11 and 12. A pulley 26, which may be mounted on either end of the shaft 22, provides for driving the impeller from a motor 27 by means of the motor pulley 28 and belt 29.

The end plates are formed with eccentric circular air intake openings 31 and 32. Preferably the end plates are stiffened and the flow of air is improved by rounded inwardly-directed flanges 33 about the air intake openings.

Holes 34 are formed in the corners of the end plates except the corner at which the air outlet is located, these holes being provided for tie bolts or rods 36 with nuts 37 which strengthen the assembly and serve as part of the arrangement for mounting the motor 27.

The preferred forms of the end plates 11 and 12, the scroll 13, and the cutoff plate 18 may also be seen in Figs. 4 and 5 which illustrate two stages in the assembly of the blower. These elements may be fabricated in any desired manner; however, a feature of the invention is an improved and economical method of forming the scroll 13.

In this method, the scroll is made from a rectangular sheet of metal of appropriate size, which is first bent to form the flanges 16 and 17. The flanged sheet is then passed through bending rolls, one of which is grooved to accommodate the flanges, to shape it into a portion of a cylinder approximating its final curvature.

The scroll is bent to a spiral curvature in the set of dies illustrated in Fig. 4, which may be made of wood. The outer dies 41 and 42 are advanced toward each other, as indicated by the arrows, in any customary manner. The inner dies are made in three parts, and are either of such length as to fit within the flanges 16 and 17 or grooved to receive the flanges. The parts of the inner die are two members 43 and 44 with curved faces and a wedge 45, the lower end of which is formed as a section of the desired spiral, and which is forced between the members 43 and 44, as indicated by the arrow, by the action of the press.

After the forming operation, the scroll 13 is spot-welded to the end plates. The scroll has sufficient flexibility that the curvature may be modified in the assembly to accommodate variations in design of the blower within reasonable limits. To attain the desired curve, a template may be used, or selected points may be laid off on the end plates. It is therefore unnecessary to have a different set of expensive dies for each different scroll formula that may be desired. Figure 5 illustrates the scroll welded to the end plate 12. Addition of the other end plate, the cutoff plate, and the tie rods completes the casing as illustrated in Figs. 1 and 2.

The preferred modes of mounting the drive

motor 27 are illustrated in Figs. 6 and 7. The arrangement illustrated in Fig. 6 provides a very simple and flexible motor mounting which is adaptable to any orientation of the blower casing about the axis of the shaft 22. As illustrated in Fig. 6, the blower is set up for horizontal discharge with the outlet at the lower edge of the casing as in Fig. 2. The motor 27 is supported by a bracket 51 which may be of any form suitable to the particular motor selected and which is adapted to be secured by bolts or cap screws to a mounting plate 52 which is a flat plate of heavy gauge steel. One end of the plate 52 rests against the tie rod 36 and is held in position thereon by two clamps 53 secured to the mounting plate by bolts 54. A thumb screw 56 fitted in a tapped hole in the end of the plate 52 opposite the clamps 53 engages the scroll 13 or the flange of one end plate, and may be adjusted to obtain the desired tension of the belt 29. A jamb nut 57 on the thumb screw 56 retains it in adjustment.

It will be noted that this mounting is characterized by great simplicity and ease of attachment to the blower. The motor may be mounted in the position as shown when the blower is rotated 90° clockwise from the position shown in Fig. 6. If the blower is rotated 90° counterclockwise the motor may be mounted on either of the other tie rods 36, and if the blower is rotated 180° from the position shown in Fig. 6, the motor may be mounted on the tie rod diagonally opposite the one on which it is shown in Fig. 6. The pulley 26 may be mounted on either end of the shaft 22. The motor 27 may be reversed on the mounting plate 52 if desired, and the mounting plate may be clamped at either end of the tie rod for drive of the fan from either end as may be convenient in the particular installation.

Fig. 7 illustrates a modified form of motor mounting in which the plate 52 is clamped in the same manner as in Fig. 6 to a rod 61 parallel to the blower axis and extending from the center of one side of the end plate 11 to the end plate 12. The rod 61 may conveniently be a section of pipe flattened and bent down at the ends at 62 and secured by bolts or rivets 63 to the end plates. The thumb screw 56 is fitted in one corner of the plate 52 so as to bear against the in-turned flange of the end plate. Preferably both corners of the plate 52 are tapped so that the thumb screw 56 may be used against either of the flanges 14, depending upon the arrangement of the motor and pulleys. The rod 61 may be mounted on any side of the blower and the end plates may be drilled or punched for mounting the rod on any side.

Fig. 2 illustrates a form of motor mounting plate 71 which is similar in principle to the mounting plate 51, but is formed with ears 72 drilled to fit over a tie rod 36.

It will be seen that the square form of the end plates results in a blower adapted to mounting conveniently with the outlet in any direction. The construction of the blower is simple, requiring a minimum of special operations and tools, but results in a rigid structure and is inherently adapted to the production of blowers of different characteristics from standard components.

The methods of mounting the drive motor disclosed herein also facilitate the mounting of the blower in any position and with the drive at either end of the impeller shaft.

Although the foregoing description is necessarily of a detailed character, in order that the invention may be completely set forth, it is to be understood that the specific terminology is not intended to be restrictive or confining, and that various rearrangements of parts and modifications of detail may be resorted to without departing from the scope or spirit of the invention as herein claimed.

I claim:

1. A blower casing comprising a pair of opposed rectangular end plates flanged on three sides and part of the fourth side, and with flanged air intake openings, the flanges being directed toward the opposing plate and a scroll having inturned flanges lying against and welded to the end plates, the ends of the scroll being disposed against the ends of the marginal flanges of the end plates.

2. A blower casing comprising a pair of opposed rectangular end plates flanged inwardly on three sides and part of the fourth side, and with air intake openings; a scroll having inturned flanges lying against and welded to the end plates, one end of the scroll being disposed against the marginal flanges of the end plates.

3. A blower casing comprising a pair of opposed rectangular end plates flanged on three sides and part of the fourth side, and with flanged air intake openings, the flanges being directed toward the opposing plate; a scroll having inturned flanges lying against and welded to the end plates, the outer end of the scroll being disposed against the marginal flanges of the end plates, and a cutoff plate mounted between the end plates adjacent the inner end of the scroll.

4. A blower casing comprising a pair of opposed rectangular end plates flanged on three sides and part of the fourth side, and with flanged air intake openings, the flanges being directed toward the opposing plate; a scroll having inturned flanges lying against and welded to the end plates, the ends of the scroll being disposed against the marginal flanges of the end plates, and tie rods joining opposed corners of the end plates.

5. A blower casing comprising a pair of opposed rectangular end plates with marginal flanges, the flanges being directed toward the opposing plate, and a scroll plate extending between the end plates and welded thereto, the scroll plate being in abutting relation to the flange of each end plate at at least one point.

6. A blower casing comprising a pair of opposed rectangular end plates with marginal flanges, the flanges being directed toward the opposing plate, and a scroll plate, with an inwardly directed flange, extending between the end plates and welded thereto, the scroll plate being in abutting relation to the flange of each end plate at at least one point.

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