

Aug. 23, 1932.

G. R. GOLDTHWAITE

1,873,386

FAN CASING AND METHOD OF ASSEMBLING THE SAME

Filed April 11, 1929

2 Sheets-Sheet 1

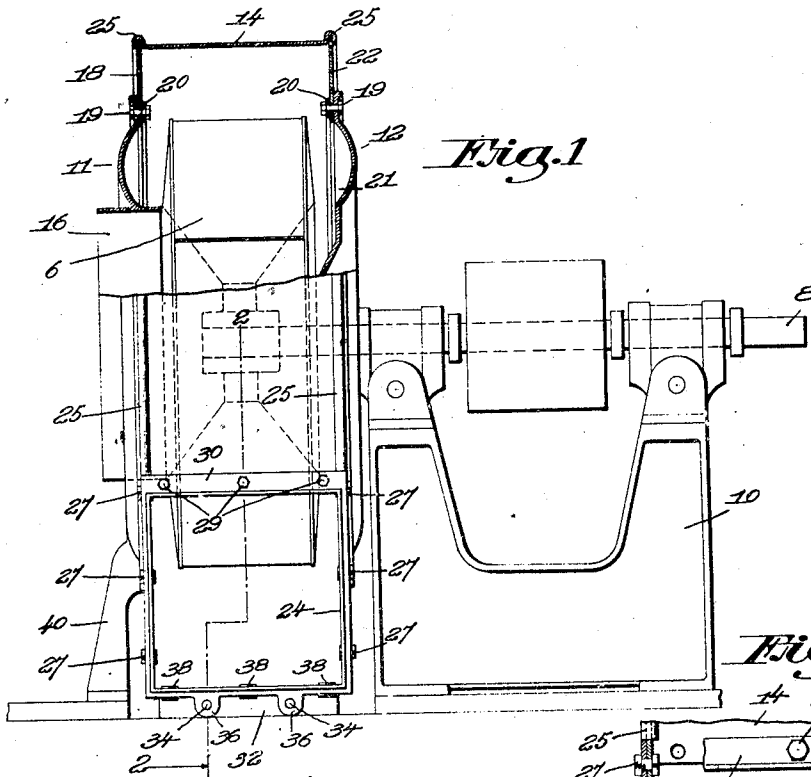


Fig. 1

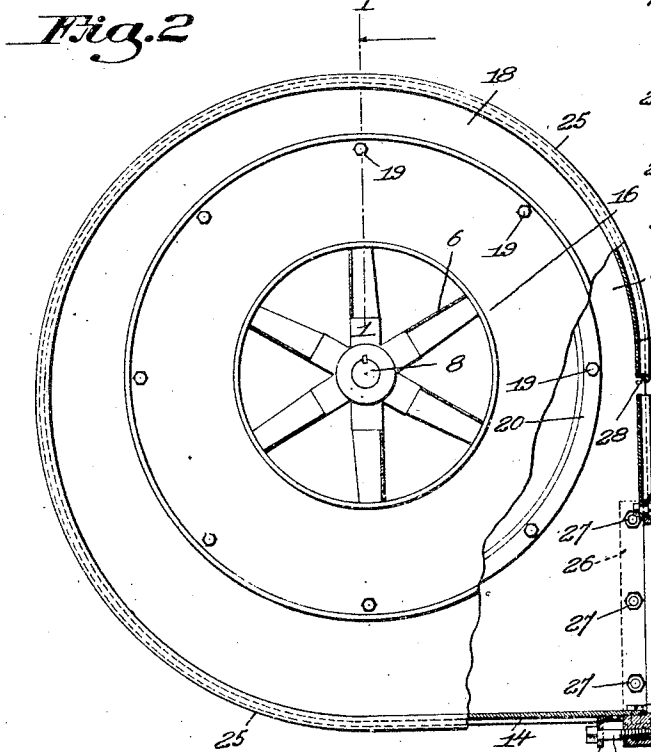


Fig. 2

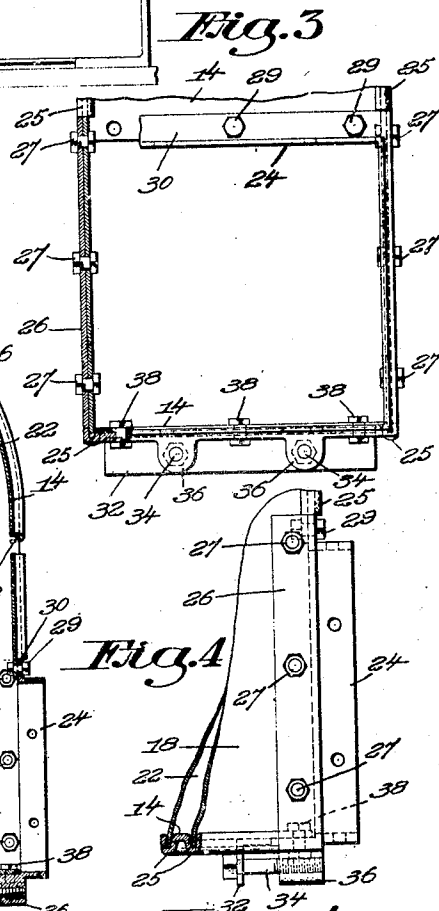


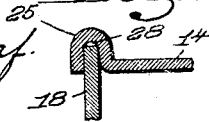
Fig. 3

Fig. 4

Fig. 5

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Fig. 7

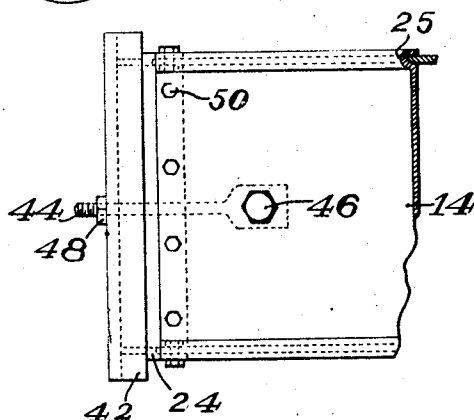


Fig. 8

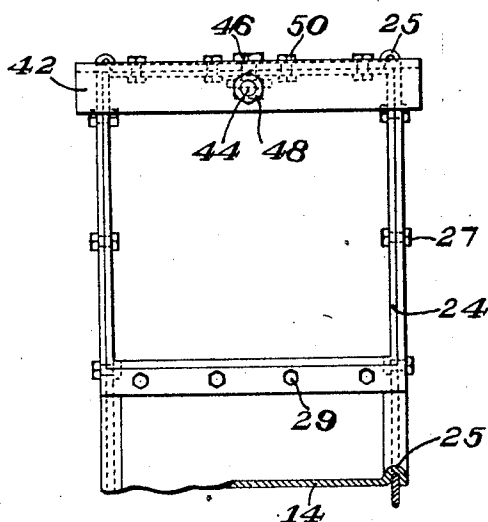


Fig. 9

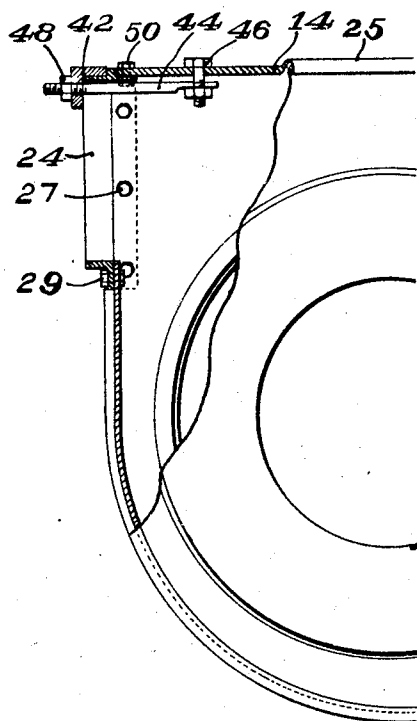
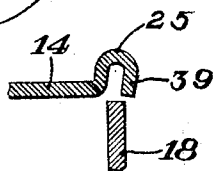


Fig. 6



Witness

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UNITED STATES PATENT OFFICE

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FAN CASING AND METHOD OF ASSEMBLING THE SAME

Application filed April 11, 1929. Serial No. 354,431.

The present invention relates to fan casings and methods of assembling the same.

The objects of the present invention are to provide a simple, inexpensive, and easily constructed fan casing and a method of assembling the same, whereby the casing may be quickly assembled and readily taken apart for repair or removal of old or worn parts.

With these objects in view, the present invention consists in the casing for centrifugal fans and method of assembling the same hereinafter described and particularly defined in the claim.

In the accompanying drawings Fig. 1 is a front elevation, partly in section on line 1—1 of Fig. 2, of a centrifugal fan embodying one form of casing of the present invention; Fig. 2 is a side elevation partly in section on line 2—2 of Fig. 1; Fig. 3 is a detail front elevation, partly in section, of the outlet portion of the casing; Fig. 4 is an enlarged sectional detail view illustrating the manner of assembling the parts; Fig. 5 is an enlarged detail sectional view of a portion of the assembled side plate and roundabout; Fig. 6 is a corresponding view of the same parts before assembling; and Figs. 7, 8 and 9 are top plan, front elevation, and side elevation, partly in section, showing an alternative method of assembling the parts.

The present invention as herein illustrated and described, comprises a casing for a centrifugal fan, which casing comprises two side plates together with a peripheral closure or roundabout engaging with the side plates and closing the periphery of the casing except at the outlet. The roundabout is conveniently of sheet metal construction and is formed in such a manner that it makes an air tight closure for the side plates and requires fastening or securing means at its ends only. This is accomplished by forming each edge of the roundabout with a bead having a groove for the reception of the side plate and by providing suitable means at the ends of the roundabout for securing such ends in position. Preferably the casing itself is provided with means for drawing or exerting a peripheral tensile stress on the roundabout

to cause the side plates to be firmly seated within the grooved beads, although if desired the device or fixture may be temporarily applied to the casing for this purpose.

Referring to the drawings, and particularly to Figs. 1 to 6, the invention comprises a centrifugal fan having a wheel or rotor 6 of any usual or preferred form which is rotated from a shaft 8 mounted on a suitable pedestal 10. The wheel is enclosed within a casing which comprises side plates indicated generally at 11 and 12 surrounded by a roundabout 14. The inlet side plate 11 comprises a central casting 16 having a central opening for admission of air and an external sheet metal plate 18 which is secured to the casting 16 by a plurality of bolts 19 and the ring 20. The side plate 12 comprises a casting 21 to which is bolted in similar manner an annular sheet metal plate 22 identical with the plate 18. Secured to the side plates is an outlet piece 24 consisting of a frame-like rectangular casting which has side flanges 26 secured by bolts 27 to the side plates 18 and 22 of the casing. The outlet piece constitutes a support or connecting member for the side plates of the roundabout.

The roundabout 14 is of sheet metal and is provided at the edges with beads 25 which form grooves 28 for the reception of the side pieces 18 and 22. The upper end of the roundabout is secured by bolts 29 to the transverse vertical flange 30 of the outlet piece and the other end of the roundabout is similarly secured to the bottom of the outlet piece. In the construction shown in Figs. 1 to 4 inclusive, the fan casing itself is permanently provided with means for exerting a peripheral tensile stress on the roundabout in order that the side plates may be firmly seated in the grooved beads. To this end an angle iron 32 is secured by brazing or welding to the roundabout at a point near its lower end. A pair of bolts 34 extend through openings in the angle piece and are threaded into the depending ears 36 formed integral with the outlet casing. Tightening of the bolts 34 draws peripherally on the roundabout, thereby seating the latter firmly on the side plates. It will be seen that owing to the convergence of the side

walls of the grooves 28 by virtue of their curvature as shown in Fig. 5, the beads of the roundabout will be firmly wedged upon the side plates as the drawing operation is performed. The roundabout has near its lower end a plurality of holes which are adapted to register with holes in the bottom inner flange of the outlet piece when the roundabout has been drawn into its proper position, the parts then being securely fastened together by bolts 38. These bolts 38 and the bolts 34 at the lower end of the roundabout, and the bolts 29 at the upper end insure rigid maintenance of the roundabout upon the side plates of the casing.

Preferably the bead of the roundabout will be formed as shown in Fig. 6, with the outer wall 39 inclined inwardly from the bottom of the groove toward the outer peripheral edge so that this outer wall is held in close contact with the outer face of the side plate when the parts are in assembled relation.

The fan may be supported in any desired manner, indicated generally by a pedestal 40 secured to the inlet side of the casing.

In the alternative construction shown in Figs. 7 to 9, instead of the fan casing comprising as a permanent part the means for exerting peripheral tensile stress on the roundabout in order to seat the side plates firmly in the groove beads, a device or fixture is temporarily applied to the casing for drawing and holding the roundabout upon the side plates until the securing bolts are inserted, after which the appliance or fixture is removed for use in assembling another casing.

This appliance or fixture comprises the angle bar 42 adapted to rest across and upon one end of the outlet of the casing. Through this bar at its middle is passed the threaded end of the bolt 44 the inner end of which is temporarily secured by means of the bolt 46 to the roundabout. By means of the nut 48 on the threaded end of the bolt the roundabout may be drawn to seat the edges of the side plates firmly in the grooves of the bead, at the same time bringing the holes for the bolts 50 into register. The bolts may now be inserted and the nuts applied and tightened, thus holding the roundabout under peripheral stress imparted to it by the fixture, with the parts in their permanent relative positions.

The tightening nut 48 may then be removed, the angle bar 42 taken off and the bolts 44 and 46 detached from the roundabout, ready to be used in the assembling of another casing. If desired, the bolt hole left in the roundabout by the removal of the bolt 46 may be closed by a short bolt and nut.

Where the fan is used as a material handling fan, the roundabout is subjected to the most wear because of the impact of the material handled. Where gritty or abrasive sub-

stances are passed through the fan, its wear is rapid, and even with light and soft material such as cotton frequent replacements of the roundabout are required.

Fans for such use will preferably be constructed as shown in Figs. 1 to 4, with the tightening means permanently forming a part of the casing itself, thus enabling replacement of the roundabout in an easy and expeditious manner. Where the fan is used solely for handling air or other gas which is free from foreign material so that replacement of the roundabout is seldom, if ever required, the casing shown in Figs. 7 to 9 may advantageously be employed.

In both forms of casing the roundabout being made of sheet metal is inexpensive to construct, and its mode of attachment to the casing is an operation which is simple and readily performed. In assembling the casing the side plates are first secured to the outlet casting. The roundabout is then positioned on the side plates and one end attached to the outlet casting by bolts 29. The other end is then drawn up by means of the bolts 34 if the construction is that illustrated in Figs. 1 to 4, or by the bolt 44 if the construction is that illustrated in Figs. 7 to 9, meanwhile hammering or otherwise working the roundabout at different points to insure its firm seating at all points on the side plates, after which the end is secured by bolts 38, and the angle bar and tightening bolts, if used, are removed. The beaded edges which lend strength and rigidity to the entire casing do not interfere with the slight bending which is necessary for sliding the roundabout over the side plates of the casing.

Having thus described the invention, what is claimed is:

A fan casing comprising side plates, a sheet metal roundabout provided at its edges with beads forming grooves within which the edges of the side plates are received, tension devices including a draft bolt to exert peripheral stress on the roundabout to seat the side plates firmly in the grooves of the roundabout, and securing bolts adjacent the end of the roundabout for securing the roundabout in position.

In testimony whereof I have signed my name to this specification.

GEORGE R. GOLDTHWAITE.