

Sept. 18, 1945.

H. MORRISON

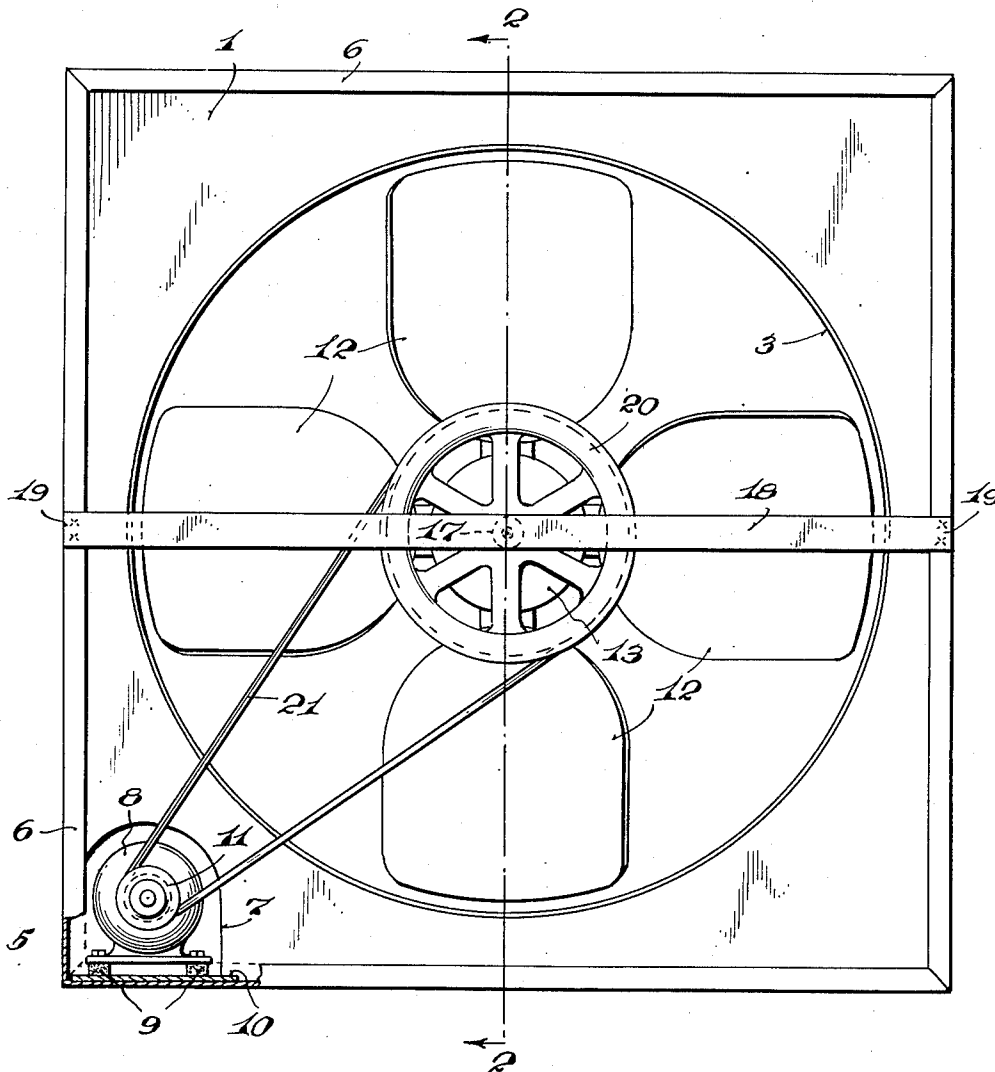
2,385,152

VENTILATING OR EXHAUST FAN

Filed Sept. 8, 1944

2 Sheets-Sheet 1

Fig. 1



Inventor
Hackley Morrison,
By Stone, Boyden & Mack,
Attorneys

Sept. 18, 1945.

H. MORRISON

2,385,152

VENTILATING OR EXHAUST FAN

Filed Sept. 8, 1944

2 Sheets-Sheet 2

Fig. 2

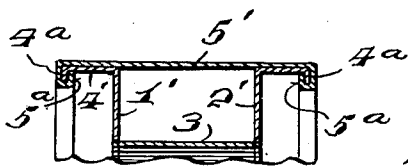
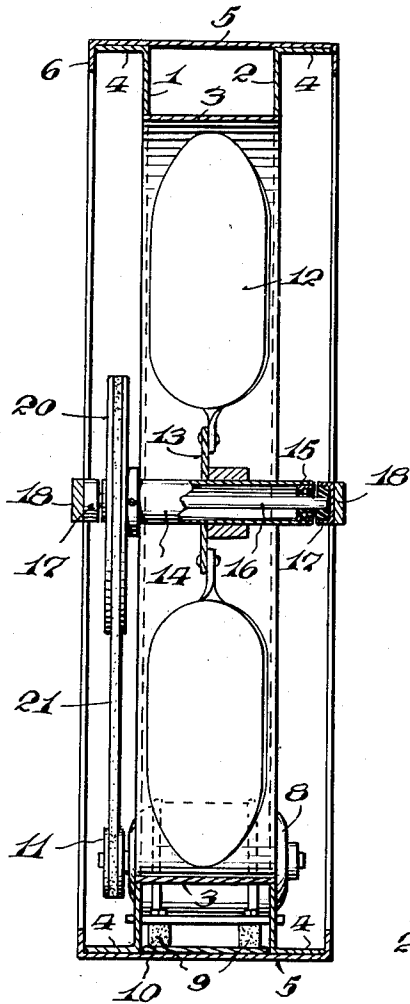


Fig. 3

Fig. 4

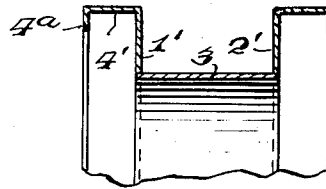


Fig. 5

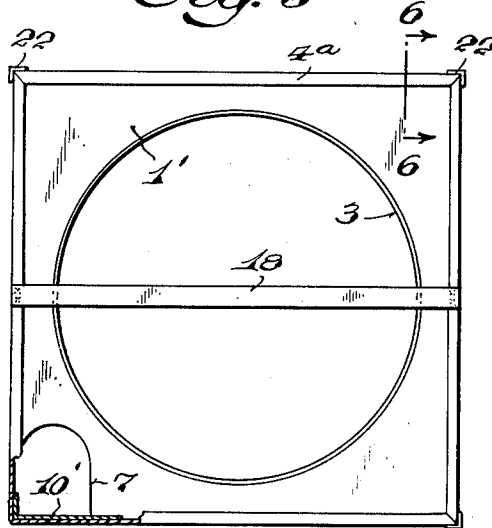


Fig. 7

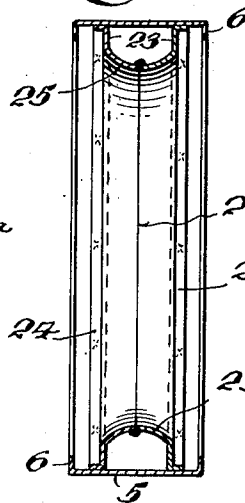
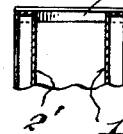


Fig. 6



Inventor
Hackley Morrison,
by
Stone, Boyden & Mack,

Attorneys.

UNITED STATES PATENT OFFICE

2,385,152

VENTILATING OR EXHAUST FAN

Hackley Morrison, Houston, Tex., assignor to Tex-
fan Company, Houston, Tex., a copartnership
composed of himself and Hackley Morrison, Jr.

Application September 8, 1944, Serial No. 553,253

8 Claims. (Cl. 230-259)

This invention relates to fans, and more particularly to ventilating or exhaust fans.

It has long been common practice to mount a fan of this character in a rectangular frame and to set such a frame in the wall of a building, or in a window opening, so that the fan will serve to cause a flow of air outwardly, thus producing a circulation of air within the building.

It has also been the common practice to drive a fan of this character by a belt, from a motor mounted in one corner of the frame.

The general object of the present invention is to provide a construction of frame which shall be stronger and more rigid than those heretofore proposed and in which the fans can operate at higher speeds and with less vibration.

In order that the invention may be readily understood, reference is had to the accompanying drawings, forming part of this specification, and illustrating several possible embodiments of the invention, in which drawings:

Fig. 1 is an elevation of one of my improved frames with a ventilating fan mounted therein.

Fig. 2 is a transverse section on the line 2-2 thereof, looking in the direction of the arrows.

Fig. 3 is a fragmentary sectional view similar to Fig. 2, but showing a slightly modified construction.

Fig. 4 is a similar view showing a still further modified construction.

Fig. 5 is an elevation, on a reduced scale, showing a frame construction in accordance with the details illustrated in Fig. 4, parts being in section.

Fig. 6 is a transverse section on line 6-6 of Fig. 5, looking in the direction of the arrows, and

Fig. 7 is a transverse section similar to Fig. 2, but on a smaller scale, and with fan omitted, showing a still further modified construction of frame.

Referring to the drawings in detail, and more particularly first to Figs. 1 and 2 thereof, my improved frame structure comprises a pair of rectangular plates 1 and 2, having circular openings formed in them slightly larger than the diameter of the fan.

These plates 1 and 2 are spaced apart a substantial distance, as shown in Fig. 2, and are united around their inner edges by means of a tubular or cylindrical member 3. Throughout this specification and claims the plates 1 and 2 will be referred to as "baffles" or "baffle plates" and the tubular member 3 will be designated as a "funnel."

These baffles and funnel may be constructed of plywood or of fibreboard, but in Figs. 1 and 2 I

have shown them as made of sheet metal. Thus they may be united by soldering, welding or crimping.

The baffle plates 1 and 2 are surrounded by a rectangular rim 5, also shown as formed of sheet metal, this rim having its edges bent inwardly to form flanges 6. The outer edges of the baffle plates are shown as bent over to form peripheral outturned flanges 4 which project laterally beyond the plane thereof. They are in close contact with the rim 5, and which may be secured thereto as by spot welding or other suitable means.

At one corner, shown as the lower left hand corner in Fig. 1, the baffle plates 1 and 2 are cut-away, as at 7, to form an opening for the reception of an electric motor 8. This motor is preferably supported on rubber mounts 9, which in turn rest upon a re-inforcing plate 10 secured to the inside of the frame 5 adjacent the corner. A suitable belt pulley 11 is secured to the shaft of the motor 8.

A fan, shown as comprising four blades 12, secured to a suitable spider 13, is rigidly mounted on a hub or hollow shaft 14, journaled by means of ball bearings 15 on a fixed, stationary shaft 16, the ends of which are set in rubber blocks held in cups or sockets 17. These cups or sockets 17 are in turn welded, or otherwise secured, to cross bars 18, fastened, as by welding, to the flanges 6 of the rim 5, as indicated at 19.

A belt pulley 20 is also rigidly secured to the hub or hollow shaft 14, and a suitable belt 21 passes around the pulleys 11 and 20. By this means the fan is driven by the motor 8.

By reference to Fig. 2, it will be observed that the funnel 3 is preferably of such width as to accommodate the fan blades 12, and that the pulleys 11 and 20 and all other parts of the unit lie wholly within the space occupied by the frame as defined by the side edges of the rim 5.

By the use of a pair of spaced baffle plates as shown, tied together at their inner edges by the funnel 3 and at their outer edges by the rim 5, I provide an exceptionally strong and rigid frame structure, well braced against distortion and resistant to vibration and to strains due to the belt drive.

Instead of constructing the baffles as shown in Fig. 2, I may employ the design illustrated in Fig. 3, in which baffles 1' and 2' are provided at their margins with outturned flanges 4' which are turned inwardly at their peripheries, as indicated at 4a. A rim 5' then has its edges crimped over the flange 4a, as shown at 5a. In this case no spot welding or other additional securing means is required.

In Figs. 4, 5 and 6, I have shown a further modified construction in which no separate outer rim is employed. In this construction the baffles 1' and 2' are formed in a manner similar to that shown in Fig. 3, namely with inturned flanges 4a at the outer edges of the outwardly projecting marginal flanges 4' thereof, these flanges themselves constituting the equivalent of a rim. These baffle plates are united at their center by the funnel 3, as before, but are tied together at their outer edges by means of angle irons 22 located at three of the corners as shown and welded or otherwise secured to the flanges 4'. At the fourth corner, where the motor is located, the baffles are tied together by a special reinforcing plate 10', which serves as a support on which the motor is mounted, as in Figs. 1 and 2.

Finally, in Fig. 7, I have shown a still further modified construction. In this construction the baffle plates 23 have outturned marginal flanges 24, similar to the flanges 4 of Fig. 2, but the funnel is made in two halves, each half being formed integral with its respective baffle plate, by die-stamping. The meeting edges of the two halves of the funnel are then united as by flash welding, as indicated at 26, and the baffle plates, thus assembled, may be enclosed within a rim 5, as in Fig. 2.

It will be observed that in the construction shown in Fig. 7, the funnel is illustrated as of curved cross section, instead of being cylindrical as in the other figures. Such a cross section has some advantages in facilitating a smooth flow of the stream of air.

Thus, while I have illustrated several different forms of construction, it will be seen in every case that my improved frame comprises a pair of spaced baffle plates united at their inner edges by means of a funnel and rigidly tied together at their outer edges, thus producing an exceptionally strong and vibration-proof structure.

What I claim is:

1. A supporting structure for ventilating fans and the like comprising a pair of rectangular baffle plates disposed in spaced, parallel relation and having central registering openings, a funnel formed integral with said baffle plates around the edges of said openings, and a rim surrounding and rigidly uniting the outer edges of said baffle plates, said rim forming a permanent part of said structure and the side edges of said rim projecting laterally beyond the plane of said baffle plates.

2. A ventilating fan comprising a rectangular frame including a pair of baffle plates disposed in spaced, parallel relation and having central, registering openings, a funnel connecting the edges of said openings, means rigidly uniting the outer edges of said baffle plates, a fan mounted to rotate within said funnel, said baffle plates being cut away adjacent one corner to provide an opening, a motor mounted on said frame within said opening, and belt gearing between said fan and motor.

3. A ventilating fan comprising a rectangular structure including a pair of baffle plates disposed in spaced, parallel relation and having central, registering openings, a funnel connecting the edges of said openings, means rigidly uniting the outer edges of said baffle plates, a fan mounted to rotate within said funnel, said baffle plates being cut away adjacent one corner to provide an opening, a motor mounted on said structure within said opening, and belt gearing between said fan and motor, all parts of said motor and gearing lying within the space defined by the side edges of said rectangular structure.

4. A supporting frame for ventilating fans and the like comprising a pair of baffle plates disposed in spaced, parallel relation and having central registering openings, and a funnel connecting the edges of said openings, the side portions of said frame projecting laterally beyond the planes of said baffle plates, and the outer edges of said laterally projecting portions having inturned peripheral flanges spaced a substantial distance from the planes of said baffle plates.

5. A supporting frame for ventilating fans and the like comprising a pair of rectangular baffle plates disposed in spaced, parallel relation and having central circular registering openings, a funnel connecting the edges of said openings, both of said baffle plates having marginal outturned flanges around substantially their entire peripheries projecting laterally beyond the plane thereof, and means forming a permanent part of said frame rigidly uniting said flanges, at least at all of the corners.

6. A supporting frame for ventilating fans and the like comprising a funnel to receive the fan, a pair of spaced, parallel baffle plates surrounding said funnel and having registering circular openings to the edges of which said funnel is connected around substantially its entire circumference, the side edges of said frame projecting laterally beyond and spaced from the planes of said baffle plates at all points.

7. A ventilating fan comprising a rectangular frame including a pair of baffle plates disposed in spaced, parallel relation and having central, registering openings, a funnel connecting the edges of said openings, a rim enclosing the margins of said baffle plates and permanently secured thereto, the side edges of said rim projecting laterally beyond the plane of said baffle plates, a fan adapted to rotate within said funnel, and means outside and wholly independent of said funnel for supporting said fan.

8. A ventilating fan comprising a rectangular frame including a pair of baffle plates disposed in spaced, parallel relation and having central, registering openings, a funnel connecting the edges of said openings, a fan mounted to rotate within said funnel, and a motor operatively connected with said fan to drive the same, said motor being supported by said frame at a point wholly outside of said funnel.

HACKLEY MORRISON.