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T. S. PUKERUD

EXHAUST OR CIRCULATING FAN

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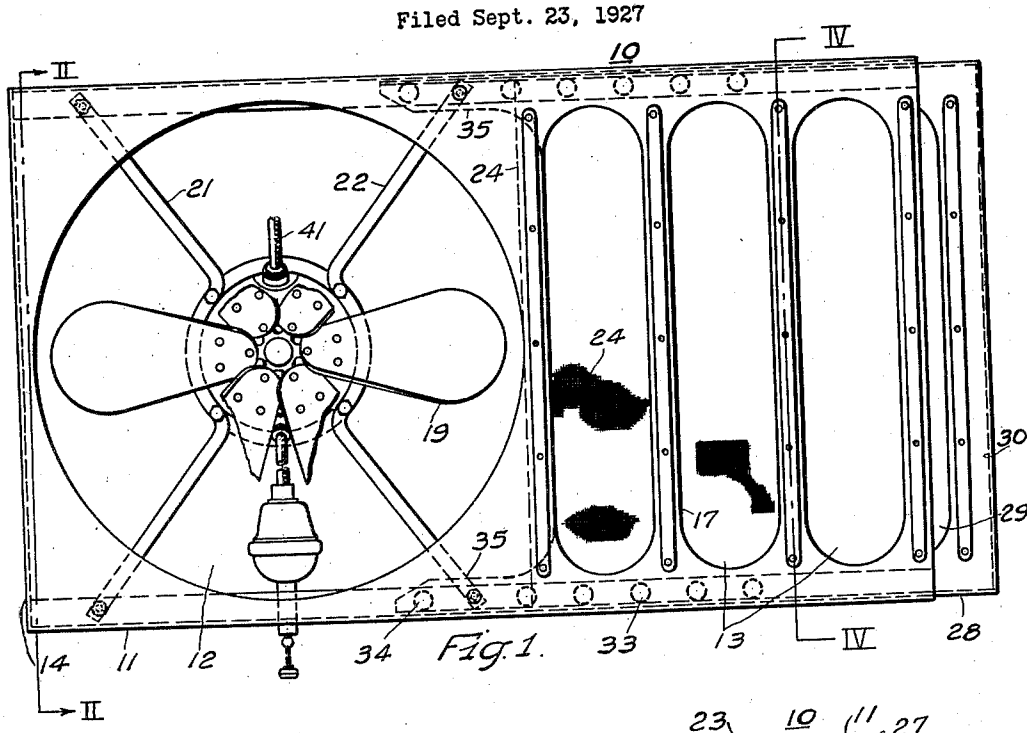

Fig. 1.

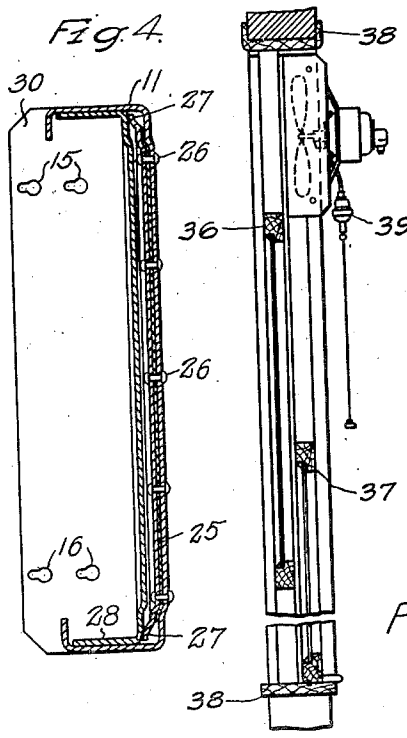

Fig. 4.

Fig. 3

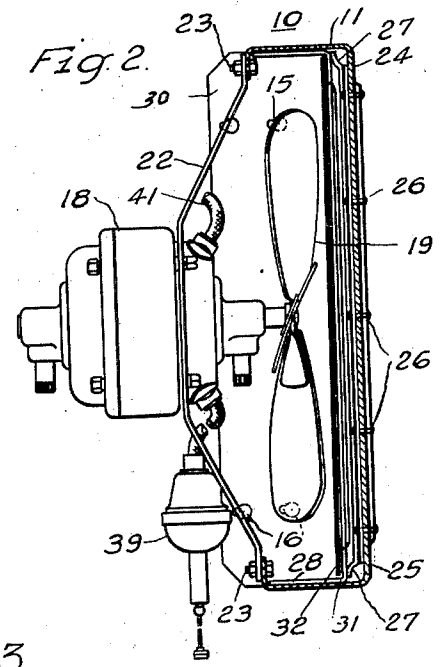

Fig. 2.

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UNITED STATES PATENT OFFICE.

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EXHAUST OR CIRCULATING FAN.

Application filed September 23, 1927. Serial No. 221,421.

My invention relates to motor-driven fans and particularly to kitchen exhaust or circulating fans.

An object of my invention is to provide a relatively simple, light and easily adjustable supporting structure for a fan adapted to be mounted in a window frame.

In practicing my invention, I provide two interfitting and longitudinally adjustable metal frames, each of substantially channel-shape in lateral section, one frame having an opening therein and a motor-driven fan located opposite to the opening and supported by a pair of bars extending across the frame. A resilient metal sheet is secured to the outer frame to yieldingly hold the inner frame in a predetermined position laterally of the outer frame.

In the single sheet of drawings,

Figure 1 is a view, in front elevation, of a device embodying my invention,

Fig. 2 is a view, partially in end elevation and partially in lateral section on the line II—II of Fig. 1, of a device embodying my invention,

Fig. 3 is a view of a device embodying my invention, shown as installed in a window frame, and

Fig. 4 is a view in lateral section, taken on the line IV—IV of Fig. 1, of a device embodying my invention.

The device embodying my invention is more particularly applicable for use in kitchens, either in homes or in restaurants, and is designed to permit of being easily and quickly mounted in proper operative position in a window frame, the upper window sash having been lowered a proper amount. It is designed also to permit of fitting within window frames of different widths.

A supporting frame 10 comprises a metal frame 11, of relatively thin sheet metal which is bent to overhung channel-shape, as shown more particularly in Fig. 2 of the drawings. The member 11 is provided with a substantially circular opening 12 located adjacent to one end of the member and with a plurality of laterally extending openings 13 located adjacent to the other end of the member. The end of the member 11 at which the opening 12 is located is provided with an integral bent-over end portion 14. Openings 15 and 16 are located therein adjacent to the upper and the lower edges, through which suitable securing means may extend, as will be hereinafter set forth. Relatively narrow strips of metal are left between the spaced openings 13 and these strips may be provided with embossed portions 17 in order to stiffen the otherwise relatively weak member. The opening 12 is made of any suitable or desired size to conform to the size of standard fan motor such, for example, as one of a 10 inch or a 12 inch size.

A fan motor assembly comprises a motor 18 having a blade assembly 19 mounted on the shaft thereof. The fan motor may be a substantially standard device save for the usual supporting means which, in this case, is omitted.

Supporting means for the motor-driven fan embodies two resilient cross-bars 21 and 22 which are substantially identical in shape and in construction. Each of the bars 21 and 22 has its intermediate portion curved to arcuate form, as shown more particularly in Fig. 1 of the drawings, the degree of curvature of this portion being such as will cause it to conform to the casing of the motor 18. A plurality of openings are provided in this portion through which the bolts holding the motor together may extend, as shown more particularly in Fig. 2 of the drawings.

The end portions of the respective bars 21 and 22 are provided with holes, through which securing bolts 23 having nuts thereon may extend in order to bolt the ends of the bars to the overhung end portions of the member 11 of overhung channel shape.

A sheet 24 of transparent material, such as a coated wire cloth, is so located within the member 11 as to cover the openings 13.

A mat or strip 25 of relatively thin sheet metal is located with one surface in close operative engagement with the outer surface of the member 24 and is held against this and secured to the member 11 by a plurality of rivets 26. The length of the member 25 is such as to extend from one end of the member 11 across the openings 13 and slightly therebeyond, openings being provided therein to correspond to the openings 13. The upper and lower edges of the member 25 are bent outwardly, as indicated at 27 in Fig. 2

of the drawings, for a purpose to be hereinafter set forth.

An inner member 28, also of substantially channel shape in lateral section, is located within the outer member 11 and is provided with a plurality of openings 29 similar in shape and dimension to the openings 13. A coated wire cloth 31 is provided to cover these openings and a sheet-metal mat 32 is provided which, however, is substantially plane and has openings therein corresponding, in size and location, to the openings 29. The member 32 is secured to the intermediate portion of the member 28 by rivets, as was hereinbefore explained in connection with the member 25.

The member 28 is bent over, at its outer end, to constitute a supporting end portion 30 similar to the portion 14 of the member 11. Suitable openings are provided in the portion 30 to receive supporting screws.

Spaced openings 33 are provided in the intermediate portion of the member 11, adjacent to the top and the bottom thereof, and an opening 34 is provided in lateral extensions 35 of the member 28. The member 28 is longitudinally movable within the member 11 and may be held in any predetermined position by suitable securing means, such as a cotter pin or some similar means well known in the art, extending through the registering openings.

As it is desired to provide a relatively light supporting structure, I have adopted the device shown in the drawings and hereinbefore described, whereby it is possible to fit a fan assembly of this kind into a kitchen window, even though it be any one of a number of standard widths or into any kind of frame having an opening therein corresponding to the shape and dimensions of the frame 10.

I have shown the structure mounted in a window frame in Fig. 3 of the drawings, the upper window being indicated by 36, the lower window by 37 and the frame of the window by 38. Suitable securing screws or nails may be provided in the frame 38, adjacent to the top of the frame and in proper position to fit either the front or the rear hole 15 hereinbefore described and so that the upper edge of the frame abuts the lower edge of the support of the frame of the window.

The front of the member 11 must be so located that the upper window 35 may be closed whenever it is necessary or desirable to do so, in which case, of course, the fan will not be operated.

In order to reduce noise and transmited vibrations caused by slight unbalances in the fan or in the motor structure, I have found it desirable to bend the bars 21 and 22 outwardly, as shown in Fig. 2 of the drawings, as this provides a resilient supporting member.

In order to prevent lateral movement or vibration of the inner member 28 in the outer member 11, I bend the edges 27 of the member 25 outwardly, as was hereinbefore described, in order to press the member 28 away from the front of the member 11 so that the edges of the bent-over portions at the rear of the member 28 will operatively engage the bentover portions at the rear of the member 11, as shown more particularly in Fig. 2 of the drawings.

I provide a pull switch 39 for the motor and I provide, also, a supply-circuit conductor 41 which may be provided with the usual extension cord and plug in order to permit of connecting the motor to a suitable source of electric energy.

The device embodying my invention thus provides a relatively simple light-weight sheet-metal frame embodying two members interfitting with each other and adapted relatively for longitudinal adjustment.

One of the members of channel shape is provided with an opening opposite to which a motor-driven fan is located, mounted on resilient supporting bars. The inner member of channel shape is pressed laterally of the outer member in order to yieldingly hold it tightly within the outer member.

A device of this kind may be easily and quickly installed and removed, as may be desirable and necessary, and will not require the removal or a change in either window of the usual double-window frame. A fan of this kind may, of course, be used for circulating air, by mounting it in a suitable frame built in an air conduit.

Since various modifications may be made in the device embodying my invention without departing from the spirit and scope thereof, I desire that only such limitations shall be placed thereon as are imposed by the prior art or are set forth in the appended claims.

I claim as my invention:

1. In an exhaust fan, the combination with a sheet-metal frame of substantially overhung channel-shape in lateral section and having an opening adjacent to one end thereof and a plurality of openings adjacent to the other end thereof, a second sheet-metal frame of channel shape in lateral section slidable within said first frame, a transparent sheet covering said plurality of openings, and a metal sheet having a plurality of openings therein secured to said first frame to hold the transparent sheet thereagainst, the metal sheet having out-turned upper and lower edges operatively engaging the second frame to resiliently clamp the same.

2. In an exhaust fan, the combination with a motor-driven fan, of a fan support comprising a sheet-metal frame of overhung channel-shape in lateral section, a second sheet-metal frame of channel-shape in lateral section interfitting with said first frame, and a resilient metal sheet secured to said first frame and operatively engaging said second frame for yieldingly holding said second frame in a prede-

termined position laterally of said first frame.

3. In an exhaust fan, the combination with a motor-driven fan, of a fan support comprising a pair of interfittitng sheet metal frames severally of substantially channel-shape in lateral section, and resilient means secured to one of said frames for yieldingly holding the other frame firmly within said first frame and for preventing lateral movement of one frame within the other.

In testimony whereof, I have hereunto subscribed my name this 19th day of September, 1927.

THOMAS S. PUKERUD.