Oct. 7, 1941. T. HESS ET AL 2,258,325

COMBINATION FAN GUARD AND MOTOR MOUNTING

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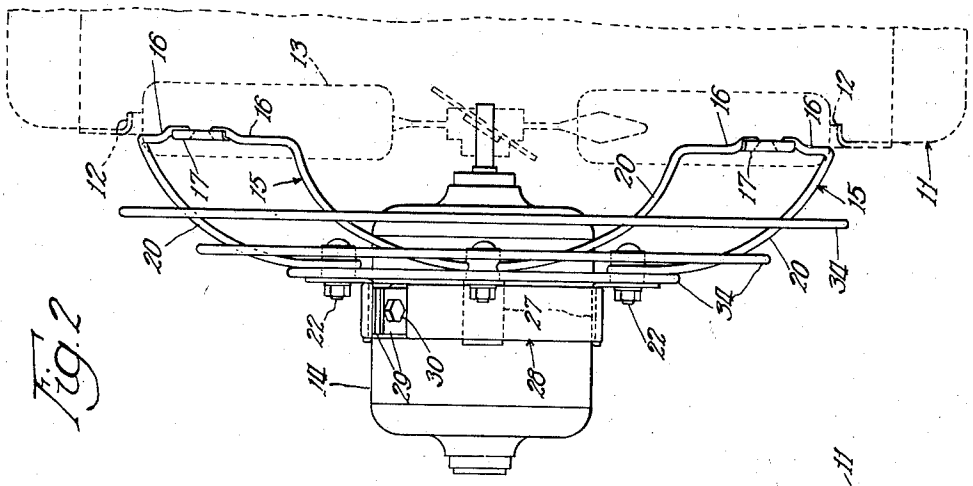


Fig. 2

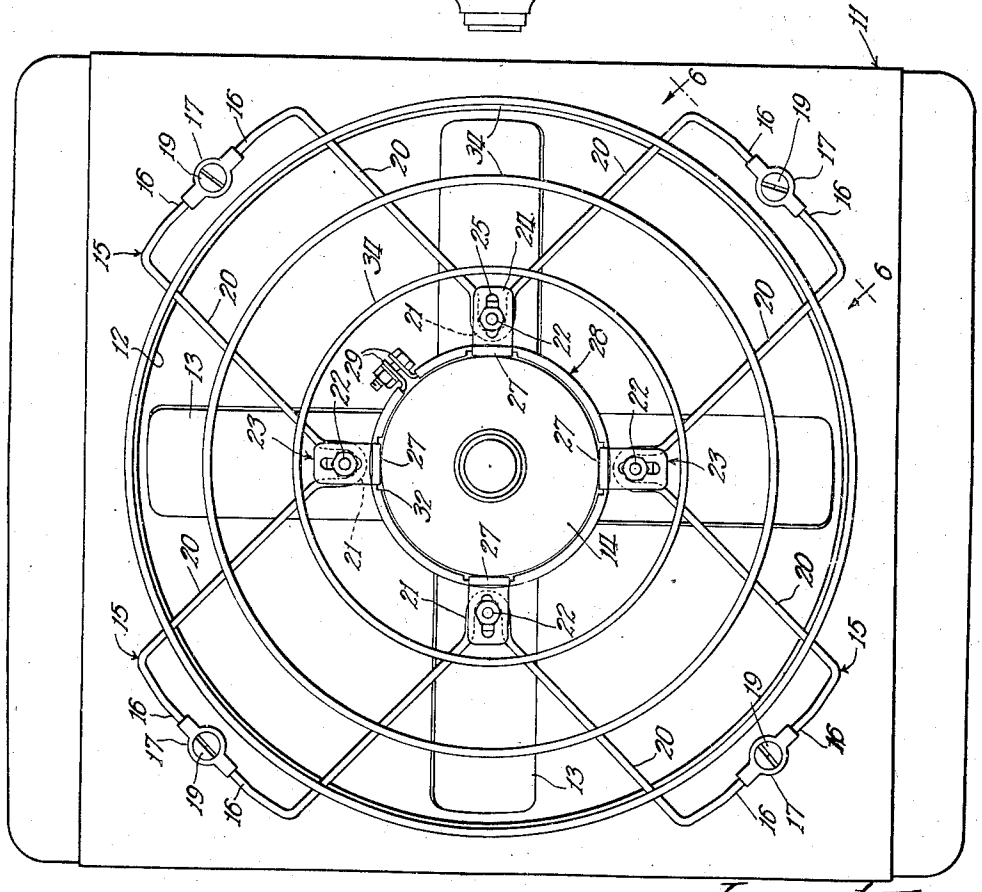


Fig. 1

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Fig. 3

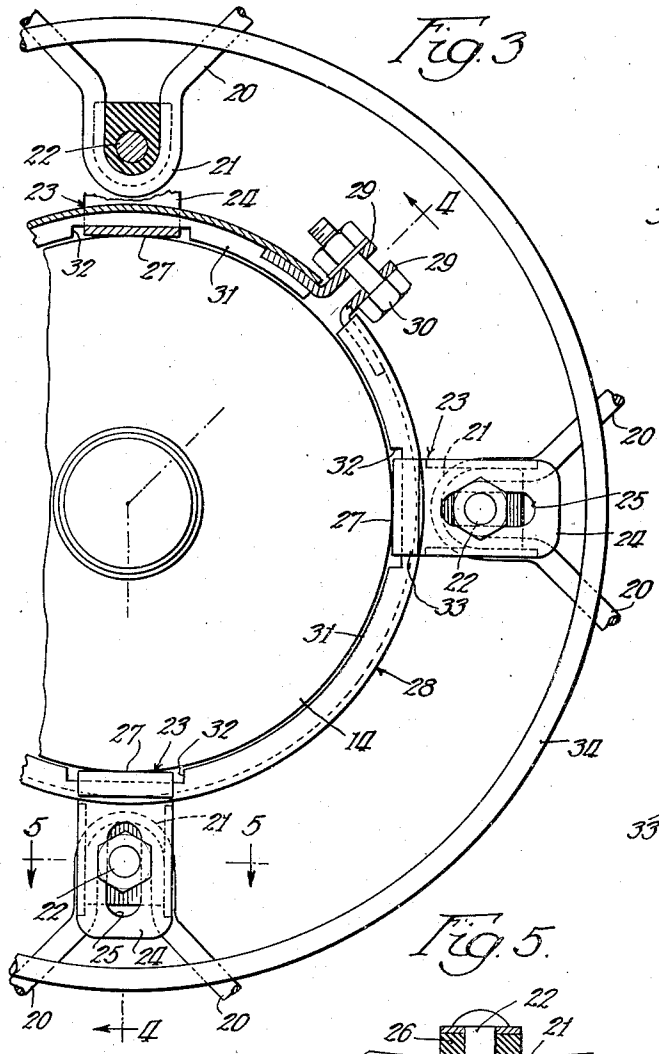


Fig. 4.

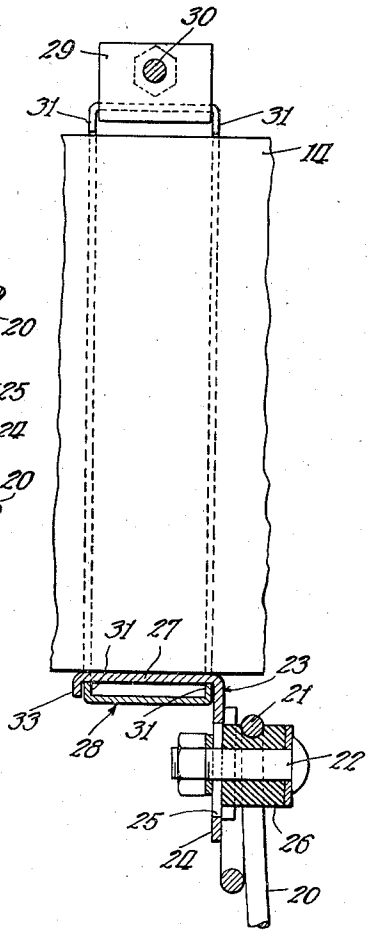


Fig. 5.

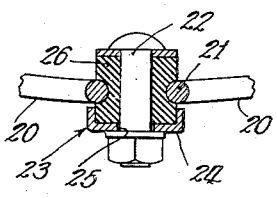
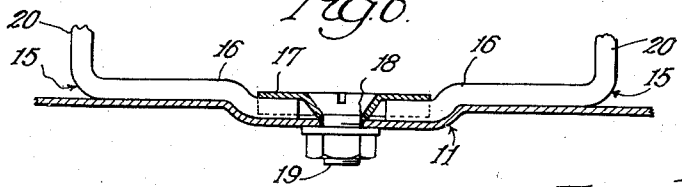


Fig. 6.



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UNITED STATES PATENT OFFICE

2,258,325

COMBINATION FAN GUARD AND MOTOR MOUNTING

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10 Claims. (Cl. 230—273)

This invention relates to a combined fan guard and fan motor mounting, and is particularly well adapted for use in unit heaters and the like, wherein it is desirable to protect one's person from coming in contact with the blades of the fan.

One object of the present invention is to provide a novel construction and arrangement wherein an efficient guard is provided to protect persons from coming in contact with the blades of the fan, and also to provide a suitable support for the motor employed for driving the fan.

Another object of the invention is to provide a novel arrangement whereby motors having a wide range of casing or frame sizes may be supported and secured in the fan guard without changes in the dimensions or construction of the guard.

Another object of the invention is to provide a novel construction whereby a motor and fan operatively related thereto may be mounted in and adjusted or shifted relatively to the fan guard and mounting in a manner to properly position or center the fan with respect to an opening, for example, in the device on which the guard is mounted, and whereby the fan and motor may be secured in such adjusted position.

A further object of the invention is to provide a device of the class described, which is efficient in its operation, of pleasing appearance and is economical to manufacture.

A still further object of the invention is to improve devices of the character described in sundry details hereinafter referred to and particularly pointed out in the appended claims.

One embodiment of the present invention is shown for illustrative purposes in the accompanying drawings, in which:

Fig. 1 is a rear elevational view of a unit heater housing having a fan and motor operatively related thereto, and illustrating my improved fan guard and motor support in connection therewith;

Fig. 2 is a side elevational view of the structure illustrated in Fig. 1;

Fig. 3 is an enlarged fragmentary rear elevational view, partly in section, of a portion of the structure illustrated in Fig. 1;

Fig. 4 is a sectional elevational view of the structure illustrated in Fig. 3, and taken substantially as indicated by the line 4—4 thereof;

Fig. 5 is a sectional plan view taken substantially as indicated by the line 5—5 of Fig. 3; and

Fig. 6 is an enlarged fragmentary sectional view taken substantially as indicated by the line 6—6 of Fig. 1.

The illustrative embodiment of the present invention is shown in the drawings as applied to a type of unit heater or other heat exchange device including a housing indicated, as a whole, by the numeral 11, said housing having an opening 12 therein, in which a fan 13 is positioned for circulating air through the housing, as is common practice in such devices, the fan 13 being operatively related to and adapted to be driven by a motor 14 suitably connected to a source of electrical current supply.

For protecting one's person from coming in contact with the blades of the fan 13, and for providing a suitable and convenient mounting for the motor 14, the present invention, as shown in the present instance, comprises a plurality of annularly spaced frames, each indicated as a whole by the numeral 15 and positioned adjacent the opening 12 of the housing 11, the said frames being, preferably, of substantially V-shape, and having the adjacent free end portions 16 of adjacent frames 15 connected by soldering, spot welding or other suitable means to a clip or connector 17 shown, in the present instance, as provided with an aperture 18 adapted to receive a bolt 19, or the like, by which the connected frames 15 and clip 17 may be secured to the housing 11, as clearly illustrated in Fig. 6.

The respective frames 15 are provided with inwardly extending arms 20 connected together adjacent their inner ends by radially extending substantially U-shaped portions 21 adapted to receive bolts 22, by which annularly spaced L-shaped brackets, each indicated as a whole by the numeral 23, are adjustably secured to the U-shaped portions 21 of the frames 15.

As clearly illustrated in Figs. 3 and 4, the respective brackets 23 are provided with radially extending leg portions 24 having elongated apertures 25 formed therein adapted to receive the bolts 22 in a manner to provide for additional adjustment of the brackets 23 with respect to the U-shaped portions 21 of the frames 15, and, by reference particularly to Figs. 4 and 5, it will be noted that resilient blocks 26 formed, preferably, of rubber or the like, are positioned between the bolts 22 and the U-shaped portion 21 for absorbing motor vibrations and preventing transmission thereof to the frames 15 and the housing 11.

For suitably positioning the motor 14 in operative position, the brackets 23 are provided, respectively, with substantially parallel legs 27

adapted to engage the motor 14 at annularly spaced points around the periphery thereof, as clearly illustrated in Figs. 1 to 4, inclusive, and for securing the motor 14 to the brackets 23, a split clamping ring, indicated as a whole by the numeral 28, is provided and adapted to surround the motor 14 and to engage the outer sides of legs 27 of the brackets 23, the clamping ring 28 being provided adjacent its ends with laterally extending portions 29 adapted to receive a bolt and nut connection 30 by which the legs 27 of the brackets 23 may be clamped securely against the sides or periphery of the motor 14.

By reference to Figs. 3 and 4, it will be observed that the clamping ring 28 is shown, in the present instance, as of relatively shallow substantially U-shaped cross-section having flanges 31 adjacent its longitudinal edge portions, and that the flanges 31 are provided with elongated notches or recesses 32 of substantially greater length than the width of the legs 27 of the brackets 23, and are adapted to receive the respective legs 27 in the respective recesses 32, the legs 27 being provided adjacent their ends with laterally extending portions 33 (Fig. 4) for retaining the ring 28 against relative displacement longitudinally of the legs 27.

By reason of the split clamping ring 28, the adjustability of the brackets 23 with respect to the U-shaped portions 21, and the relatively greater length of the recesses 32 in relation to the width of the legs 27 of the brackets 23, it will be apparent that motors of various diametrical dimensions may be employed and readily secured to the supporting frames 15, and that the motors may be shifted laterally to facilitate proper positioning or centering of the fan 13 with respect to the opening 12 in the housing 11.

For providing further protection against one's person coming in contact with the fan 13, the present structure is shown, in the present instance, as provided with a plurality of radially spaced, preferably annular guard members 34 mounted on the arms 20 of the frames 15 and secured thereto as by soldering, spot welding or other suitable means.

It will be observed from the foregoing description that the present invention provides a novel construction and arrangement whereby efficient protection against contact with the fan blades is obtained, and wherein a suitable support for the fan motor is provided, also that the present invention is readily adaptable to the use of motors having a wide range of casing or frame sizes, and also permits of relative adjustment of the motor and its support for properly positioning or centering the fan with respect to an opening or the like.

Obviously, the present invention is not limited to the precise construction and arrangement shown and described, as the same may be variously modified. Moreover, all the features of the invention need not be used conjointly as the same may be used to advantage in variously different combinations and subcombinations.

What we claim as new and desire to secure by Letters Patent is:

1. In a device of the class described, the combination with a housing having an opening therein, a fan in said opening and a motor for said fan, of a plurality of supporting frames mounted on said housing adjacent said opening and having inwardly extending arm portions forming annularly spaced junctures adjacent their inner ends, a clamping ring adapted to receive a fan motor casing, a plurality of radially extending brackets operatively related to said ring and adjustably connected, respectively, to the junctures of said arms, and a plurality of guard members adjacent said arms between the inner and outer end portions thereof.

2. In a device of the class described, the combination with a housing having an opening therein, a fan in said opening and a motor for said fan, of a plurality of supporting frames mounted on said housing adjacent said opening and having inwardly extending arm portions forming annularly spaced junctures adjacent their inner ends, a clamping ring adapted to receive a fan motor casing, a plurality of L-shaped brackets having leg portions positioned between said ring and casing and having radially extending leg portions adjustably connected, respectively, to the junctures of said arms, and guard members on said arms between the inner and outer ends thereof.

3. In a device of the class described, the combination with a housing having an opening therein, a fan in said opening and a motor for said fan, of a plurality of supporting frames mounted on said housing adjacent said opening and having inwardly extending arm portions forming annularly spaced junctures adjacent their inner ends, a clamping ring adapted to receive a fan motor casing and having a plurality of elongated annularly spaced recesses formed in said ring, a plurality of L-shaped brackets having leg portions positioned in said recesses between said ring and casing and having radially extending leg portions adjustably connected, respectively, to the junctures of said arms, and guard members on said arms between the inner and outer ends thereof.

4. In a device of the class described, the combination with a housing having an opening therein, a fan in said opening and a motor for said fan, of a plurality of supporting frames mounted on said housing adjacent said opening and having inwardly extending arm portions forming annularly spaced junctures adjacent their inner ends, a clamping ring adapted to receive a fan motor casing and having a plurality of elongated annularly spaced recesses formed in said ring, a plurality of L-shaped brackets having leg portions positioned in and movable with respect to said recesses between said ring and casing, said brackets having radially extending leg portions connected, respectively, to the junctures of said arms and radially adjustable with respect thereto, and guard members on said arms between the inner and outer ends thereof.

5. In a device of the class described, the combination with a housing having an opening therein, a fan in said opening and a motor for said fan, of a plurality of V-shaped supporting frames mounted on said housing adjacent said opening, said frames having arm portions connected adjacent their inner ends to form a plurality of radially extending U-shaped portions, a clamping ring adapted to receive said motor and having a plurality of elongated recesses formed in said ring, a plurality of L-shaped brackets having leg portions of lesser width than the length of said recesses and positioned therein, said brackets having radially extending leg portions adjustably secured to said U-shaped portions of said frames and guard members operatively related to said arms adjacent the opening in said housing.

6. In a device of the class described, the combination with a housing having an opening there-

in, a fan in said opening and a motor for said fan, of a plurality of V-shaped supporting frames adjacent said opening, means for securing adjacent free end portions of adjacent frames to said housing, said frames having arm portions connected adjacent their inner ends to form a plurality of radially extending U-shaped portions, a clamping ring adapted to receive said motor and having a plurality of elongated recesses formed in the inner side of said ring, a plurality of L-shaped brackets having leg portions of lesser width than the length of said recesses and positioned therein between said ring and motor, said brackets having radially extending leg portions adjustably secured to said U-shaped portions and said frames, and guard members operatively related to said arms adjacent the opening in said housing.

7. In a device of the class described, the combination with a housing having an opening therein, a fan in said opening and a motor for said fan, of a plurality of V-shaped supporting frames positioned annularly around and adjacent said opening, means for securing adjacent free end portions of adjacent frames to said housing, said frames having arm portions connected adjacent their inner ends to form a plurality of annularly spaced radially extending U-shaped portions, a clamping ring adapted to receive said motor and having a plurality of elongated annularly spaced recesses formed in the inner side of said ring, a plurality of L-shaped brackets having leg portions of lesser width than the length of said recesses and positioned therein between said ring and motor, said brackets having radially extending leg portions provided with elongated apertures therein, fastening means in said apertures and operatively related to said U-shaped portions for adjustably securing the brackets thereto, and guard members on said arms adjacent the opening in said housing.

8. In a device of the class described, the combination with a housing having an opening therein, a fan in said opening and a motor for said fan, of a plurality of supporting frames mounted on said housing adjacent said opening and having inwardly extending arm portions forming a juncture adjacent their inner ends, an annular clamping member adapted to receive a fan motor casing, radially disposed leg portions operatively related to said clamping member and motor casing in a manner to be secured therebetween, means for adjustably securing said leg portions to the respective junctures of said arms, cushioning means adjacent and operatively related to said supporting frames for absorbing motor vibrations, and guard members adjacent said arms between the inner and outer end portions thereof.

9. In a device of the class described, the combination with a housing having an opening therein, a fan in said opening and a motor for said fan, of a plurality of supporting frames mounted on said housing adjacent said opening and having inwardly extending arm portions forming annularly spaced junctures adjacent their inner ends, a clamping ring adapted to receive a fan motor casing and having a plurality of elongated annularly spaced recesses formed in said ring, a plurality of L-shaped brackets having leg portions positioned in said recesses between said ring and casing and having radially extending leg portions adjustably connected, respectively, to the junctures of said arms, annularly spaced, resilient cushioning means adjacent and operatively related to said supporting frames for absorbing vibrations of the motor, and guard members on said arms between the inner and outer ends thereof.

10. In a device of the class described, the combination with a housing having an opening therein, a fan in said opening and a motor for said fan, of a plurality of supporting frames mounted on said housing adjacent said opening and having inwardly extending arm portions forming annularly spaced junctures adjacent their inner ends, a clamping ring adapted to receive a fan motor casing, a plurality of L-shaped brackets having leg portions positioned between said ring and casing and having radially extending leg portions adjustably connected, respectively, to the junctures of said arms, resilient cushioning means positioned between the respective radially extending leg portions of said brackets and the junctures of said inwardly extending arm portions for absorbing motor vibrations, and guard members on said arms between the inner and outer ends thereof.

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