United States Patent

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[54] **UNIVERSAL FAN MOUNT AND FAN**
14 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **416/247,** 248/16
[51] **Int. Cl.** **F04d 29/64**
[50] **Field of Search** 248/16, 14, 15, 18, 26; 416/247

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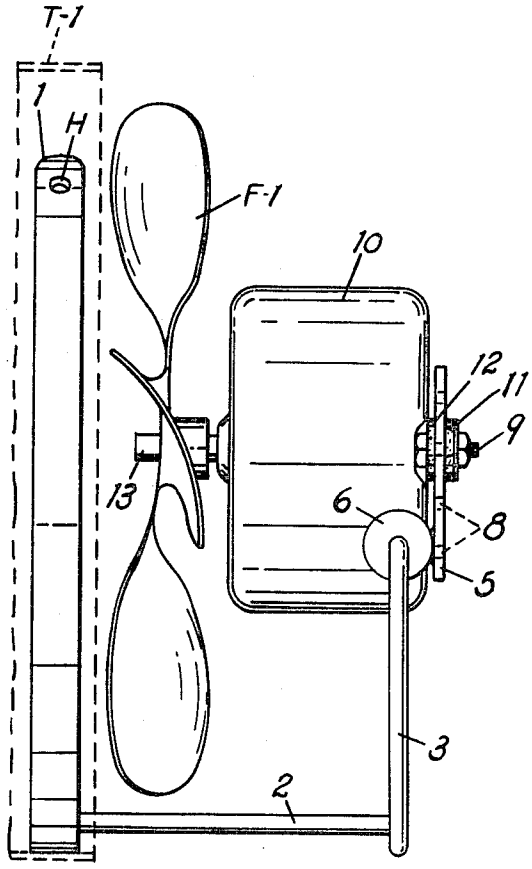
ABSTRACT: A segmental arcuate ring springable to varying diameters has two parallel rods secured near its center and extending axially of the arc of the ring. An arcuate yoke is secured to the opposite ends of the rods and extends generally parallel to ring to two spaced motor mounts. One form of the mounts is two inwardly turned and aligned pintles. Each pintle carries an angularly adjustable mounting block, and the mounting blocks each carry a mounting plate swingable about the axes of the pintles. The mounting plates have plural holes for mounting a fan motor with the axis of the motor and a fan driven thereby at different distances from the axes of the pintles, including coincident intersecting relation of the fan axis to the axes of the pintles. A modified form shows nonpivotable motor mounts directly on ends of a yoke formed from a single rod with a center section folded upon itself and extending axially to abutted connection to a similarly bent rod forming the segmental arcuate ring.



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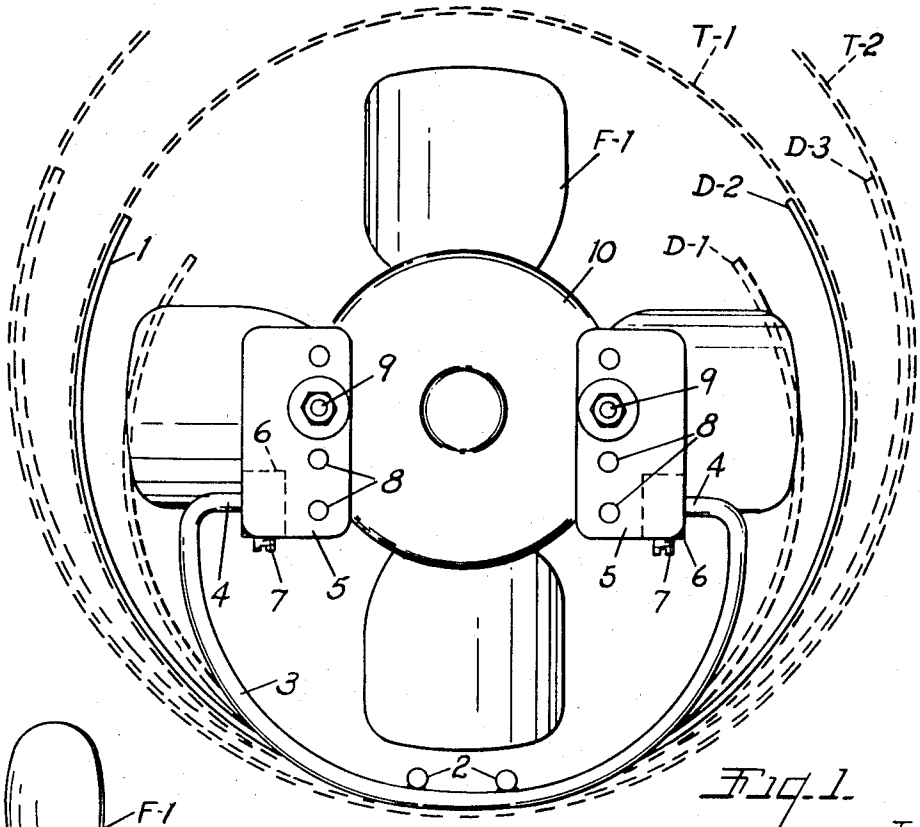

Fig. 1

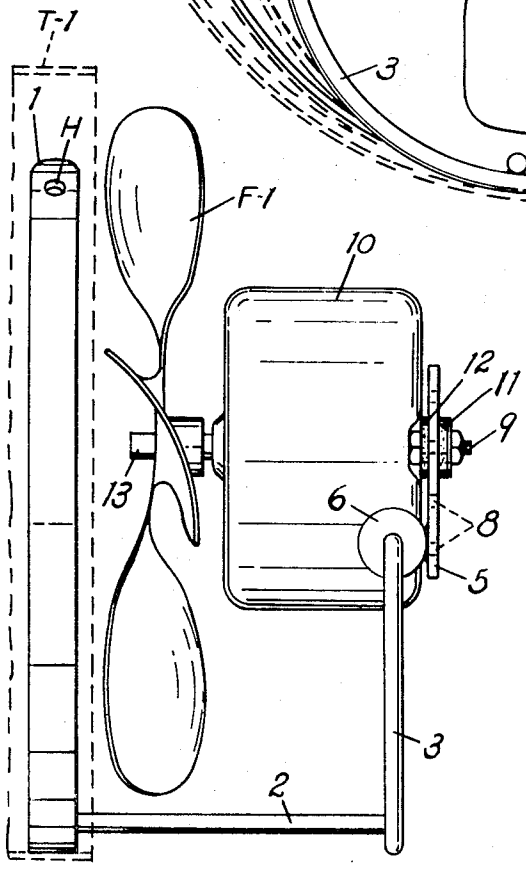

Fig. 2

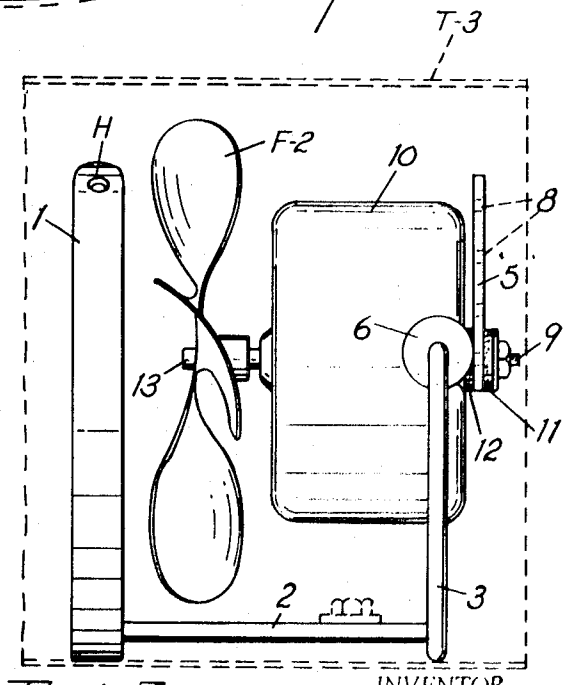

Fig. 3

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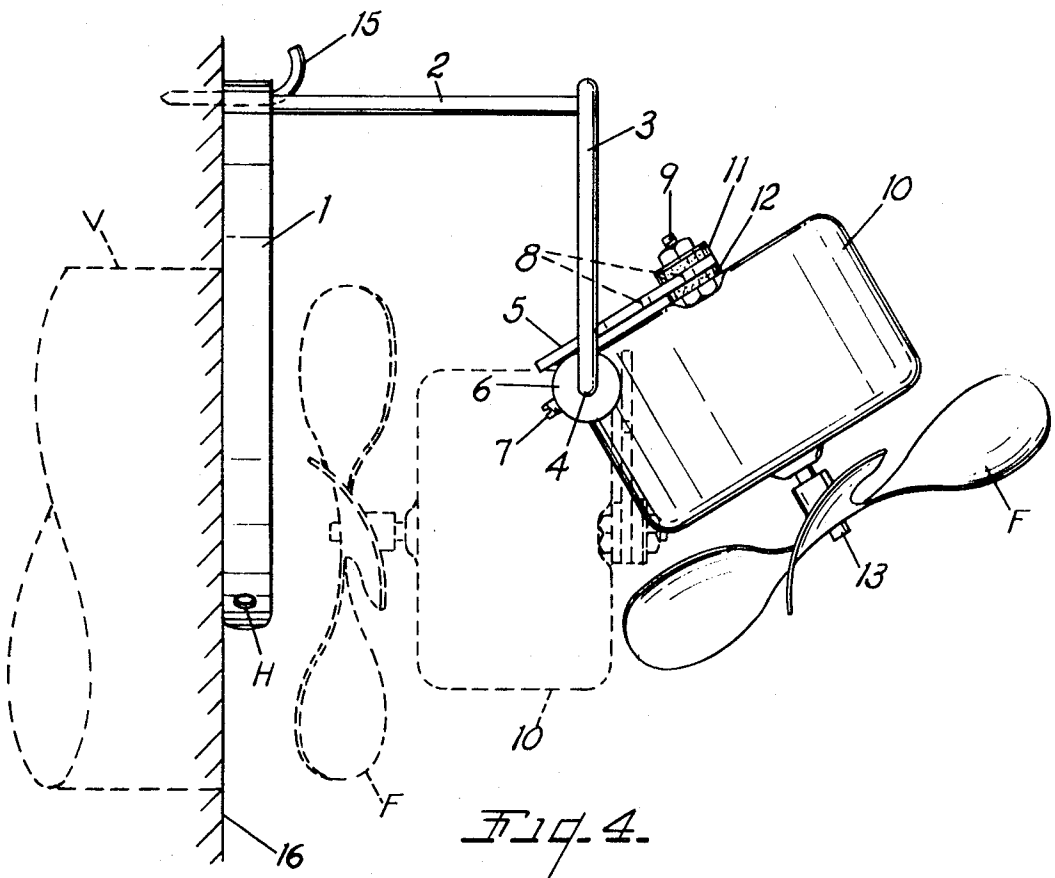

Fig. 4

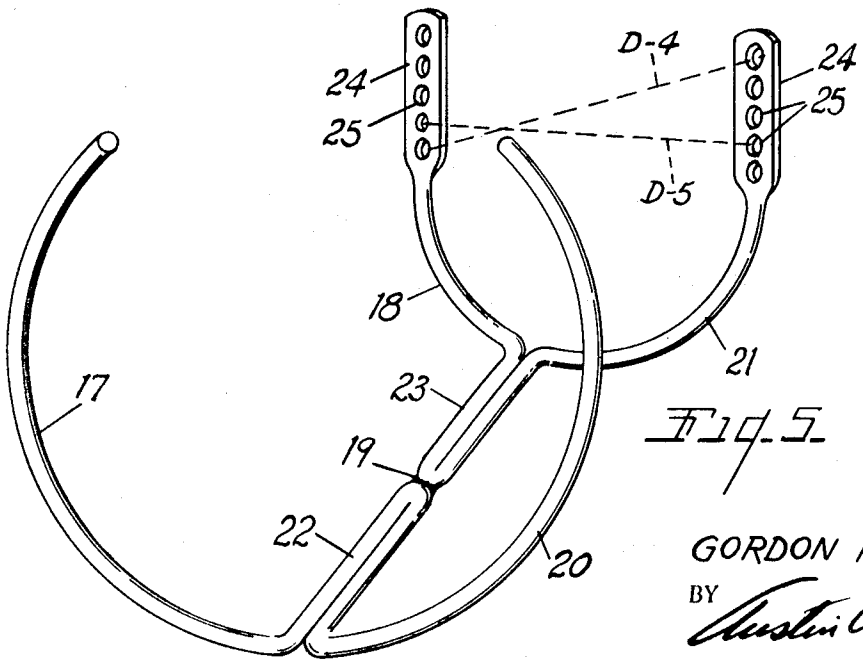

Fig. 5

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UNIVERSAL FAN MOUNT AND FAN

It is an object of this invention to provide a fan frame that will alternatively and selectively support a fan and its motor in ducts of different sizes, or in various angularly adjusted positions from vertical or horizontal supporting surfaces.

It is a further object of the invention to provide a frame which will support fans and motors of different diameters in any of the above positions.

The drawings, of which there are two sheets, illustrate two forms of the fan frame of the invention, with two sizes of fans mounted in several different adjusted positions.

FIG. 1 is a rear elevational view of a first form of the frame with a fan thereon installed at the end of a duct or vent pipe.

FIG. 2 is a side elevational view of the fan and mount shown in FIG. 1.

FIG. 3 is a side elevational view similar to FIG. 2 but showing a smaller size fan mounted entirely within a smaller duct.

FIG. 4 is a side elevational view of the frame adjustably supporting a fan on a vertical surface which may include a vent hole.

FIG. 5 is a perspective view of a modified form of the fan frame.

The first form of the frame in FIGS. 1 to 4 consists of an arcuate segmental ring 1 of bendable metal which can be bent to different diameters, as at D–1 D–2 and D–3 in FIG. 1 to fit selectively within tubular ducts T–1 T–2 and T–3 of different diameters. Secured to the base of the ring as by welding are two spaced parallel rods 2 which form a post extending normal to the plane of the ring. An arcuate yoke bar 3 is rigidly secured to the ends of the rods 2 and lies in a plane generally parallel to the ring 1. Two inwardly turned pintle pins 4 are turned into opposed alignment from the ends of the yoke bar, and form mounting connections for a motor.

Two motor-mounting plates 5 are each provided with a bearing block 6 which receives one of the pintle pins 4. Set screws 7 permit fixing of the bearing blocks and mounting plates in angularly and laterally adjusted positions on the pintles. The plates 5 each have a series of spaced holes 8 formed therethrough which receive mounting bolts 9 from a motor 10. Washers 11 and 12 provide cushioning connections between the motor and the mounting plates. The bolts 9 project through holes commonly provided on motors and located along a diameter of the motor. By mounting the motor through different sets of the holes 8, the shaft 13 of the motor can be located at different distances from the rods 2 to accommodate fans of different diameters, as at F–1 and F–2 in FIGS. 2 and 3.

The ends of the arcuate ring may have holes H therethrough which permit them to be screwed to the wall of the duct when the frame and motor project from the end of the duct, as in FIG. 2. When the frame is pressed further into the duct as in FIG. 3, a nut or screw can be passed between the rods 2 to anchor the fan. The screw connections supplement the yieldable grip of the segmental ring 1 on the tube and are optional.

By use of the single frame, a single size of fan motor can be used to drive fans of different diameters in different sized tubular ducts, such as kitchen vent ducts. The same frame can be used to support fans and motors of different diameters and in different positions. FIG. 4 shows the fan suspended from a hook 15 projecting from a vertical wall 16. The hook projects under the segmental ring 1 and between the rods 2 to assure stable positioning of the fan with the yoke 1 bearing against the wall. Note that surface 16 may have a vent hole V therethrough and that the fan can be adjusted to the dotted position to move air through the vent while being located outside of the opening. The fan and mount can also obviously be supported on a desk or other horizontal surface, with the post 2 upright and yoke 1 forming a stable base from which the fan can be adjusted to any desired angle.

While two mounting plates 5 are shown, these may be combined into a single plate means. However, by using separate plates, the spacing between the lines of holes 8 may be adjusted by bending the yoke 3. This permits the same support to cooperate with motors whose mounting bolts 9 are spaced differently from standard. The separate mounting plates also permit lateral adjustment and easy assembly of the separate bearing blocks.

Note that the mounting plates 5 and bearing blocks 6 permit the periphery of the fan F to be adjusted in an arc that clears the general plane of the segmental ring 1. The holes 8 are spaced to accommodate mounting of fan blades 5, 6, 7 and 8 inches in diameter. The segmental ring 1 is correspondingly bendable to diameters of approximately 6, 7, 8 and 9 inches.

The modified frame shown in FIG. 5 does not, in itself, provide for angular adjustment of a fan and its motor, although adjusting means may be added between the frame and the motor. The frame consists of two similarly bent continuous wire rods 17 and 18 welded together as at 19. The rods have segmental arcuate portions 20 and 21 which respectively provide a segmental ring corresponding to the ring 1 and a yoke corresponding to the yoke 3 of the first form of the frame. Intermediate of their ends, the rods are bent double and turned into axially extending post sections 22 and 23 which when welded together correspond to the post 2. The opposite ends of the rod 18 are flattened to form a divided motor mount 24 parallel to the arcuate segments 20. The flattened ends are provided with spaced holes 25 arranged to receive mounting bolts from the more common sizes of motors. Note that there is an inherent adjustability in the motor mount in that bolts may be engaged selectively at the ends of the different length diameters D–4 and D–5 in FIG. 5. In addition, the yoke arms 21 may be flexed to fit odd-sized motors. Wire 18 may be stiffer than wire 17 for more rigid support of the fan without unduly stiffening the segmental yoke 20.

It will be evident that the flattened ends 24 of the frame shown in FIG. 5 may be interchanged with the pintle pins 4 shown in HFIGS. 1 and 2 as motor mounting means, and vice versa.

The split and flexible nature of the base ring arms permits them to either support the fan on a table, or within a pipe, or to be bent as necessary to bear against a wall as in FIG. 4 regardless of the size or location of the hole in the wall.

What is claimed as new is:

1. A support frame for a fan and fan motor comprising,
a segmental metal ring bendable to different generally circular diameters,
connecting means forming a post connected to said ring and projecting normally to the plane thereof,
means forming a yoke connected to the end of said post in generally parallel relation to said ring,
and motor-mounting means on the ends of said yoke.

2. A support frame as defined in claim 1 in which said mounting means include inwardly turned pintle pins on the ends of said yoke,
bearing blocks angularly adjustably mounted on said pins,
and mounting plate means secured to said bearing blocks in parallel relation to said pins,
said plate means defining holes spaced diametrically of said yoke and adapted to receive mounting bolts of a motor to support the motor with its shaft normal to places passed through said pins.

3. A support frame as defined in claim 1 in which said mounting means comprises parallel series of holes formed in the ends of said yoke.

4. A support frame as defined in claim 2 in which said plate means define parallel series of holes for receiving mounting bolts at different distances from said pins.

5. A support frame as defined in claim 2 in which said plate means are separate plates, each secured to one of said bearing blocks.

6. A support frame as defined in claim 2 in which said bearing blocks have clamp means for adjustably securing the blocks in angularly adjusted positions on said pins.

7. A support frame as defined in claim 1 in which said post comprises spaced parallel rods secured near the center of said ring,
said yoke comprising a separate part secured to the end of the rods.

8. In combination with a fan motor having a shaft and a fan blade,

plate means secured to said motor in normal relation to said shaft,

spaced bearing means on said plate means defining aligned pintle-receiving openings parallel to said plate means,

a yoke having inwardly turned pintles on its ends angularly adjustably received in said pintle openings,

connecting post means rigidly connected to said yoke and projecting generally normally to the plane thereof at a distance from said pintles which is greater than the radius of said fan blade,

and a segmental ring of bendable material connected to said connecting means in spaced generally parallel relation to said yoke.

9. The combination as defined in claim 8 in which said plate means are secured to the back of said motor,

said connecting post means comprising spaced parallel rods secured to the centers of said yoke and said ring.

10. The combination as defined in claim 8 in which said plate means are spaced separate plates, each connected to one of said bearing means, and set screws in said bearing means engageable with said pintles.

11. A fan support frame as defined in claim 1 having a fan motor connected to said motor mounting means in overhanging spaced relation to said post.

12. A fan support frame as defined in claim 1 in which said segmental ring is formed of a single integral bar bent into coplanar segments at its ends, with its midsection doubled upon itself and bent axially of the plane of the ends,

said yoke forming means also being formed of a single integral bar bent into coplanar segments at its ends with its midsection doubled upon itself and bent axially of the plane of the ends,

the axially extending midsections of said bars being rigidly connected in opposed end to end relation.

13. A fan support frame as defined in claim 12 in which said motor mounting means are flattened portions on the ends of said yoke, each defining a hole for receiving a mounting fastener.

14. A fan support frame as defined in claim 13 in which said flattened portions each have a series of said holes formed therein.