

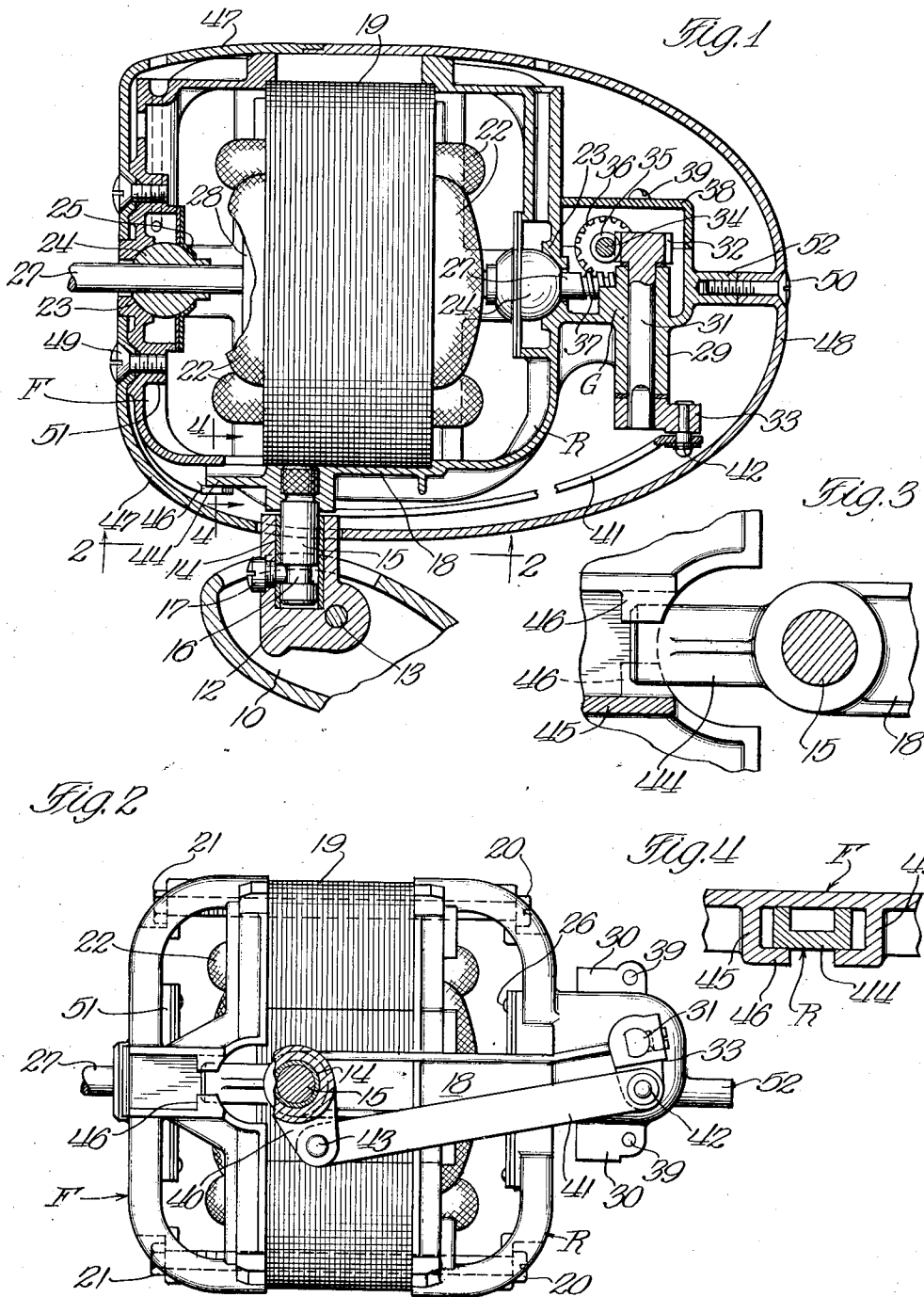
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FAN MOTOR FRAME CONSTRUCTION

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FAN MOTOR FRAME CONSTRUCTION

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My present invention relates to a motor frame construction particularly adapted for fan motors.

One object of the invention is to provide a simple and inexpensive arrangement of pivot pin and step down gearing mechanism for providing a fan of the oscillating type, the pivot pin and a gear box for the gearing mechanism being cast integral with a rear frame member or die casting of the motor whereby to effectively insure proper alignment of the pivot pin and a slow speed shaft which oscillates the fan during operation.

Another object is to provide a fan motor frame construction wherein alignment of parts of the oscillating mechanism is effected in a predetermined manner by casting at least a portion of a gear box for the oscillating mechanism integral with one of the frame members and also at the same time a pivot pin is inserted and cast into the rear frame member.

Still a further object is to provide a means of coaction between the frame members of the motor which is effective to insure alignment of the front and rear frame castings of the motor.

Still another object is to provide a construction of this character which is particularly adapted for motors having bearings of the self aligning type.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawing. Although the invention is susceptible of a variety of embodiments, it is unnecessary to fully describe and illustrate more than one in order to give a full understanding of the invention both from its structural and functional standpoints. Accordingly, I have illustrated a preferred and desirable embodiment of the invention in the accompanying drawing, in which:

Figure 1 is a vertical sectional view through a fan motor frame construction embodying my invention;

Figure 2 is a bottom plan view thereof as taken on the section line 2—2 of Figure 1 and showing the motor with a casing therefor omitted;

Figure 3 is an enlarged bottom plan view of coacting parts of the front and rear frame members, which parts effect proper alignment of the members, and

Figure 4 is an enlarged sectional view on the line 4—4 of Figure 1 showing the coaction between the parts illustrated in Figure 3.

On the accompanying drawing, I have used the reference numeral 10 to indicate a supporting arm such as would extend from a fan base. Since the base forms no part of my present invention I have omitted any showing of it. A supporting sleeve 12 is pivoted as at 13 to the arm 10 and may be suitably locked in any desired position of tilt.

The supporting sleeve 12 has a bearing sleeve 14 therein adapted to receive a pivot pin 15. The pivot pin 15 is grooved as indicated at 16 so that a retainer screw 17 may coact therewith to permit oscillation of the pin 15 relative to the sleeve 14, yet prevent undesirable withdrawal of the pin from the sleeve.

The pivot pin 15 is cast in an arm 18 of a rear frame member or casting R. A front frame member or casting F is provided, and between the frame members F and R field laminae 19 are interposed. Suitable screws 20 and nuts 21 serve to connect the parts F, R and 19 together to form a motor frame and a stator for the motor. The field coils of the motor are indicated at 22.

Each of the frame members F and R is provided with a globular bearing seat 23. Bearings 24 are seated therein and retained in seated position by retainers 25, which in turn are mounted on the frame members as by rivets 26. The bearings 24 are provided with globular exterior surfaces whereby they are self aligning relative to an armature shaft 27. The armature on the shaft 27 is indicated at 28.

Cast integral with the rear frame member R is a gear box G having a vertical bearing 29 and a pair of horizontal bearings 30. A slow speed shaft 31 is journaled in the bearing 29 and it has a worm gear 32 on its upper end. On its lower end it carries a crank 33.

For rotating the worm gear 32 I provide a countershaft 34 having a worm 35 meshing with the worm gear 32 and a worm gear 36 meshing with a worm thread 37 on the motor shaft 27. The countershaft 34 is journaled in the horizontal bearings 30.

A cover 38 is provided for the gear box G. The cover 38 may be retained in position as by screws 39.

The supporting sleeve 12 has a laterally extending arm 40 shown in Figure 2. A link 41 operatively connects a crank pin 42 of the crank 33 with a pivot pin 43 of the arm 40. Due to this arrangement, rotation of the motor shaft 27 will cause rotation of the vertical shaft 31 at relatively slow speed and consequently impart

oscillation to the parts of the fan motor from the pin 15 upwardly on the drawing.

For aligning the frame members F and R with each other when they are assembled, I provide a forward extension 44 on the arm 18. The extension 44 is channel shaped as shown in Figure 4 and is slidably received in a channel shaped portion of the frame member F which has flanges 45. The flanges 45 have terminal edges 46 which are intumed to retain the arm extension 44 in position. The terminal edges 46 are intumed for the further purpose of creating a support for the extension 44 at its extreme end to prevent breaking or bending the arm 18.

A suitable housing may be provided for the motor consisting of a front portion 47 and a rear portion 48. This may be secured in position as by screws 49 and 50 respectively. The screws 49 enter threaded bosses 51 of the front frame member F and the screw 50 enters a threaded boss 52 of the rear frame member T, which boss is formed on the gear box G. A suitable fan blade (not shown) may be secured to the front end of the armature shaft 27.

From the foregoing description, it is believed obvious how my structure operates. By casting the pivot pin 15 integral with the rear frame member R, and likewise casting the gear box G and the bearing 29 thereof integral with the rear frame member, I provide for accurate alignment of the axes of the pin 15 and the shaft 31. When the molds for the castings are once made, any frame members that are turned out by the molds will be of assured accuracy with respect to the alignment of the parts 15 and 31. Accordingly, I eliminate any possibility of subsequent binding of the parts during oscillation of the pin 15 relative to the sleeve 12 and rotation of the shaft 31 relative to the bearing 29. My construction also insures proper alignment of the crank pin 42 and the pivot pin 43 with respect to the link 41, the crank 33 and the arm 40. The various parts can accordingly be formed to minimum tolerances without having to provide sloppy fit between surfaces to avoid binding, as is necessary in existing types of construction. As a result, the undesirable loose play in such structures is eliminated with my construction.

I have illustrated and described my improvement in an embodiment which I have found very satisfactory. I have not attempted to illustrate or describe certain adaptations or modifications which I contemplate, or the various uses and adjustments possible, as it is believed that the foregoing disclosure will enable those skilled in the art to which this invention appertains to embody or adapt my improvements as may be desired.

Having thus described my invention, I now claim and desire to secure by Letters Patent:

1. A fan motor frame construction comprising front and rear castings, each having a bearing, field laminae supported by said front and rear castings, an armature having a shaft journaled in said bearings, one of said castings having a forwardly extending arm, a pivot pin cast integral relative to said arm and thereby relative to said one of said castings, the other of said castings having a socket to receive said arm, a gear box cast integral with said one of said castings, adjacent the bearing thereof, a cover secured to said gear box, step down gearing in said gear box, a slow speed shaft journaled in said gear box, said step down gearing operatively

connecting said slow speed shaft to said armature, a support for said motor having a socket oscillatably receiving said pivot pin, an arm extending laterally from said support, said slow speed shaft having a crank pin, and a link connection between said crank pin and said last arm.

2. A fan motor frame construction comprising front and rear castings, each having a bearing, field laminae interposed between said front and rear castings, an armature having a shaft journaled in said bearings, said rear casting having a forwardly extending arm, a pivot pin cast integral relative thereto and thereby relative to said rear casting, said arm being channel shaped, said front casting having a channel shaped socket to receive the forward end of said arm, the terminal edges of the flange of said channel shaped socket being intumed to retain said arm, a gear box cast integral with said rear casting, step down gearing therein, a slow speed shaft journaled in said gear box, said step down gearing operatively connecting said slow speed shaft to said armature, a support for said motor having a socket oscillatably receiving said pivot pin, an arm extending laterally from said support, said slow speed shaft having a crank pin, and a link connection between said crank pin and said arm of said support.

3. A fan motor frame construction comprising front and rear castings, each having a bearing, field laminae interposed between said front and rear castings, an armature having a shaft journaled in said bearings, said rear casting having a forwardly extending arm, a pivot pin cast integral relative thereto and thereby relative to said rear casting, said front casting having a socket to receive the forward end of said arm, a gear box cast integral with said rear casting, step down gearing therein, a slow speed shaft journaled in said gear box, said step down gearing operatively connecting said slow speed shaft to said armature, a support for said motor having a socket oscillatably receiving said pivot pin, an arm extending laterally from said support, said slow speed shaft having a crank pin, and a link connection between said crank pin and said arm of said support.

4. A fan motor frame construction comprising front and rear castings, each having a bearing, said rear casting having a forwardly extending arm, a pivot pin formed rigid relative to said arm and thereby relative to said rear casting, said front casting having means coacting with said arm to locate it relative to said front casting, a gear box cast integral with said rear casting, step down gearing therein and including a slow speed shaft, a support for said motor having a socket oscillatably receiving said pivot pin, an arm extending laterally from said support, said slow speed shaft having a crank pin, and a link connection between said crank pin and said last mentioned arm.

5. In a motor frame construction for fans and the like, front and rear frame members each having a globular bearing socket, a globular bearing in each socket, a retainer for each bearing, an armature having a shaft journaled in said bearings, field laminae supported between said front and rear frame members, said rear frame member having an arm extending under said field laminae, said front frame member having a socket coacting with the forward end of said arm for alignment purposes, a pivot pin cast integral

with said arm and extending downwardly therefrom, a support for oscillatably receiving said pivot pin, an arm extending laterally from said support, a gear box cast integral with said rear frame member and having a vertical bearing, a 5 slow speed shaft in said vertical bearing, a worm gear thereon, a countershaft in said gear box having a worm meshing with said worm gear and a worm gear meshing with a worm on the shaft of said armature, a crank carried by said 10 slow speed shaft exterior of said gear box, and a link connection between said crank and said laterally extending arm of said support, said slow speed shaft and its bearing being aligned during casting with respect to said pivot pin. 15

6. In a motor frame construction for fans and the like, front and rear frame members each having a globular bearing socket, a globular bearing in each socket, a retainer for each bearing, an armature having a shaft journaled in said 20

bearings, field laminae supported between said front and rear frame members, said rear frame member having an arm extending under said field laminae, said front frame member having a socket coacting with the forward end of said arm for alignment purposes, a pivot pin cast integral with said arm and extending downwardly therefrom, a support for oscillatably receiving said pivot pin, an arm extending laterally from said support, a gear box cast integral with said rear frame member and having a vertical bearing, a slow speed shaft in said vertical bearing, step down gearing in said gear box between said shaft of said armature and said slow speed shaft, a crank carried by said slow speed shaft exterior of said gear box, and a link connection between said crank and said laterally extending arm of said support.

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