

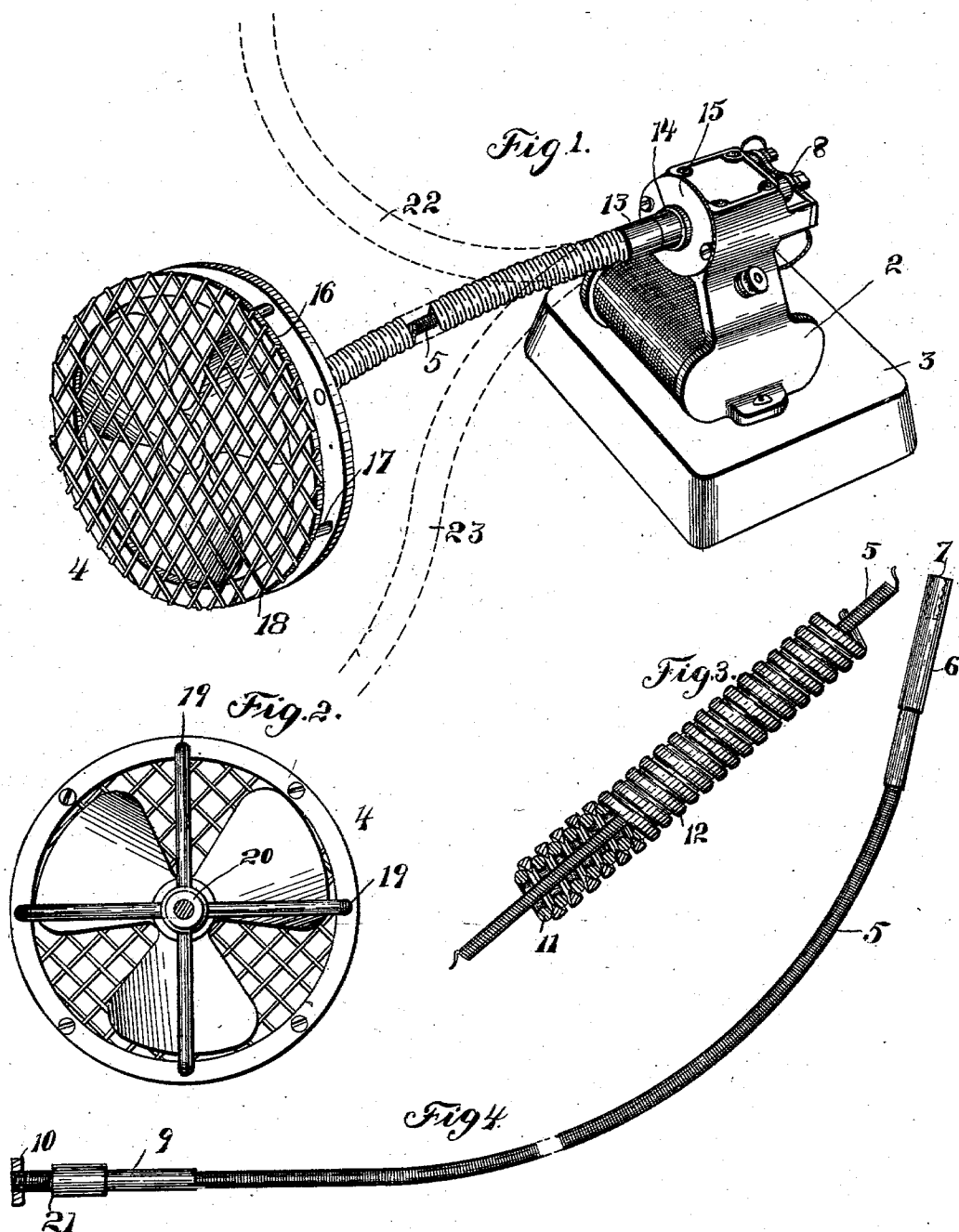
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A. R. FERGUSSON.
ELECTRIC FAN.

APPLICATION FILED DEC. 16, 1902.

NO MODEL.



Witnesses:
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UNITED STATES PATENT OFFICE.

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ELECTRIC FAN.

SPECIFICATION forming part of Letters Patent No. 758,305, dated April 26, 1904.

Application filed December 16, 1902. Serial No. 135,381. (No model.)

To all whom it may concern:

Be it known that I, ALAN ROBB FERGUSON, a citizen of the United States, residing in New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Electric Fans, of which the following is a specification.

This invention relates to a motor-driven fan, the fan element of which may be shifted into a great variety of positions and angles and when so shifted is there held, whereby the air-stream induced by the rotating fan may be directed as desired.

A motor-driven fan constructed in accordance with the present improvements comprises as one of its features a flexible driving-shaft interposed between the rotative element of the motor and the fan, thus permitting the latter to be driven from the motor whatever the disposition of the plane of movement of the fan with respect to the motor may be. In order that the fan shall thereupon be held in its adjusted position, I conveniently combine with the devices aforesaid a flexible shaft which by the friction exerted between its parts or by reason of some other characteristic serves to retain the fan in the position it may have been caused to assume, yet leaving the same free to be actuated from the motor.

In the accompanying drawings is set forth an embodiment of my invention.

In the drawings, Figure 1 is a perspective view illustrating a motor adapted to actuate through a flexible driving-shaft a fan coupled therewith. Fig. 2 is an elevation looking at the fan from the rear side thereof. Fig. 3 is an elevational view, partly in section, of a flexible driving-shaft and a flexible inclosing shaft; and Fig. 4 is a view of a flexible driving-shaft, illustrating the means adopted in the present instance for coupling the ends of such shaft to the rotative element of the motor and the fan element, respectively.

Similar characters of reference designate corresponding parts in all figures.

There is set forth in Fig. 1 of the drawings a conventional representation of an electric motor, the same being designated in a gen-

eral way by 2. Obviously the motor may be of various types and forms and mounted in any proper and desired manner upon a support, this latter in the present instance being in the form of a base-block 3.

The fan element of the device is designated in a general way by 4, and this likewise may be of various forms.

Interposed between the rotative motor element and the fan and serving thereby to drive the latter is a flexible driving-shaft, (designated by 5.) This latter may be of various constructions, and as such devices are common and well-known in the art a further description thereof is deemed unnecessary. Suffice it here to say that the desired length of shaft having been chosen suitable means are provided for coupling the same, one end thereof to the rotative element of the motor and the other end thereof to the fan element. While the present invention is not limited in its application to any particular construction of such coupling means, simple forms of the latter are disclosed, consisting, as illustrated, of a rod 6, firmly attached to one end of the flexible driving-shaft 5 and having a threaded socket 7, adapted to engage with the threaded end of the armature-shaft 8 of the motor. Preferably the sense or direction of such coupling-thread will be such, compared with the direction of rotative motion of the shaft, as that the tendency of the rotative movement shall not be such as to uncouple the coupled parts. For the attachment of the driving-shaft to the fan a rod 9 is indicated, whose threaded extremity is adapted to pass through the bore of the hub of the fan and to be secured therein by a locking-nut, such as 10.

In order to maintain the fan in any position within the scope determined by the proportion and relation of the parts and to which it may have been adjusted, I provide a section of flexible tubing characterized by the fact that it will retain the form to which it may be bent. I prefer to so combine this tubing with the apparatus thus far described as that it will constitute a guard or shield for the flexible driving-shaft. Hence the flexible

driving-shaft will be located within the bore of such flexible tube-section. While this latter may be of various constructions, the scope of the present invention not being restricted to any particular one, I have illustrated a form of such flexible tubing in Fig. 3, the same being made up from a helically-coiled wire 11, around which is wound an inclosing helically-coiled wedge-shaped wire 12, the apex of the angle of which enters somewhat into the space between the successive convolutions of the inner coil. This section of flexible tubing may be attached to the fixed part of the motor in any desired way, a sleeve 13 in this instance being indicated, the same being fastened both to the tube-section and an annular ring or boss 14; extending from a side plate 15 of the motor.

Preferably the fan element will be provided with a guard, the illustrated construction thereof set forth in the drawings comprising a pair of guard-rings 16 16, secured to each other, with interposed spacing-pieces 17. The space inclosed by the outer ring is crossed by interlaced wires 18, affording ample freedom for the flow of the air-current, while the fan is held in correct relation with respect to the guard by means of cross-arms 19, projecting diametrically across the inner guard-ring and having a hub 20 at their intersection through which the threaded end of the coupling-rod 9 extends, a shoulder 21 on such rod abutting against a shoulder formed in the hub 20.

It may be stated that the weight of the motor added to the weight of the base on which it is mounted or that the attachment of the latter to some object is sufficient to prevent the weight of the fan, fan-guard, and project-

ing shaft, and flexible tube-section from upsetting or tipping over the motor, &c.

Such being the construction and relation of the parts, it is apparent that by grasping the fan-guard the fan may be raised or lowered or shifted from one side to the other or tilted upward or downward or sidewise without disturbing the motor or the driving connection therewith or the capacity of the same to effectually rotate the fan. Such possible alteration of position is illustrated in a conventional way by the dotted lines marked 22 and 23 in Fig. 1.

Having thus described my invention, I claim—

The combination of an electric motor, a fan, a fan-guard, a flexible driving-shaft having a threaded socket at one end engaging with the threaded extension of the rotating element of the motor and a threaded stem at the other end adapted to enter and be secured in an opening in the hub of the fan, and a flexible tube-section inclosing said driving-shaft and inflexible under the application of a force as great at least as the weight of the fan and other supported parts whereby the fan upon adjustment is held in its adjusted position, said flexible tube-section having at one end a collar secured to the fixed part of the motor and at the other end a collar secured to the fan-guard.

Signed at Nos. 9 to 15 Murray street, New York, N. Y., this 15th day of December, 1902.

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