Sept. 4, 1923. 1,467,233

L. R. CRUMB

AUTOMOBILE FAN DEVICE

Filed Aug. 31, 1922

Fig. 1

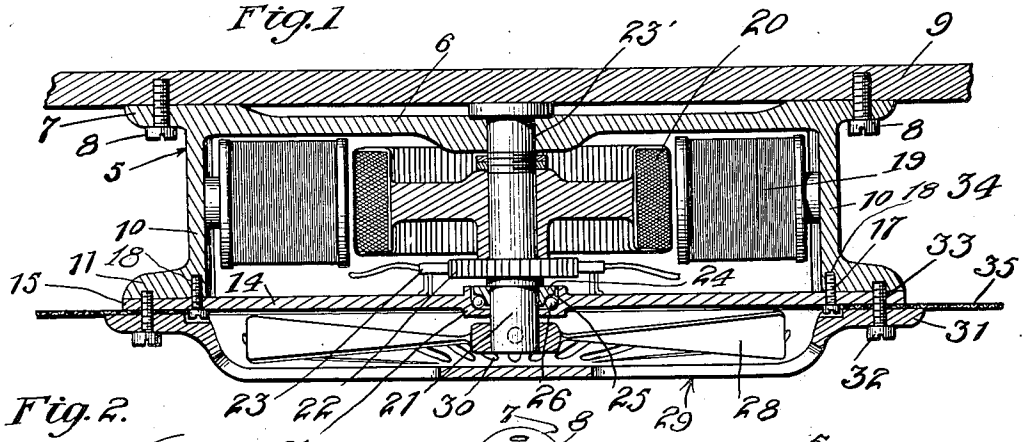
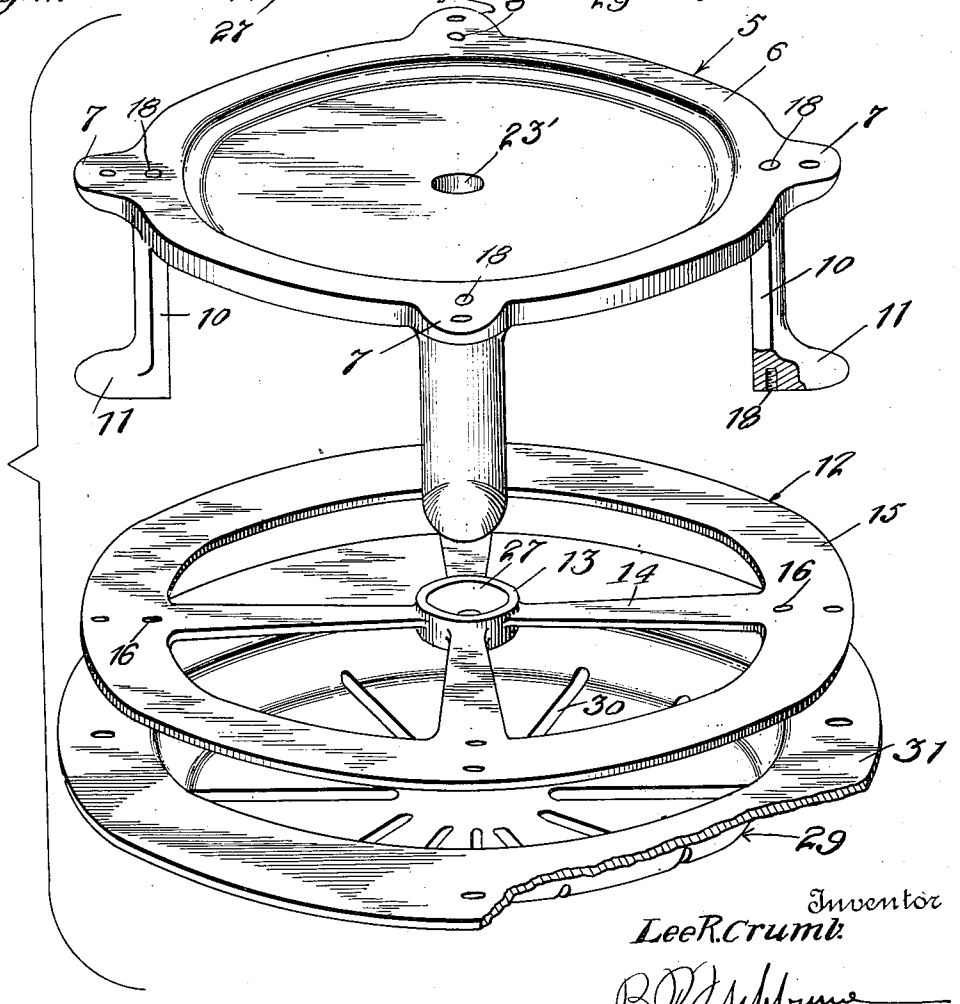


Fig. 2.



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UNITED STATES PATENT OFFICE.

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AUTOMOBILE FAN DEVICE.

Application filed August 31, 1922. Serial No. 585,537.

To all whom it may concern:

Be it known that LEE R. CRUMB, a citizen of the United States, residing at New Berlin, in the county of Chenango and State of New York, has invented certain new and useful Improvements in Automobile Fan Devices, of which the following is a specification.

My invention relates to an electric fan device, for use in connection with automobiles, particularly of the enclosed type, while not restricted to this use.

An important object of the invention is to provide an electric fan device which is designed to permit of it being mounted within the top of an automobile, between the upper wall and the lower wall, with a cover plate extending only a slight distance outwardly beyond the lower wall, which is ordinarily the upholstery of the top.

A further object of the invention is to provide a device of the above mentioned character, embodying a frame construction which not only serves to hold and support the operating parts of the motor, but also serves to connect with the lower wall or upholstery of the top.

A further object of the invention is to provide a device of the above mentioned character, so designed that its thickness is reduced to the minimum, so that its lower end may be substantially flush with, or project only a slight distance below the lower wall of the top.

A further object of the invention is to provide a device of the above mentioned character, so constructed that parts thereof may be readily removed, so that access may be had to the interior of the device, without the removal of the main supporting frame.

A further object of the invention is to provide a device of the above mentioned character, which is simple in construction, strong, durable, and neat and attractive in appearance.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification, and in which like numerals are employed to designate like parts through the same,

Figure 1 is a central vertical sectional view through a fan device embodying my invention, and,

Figure 2 is a perspective view of the frame elements separated.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 5 designates a main supporting frame or member, as a whole, embodying a plate or base 6, having projections or ears 7, for the reception of screws 8 or the like, adapted to engage with the top wall 9 of the automobile top. Preferably formed integral with the base 6 and depending therefrom are spaced legs 10, provided at their lower ends with outwardly projecting ears 11, as shown.

The numeral 12 designates a spider, as a whole, embodying a hub 13, carrying radial arms 14, secured to a ring 15. The spider is preferably an integral structure. The ring 15 has openings 16 formed therein to receive the screws 17 engaging in screw threaded openings 18, formed in the inner ends of the ears 11.

Mounted within the supporting frame 5 and held stationary therein by any suitable means, are the field windings 19 of a motor. The numeral 20 designates the armature, carried by the armature shaft 21, provided with the usual commutator 22, engaging the brushes 23.

The upper end of the armature shaft 21 is rotatable in a bearing 23′, formed in the base or plate 6, while the lower portion of the armature shaft 21 has a thrust bearing ring 24 rigidly mounted thereon, and provided with a race way 25, receiving balls 26, operating within a race way 27, formed in the hub 13, which is the coacting thrust element of the thrust bearing. This bearing not only takes the downward thrust but also takes the radial thrust.

The armature shaft 21 projects downwardly for a short distance below the thrust bearing and has a fan 28 mounted upon its lower end. This fan is preferably detachably rigidly mounted upon the armature shaft, by any suitable means, such as a set screw or the like.

The fan 28 is protected by a cover or dome 29, which may be formed of pressed or stamped sheet metal, of suitable ornamentation, and having suitable openings 30 for the free passage of the air from the fan. The cover 29 is curved in cross section adjacent to its periphery and carries at this point an annular flange 31, which is apertured for

receiving machine screws 32, which engage in screw threaded openings 33, formed in the ring 15 and ears 11, as shown.

The supporting frame 5 is relatively thin, and is designed to be mounted entirely within the air space occurring in the top construction of closed cars, such as the sedan or coupé. In the drawings, the numeral 34 represents this space and 35 the lower wall of the top structure, which is ordinarily upholstery, such as cloth, leather or the like. The upholstery 35 has a circular opening cut therein, and the edges of this opening are passed between the flange 31 and the ring 15, and these parts are clamped together by screws 32. In this manner the upholstery is connected with a ring 31 and a neat and attractive union is secured. The cover or dome 29 projects downwardly only a slight distance beyond the upholstery 33.

Should it be desired to gain access to the commutator 22, the cap 29 is first removed, and the screws 17 are removed, and the spider 12 would then be moved downwardly, carrying with it the armature shaft and associated elements. The fan may now be removed from the lower end of the armature shaft, and the spider removed from the armature shaft, thereby affording free access to the commutator and brushes.

The supporting frame 16 is open on all sides, by virtue of the spacing of the legs 10, and the spider 12 also has large segmental openings, and the air may be drawn over the fan from the space 32, and discharged into the car. Further, these spaces afford means for access to the commutator and other parts, in making minor repairs.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described my invention, what I claim is:

1. A fan device for use in the top structure of automobiles, comprising a supporting frame adapted to be arranged between the spaced upper and lower walls of the top structure, means for connecting the frame with the upper wall, a spider embodying a ring at its periphery secured to the lower end of the supporting frame, field windings mounted within the supporting frame, an armature mounted between the field windings and having an armature shaft journaled in the supporting frame and in the spider, a fan arranged beneath the spider and secured to the lower end of the armature shaft, and a cover for the fan provided at its periphery with a flange, the lower wall of the top structure being inserted between the flange and ring, and means for drawing the flange toward said ring to clamp the lower wall between the same.

2. A fan device for use in the top structure of automobiles, comprising a supporting frame adapted to extend between the spaced upper and lower walls of the top structure, means for securing the supporting frame to the top wall, field windings mounted within the spporting frame, an armature mounted within the supporting frame and having its armature shaft extending downwardly below the frame, a supporting element detachably secured to the lower end of the frame and having the armature shaft journaled therein, a fan mounted upon the lower end of the armature shaft, a cover for the fan, the edges of the lower wall being arranged between the cover and the frame, and means to clamp the cover to the frame.

3. A fan device for use in the top structure of an automobile such top structure embodying spaced upper and lower walls, a relatively thin motor bodily mounted within the space between the upper and lower walls and having its armature shaft projecting downwardly a short distance below the lower wall, a fan blade secured to the lower end of the armature shaft in close relation to the lower wall, and a substantially flat cover for the fan blade.

4. A fan device for use in the top structure of an automobile, such top structure embodying spaced upper and lower walls, a relatively thin supporting frame secured to the top wall and arranged between said upper and lower walls, a motor mounted entirely within said supporting frame and having its armature shaft projecting downwardly a short distance below the lower wall, a fan blade secured to the lower end of the armature shaft in close relation to the lower wall, a cover for the fan blade, the lower wall of the top structure being inserted between the supporting frame and the cover, and means for drawing the cover towards the supporting frame to clamp the lower wall between the same.

5. A fan device for use in the top structure of automobiles, comprising a supporting frame adapted for connection with the top wall of the top structure and embodying spaced depending legs, a spider embodying a hub and radial arms and a ring, said hub having a race way and constituting one element of a thrust bearing, means to detachably connect said ring and legs, field windings held within the supporting frame, an armature having a vertical armature shaft provided with a ring having a race way constituting the coacting element of the thrust bearing, balls operating within the race ways, a fan arranged beneath the spider and carried by the lower end of the armature shaft, a generally horizontal cover

for the fan, and means for detachably securing the cover to said legs.

6. A fan device for use in the top structure of an automobile, such top structure embodying spaced upper and lower walls, a motor having a relatively thin casing having its major portion bodily mounted within the space between said upper and lower walls, said motor casing having an outwardly extending attaching flange arranged adjacent to the lower wall, said motor having a substantially vertical armature shaft projecting downwardly below the motor casing, a fan blade secured to the lower end of the armature shaft, and a cover for the fan blade, the cover having a flange arranged adjacent to the attaching flange of the motor casing, and means to draw the flange of the cover toward the attaching flange whereby the lower wall of the top structure may be clamped between said flanges.

In testimony whereof I affix my signature.

LEE R. CRUMB.