

Jan. 8, 1924.

1,479,895

E. F. COLBY

FAN

Filed Oct. 31. 1922

2 Sheets-Sheet 1

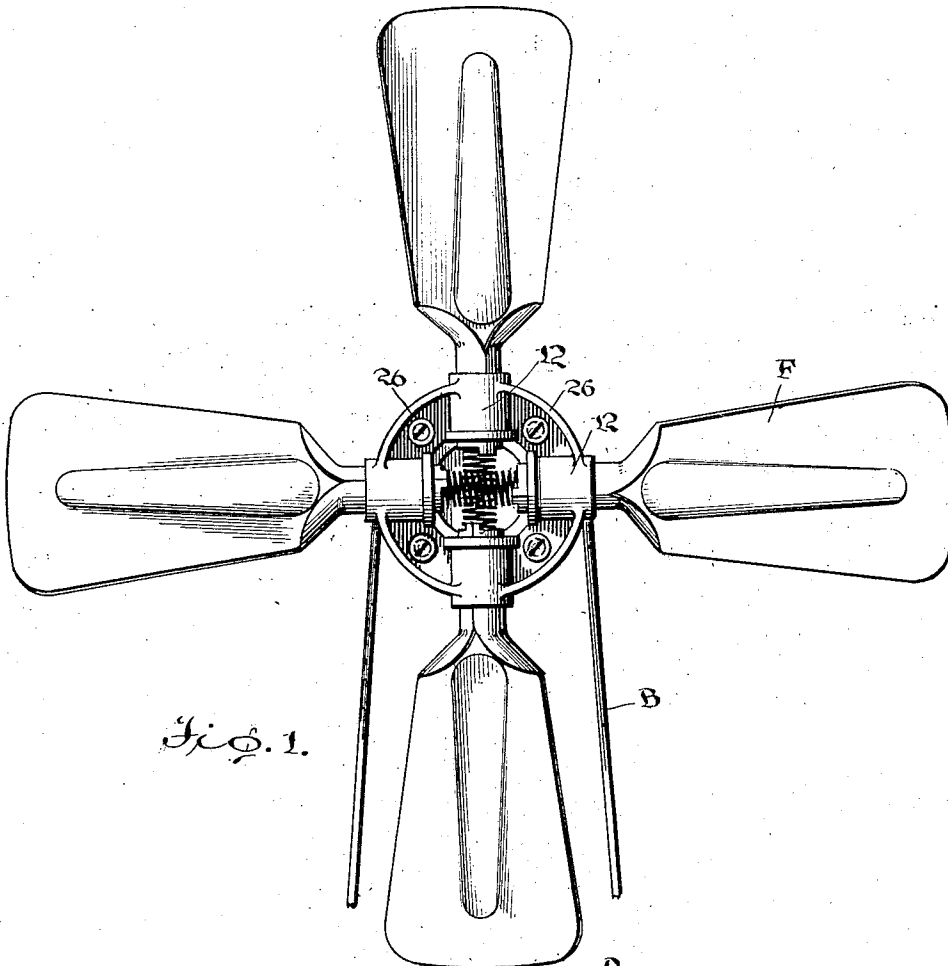


Fig. 1.

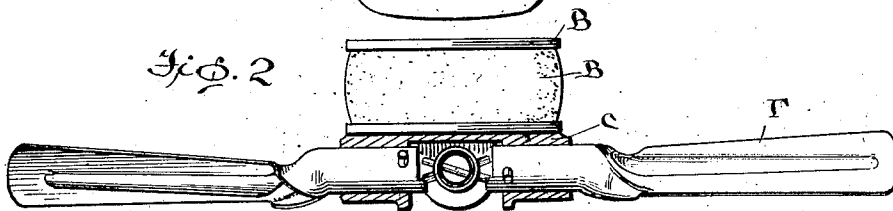


Fig. 2.

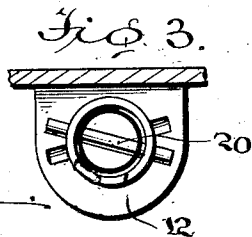


Fig. 3.

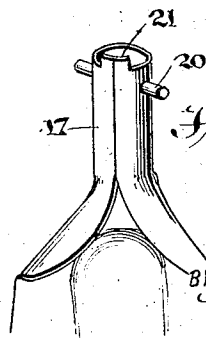


Fig. 4.

WITNESSES

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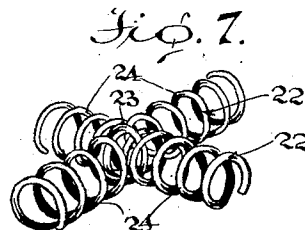
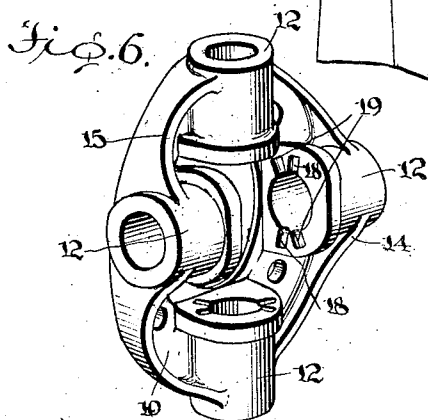
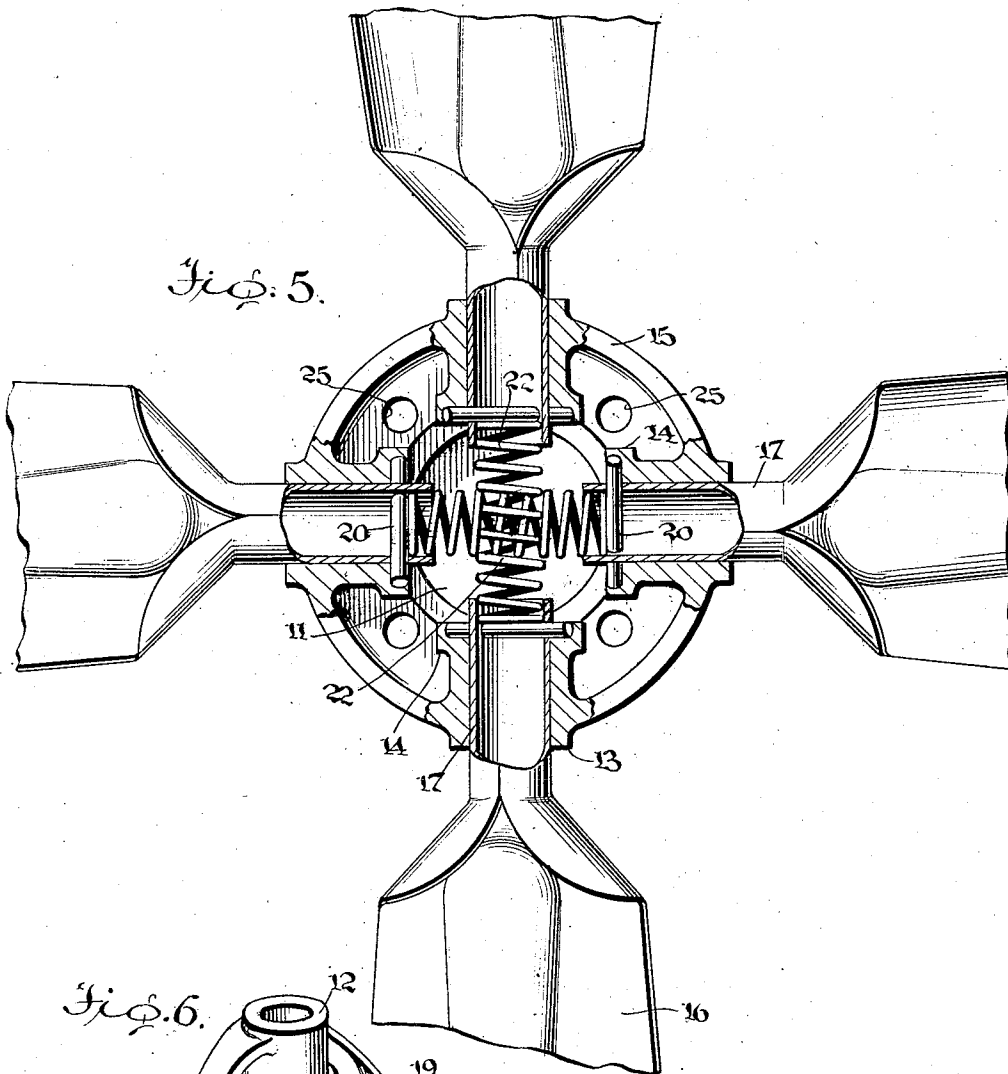
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2 Sheets-Sheet 2



WITNESSES

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UNITED STATES PATENT OFFICE.

ELI FRANKLIN COLBY, OF LAKE MILLS, IOWA.

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Application filed October 31, 1922. Serial No. 598,148.

To all whom it may concern:

Be it known that I, ELI F. COLBY, a citizen of the United States, and a resident of Lake Mills, in the county of Winnebago and State of Iowa, have invented certain new and useful Improvements in Fans, of which the following is a specification.

This invention relates to improvements in fans.

The fan of the present structure is particularly adapted to be employed for cooling internal combustion engines on motor vehicles. As is well known most internal combustion engines of motor vehicles carry a pulley upon which there is mounted fan blades and which are used for circulating air about the internal combustion engine.

An object of this invention is to provide an extremely simple and efficient casting by which fan blades may be securely mounted upon a pulley of the character referred to.

It is also an important object of the invention that means be associated with the casting and blades whereby to permit blades to be adjustably rotated upon their longitudinal axis and thereby to change the direction of current of air propelled thereby. The purpose of changing the current of air propelled by the fan blades as well known is to either cause the fan to cool the engine or to utilize the heat radiating from the engine for heating the radiator forward there-to.

Other objects relating to details of construction will hereinafter appear.

The invention is illustrated by way of example in the accompanying drawings, in which:—

Figure 1 is a view in front elevation of a fan mounted in accordance with the present invention.

Figure 2 is a top plan view of the same.

Figure 3 is a detailed inner plan view of a fan blade supporting nipple formed upon the casting of the present invention and illustrating the manner in which the fan blade may be turned about its longitudinal axis.

Figure 4 is a detailed end view of the fan blade employed.

Figure 5 is a vertical sectional view further illustrating the construction of the fan blade supporting the casting and the manner in which the blades are adjustably held against turning movement about their longitudinal axis.

Figure 6 is a perspective view of the casting, and

Figure 7 is a similar view showing the manner in which the coil springs for holding the fan blades in their adjusted position are connected to each other.

Like reference numerals refer to like parts throughout the drawings.

Referring to the drawings more particularly, P indicates generally a pulley which is usually in the form of a casting and having a central opening through which a supporting shaft therefor is extended and secured. Over this pulley there passes the usual fan belt indicated at B whereby to rotate the pulley.

In carrying out the present invention there is provided a casting generally indicated by the reference numeral C, said casting consisting in a circular plate 10 having a circular depression 11 occurring centrally thereof and upon one face and also having formed upon this face a plurality of radially extending nipples 12. The nipples 12 correspond to the number of fan blades to be supported and in this instance there is shown four nipples and arranged at equal spaced relation with each other. The nipples terminate at their outer ends in a slight protrusion 13 and at their inner ends in an enlargement 14, said enlargement occurring upon the outer periphery thereof as shown, and the inner ends of said nipples also terminating with the circular depression 11 as shown. Between each pair of adjacent nipples there is formed a reinforcing rib 15, said rib occurring adjacent the peripheral edge of the casting.

A plurality of fan blades are provided, each blade being generally indicated by the reference character F, and each blade preferably comprises a body portion 16 which is of sheet metal and stamped to form at its inner end a tubular extension 17 to serve as a stem therefor. This stem is adapted to be received by either of the nipples 13 and freely rotate therein.

The inner end of each nipple 12 is provided with a plurality of notches extending radially thereof, said notches being arranged in pairs as at 18 and 19, Figure 6, and said pairs being so arranged that one notch occurs diametrically opposite of the other. Each fan blade F carries at the free end of its stem 17 a pin 20, said pin being disposed transversely of the longitudinal axis of the

associated stem as shown, and the ends projecting from the stem and adapted to engage in diametrically opposed notches 18—19. Each fan blade has the free end of its stem formed with a projection 21, said projection preferably occurring upon similar sides of the blades as shown.

A pair of coil springs 22 are provided, as shown to advantage in Figure 7, and said coil springs are connected with each other by engaging two of the end convolutions of one of the springs about two middle and adjacent convolutions of the other spring and then rotating the first named coil so that the center convolutions of this coil will engage the middle convolutions of the first named coil, as shown in Figure 7; and thus form a connection as at 23 between these coils which is adapted to hold the same together and also adapted to position the coils so that their end portions 24 radiate from a common center. These coil springs are positioned as best illustrated in Figures 1 and 5 and the end portion 24 of each coil is extended into the associated fan blade stem 17 and brought to abut the cross pin 20 carried by said fan blade stem. The extensions 21 aid to hold the coil springs in alignment with the fan blade stems.

For mounting the casting C into the pulley P a plurality of openings 25 is provided in the plate portion 10 of the casting and screws 26 are extended through each of these openings and threaded into the pulley P and thus securely clamping the casting to the fan pulley.

It is believed that from the description heretofore given of the present invention that it is apparent that the casting C may be quickly secured to a fan pulley and the fan blades F efficiently supported by said casting. The springs 22 tend to urge the fan blades outwardly and thus maintain the pins 20 in adjusted position. If it is desired to change the direction of air currents propelled by the blades F then the blades may be pressed inwardly and turned about their longitudinal axis and the pins 20 brought to the position desired. As is obvious this adjustment may be made in a very short interval of time.

I claim:—

1. A fan blade supporting member, comprising a plate-like member having formed upon its front face a plurality of circumferentially arranged nipples, each nipple terminating in spaced relation with respect to the center of said member at its inner end, and each nipple protruding from the outer periphery of said member said member being adapted for attachment to a pulley.

2. In combination, a fan blade supporting member, comprising a plate-like member having formed upon its one face a plurality of nipples, said nipples being circumferen-

tially arranged, a plurality of fan blades, one for each of said nipples, and each fan blade having a stem adapted to extend within the associated nipple, and means carried by the inner end of each fan blade stem whereby the same may be held against rotation about its longitudinal axis.

3. In combination, a fan blade supporting member, comprising a plate-like casting having formed upon its one face a plurality of nipples, said nipples being circumferentially arranged, a plurality of fan blades, one for each of said nipples, each fan blade having a stem adapted to extend within the associated nipple, and means associated with each of said stems adapted to cooperate with said nipples whereby to adjustably hold the fan blades against turning movement about the longitudinal axis thereof.

4. In combination, a circular casting, a plurality of nipples formed upon one face of the casting extending radially thereof, a plurality of fan blades, one for each of said nipples and each of the fan blades having a stem adapted to be received by the associated nipple, a transversely extending pin carried at the inner end of each stem and adapted to be seated in notches formed upon the inner end of the associated nipple whereby to adjustably hold the fan blade against turning movement about its longitudinal axis, and yieldable means for forcing said stems outwardly said casting having apertures whereby the same may be attached to a pulley.

5. In combination, a circular casting, a plurality of nipples formed upon one face of the casting extending radially thereof, a plurality of fan blades each having a stem adapted to be received by the associated nipple, a transversely extending pin carried at the inner end of each stem and adapted to be seated in notches formed upon the inner end of the associated nipple whereby to adjustably hold the fan blade against turning movement about its longitudinal axis, and a coil spring disposed between each pair of diametrically opposed fan blade stems and adapted to press said stems outwardly.

6. In combination, a fan blade supporting member, a plurality of fan blades supported thereby arranged in circular formation and each fan blade having a stem supported by said supporting member to permit turning movement of the blade about its longitudinal axis, coiled springs interposed between the inner ends of diametrically opposed fan blades and adapted to press the same outwardly, and means actuated by said coil springs adapted to adjustably hold the fan blades against turning movement about their longitudinal axis.

7. In combination, a fan supporting member, a plurality of fan blades supported thereby, said fan blades arranged in circular formation and each fan blade hav-

ing a stem journaled for turning movement by said supporting member and said stems extending radially from a common point, a plurality of interconnected coil springs disposed within the circumference described by the inner ends of the fan blades, each of said fan blade stems being engaged by an end of one of said coil springs whereby to press the fan blade outwardly, and means cooperating with said coil springs for adjustably holding the fan blades against turning movement about their longitudinal axis.

8. In combination, a plate-like casting, circular in formation, and having formed upon its one face a plurality of radially disposed nipples, a plurality of fan blades one for each of said nipples, said nipples being arranged in pairs and the nipples of each pair being diametrically opposed to each other, a fan blade for each nipple having a stem adapted to be journaled thereby, a cross pin carried upon the inner end of each stem and its ends adapted to seat in diametrically opposed notches formed in the inner end of the nipple, and a coil spring interposed between said cross pins of the fan blades whereby to adjustably hold the fan against turning movement about their longitudinal axis.

9. In combination, a circular plate-like casting, having four nipples formed upon one face thereof, said nipples being equally spaced circumferentially, a plurality of fan blades, one for each of said nipples and each fan blade having a stem adapted to be journaled by the associated nipple and also carrying at its inner end a transversely disposed pin, the ends of which extend and adapted to be disposed in notches formed upon the inner end of the nipples, a pair of interconnected coil springs disposed within the circumference described by the inner ends of said nipples, and each fan blade stem abutted by an end of one of said coil springs whereby the cross pins are retained in their notches to adjustably hold the fan blades against turning movement about the longitudinal axis thereof.

10. In combination, a plurality of members, arranged in circular formation and the inner ends thereof in spaced relation with a common point, said members being adapted for free inward movement, and means for yieldingly pressing said members outwardly,

said means comprising a pair of coil springs interconnected to provide a plurality of coil springs extending from a common point and the free end of each spring adapted to engage with the inner end of a member.

11. A device of the character described, comprising a supporting member, a plurality of stem journals arranged thereon and about a common point, a fan blade stem supported by each journal, a plurality of coil springs, one for each pair of fan blade stems and each coil spring having a plurality of central convolutions threaded through similar convolutions of another coil spring whereby said coil springs are connected with each other, and the ends of each coil spring adapted to engage the associated ends of a pair of fan blade stems for pressing the same outwardly, and means for limiting the outward movement of said fan blade stems.

12. A device of the character described, comprising a supporting head, a plurality of sleeve journals or nipples arranged upon said head in circular formation and about a common point, a plurality of fan blades, one for each sleeve journal, and each fan blade having a hollow stem adapted to be received by said sleeve journal, a plurality of interconnected coil springs, one for each pair of fan blades, said coil springs being arranged so that their central portions are connected to each other and the ends thereof extending into the stems of said fan blades, and means extending transversely of each fan blade stem adapted to serve as a stop for the one end of associated coil spring and also to serve to limit the outward movement of said fan blade stem.

13. A device of the character described, comprising a supporting head, a pair of journal sleeves carried by said head and arranged in axial alignment with each other and their opposing ends in spaced relation, a hollow stem journaled in each journal sleeve, a pin extending transversely through the inner end of said stem and adapted to limit the outward movement thereof, and a coil spring having its ends disposed within the inner ends of said hollow stems and each end engaging the associated cross pin and thereby to urge the stems outwardly.

ELI FRANKLIN COLBY.