

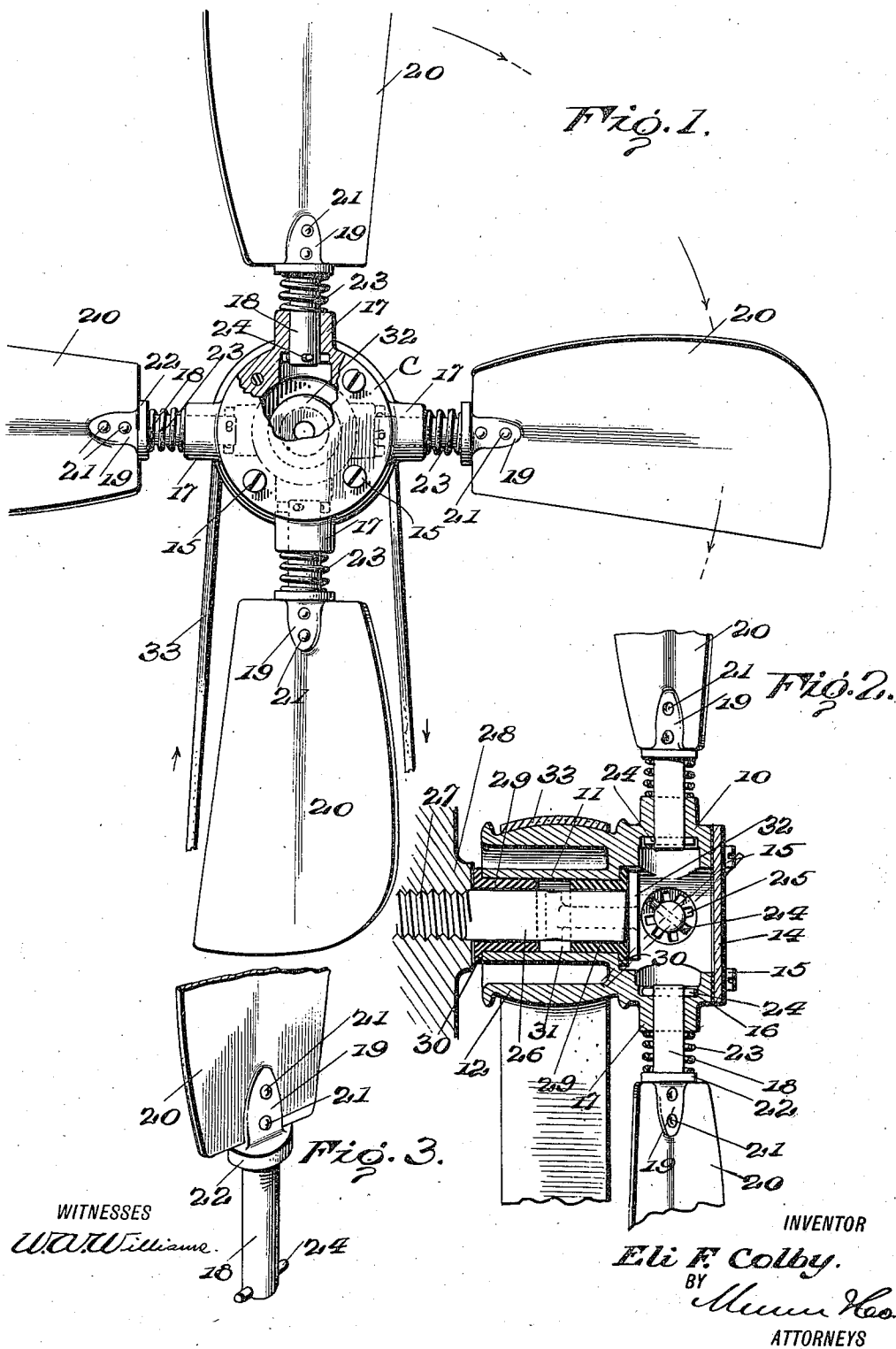
March 4, 1924.

1,485,552

E. F. COLBY

FAN AND PULLEY THEREFOR

Filed Feb. 10. 1922



UNITED STATES PATENT OFFICE.

ELI F. COLBY, OF LAKE MILLS, IOWA.

FAN AND PULLEY THEREFOR.

Application filed February 10, 1922. Serial No. 535,512.

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 and Pulleys Therefor, of which the following is a specification.

This invention relates to a fan.

The invention particularly relates to the type of fans used in connection with forcing air to radiators associated with internal combustion engines similar to subject-matter of invention disclosed in my co-pending application, Ser. No. 598,148, filed October 31, 1922, and consists in an attachment and adjustable fan blades carried thereby whereby the direction and intensity of the air current caused by the rotation of said blades may be closely controlled.

The object of the invention is to provide a hub structure and reversible fan blades therefor as above characterized which is exceedingly simple in construction and adapted to permit easy and quick adjustment of the blade.

It is also an object of the invention that the hub structure be adapted to be made as a single casting and at a relatively low cost. 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 front elevation of a hub structure and reversible fan blades carried thereby constructed in accordance with the present invention, and with parts broken away and shown in section to more clearly illustrate the manner in which the blades are adjustably held for turning movement.

Figure 2 is a vertical longitudinal view of the same.

Figure 3 is a detailed view showing the stem by which each fan blade is turnably supported and also a position of the fan blade carried thereby.

Referring to the drawings more particularly, C indicates generally a hub casting which consists in the hollow cylindrical portion 10 having extending from its one end the journaled sleeve 11 which communicates with the interior of the cylindrical portion 10 and in axial alignment therewith. Also there extends from the similar end of the cylindrical portion 10 a second sleeve 12

which is concentric to the sleeve 11 and in the form of a belt pulley. This construction makes an exceedingly light casting and at the same time of sufficient strength to endure all the strength that may be imposed thereon. The end of the cylindrical portion 10 opposite to that upon which the sleeves 11 and 12 are formed is provided with a removable cap, consisting in a plate member 14, which is secured to the end of the cylindrical portion 10 by the means of machine screws 15; and between the plate 14 and end of cylindrical portion 10 there is interposed a gasket 16.

The cylindrical portion of the casting is formed about its periphery with a plurality of nipples 17, each nipple being hollow and communicating with the interior of the cylindrical portion 10 of said casting. For each nipple there is provided a stem 18 which is freely slidable within the nipple, and said stem being formed at its one end with a pair of spaced prongs 19 between which the inner end of a blade 20 may be positioned and secured to the stem by rivets 21 or a similar means. The end of each stem 18 which terminates in the prongs 19 is also formed with a collar 22, and between the collar 22 and outer end of an associated nipple there is interposed a compression spring 23 which encircles the stem 18 as shown. The inner end of each stem has projected therethrough a pin 24, said pin having its ends projecting from the stem as shown and adapted to seat in notches formed about the inner end of the passage leading through the associated nipple, as illustrated in Figure 2 of the drawings, such notches being indicated by the reference numeral 25, and arranged in equal spaced relation about the inner end of a passage of each nipple so that by rotating the stem 18 the associated fan blade 20 may be held in any number of positions.

In mounting a hub of this character an elongated bolt is used as a journaling means and said bolt is threaded into the wall of associated engine. In this instance the elongated bolt is indicated by the reference character 26, said bolt having its one end threaded as at 27 which may be threaded into the wall of the associated engine indicated at 28. The bolt extends through the sleeve 11 of the casting, and within each end of the sleeve there is extended a bushing 29, each bushing being provided with a flange

30 at its one end whereby to hold the fan against inward movement and also hold the opposing ends of the bushing in spaced relation with one another to provide an oil space as at 31 into which the lubricant for the pulley passes from the hollow cylindrical portion through the lubricant duct in the bolt 26, as shown in dotted lines in Fig. 2. The bolt 26 is provided with a rounded cap or head 32 which holds the casting from displacement from said bolt. When the fan is positioned as shown in Figures 1 and 2, a belt 33 is passed about the pulley sleeve 12 for driving the fan, said belt being driven from the crank shaft of the associated engine in the usual manner.

In the use of the present invention, when it is desired to change the direction of current of air caused by the rotation of the fan blade 20, the fan blades may be each adjusted for this purpose by inward pressure against the coil spring 23 and rotating to the point desired and then permitting the pin 24 to be seated in the proper notches 25. The spring 23 will at all times maintain its stem 18 in adjusted position. As is obvious the fan blades may be adjusted to cause the air to be drawn rearwardly through the associated radiator and driven against the engine, or they may be adjusted to cause air to be drawn from about the engine and driven through the radiator. They also may be adjusted to regulate the intensity of the current of air in either direction.

With relation to the structural advantages of the casting it may be said that the interior of the cylindrical portion 10 provides an oil reservoir for lubricating the bolt 26. The cap 14 prevents any oil from leaking from this portion of the casting. The space between the bushings 29 permits a collection of oil to insure constant communication of the bolt 26.

I claim:—

1. A hub member for a fan, comprising a cylindrical portion, a journal sleeve extending axially from one end of the cylindrical portion, a second sleeve in the form of a belt pulley surrounding the first named sleeve and extending from the same end of the cylindrical portion; and means carried by said cylindrical portion whereby a plurality of fan blades may be supported.

2. A hub member for a fan, comprising a cylindrical portion, a journal sleeve extending axially from one end of the cylindrical portion, a second sleeve in the form of a belt pulley surrounding the first named sleeve and extending from the same end of the cylindrical portion, a bushing extending inwardly from each end of the journaled sleeve and having their inner ends in spaced relation with one another, a flange formed upon the outer end of each bushing to hold the same against inward movement, and

means in connection with said cylindrical portion for supporting a plurality of fan blades.

3. A hub casting for a fan, comprising a hollow cylindrical portion, a journal sleeve extending axially from one end of the cylindrical portion, a second sleeve surrounding the journal sleeve and extending from the similar end of the cylindrical portion, said second sleeve being in the form of a belt pulley, a bushing extending into each end of the first named sleeve having a flange formed about its outer end adapted to hold the same against inner movement and the opposing ends of said bushings being in spaced relation with one another, said cylindrical portion having its end opposite to the end upon which the sleeves are formed open, a removable plate closure for said open end, and means formed upon the cylindrical portion whereby a plurality of fan blades may be carried radially thereto.

4. In combination, a cylindrical hollow casting having a plurality of radially extending nipples formed therewith, the passage of each nipple communicating with the interior of the casting, a stem for each nipple and adapted to extend within the passage thereof, a fan blade secured to the outer end of each stem, a compression spring for urging the stem outwardly, and means upon the inner end of each stem adapted to cooperate with the associated compression spring whereby to adjustably hold the stem against rotative movement.

5. In combination, a cylindrical hollow casting having a plurality of radially extending nipples formed therewith, the passage of each nipple communicating with the interior of the casting, a stem for each nipple and adapted to extend within the passage thereof, a fan blade secured to the outer end of each stem, a coil spring encircling each stem and adapted to urge the same outwardly, and means carried upon the inner end of each stem adapted to cooperate with said coil spring for adjustably holding the stem against turning movement.

6. In combination, a cylindrical hollow casting having a plurality of radially extending nipples formed therewith, the passage of each nipple communicating with the interior of the casting, a stem for each nipple and adapted to extend within the passage thereof, a fan blade secured to the outer end of each stem, a collar formed about the outer end of each stem, a coil spring encircling each stem and interposed between the collar and the outer end of the associated nipple whereby to continuously press said stem outwardly, and means carried upon the inner end of each stem adapted to cooperate with the coil spring for adjustably holding the stem against rotative movement.

7. In combination, a cylindrical hollow

casting having a plurality of radially extending nipples formed therewith, the passage of each nipple communicating with the interior of the casting, a stem for each nipple and adapted to extend within the passage thereof, a fan blade secured to the outer end of the stem, a collar formed about the outer end of each stem, a coil spring encircling each stem and interposed between the collar and the outer end of the associated nipple whereby to continuously press said stem outwardly, and a pin extending transversely through each stem at its inner end and adapted to have its ends projecting from the stem enter diametrically opposed notches formed about the inner end of the passage in each nipple, whereby to adjustably hold the stem against turning movement.

8. In a fan construction, a head provided with sockets disposed substantially radially thereof, standards arranged in said sockets, means providing interlocking connections between said standards and sockets, and springs to normally hold said standards and sockets engaged.

9. In a fan construction of the character described, a head provided with sockets disposed substantially radially thereof, standards arranged in said sockets, means providing interlocking connections between said standards and sockets, and means whereby to releasably hold said standards and sockets engaged.

10. A fan pulley comprising a hollow cylindrical portion adapted for containing lubricant, a journal sleeve extending axially from one end of the cylindrical portion, a second sleeve in the form of a belt pulley concentric with said first sleeve extending from the same end of the cylindrical portion, a bushing extending inwardly from each end of said journal sleeve, the inner ends of said bushings being in spaced relation for receiving lubricant from said cylindrical portion, and means in connection with said cylindrical portion for supporting a fan.

11. A fan pulley comprising spaced con-

centric sleeve members integrally united at one end, a hollow extension extending from said integrally united ends adapted for containing lubricant and supporting a fan, and a support for the pulley having means abutting the inner wall of said hollow extension for confining the pulley thereon.

12. A fan pulley comprising a pair of integral concentric members, the outer member being adapted for supporting a belt, and the other forming a journal hub, sleeves extending into said hub with the inner ends thereof spaced apart and a hollow cylindrical extension on said pulley for containing a lubricant and supporting a fan.

13. A fan pulley comprising a pair of spaced and integral concentric members, the outer member being adapted for supporting a belt, and the inner member forming a journal hub, means for providing a lubricant chamber within said journal hub and a cylindrical fan supporting extensions on one end of said pulley, adapted for containing lubricant and supplying the same to said journal hub.

14. A fan pulley comprising an integral structure having a belt supporting member and a journal sleeve concentric with said belt supporting member, one end of said pulley being extended beyond said member and sleeve to provide a chamber and a support for rotatably supporting said pulley having means engaging the inner wall of said chamber.

15. A fan pulley comprising spaced concentric sleeve members integrally united at one end, a hollow extension extending from said integrally united ends adapted for containing a lubricant and supporting a fan, flanged bushings extending inwardly from opposite ends of the inner concentric member with their inner ends spaced apart and a support adapted for extending through the inner concentric member and provided with means abutting the flange of one of said bushings.

ELI F. COLBY.