A. KOENIG.

REVERSIBLE ENGINE FAN.

APPLICATION FILED JULY 7, 1919.

1,368,808. Patented Feb. 15, 1921.

Fig. 2.

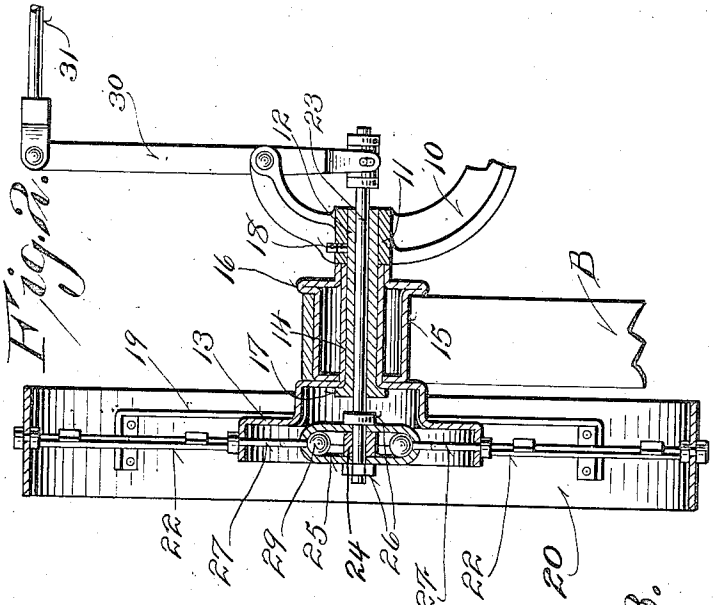


Fig. 1.

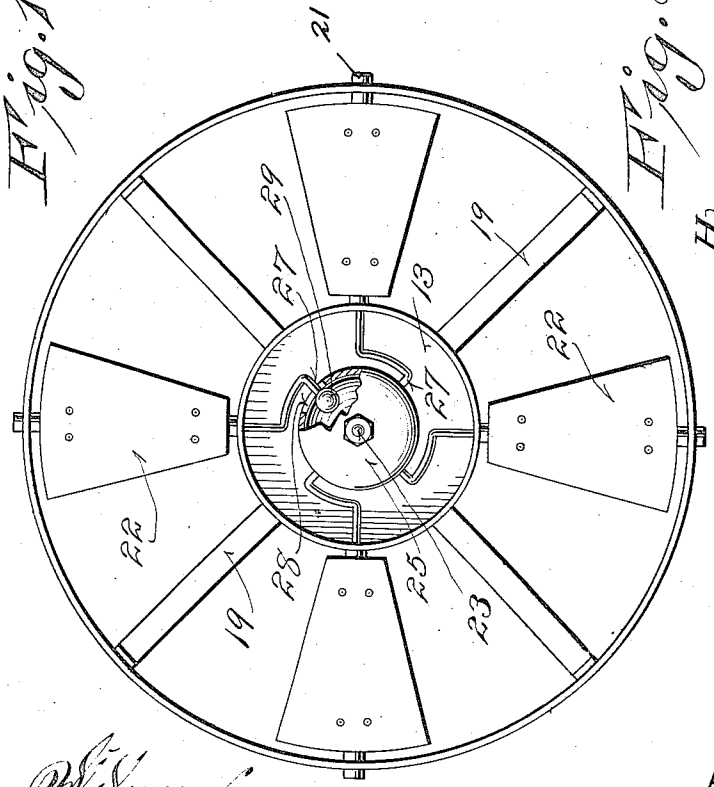
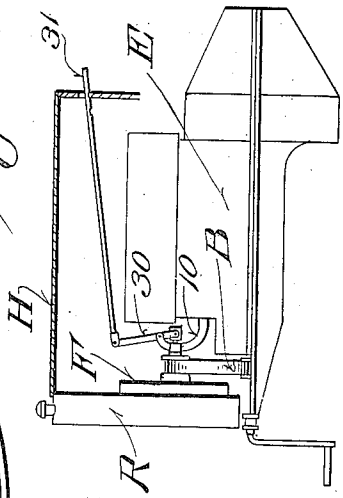


Fig. 3.



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ARTHUR KOENIG, OF RACINE, WISCONSIN.

REVERSIBLE ENGINE-FAN.

1,368,808. Specification of Letters Patent. Patented Feb. 15, 1921.

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To all whom it may concern:

Be it known that I, ARTHUR KOENIG, a citizen of the United States, and resident of Racine, in the county of Racine and State of Wisconsin, have invented certain new and useful Improvements in Reversible Engine-Fans; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to new and useful improvements in rotating fans and more particularly to fans associated with the cooling systems of internal combustion engines of power plants of that type usually employed on automobiles.

During the winter in northern countries, the extreme cold is often effective to freeze the radiator of an automobile, even when the engine of the automobile is running due to the exposed condition of the radiator and to the action of the usual radiator fan in drawing air therethrough onto the engine, which is also unduly cooled under these conditions.

It is therefore primarily the object of my invention to provide an arrangement for reversing at will the propelling directions of a radiator fan, whereby said fan may be utilized in its normal function to set up a cooling draft of air through the fan, or may be reversed to impart some of the heat of the engine to the radiator and prevent its freezing under severe weather conditions while the engine is running.

It is more particularly an object of my invention to provide an exceedingly simple and efficient device for changing the inclination of the blades of a radial fan.

With the above and other objects and advantages in view, which will be apparent as the description proceeds, my invention resides in the novel features of construction, combination and arrangement of parts as hereinafter described and defined by the appended claims.

In the accompanying drawings:

Figure 1 is a front elevational view of a radiator fan constructed in accordance with my invention.

Fig. 2 is a vertical sectional view through the fan, and

Fig. 3 is a side elevational view of an engine and radiator with my improved fan structure associated therewith.

Referring now more particularly to Fig. 3 of the drawings, there is conventionally shown an engine E having a radiator R disposed forwardly thereof, the usual hood H being disposed over the engine and defining an engine chamber, the fan F being disposed in this chamber immediately rearwardly of the radiator and being driven by a belt B from the usual engine shaft. In the present structure, my improved fan mechanism is carried on a bracket 10 curved forwardly and upwardly from the engine casting.

This bracket is provided with a bearing sleeve in which is secured the rear end of a hollow stationary journal shaft 12. My improved fan structure includes a shell like hub 13 which is connected at one side with a hub sleeve 14 mounted on the journal shaft 12 and this hub sleeve carries a pulley member 15 for receiving the belt B, which comprises a tubular section having its ends inturned for securement to the hub sleeve 14, one of said ends adjacent the annulus 13 being turned directly inward from the pulley surface, while the other end is turned outwardly and then inwardly for engagement with the hub sleeve, thus forming a retaining flange 16 for the belt B. The hub sleeve 14 is retained on the journal shaft 12 by a flange 17 at the outer end of said shaft, and said journal shaft is in turn secured within the bracket sleeve 11 by a set screw 18 threaded in the sleeve and engaged therewith, thus providing for a most ready assembly of the parts described.

Spider arms 19 extend radially from the inner annulus 13 and support an outer annulus 20 and a series of radial shafts 21 are provided each journaled in the inner and outer annulus and carrying therebetween a preferably flat fan blade 22.

For adjusting these fan blades and holding them in desired adjusted positions, a rod 23 is slidably and rotatably mounted in the hollow journal shaft 12, and this rod carries a spacer thimble 24 on its forward end against which are secured a pair of oppositely cupped head plates 25 having their peripheral portions directed together, said plates being held against the spacer sleeve by nut members 26 in threaded union with the shaft to thus form a hollow head which can readily be assembled and dismantled with relation to fan shaft actuating cranks. The inner end of each of the radial fan shafts is provided with a crank offset

27 and each of these offset portions is extended through a circumferential slot 28 in the shifter head and terminates in a spherical contact head 29 disposed therein.

Thus it will be seen that the slotted connection between the crank portions of the blade carrying shafts, will permit the same to swing upon the journals as the hollow head is moved axially, it being understood that the enlarged spherical heads form points of contact between the opposite walls of said hollow head to effect the shifting operation, thus friction is reduced to a minimum, which is an important feature, owing to the fact that the moving parts are revolving at high speed. Thus longitudinal shifting movement of the rod 23 will adjust the angularity of the fan blades 22, said rod rotating with the fan structure when the same is driven. For adjusting the angular position of the rod, a lever 30 is intermediately pivoted to the upper end of the journal bracket 10, said lever having one end in spanner connection with the rear of the rod 23 and having its other end connected with a link 31 which extends rearwardly for convenient manipulation by the operator of the automobile.

In operation the rod 23 is normally set to procure rearward propelling action of the fan blades 22, throwing the outer air through the radiator to cool the circulating fluid passing therethrough. When, however, exceedingly cold weather conditions are encountered, the rod 23 is shifted to reverse the action of the fan blades and thus propel heated air from the engine chamber through the radiator structure to impart a portion of the engine heat to the radiator and preventing freezing thereof under such severe weather conditions.

While I have shown and described a preferred embodiment of my invention, it will be appreciated that various changes and modifications of structure may be employed to meet different conditions of use and manufacture without departing in any manner from the spirit of my invention.

What is claimed is:

In a reversible bladed fan having a rim member and a shell like hub member, a hollow stud shaft on which the hub is journaled, and a series of radially disposed blade carrying shafts journaled in the rim and hub members having inner crank ends terminating with enlarged heads, the combination of an actuating mechanism for the crank ends of the fan blades comprising a revoluble and slidable shaft mounted in the hollow stud shaft, and extending into the shell hub, a spacing sleeve mounted upon the rod, a pair of oppositely cupped head plates mounted on the rod in abutting engagement with the sleeve ends, the companion cup disks having annular slots through which the cranked ends of the blade carrying shafts project, and the enlarged heads being engageable with the opposite walls of the cupped head member, clamping nuts carried by the shifting rod for securing the cupped head members together, and means for adjusting the fixed rod longitudinally for varying the angle of the fan blades.

In testimony that I claim the foregoing I have hereunto set my hand at Racine, in the county of Racine and State of Wisconsin.

ARTHUR KOENIG.