To all whom it may concern:

Be it known that I, Percival L. Silick, a subject of the King of Great Britain, residing at Sacramento, county of Sacramento, and State of California, have invented new and useful Improvements in Engine-Radiator Fans, of which the following is a specification.

This invention relates to a fan construction, and particularly pertains to a fan adapted to be used in connection with automobile radiators.

It is desirable to provide a fan for forcing air through the water cooling radiator of an engine to provide a variable fan action under different atmospheric and climatic conditions, and it is the principal object of the present invention to provide a fan embodying means whereby the pitch of the fan blades may be instantly varied without interrupting the operation of the fan, and will thus produce a desired force for creating a flow of air through the radiator.

The present invention contemplates the use of a hub driven by a suitable power transmission means and carrying a plurality of fan blades, said hub forming a closure for operating means for the blades whereby their pitch may be varied at will.

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

Fig. 1 is a view in side elevation showing the fan with which the present invention is concerned.

Fig. 2 is an enlarged view in longitudinal section through the hub of the fan, showing the blade operating mechanism.

Fig. 3 is an enlarged view in transverse section through the hub.

Fig. 4 is a view in plan showing the operating disk of one of the blades.

Referring more particularly to the drawings, 10 indicates a bearing supporting a tubular shaft 11. This shaft projects forwardly and carries a hub structure 12. The rear end of the hub is formed with a pulley section 13 for receiving a belt 14. The forward end of the hub provides a housing for blade operating means 15 and also bearings for fan blades 16. The outer end of the hub is closed by a cap 17. The hub is secured upon the shaft 11 by a collar 18 which is pinned to the shaft and held against the back of the hub while holding the counterbore face of the hub against an enlarged shoulder on the end of the shaft 11, which shoulder is formed by a forwardly projecting portion 19 of the shaft. The projection 19 is circular in section and serves as a bearing for a sliding sleeve 20. This sleeve is adapted to reciprocate lengthwise of the shaft as operated by a control rod 21 extending through a central bore of the shaft 11 and being fastened to the end of the sleeve by a nut 22.

The sleeve is square in section and thus provides four flat outer faces against which operating disks 23 seat. These disks, as shown in Fig. 4, are each formed with a radial slot 24. The slots receive operating pins 25 which project from the flat surfaces of the sleeve and are so exposed as to cause all of the disks 23 to rotate in like direction when the sleeve is moved. The disks 23 are formed at the lower ends of the blade mountings 26. These members are circular and extend through radial openings in the hub 12. The outer ends of the mountings are split to receive the blades 16 which are held in position by screws 27.

It is to be understood that the mountings rotate within the hubs; thus when the sleeve 20 is reciprocated, the pins 25 will engage the slots 24 of the various disks 23 carried by the mountings and will cause them to simultaneously rotate, changing the pitch angle of the blades. This arrangement will be extremely advantageous when starting a cold motor, as the blades may be placed in a single plane at right angles to the rotary axis of the fan and will minimize the cooling action of the radiator so that it will be possible for the engine to readily warm up.

After the engine has attained its running speed the load of the fan may then be thrown on the engine as the blades are turned, thus causing a current of air to be drawn through the radiator. Under low temperature climatic conditions the blades may be reversed so as to create a current of air from under the hood of the engine and around the exhaust pipe through the radiator, thereby warming the radiator.

It will thus be seen that the invention here disclosed provides simple and effective means for accurately controlling the operation of a radiator fan and thereby insuring that an engine connected therewith will operate under the most favorable temperature, irrespective of climatic conditions.

While I have shown the preferred form
of my invention as now known to me, it will be understood that various changes may be made in the combination, construction and arrangement of parts by those skilled in the art, without departing from the spirit of the invention, as claimed.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A fan for radiators and the like comprising a tubular shaft, a hub rotatably disposed on said shaft, said hub formed with an enlarged counterbore into which the end of said shaft projects, a sleeve reciprocably mounted on the end of said shaft, said sleeve having flat exterior faces, a plurality of fan blade mountings extending radially through and journaled in the wall of said hub, said mountings being rotatable around their radial axes, fan blades carried at the outer ends of said mountings, disks formed on the inner ends of the mountings and bearing on the flat faces of said sleeve, each of said disks having a radial slot formed in the marginal edge thereof, pins carried by the flat faces of the sleeve and in engagement with the slots in the disks whereby reciprocation of the sleeve will cause turning of the blade mountings, and a control rod extending through said tubular shaft and connected to said sleeve to reciprocate the same.

2. A fan for automobiles comprising a stationary tubular shaft, a hub rotatably disposed on said shaft and secured from axial movement thereon, a pulley section on the hub whereby it may be revolved, said hub being formed with an enlarged counterbore into which the end of said shaft extends, a sleeve slidably mounted on the end of said shaft within the counterbore in the hub, said sleeve having flat faces formed on the exterior surface thereof, fan blade mountings extending radially through the walls of said hub, said mountings having cylindrical portions journaled in the walls of the hub whereby the mountings may rotate about their radial axes, the outer ends of said mountings being split to receive and connect with the inner ends of fan blades, disks formed on the inner ends of said mountings, the inner faces of said disks bearing on the flat faces of said sleeve, each of said disks being formed with a radial slot in its marginal edge, a pin projecting from each of the flat faces of the sleeve, said pins engaging said slots in the disks whereby axial movement of the sleeve will cause turning of the mountings, a control rod extending through the tubular shaft and secured to one end of the sleeve to reciprocate the same.

PERCIVAL L. SILICK.