Dec. 2, 1930. E. O. SCHJOLIN 1,783,928

RADIATOR

Filed Sept. 26, 1927

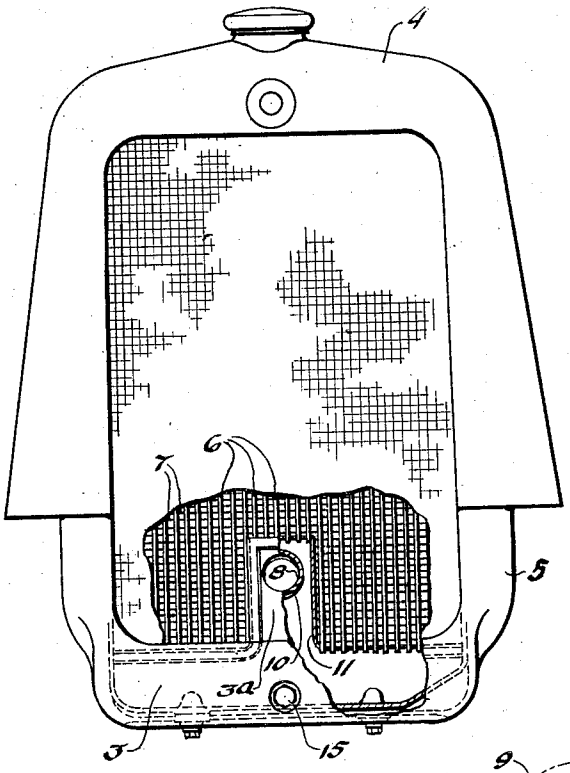


Fig. 1

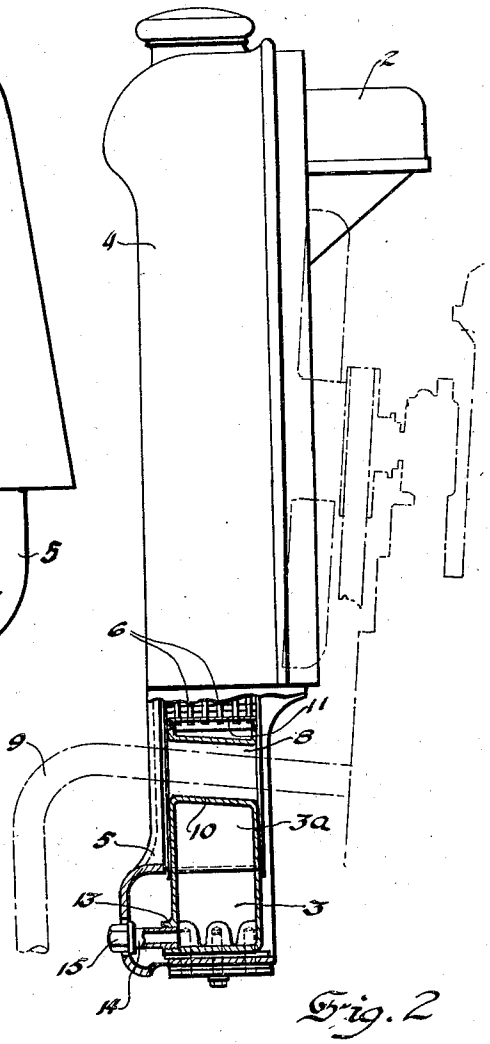


Fig. 2

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UNITED STATES PATENT OFFICE

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RADIATOR

Application filed September 26, 1927. Serial No. 222,103.

This invention relates to motor vehicles, and more particularly to an improvement in the radiator forming a part of the cooling system of an internal combustion engine.

Heretofore, the general practice has been to support the radiator above the axis of the engine crankshaft, where it will not interfere with the engagement of the starting crank with the crankshaft, when the engine is to be turned over by hand. Especially in the case of buses and trucks, where the size of the engine necessitates a large capacity radiator and a maximum of cooling surface, the extreme height and bulk of the radiator and engine hood materially detracts from the appearance of the vehicle, and the front end thereof is not in harmony with the body lines.

To meet the situation, the present invention contemplates mounting the cooling radiator at the front of the engine and below the axis of the crankshaft, and the provision of an opening thru the radiator for the insertion of the starting crank. So as not to interfere with the circulation of cooling medium thru the assembly of heat radiating elements, the lower tank has an upwardly extending portion at the center, in which is located the starting crank opening. The arrangement enables the radiator and engine hood to be dropped quite low and more in accord with the present day trend toward low swung automobile body design.

In the accompanying drawing, illustrating a preferred embodiment of the invention, Figs. 1 and 2 are front and side elevations, respectively, of the radiator structure, with parts thereof broken away.

Referring more particularly to the drawing, a fragmentary outline of an internal combustion engine, referred to by the numeral 1, is indicated by broken lines, to the front of which is located, the radiator forming the present subject matter. The radiator may be mounted upon any suitable form of support, which, not constituting any part of the invention, has not been illustrated.

Following general practice, the radiator comprises an upper tank or header 2, a lower tank or header 3, and an assembly of heat radiating elements connecting said tanks, thru which the cooling fluid may pass from one tank to the other to dispel the heat carried thereby. A protective shell or casing, in this case, shown as being formed in upper and lower parts 4 and 5 respectively, and which is so shaped as to be of pleasing appearance, is preferably provided to border the outer edges and surround the parts.

In order that the radiator may be brought closer to the ground, without interfering with the circulation thru the heat radiating assembly, in this instance, comprising a plurality of vertical flow pipes or tubes 6, passing thru the fins or plates 7, the lower tank 3 is provided with an upwardly extending portion 3^a, at the center thereof, having an opening 8 therethru, in alignment with the axis of the engine crankshaft, and thru which a starting crank, indicated by the dot and dash lines at 9 in Fig. 2, may be inserted to permit the engine to be turned over by hand. Thus, the lower tank, which for economy and convenience of manufacture, is of cast metal, is of substantially an inverted T-shape, the upright portion having an integral circular wall 10, extending between the front and rear walls, the space within which forms the starting crank opening 8 before referred to. The top of the lower tank 3, which in casting is left open, is closed by a channelled plate member 11, the side flanges being soldered or otherwise secured to the adjacent margins of the tank walls. The lower ends of the tubes 6 communicate with the bottom tank 3, thru openings in the channelled closure plate 11, the joints between the plate and tubes being made waterproof. The tubes at either side of the upright portion of the tank will thus be of greater length than those at the center of the assembly, the upright portion fitting into the space between the outer tubes, afforded by those ending short.

Cooling fluid flowing downward thru the longer tubes, enters the lower cross portion of the tank, while that flowing thru the shorter tubes, enters the upright portion and passes, on either side of the circular wall 10 to the bottom of the tank.

To facilitate the easy draining of the liquid within the circulating system, an apertured

boss 13 is formed on the front wall at the base of the tank 3, having a short length of tubing 14 threaded therein and closed by a drain plug 15. The drain plug is thus readily accessible at the front of the vehicle.

While the particular construction shown has been described more or less in detail there is no intention to limit the invention to specific details, but it is to be understood that such modifications may be made as come within the scope of the appended claims.

I claim:

1. In a radiator of the tubular type, spaced inlet and outlet tanks, a series of straight water flow tubes connecting the tanks, a hollow extended portion constituting a part of one tank and projecting at right angles therefrom toward the other tank with its side walls in substantial parallelism with the straight water flow tubes, some of the tubes being longer than others and projecting beside the side walls of the extended portion and therebeyond into communication with the main portion of the tank and the other tubes terminating at the end wall of and communicating with said extended portion, a series of transverse plates through which said tubes extend, those plates beyond the extended portion each being continuous from side to side and receiving all of the tubes and the remaining plates being of shorter length and ending at an adjacent side wall of the extended portion and receiving only longer tubes of the tube series, and a lateral passageway through the extended tank portion for the insertion of a starting crank or the like.

2. A heat radiating unit for an automobile radiator or the like, including a series of straight water flow tubes adapted to connect spaced inlet and outlet tanks, and a series of transverse heat radiating plates through which said tubes extend, certain of said tubes and certain of said plates ending short of others thereof in cooperative relation with one another, to provide an open space in the unit adjacent the lower end thereof, a bottom tank extending across the lower ends of the tubes and having a riser projecting up into the open space to connect with the shorter tubes, and a starting crank opening through the riser.

In testimony whereof I affix my signature.

ERIC OLLE SCHJOLIN.