E. A. BASEL.

WATER CIRCULATOR.

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1,270,101.

Patented June 18, 1918.

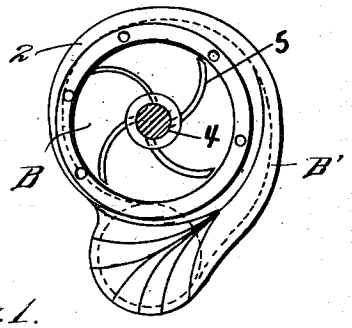

Fig. 1.

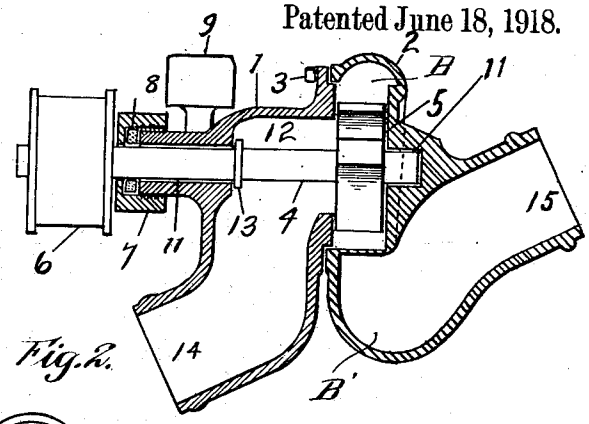

Fig. 2.

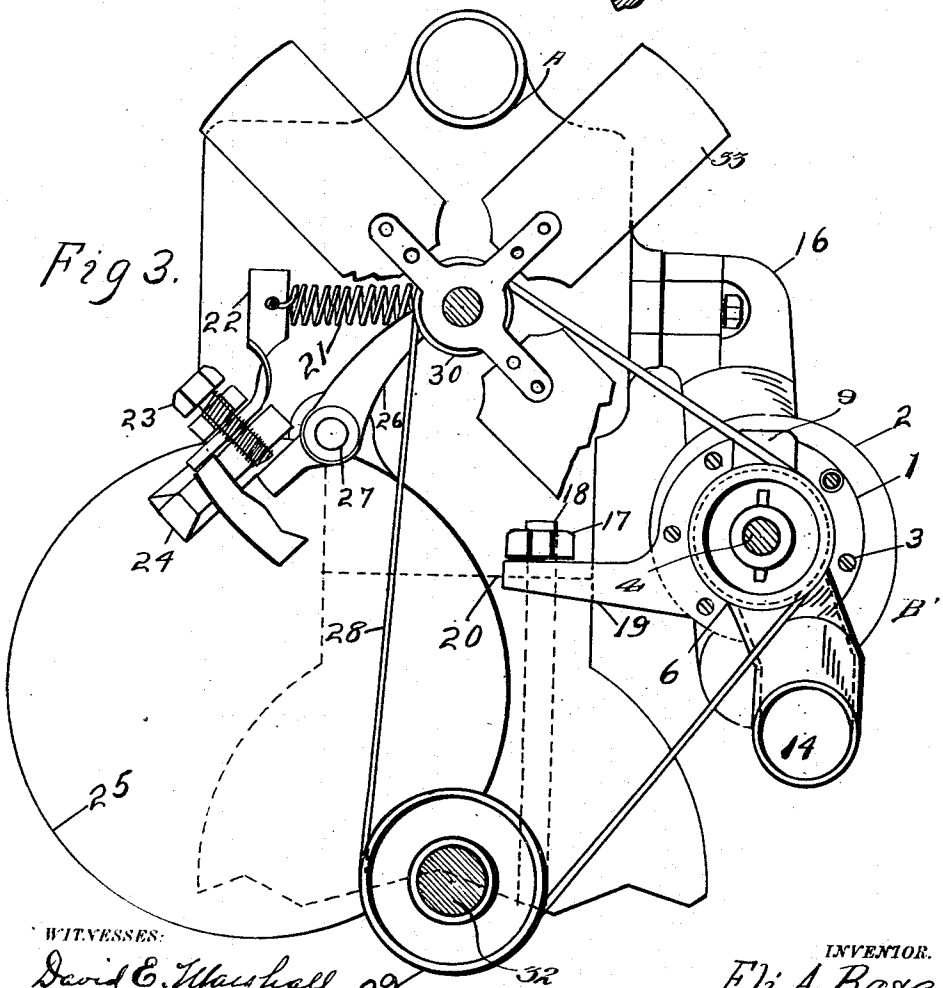

Fig 3.

WITNESSES:

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WATER-CIRCULATOR.

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To all whom it may concern:

Be it known that I, ELI A. BASEL, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Water-Circulators, of which the following is a full and exact specification.

The present invention relates to water circulating devices and aims to provide an improved water circulating means adapted more particularly to the cooling of internal combustion engines, especially of that type employed in automobile constructions.

One object of the invention is to provide a water circulating device so constructed as to produce a circulation of the water by the action of a centrifugal impeller member arranged in the water conduit.

Another object of the invention is to devise an improved construction adapted for automobile engines which will induce the proper water flow at all times during the operation of the engine and independently of its thermo-siphon action.

It is also an object to produce a self-contained water circulating device in the form of an attachment which may be conveniently applied to an automobile engine as commonly constructed.

A further object is to devise a simple engine cooling construction having the fan and water impeller members operated by a single drive connection from the engine. Incidental to this construction an improved belt-tightener feature is provided in conjunction with said drive connection.

It is also sought to devise a neat, simple and compact construction for effectively carrying out the objects of the invention, and which will be economical and inexpensive to manufacture, and not easily gotten out of order.

With these general objects in view, the invention will now be described with reference to the accompanying drawing, illustrating one form of embodiment of the proposed improvements, after which those features and combinations of parts deemed to be novel will be severally set forth and defined in the appended claims.

In the drawing—

Figure 1 is a face view of one of the tubular casings forming a part of the device, showing the water impeller member mounted therein and the shaft of the latter in section;

Fig. 2 is a central longitudinal sectional view of the device; and

Fig. 3 is an end elevation of an internal combustion engine, with parts broken away and showing the same equipped with a cooling system constructed in accordance with the present invention.

Referring to the said drawing in detail, this illustrates the entire housing of the invention as comprising a pair of tubular water conduit casings 1 and 2 arranged in communication with each other as shown in Fig. 2, and the casing 1 being formed with the intake extension 14 adapted to make hose connection with the lower extremity of the engine radiator, and the casing 2 having the outlet or delivery extension 15 adapted to make hose connection with the conduit 16 communicating with the water jacket of the engine A. The casing 1 is formed with an arm 19 extending in position for convenient attachment to one of the engine bolts 18 having the nut 17 which is employed for clamping the arm 19 securely in place. The casing 2 is secured to the casing 1 by means of the cap screws 3, and the adjoining portions of the said casings are formed, as shown in Fig. 2, in a manner coöperating to provide a chamber B for housing an impeller member 5. This member 5 is equipped with impeller blades of a width fitting snugly the width of said impeller chamber, and the latter is formed with the curved and tapered swell B′ arranged to receive the water as driven under the centrifugal action of said impeller blades, and to conduct the water on into the casing 2, from which it is forced out through the outlet extension 15.

The impeller member 5 is carried by a shaft 4 which extends through the impeller chamber B and one end of the casing 1, the opposite ends of said shaft being journaled, respectively, in an elongated bearing 11 formed in the casing 1 and in a socket bearing 11^a formed in the casing 2. The shaft is provided with a collar 13 abutting against the inner end of the bearing 11 and thereby coöperating with the socket bearing 11^a for preventing any axial motion of the shaft 4 which would result in injury to the side margins of the blades of the impeller member 5. A grease cup 9 is mounted

on the casing 1 in position for providing proper lubrication to the bearing 11 of the shaft 4.

The shaft 4 projects on out through the bearing 11 and through a packing nut 8, and the outer end of said shaft has fitted thereon a pulley 6 positioned in approximately the same vertical plane as a pulley 29 provided on the engine shaft 32, from which said pulley 6 is driven by means of the belt 28.

The same pulley 28 is also utilized for driving the radiator fan member 33, the pulley 30 of which is also arranged in approximately the plane of the pulleys 6 and 29 in position for suitable driving engagement by said belt 28. The fan member 33 is journaled upon the upper end of an arm 26 which is pivoted at its lower end, at 27, upon the engine, so that the fan pulley 30 is thus afforded a bodily movement for taking up the slack in the belt 28. This take up movement is automatically effected by means of a coil spring 21, one end of which is attached to the upper end of the arm 26 adjacent the pulley 30, the opposite end of said spring being attached to a plate member 22 which is secured to a part 24 of the engine by means of a screw 23.

It will thus be apparent that a simple and efficient construction and arrangement have been devised for carrying out the desired objects of the invention. The principal objection to the usual water circulating arrangement, which depends upon the heat generated by the engine to produce the water flow, lies in the fact that the circulation of the water must necessarily lag back until its temperature rises to a point where it has lost a large proportion of its efficiency as a cooling medium; and the unduly high temperatures, due to inadequate circulation, frequently results in boiling and evaporating away of the water, with serious inconvenience, necessitating stopping and filling up the radiator, and sometimes causing serious injury to the engine. With the present improvements, so long as the engine is in operation, the device will be operated continuously through the medium of the belt 28, and immediately the engine is started the water circulation will begin, being of course independent of any thermo-siphon action. And since the circulation is maintained continuous and substantially constant, the temperature throughout the water will also be practically uniform, and its efficiency as a cooling medium is materially increased as compared to that of water flowing unevenly and the temperature of which has been raised by a lagging action. The drive arrangement in the present construction is also simplified, a single drive operating both the fan and water circulating member, and the peculiar mounting of the fan member and the spring element connected therewith providing a novel and simple means for maintaining the belt at a proper tension.

In case the impeller member of the device should be stopped from any cause, as accidentally, or its use not be required, as in the winter time, the size of the conduit casings 1 and 2 and the space between the impeller blades are made amply large so as not to interfere with a normal flow of the water while the device remains out of operation.

While the foregoing represents what is now deemed to constitute the preferred form of embodiment of the improvements, the right is reserved to all such formal changes or modifications as may fairly fall within the scope of the appended claims.

Claims:

1. A self-contained water circulating device for internal combustion engines comprising a water conduit casing provided with means for detachably securing the same to the engine, a second conduit casing provided with means for securing the same to said first casing, the adjoining portions of said casings coöperating to form a housing, a shaft provided with an impeller member operating within said housing, each of said casings being formed with a bearing portion and the bearing portions of said casings being arranged in alinement for journaling the opposite ends of said shaft, and means for driving said shaft from the engine.

2. In an engine cooling system, the combination of a water conduit, a water circulating member mounted in said conduit and provided with a drive pulley, a fan member provided with a drive pulley, a swivel arm forming an independent support for said fan member with its drive pulley substantially in the plane of said first pulley, a single belt driven from the engine and operating around both said pulleys to drive the same, and a yielding element attached to the engine and associated with said arm for actuating the same to take up the slack in said belt.

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