Aug. 14, 1923. 1,464,568

E. G. GUNN

HYDROCARBON MOTOR

Filed March 20, 1920

Fig. 1.

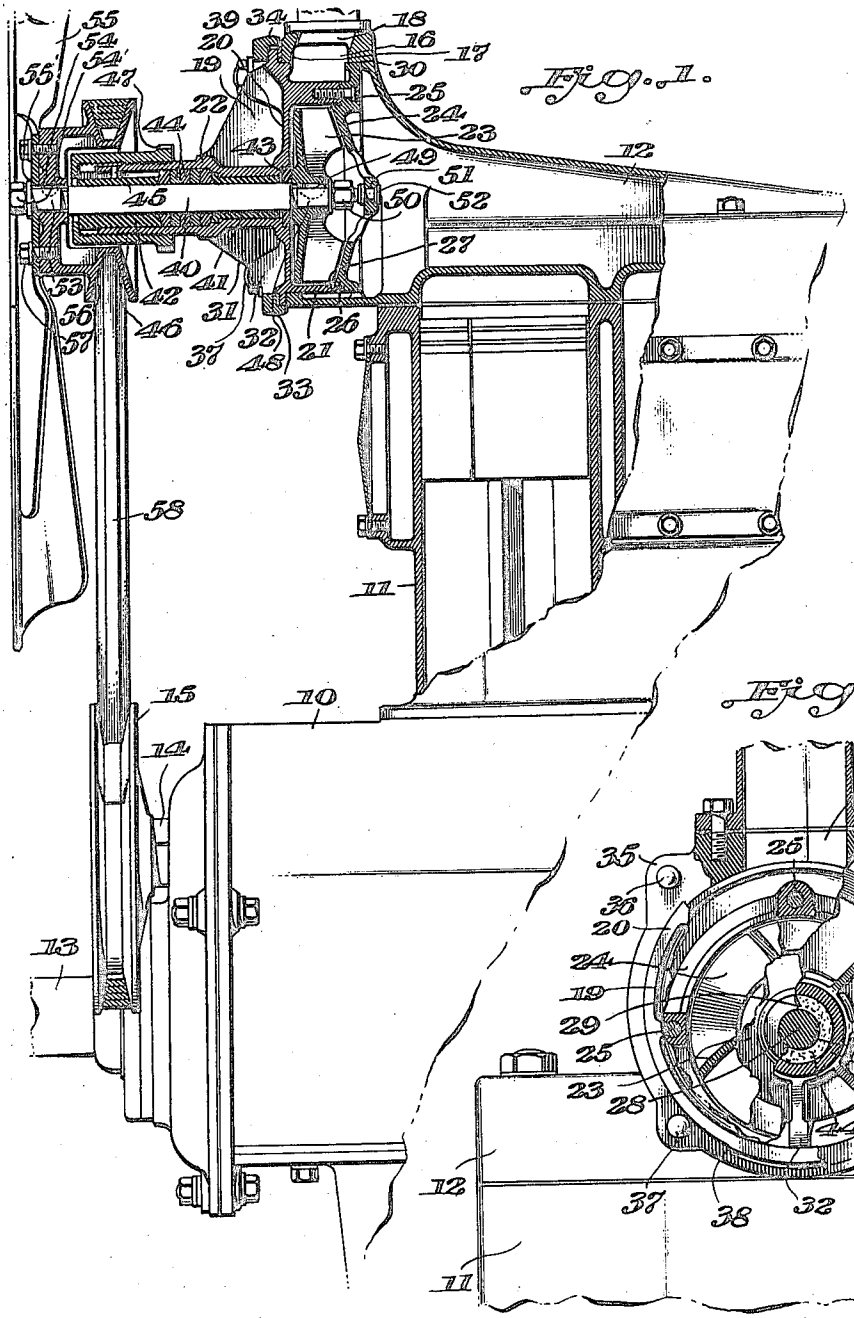


Fig. 2.

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UNITED STATES PATENT OFFICE.

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HYDROCARBON MOTOR.

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To all whom it may concern:

Be it known that I, EARL G. GUNN, a citizen of the United States, and resident of Detroit, Wayne County, State of Michigan, have invented certain new and useful Improvements in Hydrocarbon Motors, of which the following is a specification.

This invention relates to hydrocarbon motors, and more particularly to the mounting of, and driving connections for, the water pump and fan on such motors.

The invention has for its object to simplify the mounting of, and driving connections for, the fan and water pump.

Another object of the invention is to so mount the fan and water pump that the sides of the cylinder block will be free from such accessories, thereby materially adding to the clean appearance of the motor.

Another object of the invention is to provide simple and effective means for adjusting the fan pulley in order to loosen or tighten the fan belt.

Another object of the invention is to eliminate unnecessary parts, thereby decreasing the expense of the construction and lightening the motor.

Further objects will appear from the following description taken in connection with the drawings, in which:

Fig. 1 is a vertical section of the front end of a motor, having mounted thereon the water pump and fan; and

Fig. 2 is an enlarged detailed view, partly broken away and partly in section, illustrating the eccentric mounting of the pump and the pump driving shaft.

In the embodiment of the invention illustrated, the water circulation pump of the hydrocarbon motor is mounted on the top of the motor, as on the cylinder head, and the movable or rotary member of the pump or pump impeller and fan are mounted on a single driving shaft. The pump casing, and shaft carried by the casing, are so mounted that the distance between the drive or power transmitting shaft of the motor and the driving shaft for the pump and fan may be varied by adjusting the pump impeller cage with respect to the pump casing. As illustrated, the pump shaft is eccentrically mounted with respect to the pump casing.

The motor in connection with which the invention is illustrated, comprises a crank case 10, having a cylinder block 11 secured thereto, a water-jacketed cylinder head 12 being mounted on the cylinder block 11. A crank shaft 13 is carried by the crank case, and a cam shaft 14 is also mounted in the crank case and is driven in any suitable manner from the shaft 13. The cam shaft 14 has secured thereto a pulley 15 from which the driving shaft for the pump and fan are driven in a manner hereinafter described.

As shown in Fig. 1, the water jacket of the cylinder head is flared or enlarged at one end to form a cylindrical pump casing 16, this casing having an inwardly extending circumferential flange 17 at its outer end and a peripheral opening 18 in its upper surface.

The pump includes, in addition to the pump casing a main body member 19, having a central web 20, an outwardly extending cage 21 formed on one side of said web, and an outwardly projecting sleeve 22 formed on the other side of said web. The cage 21 houses an impeller 23 and is provided with a cover 24, secured to the cage by means of a plurality of screws 25, the cover having a peripheral flange 26 which is positioned within the inner circumferential surface 27 of the cage.

From the showing in Fig. 2, it will be noted that the cage 21 is positioned with its center 28 disposed eccentrically with respect to the center 29 of the body member 19 or the pump or with respect to the center of the inner surface of the flange 17 in which the body member 19 is rotatably mounted.

The pump casing 16 is provided with an annular recess 30 in which the outer periphery of the cover 24 for the cage seats when the pump is mounted in the pump casting. The body member 19 of the pump has formed thereon outwardly extending ribs 31, certain of these ribs, indicated at 32, being reinforced or enlarged in order to permit the rotation of this body member by means of a wrench or some other suitable tool which may be secured to, or engage these enlarged ribs 32.

Suitable detachable clamping means for the pump comprises a clamping ring 33, having a peripheral flange 34, this clamping member having outwardly extending lugs or ears 35, which are apertured to receive bolts 36 carried by the pump casing. From the

showing in Fig. 2, it will be seen that one of these bolts, indicated at 37, is positioned nearer to the center 29 of the pump casing than the other bolts, and this bolt 37 is adapted to be engaged by a pair of stops 38 formed on the outer periphery of the body member 19, to limit the rotational movement of this body member in the pump casing. It will be understood that in order to rotate the pump cage, or the body member, in the casing, it is necessary to loosen the nuts 39 carried by the bolts 36, thereby releasing the clamping ring 33 and freeing the pump cage for rotational movement.

The pump shaft 40 is supported in the outwardly extending sleeve 22 by means of a pair of bushings 41, 42, the inner bushing 41 bearing against a collar 43 at one end and at its opposite end, against a packing 44, preferably formed of metallic material. The bushing 42 also has its inner end, or the end toward the motor in engagement with one end of the packing 44, and is secured to the outer end of the sleeve 22 by means of a pin 45, in order to prevent the rotation of the bushing in the sleeve. As illustrated in Fig. 1, the free end of the sleeve 22 is screw threaded and receives a screw threaded bushing retaining member 46 by means of which the bushing and packing 44 are retained in the sleeve. The retaining member 46 has upon its outer surface a plurality of notches 47 to facilitate the turning of this member on the sleeve.

The opposite ends of the shaft 40 are reduced, the inner reduced end 48 having keyed thereto, as shown at 49, the impeller 23 of the pump, this member being retained on the shaft by means of a nut 50 on the end of the shaft. The central portion of the cover 24, above referred to, is open to admit the water, being formed as a spider, having a central opening 51 which receives a pin 52 adapted to form an abutment for the end of the shaft 40. The opposite reduced end 53 of the shaft 40 has keyed thereto, at 54, a fan 55, the fan being secured by a nut 54′ and washer 55′. A fan pulley 56 is secured to the fan by means of bolts 57, the pulley extending over or overlapping the bushing retaining member 46. It will be noted that the fan pulley 56 is positioned in the same plane as the pulley 15 carried by the cam shaft 14, the pulleys being connected by a belt 58.

The operation of the construction above described may be outlined as follows:

To assemble the device, the impeller and cage cover are mounted upon the body member of the pump, the pump shaft being secured to the impeller. The bushings are then placed in the sleeve 22, the packing member 44 being positioned between the bushings and the body member of the pump, with the parts referred to secured thereto, is inserted in the pump casing. After the fan and fan pulley have been secured to the shaft, and the belt has been placed over the pulleys 15 and 56, the pump body member or cage, shaft, fan, and pulley, may be rotated in the pump casing until the fan belt has been placed under proper tension. After this has been done, the clamping ring may be tightened, thereby firmly clamping the pump unit in place on the pump casing. Should it be found necessary or desirable at any time to again tighten the fan belt, it is necessary merely to loosen the nuts 39 and rotate the pump body member by means of a wrench or other suitable tool, engaging reinforced ribs 32.

From the above specification, it will be evident that I have devised a practical construction of pump and fan unit, and a construction having few parts, and by means of which the tension of the driving belt may be readily and quickly adjusted.

While I have in the above specification described certain specific embodiments of the invention, it will be understood that the invention is capable of modification, and that modifications and changes in the construction and arrangement of the various parts can be made without departing from the spirit or scope of the invention as expressed in the following claims:

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

1. In a hydrocarbon motor, a cylinder block, a water-jacketed cylinder head secured to said block, a pump casing formed integral with said head, a cylindrical pump cage mounted in and projecting into said casing and including a rotary member, a driving shaft for said member, and a fan mounted on said shaft.

2. In a hydrocarbon motor, a cylinder, a water-jacketed cylinder head secured thereto, a pump casing formed integral with said head, a pump body member rotatably mounted in and projecting into said casing, and provided with an eccentric bearing support, a pump shaft mounted in said support, means for clamping said body member to said casing and means for driving said shaft.

3. In a hydrocarbon motor, a cylinder, a water-jacketed cylinder head secured thereto, a pump casing formed integral with said head, a pump body member rotatably mounted in said casing, and having an outwardly projecting eccentrically disposed bearing support, means for limiting the rotation of said body member in said casing, a pump shaft mounted in said support, and means for driving said shaft.

4. In a hydrocarbon motor, a water-jacketed cylinder head, having a pump casing formed integrally therewith, a pump body member secured in said casing, and having

an outwardly projecting shaft support disposed eccentrically with respect to the center of said casing, a pump shaft mounted in said support and adjustably movable therewith, as said body member is rotated in said casing and a pump impeller mounted on said shaft and disposed within said body member.

5. In combination, with an internal combustion engine, a cooling system comprising a pump casing, a pump cage mounted therein and rotatable with respect thereto, and including a pump shaft support, said shaft support being disposed eccentrically with respect to said casing.

6. In combination, with an internal combustion engine, a cooling system comprising a pump casing, a pump cage mounted therein and rotatable with respect thereto, detachable means for securing said cage to said casing, a shaft support formed on said cage and disposed eccentrically with respect to the axis of rotation of said cage, a pump shaft mounted on said support and means for driving said pump shaft.

7. In a hydrocarbon motor having a cylinder, a water-jacketed cylinder head, a pump casing formed on said cylinder head, a pump cage mounted in said casing and including an outwardly projecting shaft support, a plurality of bushings in said support, said bushings having a common packing member therebetween, a pump shaft mounted in said bushings, an impeller secured to one end of shaft within said cage and a fan secured to the other end of said shaft.

8. In combination a cylinder head, a pump casing formed integral therewith, a pump body member mounted therein and including an impeller cage and an outwardly projecting shaft support, a pump shaft mounted in said support, an impeller mounted in said cage and secured to said shaft, a plurality of bushings carried by said support and surrounding said shaft, a bushing retainer secured to the end of said support, a fan secured to said shaft and a fan pulley carried by said fan and overlapping said bushing retainer.

9. In a cooling system for hydrocarbon motors, a pump casing, a pump cage rotatably mounted therein and having a shaft support, a shaft in said support, an impeller on said shaft and disposed in said cage and means for securing said cage to said casing.

10. In a cooling system for hydrocarbon motors, a pump casing, a pump cage rotatably mounted therein and having a shaft support, a shaft eccentrically mounted in said support, an impeller on said shaft and disposed in said cage and means for securing said cage to said casing.

11. In a cooling system for hydrocarbon motors, a pump casing, a pump cage, having a central inlet and peripheral outlet openings, rotatably mounted therein and having a shaft support, a shaft in said support, an impeller on said shaft and disposed in said cage and means for securing said cage to said casing.

12. In combination with a hydrocarbon motor having a water jacket, a pump casing formed integral therewith, an impeller cage detachably secured to said casing and having an eccentric shaft support, a shaft mounted in said support and an impeller mounted on said shaft and disposed within said cage.

In testimony whereof I affix my signature.

EARL G. GUNN.