O. E. SZEKELY.

WATER PUMP.

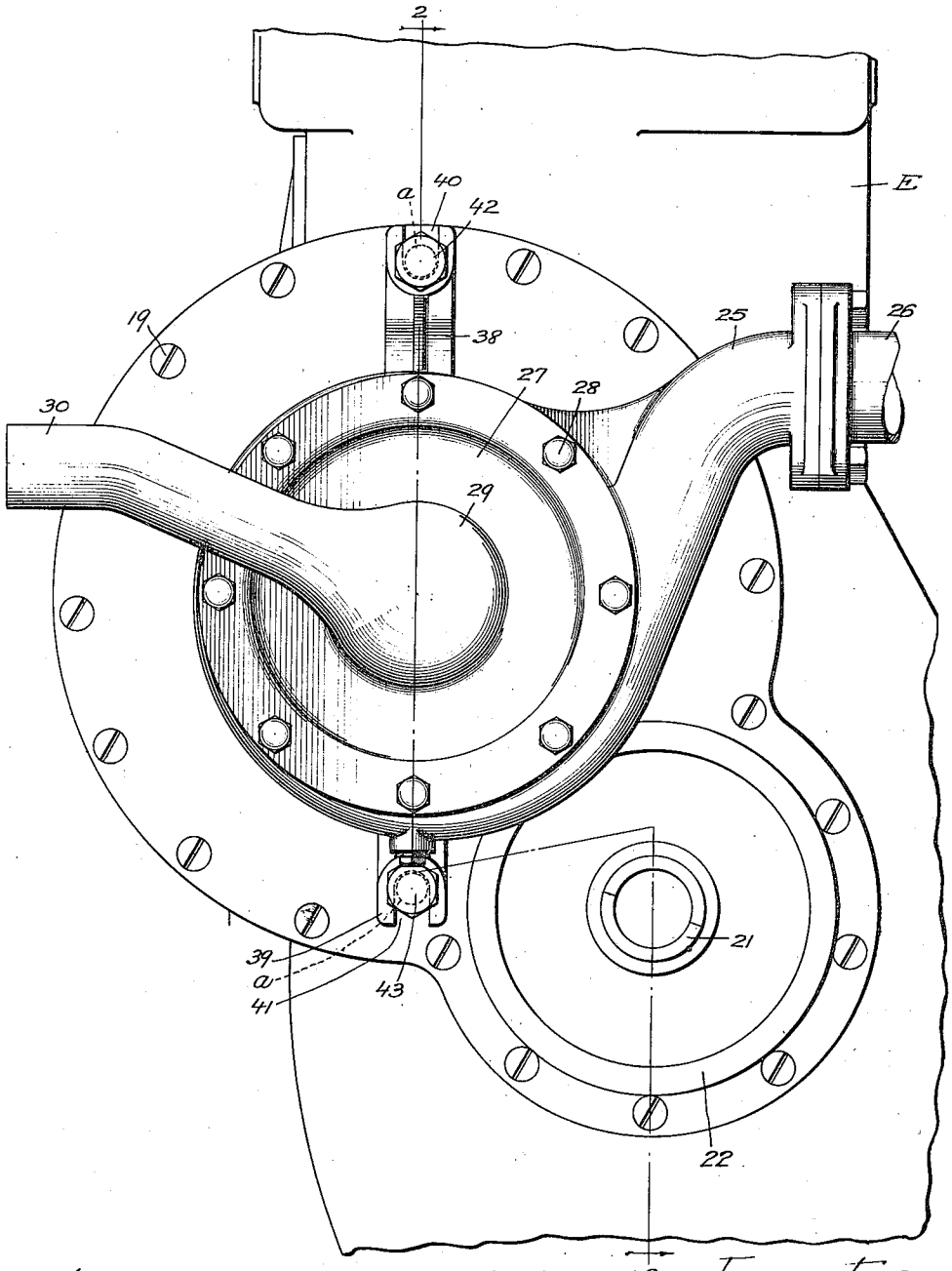
APPLICATION FILED MAY 3, 1918.

1,295,234.

Patented Feb. 25, 1919.

3 SHEETS—SHEET 1.

Fig. 1.



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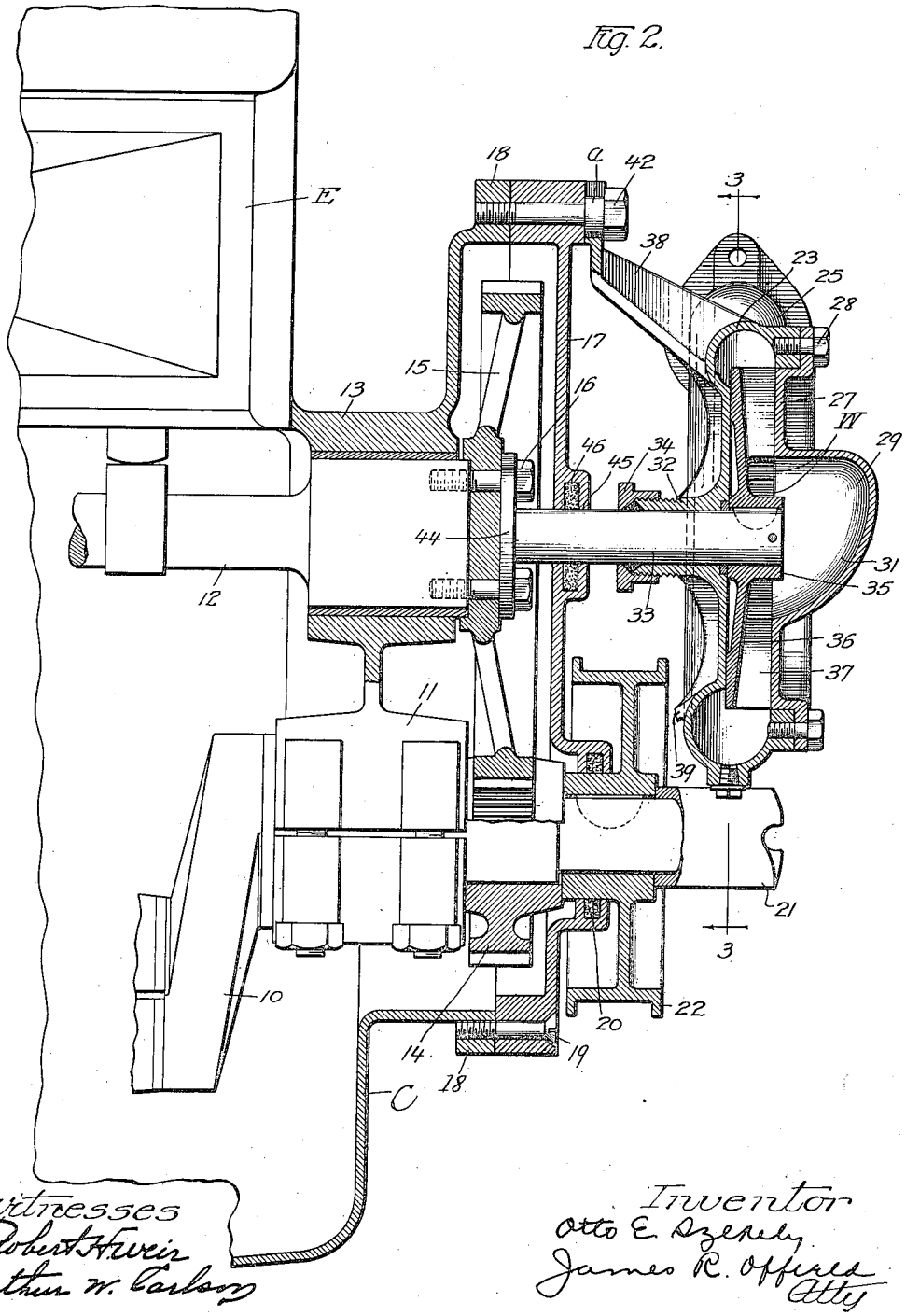
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3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

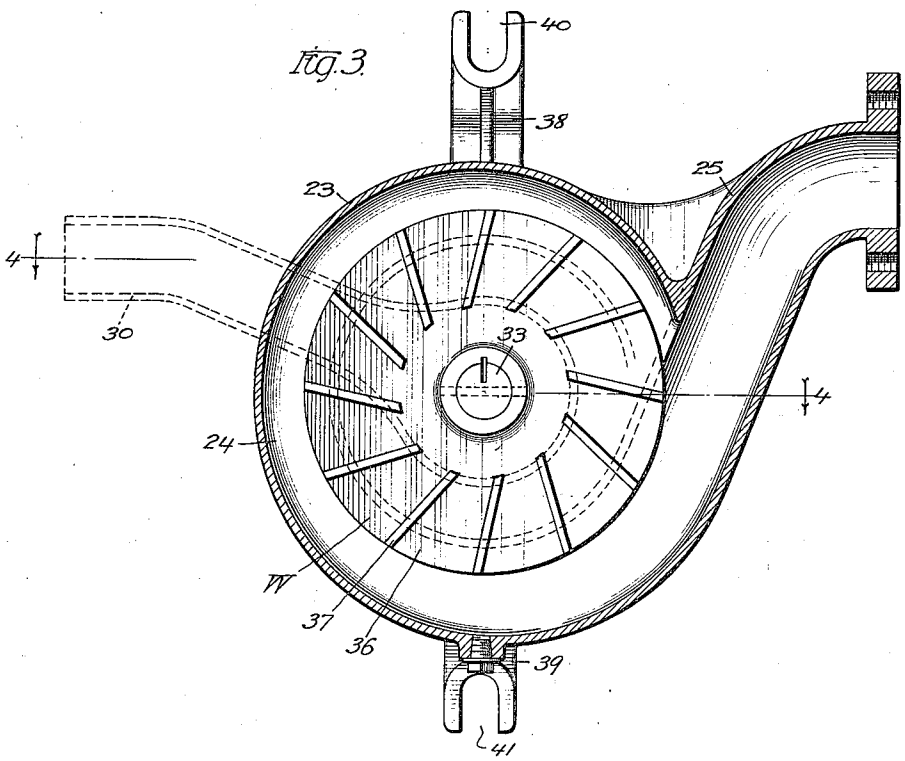
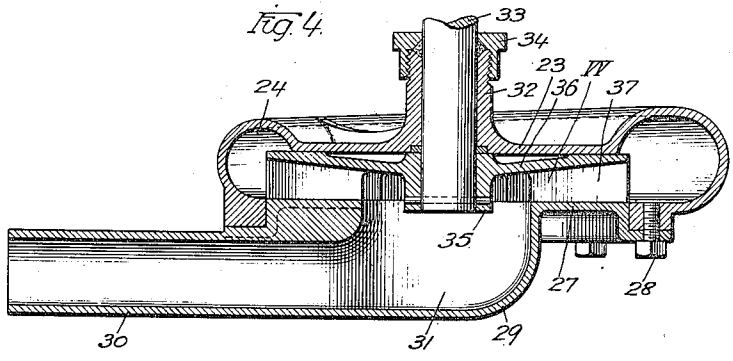


Fig. 4.



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UNITED STATES PATENT OFFICE.

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WATER-PUMP.

1,295,234. Specification of Letters Patent. Patented Feb. 25, 1919.

Application filed May 3, 1918. Serial No. 232,321.

To all whom it may concern:

Be it known that I, OTTO E. SZEKELY, a citizen of the United States, and a resident of Rock Island, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Water-Pumps, of which the following is a specification.

My invention relates to an improved water pump which can be easily and readily attached to automobile engines for the purpose of circulating the engine cooling water.

In prior arrangements pumps have been provided to be connected to be driven at considerable speed, such pumps being small and usually of the cylinder type. In its travel through the radiator tubing and the engine water jacket passageways the cooling water encounters many obstacles and resistance and where the pump is driven at high speed the water pumped thereby will not flow uniformly through the various passageways, but the flow will be more or less impulsive or vibratory. The water will not have a chance to efficiently absorb heat nor will the radiator have a chance to efficiently dissipate heat.

The object of my invention is to provide a larger pump which can be connected with the engine to be driven at slower speed so that the water flow through the circulatory system will be uniform and the water is given a chance to absorb the heat from the engine and to dissipate the heat during flow through the radiator. This uniform circulation of the water will also permit thermo-siphon circulation, that is, the upward flow of heated water and the downward flow of cooler water. Another object of the invention is to produce a simple compact pump structure which can be easily and quickly attached to or removed from the engine structure, provision being made to connect the pump shaft directly with the engine cam shaft.

The above and other features of my invention are embodied in the structure disclosed on the accompanying drawings, in which—

Figure 1 is an end view of part of an engine structure showing my improved pump applied thereto,

Fig. 2 is a sectional view on plane 2—2, Fig. 1,

Fig. 3 is a sectional view on plane 3—3, Fig. 2, and

Fig. 4 is a sectional view on plane 4—4, Fig. 3.

E represents the cylinders and C the crank case of the engine housing. 10 is the crank shaft which is journaled at one end in the bearing frame 11. 12 is the cam shaft parallel with the crank shaft and journaled in the frame 13. Adjacent the bearing frame 11 is the gear pinion 14 which meshes with the gear 15 secured to the end of the cam shaft by means of screws 16 passing through the hub of the gear 15. The cover 17 is secured to the flange 18 of the engine housing by means of screws 19 and closes the end of the crank case and surrounds the gears 14 and 15, the cover having the outlet 20 for the crank shaft end which supports the crank socket 21. Outside of the cover the crank shaft supports the pulley 22 which in practice is connectel by a belt with the pulley which drives the fan. In prior arrangements pumps have been provided having a driving gear adapted to be brought into mesh with the gear 15, these pumps being driven substantially at crank shaft speed.

My improved pump structure is adapted for attachment with the engine frame to be driven directly by the cam shaft. The pump structure comprises a circular pump body 23 having the annular water compartment 24 from which the outlet pipe 25 extends tangentially to be coupled at its end to a pipe 26 which extends to the top of the vehicle radiator. The cover or cap 27 is secured to the pump body by screws 28 and at the center of this cover is the enlargement 29 from which the pipe 30 extends to

be connected with the bottom of the radiator. This enlargement forms the water entrance chamber 31 for the pump. Extending laterally and axially from the pump body 23 is the bearing hub 32 for journaling the pump shaft 33, a stuffing cap 34 being provided. Inside of the pump the shaft supports the pump wheel *w*. This wheel comprises the hub 35 which supports the circular disk 36 from which the vanes or blades 37 extend laterally. The back of the disk 36 bears against the pump body inner wall and the blades bear at their outer edges against the cover 27. The blades are inclined at suitable angle with reference to the wheel radius depending upon the volume of flow desired, water being drawn into the chamber 31 through the pipe 30 and being expelled by the blades into the annular pump chamber 24 and from thence through the pipe 25 to the radiator.

The pump body has arms 38 and 39 extending radially and laterally therefrom, these arms having the slots 40 and 41 at their ends for receiving the bolts 42 and 43 which thread into the engine housing cover 17 or extend entirely through the cover to thread also into the flange 18. The shaft 33 terminates at its outer end in a flange 44 which has openings for receiving the screws 16 in order that the flange may be secured to the cam shaft in common with the gear 15 to support the pump shaft 33 in axial alinement with the cam shaft. To accommodate the the pump shaft, the cover 17 is provided with the bearing hub 45 having the groove 46 therein for receiving packing 46.

When the pump is to be applied, the cover 17 is removed and the pump shaft secured to the cam shaft, and the cover 17 then replaced. The pump frame is then secured by means of the bolts 42 and 43 and the pump wheel applied to the pump shaft and the pump frame cover 27 secured in place. To prevent binding of the shaft 33 sufficient lost motion is provided between the bolts 42 and 43 and the supporting arms 38 and 39 to permit shifting of the pump frame and self centering thereof with reference to the shaft 33 as the pump is operated. As shown, the enlarged shank sections *a* of the screws 42 and 43 are of slightly less diameter than the width of the slots 40 and 41 and the length of the shank sections is a trifle greater than the thickness of the arms 38 and 39. The slots are also of sufficient depth to leave clearance space between their bases and the enlarged shank sections. This arrangement will permit sufficient play of the pump frame after the screws 42 are turned down tight and the pump frame can therefore readily center itself to prevent binding of the pump shaft 33 therein.

The dimensions of the rotary pump are such that when the pump is connected with the cam shaft of an engine it will deliver the proper volume of cooling water and will cause steady and uniform flow of the water through the various passageways of the cooling circulatory system and at a proper velocity to permit the water to efficiently take up heat from the engine and give the radiator a chance to radiate the heat. I have found that my pump will keep the cooling water at a substantially constant temperature irrespective of the speed at which the engine is running, for at any speed of the engine the flow of cooling water will be steady and uniform. In prior arrangements the higher the engine speed the more rapid the water pulsations and the less the cooling efficiency will be.

I do not desire to be limited to the exact construction, arrangement and operation shown and described as it is no doubt possible to make changes and modifications which would still come within the scope of the invention.

I claim as follows:

1. The combination with a gas engine having a crank shaft and a valve controlling cam shaft driven by the crank shaft, and a housing for said shafts, of a pump shaft extending axially from said cam shaft through said housing, a pump frame detachably secured to said housing, a pump wheel for the pump secured to the pump shaft, said pump having an inlet and an outlet adapted for connection with the cooling water circulatory system for the engine.

2. The combination with an engine having a shaft, a housing for the shaft, an extension on said shaft extending axially therefrom through said housing, a pump frame receiving said shaft extension, a pump wheel within the pump frame secured to the shaft extension to rotate therewith, means for supporting said pump frame on the outside of said housing, said supporting means permitting limited movement of said pump frame to center itself with reference to the pump shaft during rotation thereof, and a fluid inlet and outlet for said frame.

3. The combination with a gas engine having a crank shaft and a cam shaft, a gear on said crank shaft and a gear on said cam shaft, said gears intermeshing to transmit rotation from one shaft to the other, a housing inclosing said gears, a rotary pump frame detachably secured to said housing concentric with said cam shaft, a pump shaft detachably secured to said cam shaft gear to be co-axial with said cam shaft to rotate therewith, a pump piston member secured to the pump shaft, and an inlet and an outlet for said pump frame.

4. The combination with a gas engine having a crank shaft and a cam shaft, a gear on said crank shaft, a gear secured by its hub to the end of said cam shaft, said gears intermeshing, a housing for said gears, an opening in said housing opposite the cam shaft end, of a pump comprising a pump frame detachably secured to said housing, and a pump shaft extending through said housing opening and detachably secured to said cam shaft gear hub concentric with said cam shaft.

In witness whereof I hereunto subscribe my name this 20th day of April, A. D. 1918.

OTTO E. SZEKELY.