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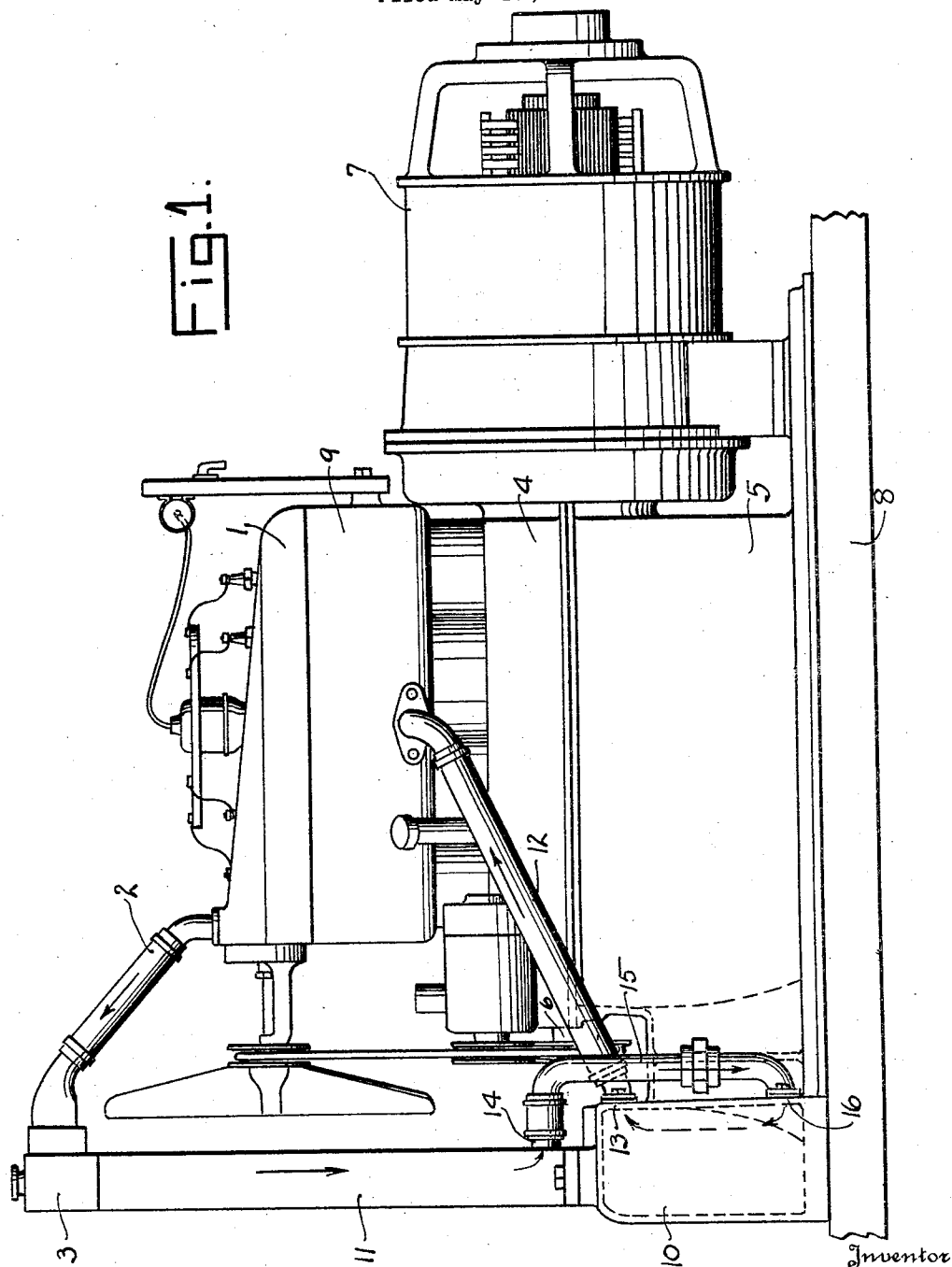
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COOLING DEVICE FOR INTERNAL COMBUSTION ENGINES

Filed May 18, 1931

2 Sheets-Sheet 1



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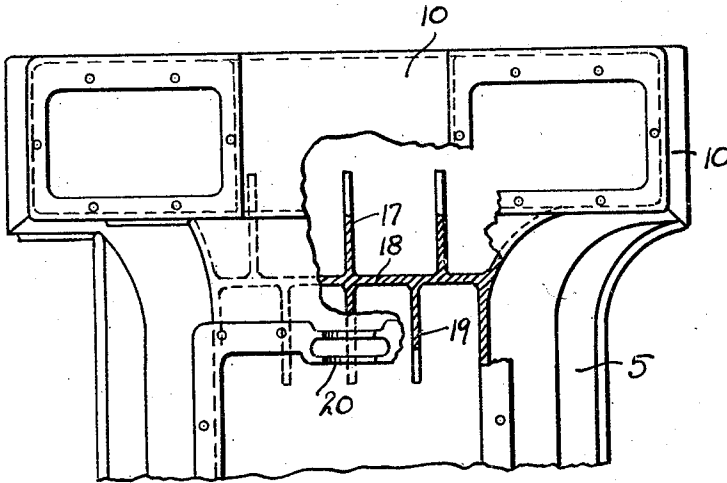


Fig. 2.

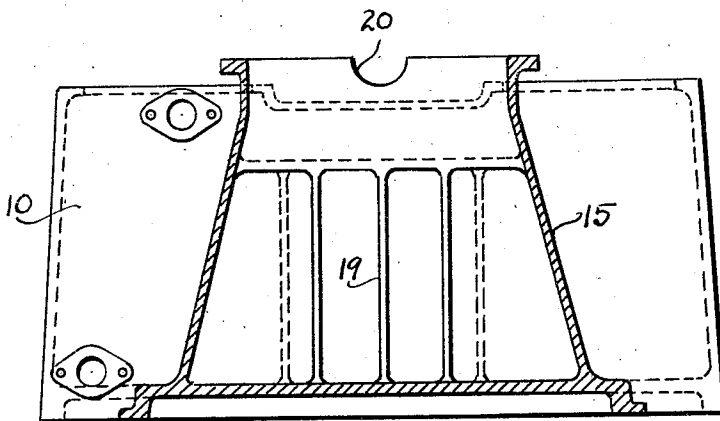


Fig. 3.

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COOLING DEVICE FOR INTERNAL COMBUSTION ENGINES

Application filed May 18, 1931. Serial No. 538,159.

My invention relates to cooling means for use with internal combustion engines and more particularly for use with engines of this character which are for stationary use.

5 In the use of internal combustion engines for operating small units such as electric lighting devices and the like it is a common difficulty that the speed of operation of these devices is more or less limited by the ineffective means which is ordinarily employed for
10 cooling the engine itself and the oil which lubricates the same.

It is an object of this invention to provide a simple and effective means for more efficiently cooling the engine and the lubricating oils employed therewith.

15 I desire to increase the capacity for cooling liquid beyond the usual capacity of engines of this character and to also provide a construction whereby the cooling effect of the liquid being circulated may be increased.

20 The invention lies particularly in the arrangement for the increased capacity of the cooling system and the means by which it is utilized in the cooling of the engine.

25 In the drawings herewith, Fig. 1 is a side elevation of an internal combustion engine in which my invention is employed.

30 Fig. 2 is a broken top elevation of the base of the engine whereby the cooling apparatus is disclosed.

35 Fig. 3 is a broken vertical section through the base and showing the arrangement for cooling the lubricant.

40 In Fig. 1 I have shown an internal combustion engine of ordinary construction, the upper head 1 of the engine being connected by means of a flow line 2 with the upper end 3 of the radiator. The crank case 4 of the engine is seated upon a base 5, which is in fact a downward extension of the crank case. The crank shaft 6 within the crank case is connected for operation with a small electric
45 generator 7 at the rearward end thereof. This generator is shown somewhat diagrammatically and it is to be understood that this operated device is shown as one of many devices which could be operated by means of a stationary motor of this character. The crank
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case and operated unit are both assembled upon a base 8.

There is an inlet manifold 9 at one side of the head of the engine which receives the cooling fluid, ordinarily water, coming from the base 10 of the radiator 11. Said liquid is circulated into the engine about the cylinders through a pipe 12 connected at 13 with the upper end of the base 10 of the radiator. Said base is thicker than the radiator and has an inner chamber which materially increases the capacity of the radiator. This base is closed at its upper end from connection with the radiator and the circulation from the radiator is through an outlet 14 on the lower rearward side of the radiator connected by a pipe 15 with an inlet 16 at the lower end of the base 10. It will thus be seen that the liquid circulation is in the direction of the arrows shown in the drawings and from the lower end of the radiator to the lower end of the radiator base 10 and then upwardly and through the pipe 12 back to the cooling chambers about the cylinders of the engine.

75 In circulating through the base of the radiator the liquid is not only further cooled itself but is brought into contact with the forward end of the crank case 5 and thus serves to cool the lubricant within the base of the crank case. This cooling effect is increased by means of vanes or webs 17, which, as shown in Fig. 2, extend inwardly into the interior of the base 10. The circulating fluid coming in contact with these vanes serves to cool the same and to receive the heat transmitted through said vanes from the partition 18 between the radiator base and the base of the crank case. On the inner side of the partition 18 are similar radiating webs or vanes 19 projecting into the interior of the lubricant chamber at the base 5 of the crank case.

85 The construction of the base 5 of the crank case and the base 10 of the radiator may be seen from Fig. 3. The radiator base is materially wider in extent than is the crank case and the crank case base extends slightly above the radiator at a point spaced somewhat from its connection with the radiator base and the
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upper portion has a support at 20 for the crank shaft 6. The webs 19, which affect the cooling of the lubricant, are extended into the crank case for a material distance so that the cooling effect may be greatly increased.

I have found that by the use of the particular construction of the base member 10 for the radiator and the connecting base 5 for the crank case I am enabled to maintain an effective cooling of the engine and the lubricant therein whereby the said engine is enabled to operate at high speeds for long periods of time without danger of overheating. This gives a material advantage particularly in the operation of electrical apparatus where high speeds are desirable. This base structure may be connected with commercial types of internal combustion engines so that it may be constructed as an attachment for the usual forms of commercial engines of this character and by its use it will make it possible to operate ordinary types of internal combustion engines without danger of overheating and the efficiency of the lubricant employed with the engine will be also increased and its life materially prolonged.

The improvement has the effect of cooling the lubricant in summer but obviously it tends to keep the lubricant temperature like that of the cooling water and in winter when the engine operates under extreme cold, it has the effect of heating the oil somewhat, thus keeping it sufficiently fluid to circulate properly.

What I claim as new is:

1. In an apparatus of the character described, an internal combustion motor, a casing for the head of said motor, a crank case, a base therefor to contain lubricant, a radiator, a base of comparatively large capacity for said radiator, a pipe connecting the upper casing of said motor with the upper end of said radiator, a pipe connecting the lower end of said radiator with the lower end of said radiator base, and a connecting pipe from the upper end of said radiator base with the lower end of said motor casing whereby cooling liquid may be circulated from said motor casing through said radiator and base.

2. In an apparatus of the character described, an internal combustion motor, a casing for the head of said motor, a crank case, a radiator, a base for said radiator and separated therefrom, a crank case for said motor adjacent said radiator base, webs on the wall of said crank case projecting into said radiator base and connections from said radiator through said radiator base and to the motor casing whereby cooling liquid may be circulated to said casing and over said webs to cool said motor and the lubricant in said crank case.

3. In an apparatus of the character described, an internal combustion motor, a cas-

ing for the head of said motor, a crank case, a radiator, a base for said radiator and separated therefrom, a crank case for said motor, a crank case base, a wall between said radiator base and said crank case base, heat conducting webs projecting laterally from said wall, and connections for cooling fluid from said motor casing to said radiator and said radiator base and back to said motor casing.

4. In an internal combustion motor including a casing for the head of said motor, a radiator, and a crank case, the combination of a radiator base, a crank case base to hold lubricant for said motor, a wall separating said radiator base from said crank case base, laterally extending heat conducting webs on opposite sides of said wall, and means to conduct cooling liquid from said radiator to said radiator base and from the upper end of said radiator base to said motor casing for the purpose stated.

5. In an internal combustion motor including a casing for the head of said motor, a radiator, and a crank case, the combination of a radiator base, a crank case base to hold lubricant for said motor, a wall separating said radiator base from said crank case base, laterally extending heat conducting webs on opposite sides of said wall, a pipe connecting said motor casing with the upper end of said radiator, a pipe connecting said radiator with the lower end of said radiator base and a pipe connecting said radiator base with said motor head casing.

6. In an internal combustion motor including a radiator, a radiator base of comparatively large capacity, a crank case base for holding lubricant adjacent said radiator base, heat conducting webs projecting from the forward wall of said crank case base into said radiator base and into said crank case base, and means to circulate cooling liquid from said radiator through said radiator base to said motor for the purpose described.

In testimony whereof I hereunto affix my signature this 13th day of May, A. D. 1931.

JOHN C. GARROTT.