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INTERNAL COMBUSTION ENGINE

Filed Nov. 13, 1924

Fig. 1.

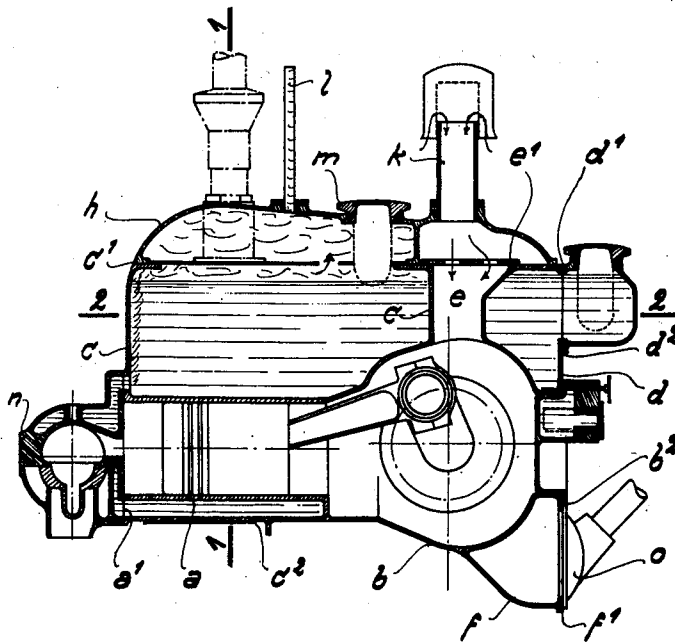


Fig. 2.

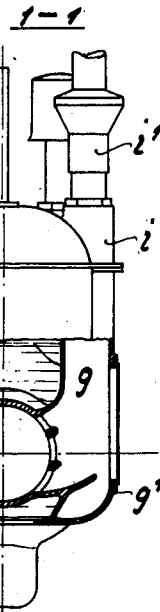
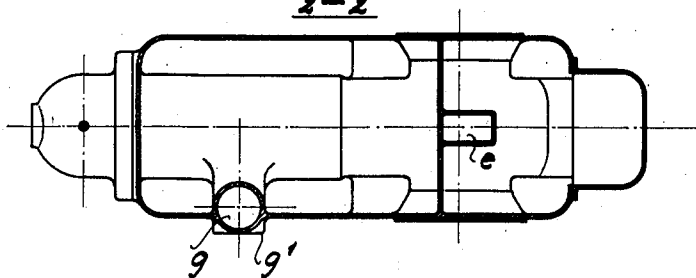


Fig. 3.

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UNITED STATES PATENT OFFICE.

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INTERNAL-COMBUSTION ENGINE.

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The present invention relates to internal combustion engines, and the object thereof is to simplify and otherwise improve the construction of such engines, to thereby facilitate not only their manufacture, on a mass or quantity basis, but also their shipment and installation in the respective power stations for which they are intended, namely, motor vehicles, motor plows, motor boats, etc.

To this end the invention consists, essentially, in combining in a single unitary structure all the main parts of a complete plant, such as the engine or motor, the reservoir for the cooling water, and the fuel tank, thus making possible the casting of these parts in a single piece and so avoiding the necessity of finishing, shipping, and setting up a number of separate elements.

A further feature consists in so assembling and arranging the several parts of the unitary plant that not only will they be compactly grouped in suitable relationship for the satisfactory performance of their respective functions but the surfaces of the casting which require machining, the flanges of the shut-off openings for the usual covers and for the attachment of the necessary auxiliary parts, will all lie in plane surfaces, in one plane or in planes at an angle to each other, thus making it possible to finish them in one or a few operations—an arrangement which in fact permits the placing of a large number of the unitary castings on a work table and the finishing of the flange surfaces of all of them in a single operation, first on one side and then, after turning them over, on another side.

The invention also comprises the additional novel features hereinafter described and more particularly pointed out in the appended claim.

A motor plant illustrating one embodiment of the invention is shown, by way of example and not of limitation, in the accompanying drawings, in Fig. 1 in longitudinal vertical section, in Fig. 2 partly in end elevation and partly in section on the line 1—1 of Fig. 1, and in Figure 3 in section on the line 2—2 of Figure 1.

Referring to the drawing, *a* is the motor cylinder, *b* is the crank-shaft casing, constructed as a crank casing scavenging pump, *c* is the cooling water reservoir or container, *d* is the fuel tank, *e* is an air inlet passage

to the scavenging air pump, and *f* is a chamber for the control gear. All of these parts, or the walls thereof, are integrally united and are cast in one piece. It will be noted that the cooling water reservoir is located immediately above the cylinder and extends over the adjoining inner portion of the crank-shaft casing and that the fuel tank is located over the outer end of this casing and is separated from the cooling water reservoir by the downwardly projecting air inlet passage to the crank-shaft casing and the scavenging pump; and it will be further noted that as the result of the assembling and arrangement of the several parts the casting, which is substantially rectangular in shape, can be conveniently finished since it is thus possible to locate the flanged surfaces, as shown, in the plane surfaces of its sides and so finish those on each side at a single operation, or by assembling a number of the cast bodies on a work table to finish the surfaces on one side of all of them at the same time—a feature especially favorable for quantity production. The surfaces which require finishing are the following: The cover flange *a*¹ of the cylinder, the cover flanges *c*¹ *d*¹ and *e*¹ of the water reservoir and of the fuel tank, and scavenging air inlet passage, the flanges *b*² *d*² and *f*¹ for the attachment respectively of a shut-off cover for the crank-shaft casing, a fuel filling support, and a cover *o* for the control gear chamber in which is mounted the control shaft, the cover flange *c*² of an opening for cleaning the cooling water reservoir, the bearing cover flanges *b*¹, on both sides of the crank-shaft casing, in which covers is mounted the crank-shaft, and the cover flange *g*¹ of an opening to the exhaust chamber *g*.

The dome-shaped cover *h* of the cooling water reservoir, which is extended over and serves as a shut-off for the scavenging air inlet passage, is also cast in one piece and provides, as integral parts thereof, a shut-off and support *i*, for the exhaust chamber and the exhaust pipe *i*¹, and a shut-off support for the scavenging air inlet pipe *k*. The cover is further provided with a steam outlet pipe *l*, which is set into a boss in its upper wall, and with a threaded opening, for the screw cap *m*, through which to fill the cooling water reservoir.

The motor here illustrated is a motor of the incandescing head type, with incandescing head *n* attached to the cover flange of the cylinder. The invention, however, is in no way limited to the use of such a motor.

What I claim as new, and desire to secure by Letters Patent, is—

In an engine of the hot bulb and scavenging pump type, a unitary rectangular casting having plane upper and end surfaces and which includes the cylinder, the crank

case, and the cooling water reservoir, the latter being located over the cylinder and a portion of the crank case, the balance of the portion over the crank case being the fuel reservoir, an air inlet for the scavenging pump passing through the fuel reservoir and the opening flanges of said cylinder, water and fuel reservoirs being integral with said plane end, upper and opposite end surfaces of the said casting, respectively.

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