

Dec. 15, 1936.

P. CROSLY, JR

2,064,463

MOTOR BOAT AND DRIVING UNIT THEREFOR

Filed March 18, 1933

4 Sheets-Sheet 1

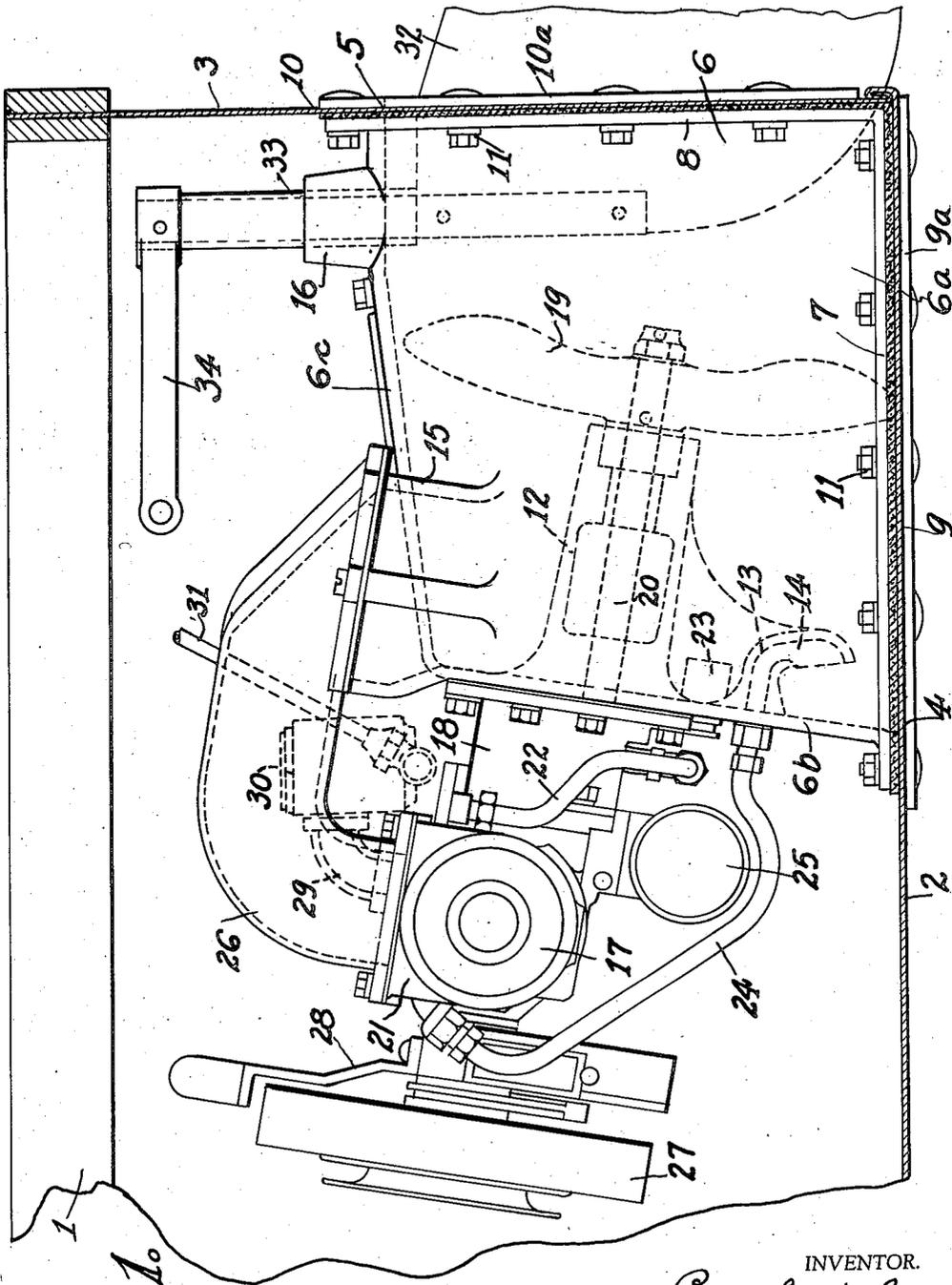


Fig. 1.

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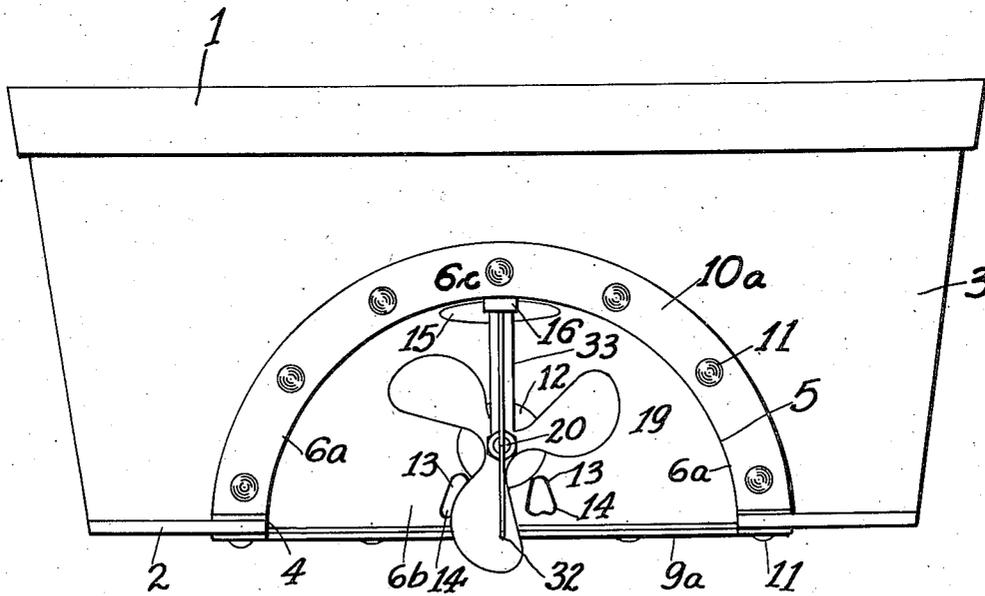
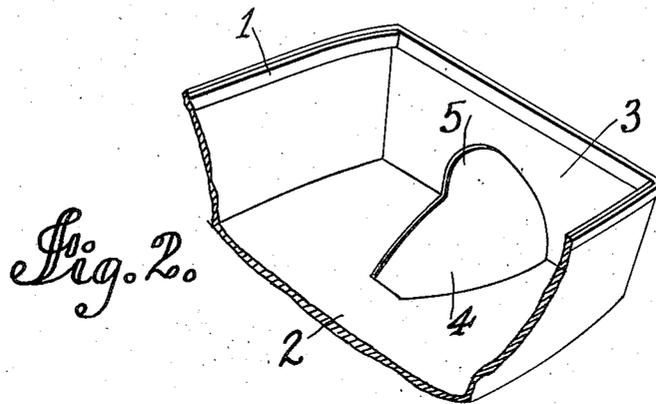


Fig. 3.

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4 Sheets-Sheet 3

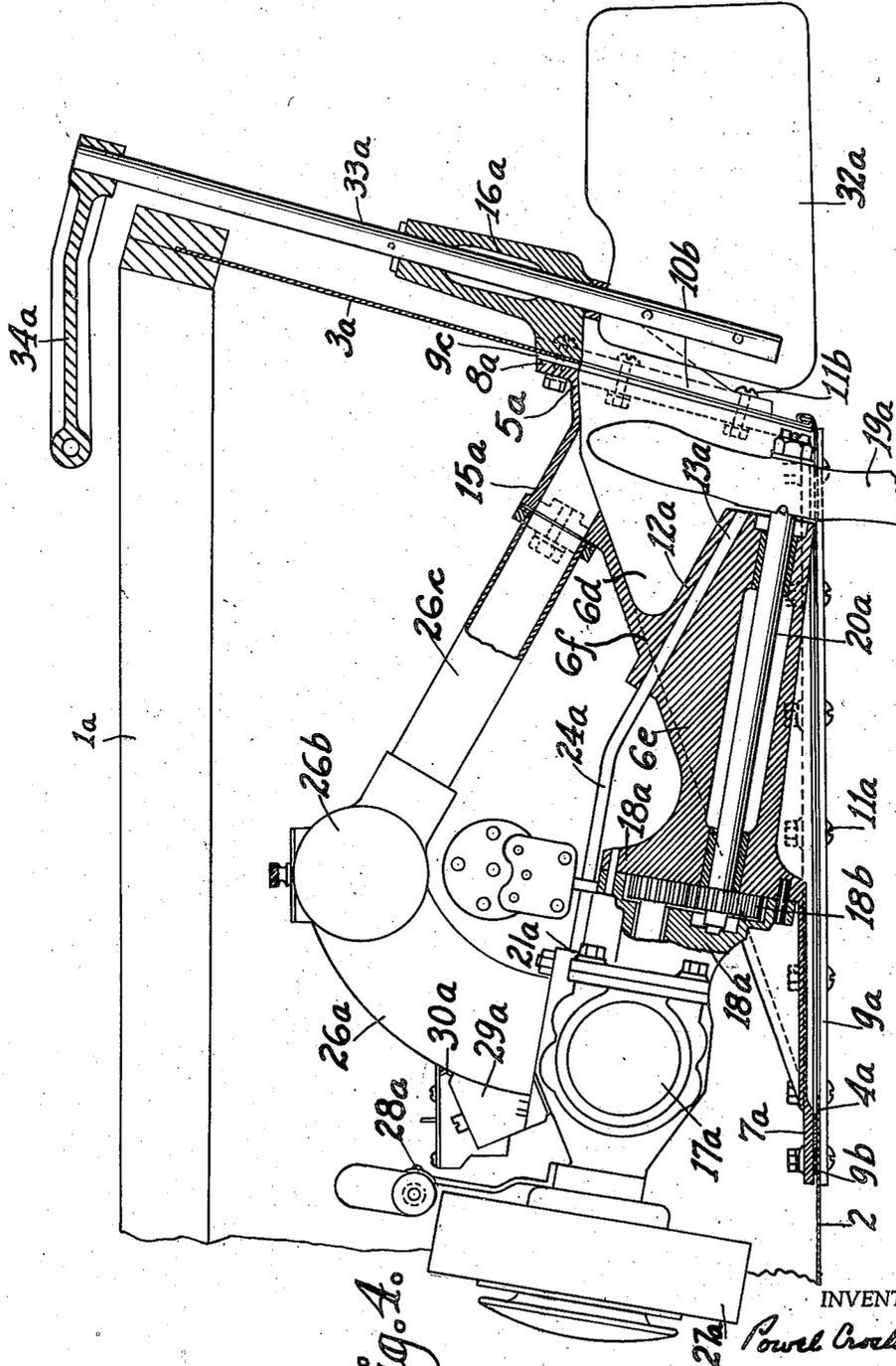


Fig. 1.

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4 Sheets-Sheet 4

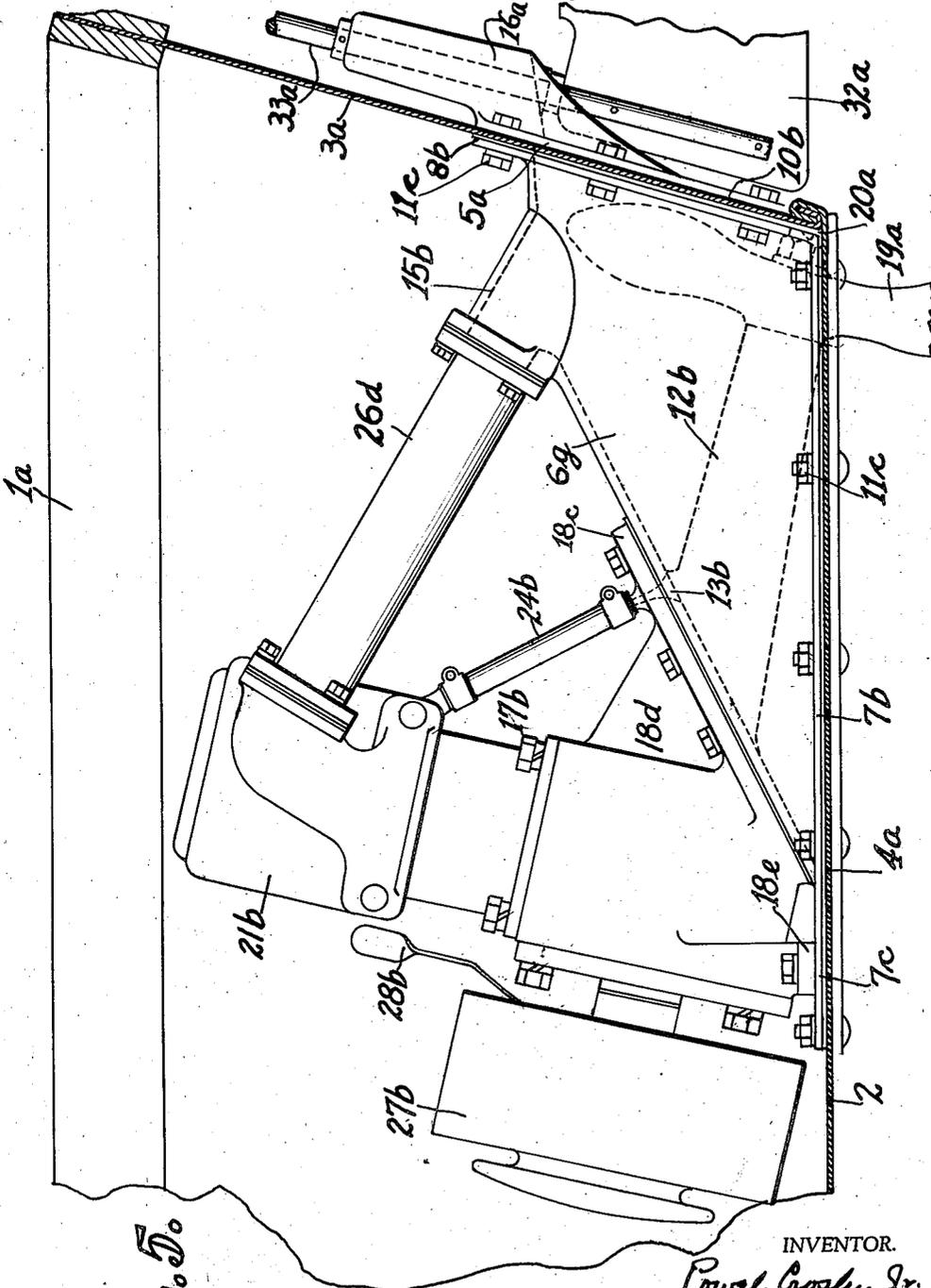


Fig. 5.

RV

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MOTOR BOAT AND DRIVING UNIT THEREFOR

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Application March 18, 1933, Serial No. 661,608

2 Claims. (Cl. 115—34)

My invention relates to motor boats, and more especially to motor boats having the motor and the propeller mounted as a unit for attachment to the boat. Such units often have the rudder also contained in them. A familiar example of attachable and detachable units such as I have above referred to is the outboard motor unit. Usually such outboard units are arranged along a vertical shaft, which connects the motor to the propeller with the motor located above the stern structure of the boat. Such a unit has a predominant part of its weight considerably above the water line of the boat, and therefore tending to have a top heavy effect. This effect is especially objectionable when this unit is not exactly at the middle; and as these units usually are provided, they merely have a clamp which readily permits attaching the unit to the body with the objectionable effect above noted. Such units are mostly limited to the smaller sizes, and in proportion to their size are usually rather complicated in construction and arrangement. If this principle is used in the provision of much larger sized units, the defective distribution of weight and the complication becomes that much more objectionable.

An object of my invention is to provide a unit which may be readily installed on a boat, and which will avoid much more of the complication than the units heretofore used. A further object is to provide such a unit with the preponderance of its weight at or below the water line of the boat, thereby avoiding the difficulty as to stability of the boat, as was above explained. A further object is to provide for the cooling of the motor and for efficient disposal of the exhaust from the motor. Other objects will appear in the course of the following description, which is illustrated by the accompanying drawings, in which

Figure 1 is a longitudinal section of the stern structure of a boat showing one example of my invention installed therein.

Fig. 2 is a perspective view of the stern structure of the boat showing the opening provided therein for installation of my unit as shown in Fig. 1.

Fig. 3 is a rear elevation of the example shown in Fig. 1.

Fig. 4 is a section corresponding to that of Fig. 1, showing a modification of my improved unit, part of the unit being in longitudinal vertical section.

Fig. 5 is a view similar to Fig. 4 showing a

further modification of my improved unit, the entire unit being shown in side elevation.

In the example of Figs. 1, 2 and 3 the hull of the body is represented as of sheet metal, with a flat bottom 2 and a vertical stern wall 3. As best shown in Fig. 2, the bottom 2 has an opening 4 and the stern wall 3 has an opening 5. The latter opening is preferably semi-circular and the bottom opening 4 is approximately parabolic. These openings 4 and 5 are continuous with each other, and all that is necessary to make a boat ready for receiving my unit is to cut these openings of the proper shape.

The casing 6 of my improved unit is made up of the lateral sides 6a, front sides 6b and top 6c, and its bottom and rear end are shaped correspondingly with the openings 4 and 5 respectively, with a flange 7 at the sides and front of the bottom and a flange 8 around the sides and top of the rear end of the casing which have gaskets 9 and 10, respectively, between them and the edge portions around the openings 4 and 5. Bolts 11, passing through the flanges interiorly of the hull and through stiffening bars 9a and 10a, respectively, exteriorly of the hull, clamp the edge portions of the openings together with the gaskets tightly so that the casing 6 forms a water-tight closure for the openings 4 and 5, and becomes practically a unitary part of the hull. It will be seen that so far as described, a boat hull is provided which is recessed inwardly at the lower part of its stern, with the recess opening aft and downwardly. This recess thus provided houses a propeller, and its openings are so disposed that there is free flow of water to and from the propeller.

Inside this casing 6 projecting inward from its forward end is the bearing boss 12 for supporting the propeller shaft. Below this bearing boss is the inlet boss 13, with a passage curving downwardly and having a groove 14 opening forwardly inside the front part of the casing. On the top 6c of the casing near the forward end are two upwardly opening necks, one of which is shown at 15. Also in this example the casing has on the rear part of its top 6c a bearing boss 16 for a rudder stem.

The motor shown in this example will be understood to have two opposed cylinders on a horizontal axis, one of these cylinders being shown at 17. It will be understood that between the cylinders the motor has a crank case, connected to which is a pedestal 18, which is bolted to the front 6b of the casing 6, and is understood to contain suitable operative connection to the

crank of the motor. The propeller 19 is fixed on its shaft 20, which is journaled in the bearing boss 12 and is understood to make connection with the motor by the connecting means in the pedestal 18. This propeller 19 is located about
5 midway of the fore and aft length of the casing in this example.

The motor will be understood to have a water jacket for each cylinder 17, one of these jackets being shown at 21 as having an outlet pipe 22
10 from its rear side extending downwardly, and opening through the front 6b of the casing through a discharge mouth 23 inside the casing. The water jacket inlet pipe 24 leads from the passage in the inlet boss 13 through the front
15 wall 6b of the casing, and leads forwardly under the oil reservoir 25 of the motor and up into the forward side of the water jacket 21. The water jacket of each cylinder has an outlet pipe 22 and an inlet pipe 24 as will be understood. In Fig. 3
20 the inlet bosses 13 with their lower widened mouths 14 for both cylinders are indicated; and as there shown are seen to be close to the keel line of the boat on each side thereof.

In a similar manner each cylinder 17 will be understood to be provided with an exhaust conduit, one of which is shown at 26 in Fig. 1 leading up from the top of the cylinder and curving
25 backward, where it is connected to a respective top neck 15 of the casing. It will be seen that the motor is detachably bolted to the casing at its pedestal 18, and that this exhaust conduit is detachably bolted to the motor cylinder and to the casing.

Forwardly the motor has its fly wheel 27 and starter 28. Also shown in dotted lines are the motor fuel intake 29, carburetor 30 and fuel supply pipe 31, it being understood that each cylinder has a fuel intake 29 branching into it from the carburetor 30.
40

The rudder 32 has a short forward portion within the rear end of the casing, and has its stem 33 extending up and supported and journaled in the bearing 16. This stem 33 extends
45 some distance above the bottom 16 and has fixed to it the steering arm 34.

In the example of Fig. 4 the hull 1a has the flat bottom 2, a stern wall 3a, and these have the openings 4a and 5a, respectively, over which is fitted the casing 6d, with its bottom flange 7a and rear flange 8a clamping gaskets 9b and 9c to edges of the hull openings by means of the bottom stiffening bar 9a and the stern stiffening bar 10b, which also forms part of the rudder mounting as will later be explained. These parts are secured together by bottom bolts 11a and stern bolts 11b.
50

The casing 6d here shown is of considerably less height in proportion to the depth of the hull, and a considerable proportion of its interior is occupied by its bearing boss 12a. The upper part of this bearing boss has the passage 13a from the rear end of the boss upwardly and forwardly through the front portion 6e of the casing. On the top 6f of the casing is a forwardly and upwardly inclined top neck 15a. This casing in its rear part will be understood to be substantially semi-circular in cross section, so that its sides 6d clear the propeller blades and leave ample space around the bottom boss 12a so that there is free flow of water to the propeller.
60

The motor in this example is understood to have two horizontal opposed cylinders and their crank case is bolted to an upward extension or
70 pedestal 18a on the front upper part 6e of the

casing. The propeller 19a is fixed on its shaft 20a, which is journaled in the bearing boss 12a, and is shown as being connected by gearing 18b at its front end to the crank shaft on the motor.

The water jacket 21a of each cylinder is connected to the passage 13a by a tube 24a for inlet of water to the jacket. Each cylinder 17a is provided with an exhaust duct 16a leading upwardly and rearwardly into a manifold 26b, from which the conduit 26c leads rearwardly and downwardly to the casing top neck 15a. The fly wheel 27a, starter 28a, fuel intake 29a, and carburetor 30a are shown on the forward part of the motor.
5

In this example the rudder 32a has its stem 33a journaled in a bearing 16a, which forms part of the stern stiffening bar 10b, as above mentioned. This locates the entire rudder device outside the stern of a boat, but it will be seen that it is principally supported by the casing 6d, by the extended connection of the stiffening bar 10b thereto. The rudder stem 33a has the steering arm 34a extending forward over the stern of the boat.
10 15 20

In Fig. 5 the construction is very similar to that of Fig. 4. Here the casing 6g is connected to the hull 1a, around and over the openings therein, as before described, and has inside of it the bearing boss 12b. Just above this boss the passage 13b leads up through the front wall of the casing, and the rear part of the top of the casing has the forwardly and upwardly inclined neck 15b.
25 30

The chief difference between this example and that of Fig. 4 is that an upright motor is provided. The motor here shown may be understood as having but one cylinder 17b, mounted on top of the crank case 18d, which has a flat boss 18c bolted to the inclined top of the casing 6g. This casing has a forward extension 7c from its bottom, and the crank case 18d has feet 18e bolted to this extension. The propeller 19a at the rear of the bearing boss 12b will be understood to be operatively connected with the motor crank through a shaft not shown journaled in the boss 12b.
35 40

The upper part of the cylinder 17b has the water jacket 21b, and the inlet pipe 24b leads up from the casing passage 13b into this water jacket. The exhaust conduit 26d leads from the cylinder downwardly and rearwardly to the casing neck 15b. The rudder 32a has its stem 33a journaled in the bearing 16a, which is part of the stern stiffening bar 10b, the same as in the previous example.
45 50

It will be seen that in any of these examples the motor and all of its accessories and the propeller are a single unit which is very readily attached to the hull of the boat well down therein, and thereby bringing the center of gravity of the boat much lower than in the usual boat driving units mounted on the rim or gunwale of the boat. In the example of Fig. 1 the rudder is also included in this unit, and in Figs. 4 and 5 the rudder and its mounting are practically part of the unit on account of their attachment as above described. In Figs. 1, 2 and 3 the propeller is mounted practically entirely up within the casing 6. In the other two examples most of the lower half of the propeller extends below the casing. These, of course, are matters of choice; there being an advantage in containing the propeller entirely within the casing as it will not tangle with weeds and will not strike objects in channel which might damage it or the boat. It will be understood that the casing of either Fig. 4 or Fig. 5 may be modified as to relative height were it desired to include the entire propeller within the casing.
55 60 65 70 75

Another advantage which I provide is the water intake for the cooling of the motor inside the casing at a point where the intake of water will be promoted. This is best seen in Fig. 1, where the mouth 14 opens forwardly within the stream of water passing to the propeller 19. In Figs. 4 and 5 the intake for the water cooling is not directed forwardly, but is located near the center of the cylinder of propeller action. In Fig. 5 the flow of water toward the central part of the propeller will enter the passage 13b; and the passage 13a in Fig. 4 will reflow water somewhat in the same manner.

A further advantage is the connection of the exhaust outlet of the motor to the interior of the casing at the suction side of the propeller in the upper part of the casing. It is in this region that there will be the least back pressure from the water in the casing as the propeller forces the water out of the upper part of the casing, but the inflow of water to this part of the casing is not as free as it is to the lower parts thereof.

It will be understood that my invention is applicable to boats already built, and not provided with motors; all that is necessary being to cut the openings of the required shape and fit the unit thereto. The improvement also is adapted to be incorporated in boats being built. Also it will be understood that my invention may be constructed for application to boats with wooden hulls rather than sheet metal hulls as herein illustrated. Various modifications may be made in the construction and arrangement for these rea-

sons or other reasons, and although I have described my invention rather specifically, it will be understood that I am not limited to such precise description, but what I claim as new and desire to secure by Letters Patent, is:—

1. A boat driving unit comprising a casing with side, top and forward walls and opening rearwardly and downwardly from between said side walls to cover and close an opening in the stern wall and bottom structure of a boat and having openings in the top and forward walls, a motor permanently mounted on, and over said opening in the forward wall of the casing, and a propeller mounted inside said casing and operatively connected to said motor, said motor having a combined exhaust manifold and brace unit rigidly connected to said motor and to the top of said casing and registering with the opening in the top of the casing whereby said exhaust manifold unit will serve as a brace for said motor.

2. A removable boat driving unit comprising a casing adapted to be placed over an aperture in the stern and bottom of a boat and having vertically spaced openings therein, an internal combustion engine mounted by securing its crank case to the side of said casing with its drive shaft projecting into said casing through one of said openings, a propeller mounted on the end of said drive shaft and aft of said spaced openings and a combined exhaust manifold and brace unit rigidly secured to said engine and said casing and registering with the other of said openings.

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