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CONTROLLING DEVICE FOR MARINE ENGINES

Filed Feb. 17, 1922

Fig. 1.

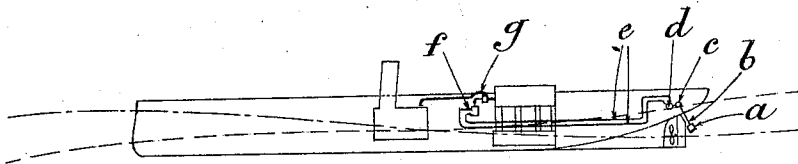
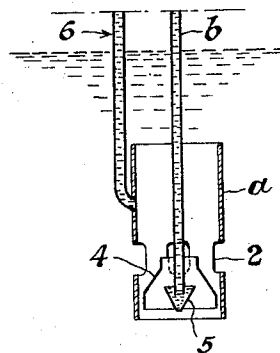


Fig. 2.



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UNITED STATES PATENT OFFICE.

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CONTROLLING DEVICE FOR MARINE ENGINES.

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My invention has for its object a device which is intended to prevent the racing of marine engines caused by the emersion of propellers of vessels and comprises the combination of various means or apparatus in view of obtaining automatically the reduction of the driving power on a vessel or boat in the case in which for any reason such as rough sea or rising of the boat out of the water, the propeller or propellers no longer have the sufficient immersion to entirely absorb the power furnished by the engine.

In this case, the engine increases in speed in a proportion such that this speed may become dangerous for the safety of the engine and the vessel.

The present device is intended to prevent dangerous racing by acting upon the admission of steam, in the case of steam engines, or upon the control device for regulating the speed in the case of other motors, and is based on the direct use of the variation of the actual immersion of the propeller.

In the accompanying drawings given by way of example:

Fig. 1 is a general diagrammatical view of a controlling device or apparatus constructed in accordance with my invention and mounted on a ship.

Fig. 2 is a sectional view of a receiver amplifier which may be used in said controlling device.

As shown in Fig. 1, my controlling device comprises a receiver amplifier *a* which is carried by the hull of the vessel and immersed at a suitable depth in the neighborhood of the propeller to be controlled. This apparatus receives and amplifies as later explained the liquid pressure corresponding to the depth of immersion of the propeller and transmits the same through a tube *b* or several tubes containing a liquid to a transformer *c* which is placed within the vessel at the level, or above or below the plane of the normal water line, and adapted to transform this liquid pressure into an alternating rectilinear or circular movement. Said transformer operates an actuator or manipulator *d* which actuates, through a transmission *e* either mechanical, electrical, or acting by liquids or fluids under pressure, the controlling member of a servomotor *f* which itself controls the operation of the moderator or controller properly so called *g* which is constituted in the case of a steam engine by the valve or register of the engine, and pref-

erably by a special valve or throttle disposed to this effect, or in the case of another class of motor by an element controlling and regulating the speed of the motor and, if necessary by a special independent element.

It will be seen that by reason of the operation of this combination of apparatus which control each other successively in series, any reduction or increase of the immersion of the propeller will be manifested by a correlative variation of the power and the speed of the corresponding motor and proportionally to this immersion, until we arrive if need be at a complete stop, thus preventing all dangerous and harmful racing of the motor and restoring the normal speed when the propeller resumes its normal immersion.

The operation of the improved controlling device described above is more precise, more flexible, and in a word, more automatic, than what is obtained by the devices hitherto employed and which are generally based either on the use of a pendulum swinging in the interior of the vessel, of floats located near the propeller, or on the use of efforts of inertia produced in elements such as centrifugal governors or similar devices and which only act in reality when the motor under control already undergoes a variation of speed. With said known devices, the desired effect is usually produced too late, which may be dangerous especially with motors having a mean or a slow speed or steam engines having a fractionated expansion termed double, triple or quadruple expansion.

By means of my improved controlling device the desired result will be obtained only in function of the actual immersion of the propeller and without the possibility of the intervention of disturbing effects due for example either to the inertia of the mass of the vessel, to effects produced by a considerable inclination of the vessel to one side caused by a wind abeam, or to a variation of the draught.

The same result will be obtained in the case in which, when not heading the sea, the vessel rolls and pitches at the same time, thus varying in an irregular and dangerous manner the immersions of multiple propellers for example in the case of a vessel having two, three or a greater number of propellers. In this case several controlling devices are used, each of them controlling one of the propellers.

The receiver amplifier shown in Fig. 1

may comprise for instance a vertical cylindrical envelope *a* (Fig. 2) open at both ends and provided with lateral openings 2. A tube *b* extends longitudinally through said envelope and opens below a substantially conical partition 4 provided in the envelope and having at the top an opening of a smaller diameter than the envelope. A V-shaped baffle plate 5 is provided under the lower end of said tube. The upper end of the latter is connected to the transformer *c* above referred to. Another tube 6 extending from the side wall of the envelope may be connected to a pressure gauge.

Having now described my invention, what

I claim as new and desire to secure by Letters Patent is:

A device for automatically regulating marine engines in accordance with the depth of immersion of the propellers, comprising in combination a receiving and amplifying device of the type adapted to receive and transmit an amplified liquid pressure proportional to the depth of immersion of the propeller, and means for regulating the speed of the marine engine and adapted to be controlled by said amplified liquid pressure.

In testimony whereof I have signed my name to this specification.

EUGENE FRANÇOIS JOSEPH BRELAND.