

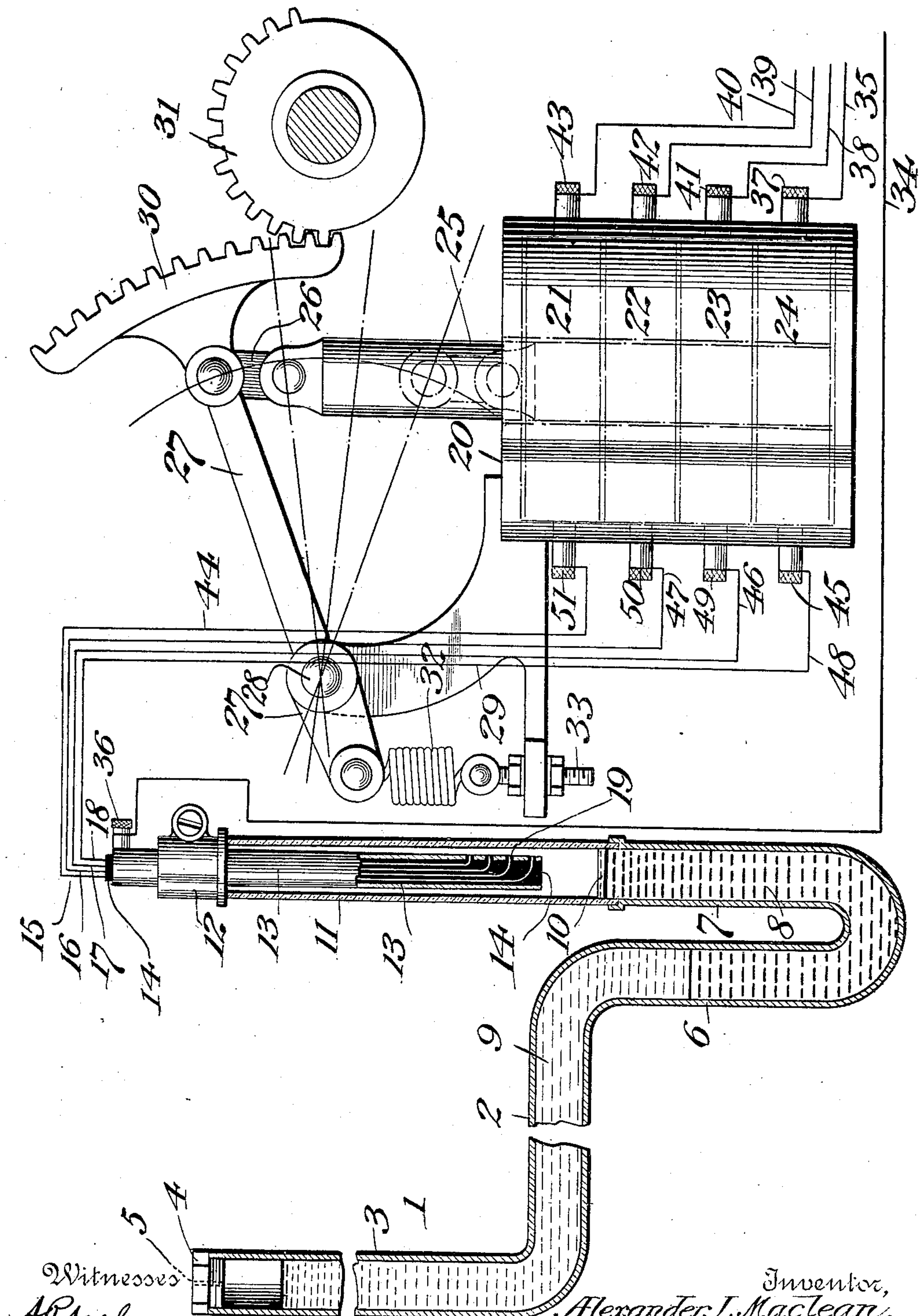
No. 863,735.

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A. J. MACLEAN.

DEVICE FOR PREVENTING RACING OF MARINE ENGINES.

APPLICATION FILED OCT. 29, 1906.



Witnesses
A. R. Appleman
A. B. Blackwood.

Inventor,
Alexander J. Maclean,
By his Attorney,
Charles A. Stephens.

UNITED STATES PATENT OFFICE.

ALEXANDER J. MACLEAN, OF NEW YORK, N. Y.

DEVICE FOR PREVENTING RACING OF MARINE ENGINES.

No. 863,735.

Specification of Letters Patent.

Patented Aug. 20, 1907.

Application filed October 29, 1906. Serial No. 340,971.

To all whom it may concern:

Be it known that I, ALEXANDER J. MACLEAN, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have
5 invented certain new and useful Improvements in Devices for Preventing the Racing of Marine Engines, of which the following is a specification.

My invention relates to automatic devices for preventing the racing of marine engines.

10 It has for its object to provide an electrically actuated device for controlling the steam throttle valve of a marine engine and thereby preventing the engine from racing when, on account of a high sea, the vessel is
15 caused to pitch, raising its propeller out of the water at frequent intervals.

It has for a further object to provide a device of this character embodying advantages in point of effectiveness, lightness and simplicity and inexpensiveness of construction.

20 In the drawings: the figure is a side view partly in section showing my device.

Like reference characters designate corresponding parts in the drawing illustrating my invention.

Referring to the drawing, 1 designates a tube the horizontal portion 2 of which is adapted to be placed within
25 the tunnel of the propeller shaft of a vessel and preferably extend from end to end thereof, the rear end of the tube being bent to form an upwardly extending portion 3 which is covered by a threaded cap 4 engaging threads
30 in the tube and having a small opening 5 therein for the passage of air, the forward end of the tube being bent into U-shape to form arms 6 and 7. A sufficient quantity of mercury 8 is placed in the tube to have a normal level in the arms thereof just below the horizontal portion 2; a sufficient quantity of water 9 is placed therein
35 to rest on top of the mercury in the arm 6 and to have a normal level in the upturned portion 3 just below the cap 4; and a small quantity of oil 10 is placed in the arm 7 of the tube on top of the mercury to prevent sparking.
40 The lower end of a glass tube 11 is fitted into the upper end of the arm 7 of the tube and its upper end is fitted into a supporting clamp 12 and closed (but not hermetically), thereby forming a transparent tubular extension. Within the glass tube 11 is inserted a metallic
45 tube 13 adapted to be adjusted up and down therein and held in the desired position by the clamp 12 through which its upper end extends. A plug 14 of insulating material is inserted within the tube 13 and provided with bores in which electrical conducting wires
50 15, 16, 17 and 18 are placed, the lower ends of the wires extending through insulating sleeves 19 inserted in holes extending through the tube 13, the tube 13 and the wires forming terminals, electrical connection being established by means of the mercury 8 in the manner
55 to be hereinafter described.

A solenoid 20, preferably of the iron clad class, having a plurality of separate coils (shown in the drawing as having coils 21, 22, 23 and 24) is placed in a convenient position, and its core 25 is connected by a link 26 to a lever 27 fulcrumed at 28 on a bracket 29, one
60 end of said lever being provided with a toothed segment 30 which gears with a mutilated gear 31 on the throttle or steam valve spindle to open or close the steam valve; and to the other end of the lever 27 is connected one end of a reaction spring 32, the other
65 end of said spring being connected to a screw threaded rod 33 adjustable in the bracket 29, said spring being adapted to reopen the valve when the electrical connection with the solenoid is broken. An electrical
70 conducting wire 34 leads from the "bus bar" of an electric switch board to the binding post 36; electrical conducting wires 35, 38, 39 and 40 lead from the "bus bar" to the binding posts 37, 41, 42 and 43 respectively
75 of the coils 24, 23, 22 and 21, respectively; and electrical conducting wires 44, 47, 46 and 48 lead from the binding posts 51, 50, 49 and 45 of the solenoid to the wires 15, 16, 17 and 18 respectively.

It will be understood that on account of the adjustability of the tube 13 in relation to the mercury in the tube 1 that electrical connection can be established
80 between the lower ends of the wires in the plug 14 and the tube 13 at any pre-determined height of the mercury, and therefore the coils of the solenoid may be brought into action successively to control the
85 action of the steam valve at any pre-determined height of rise of the stern of the vessel.

The operation is as follows:—When the stern of a vessel installed with my device rises by the action of the waves, the water in the tube presses by force of gravity on the mercury, forcing it up within the arm
90 8; and if the rise of the vessel is sufficient to force the mercury up so as to surround the lower end of the tube 13 at a point on a level with the lower end of the wire 15, circuit is established to bring the coil 21 of the solenoid into action to close the steam valve
95 quarter way; if the rise of the vessel is sufficient to force the mercury up so as to surround the lower end of the tube 13 at a point on a level with the lower end of the wire 16 circuit is established to bring the coils
100 22 and 23 into action to close the steam valve half way, if the rise of the vessel is sufficient to force the mercury up so as to surround the lower end of the tube 13 at a point on a level with the lower end of the wire 17 circuit is established to bring the coils 21, 22 and 23
105 into action to close the steam valve three fourths way and if the rise of the vessel is sufficient to force the mercury up so as to surround the lower end of the tube 13 at a point on a level with the wire 18 circuit is established to bring the coils 21, 22, 23 and 24 in action
110 to fully close the steam valve.

I do not wish to be understood as limiting myself to the precise details and arrangements of parts shown and described, but reserve the right to all modifications within the scope of my invention.

5 Having now described my invention what I claim as new and desire to secure by Letters Patent, is

10 1. In a device for preventing the racing of marine engines, a solenoid having a plurality of separate coils, means actuated by the core of said solenoid to control the action of the throttle valve to thereby govern the speed of the propeller and means automatically actuated by the rise and fall of the vessel for energizing the coils of the solenoid, substantially as described.

15 2. In a device for preventing the racing of marine engines, a solenoid having a plurality of separate coils, means actuated by the core of said solenoid to control the action of the throttle valve and thereby govern the speed of the propeller, a tube having water in the inner end and mercury in the outer end, an open circuit including the coils of said solenoid and a source of electrical supply, a metallic tube extending into the inner end of said tube and forming one terminal of said circuit and wires leading from the coils of the solenoid into said metallic tube and forming the other terminal of said circuit, and their ends being located at different heights, substantially as described.

3. In a device for preventing the racing of marine engines, a solenoid having a plurality of separate coils, means actuated by the core of said solenoid to control the action of the throttle valve and thereby govern the speed of the propeller, a tube having water in the inner end and mercury in the outer end, an open circuit including the coils of said solenoid and a source of electrical supply, a metallic tube extending into the inner end of said tube and forming one terminal of said circuit, wires leading from the coils of the solenoid into said metallic tube and forming the other terminal of said circuit, and their ends being located at different heights, and means for adjusting said terminals in said tube with relation to the coil, substantially as described.

4. In a device for preventing the racing of marine engines, a solenoid having a plurality of coils, means actuated by the core of said solenoid to control the action of the throttle valve and thereby govern the speed of the propeller, an open circuit including the coils of said solenoid and a source of electrical supply and means actuated by the rise and fall of the vessel for successively closing circuit through said coils, substantially as described.

Signed at New York, in the county of New York, and State of New York, this 27th day of October, A. D. 1906.

ALEXANDER J. MACLEAN.

Witnesses:

A. R. APPLEMAN,

A. B. BLACKWOOD.