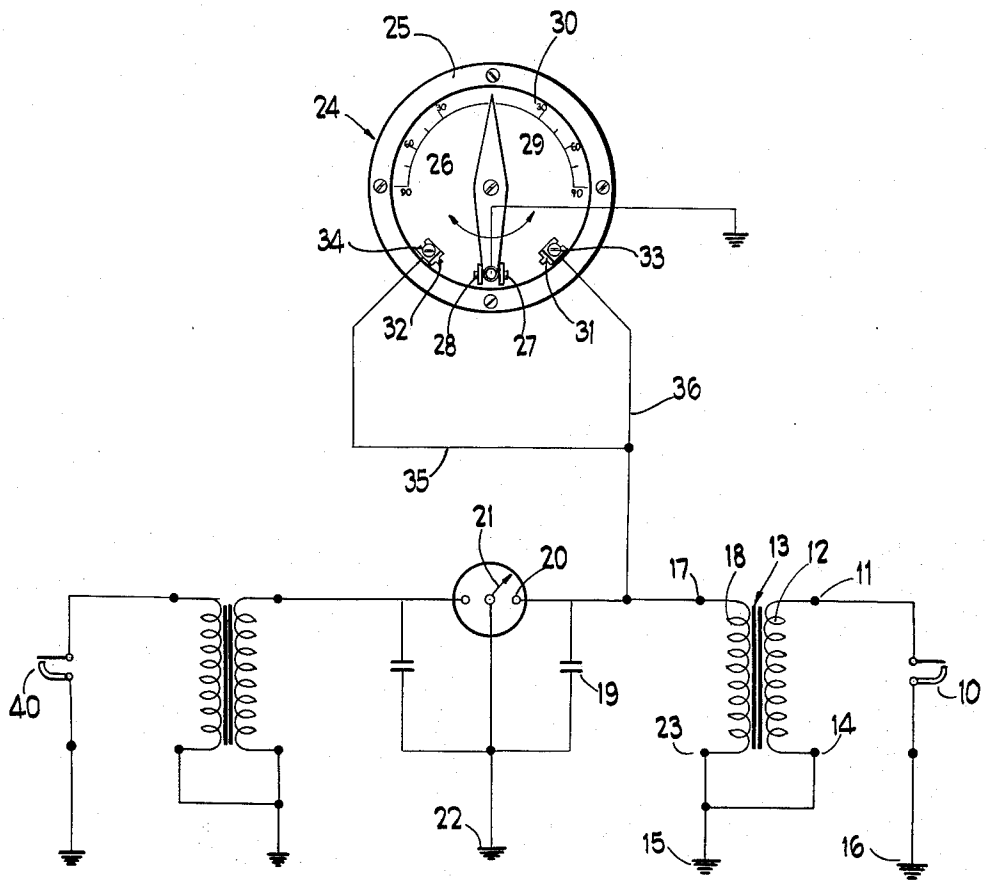
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IGNITION CONTROL FOR MOTOR BOAT ENGINE

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IGNITION CONTROL FOR MOTOR BOAT ENGINE

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The present invention relates to an ignition control system, and more particularly the invention relates to an ignition control system for a boat or other vehicle which is operated under conditions where it is reasonable to expect the boat or other vehicle to assume an extreme tilted position.

It has been found desirable to provide some means whereby the power of the engine of the vehicle can be materially reduced automatically should the vehicle assume an abnormal tilted position. The reason for this is that when the boat is abnormally tilted the vehicle may proceed forward at greatly reduced speed. Experience has shown that at the times a boat is extremely tilted at least some power is needed to enable the vehicle to proceed slowly while returning to its normal position. This has been found to be particularly so in case of boats where the judicious application of some power will enable a badly tilting boat promptly to assume an even keel, especially when the boat is moving in rough water. It is therefore desirable to reduce the power so that the continued headway in the rough water will be greatly reduced.

A primary object of the present invention, therefore, is to provide an automatic ignition system which, in the event a boat tilts beyond a certain predetermined critical inclined position, will reduce the maximum power available and substantially reduce its speed.

It is another object of the present invention to provide an automatic system for use with a boat having a two-cylinder engine which system will render but one of the two cylinders inoperative should the boat reach a tilted position steeper than a certain predetermined angle.

Additional objects and advantages of the present invention will become apparent from a consideration of the accompanying drawing, in which the single figure is a schematic illustration of an automatic ignition control system made according to the present invention.

In motor-boating, while making a turn in rough water the boat may suddenly be tilted to an unsafe angle. If forward motion of the boat were continued at full power and speed, the tilting would increase beyond a safe limit. To prevent this additional tilting, a pendulum-operated switch is inserted in the ignition circuit to one only of a two-cylinder engine or to some of the cylinders of an engine having a greater number.

Referring in detail to the drawing, there are shown two spark plugs **10** and **40**, associated, respectively, with two cylinders of a conventional internal combustion engine such as may be mounted in a boat. The details of the engine and its mounting are not shown as these may be conventional and form no part of the instant invention.

Each spark plug has its own ignition circuit and since both ignition circuits are identical, only that of the spark plug **10** will be described. The spark plug **10** is connected to one terminal **11** of the secondary winding **12** of a magneto coil **13**, the other terminal **14** of the secondary winding being grounded at **15**. The spark plug **10** also is grounded as shown at **16**.

One terminal **17** of the primary winding **18** of the magneto coil **13** is connected to a condenser **19** as well as to one point **20** of a distributor. The cooperating point **21** of said distributor as well as the other terminal of the condenser **19** is grounded as shown at **22**. The other terminal **23** of the primary **18** is grounded at **15**.

It will be understood that, during normal operation of the engine, a voltage across the spark gap of the spark plug **10** will cause a spark to occur, thereby igniting the fuel in the cylinder with which the spark plug **10** is associated. Similarly, an appropriately timed spark will be produced across the spark gap of the spark plug **40** by means of a similar circuit.

The automatic ignition control system according to the present invention further includes a list or tilt-responsive switch device indicated generally at **24**. The switch includes a grounded casing **25** fixedly mounted within the boat and a freely swinging contact arm **26** electrically connected to said casing and having a lower branch carrying two contacts **27** and **28** as well as an upper branch **29** which is fashioned as a pointer and cooperates with a scale **30** which is fixed to the casing **25**. The switch casing **25** further carries two stationary contacts **31** and **32** which are in the path of the movable contacts **27** and **28**, respectively, when the arm **26** pivots in one direction or the other about its center. Thus, it will be readily appreciated that as long as the boat carrying the casing **25** is in a substantially normal upright position, the movable contacts on the arm **26** will be out of contact with their respective stationary contacts. However, should the boat tilt to an angle equal to or greater than a safe angle of say approximately 30°, then one of the movable contacts will engage its cooperating stationary contact, and the switch will assume a closed position.

Each stationary contact **31** and **32** is part of a terminal block which is insulated from the remainder of the casing and which includes wire attachment screws **33**, **34**. These screws are provided with leads **35** and **36**, said leads being connected to the line connecting the point **20** and the terminal **17** of the primary **18**. Thus, whenever the switch **24** assumes a closed position, wherein one of the movable contacts engages its cooperating stationary contact, which occurs only whenever the boat assumes an unsafe list, the distributor made up of the points **20**, **21**, the condenser **19** and the primary **18** will be short-circuited, thereby rendering the cylinder containing the spark plug **10** inoperative. Spark plug **40**, which does not include in its circuit the switches on arm **26**, is not affected and therefore continues to operate.

From the above, it will be seen that closing of the switch **24** at no time renders both cylinders inoperative, so that the engine will always be able to apply some power.

It will be understood that the above description of the present invention is susceptible to various modification, changes and adaptations, and the same are intended to be comprehended within the meaning and range of equivalents of the appended claims.

I claim as my invention:

1. An automatic ignition control system for a vehicle subjected to tilting, said system comprising: a multiple cylinder engine mounted on the vehicle, each cylinder having its own ignition circuit; normally open tilt-responsive switch means mounted on the vehicle, said switch means assuming a closed position whenever the vehicle assumes a tilted position which is further inclined than a predetermined angle; and means connecting said switch means to the ignition circuit of only some of the cylinders for rendering such ignition circuit inoperative by short-circuiting a component part of such ignition circuit whenever said switch means is in its closed position, whereby when the vehicle is tilted beyond said predetermined angle, only some and not all of the cylinders will become inoperative.

2. An automatic ignition control system for a vehicle subject to tilting, said system comprising: a two-cylinder

engine mounted on the vehicle, each cylinder having its own ignition circuit; normally open tilt-responsive switch means mounted on the vehicle, said switch means assuming a closed position whenever the vehicle assumes an inclination which is steeper than a predetermined angle; and means connecting said switch means to the ignition circuit of only one of the two cylinders for short-circuiting and rending inoperative a component part of such ignition circuit whenever said switch means is in its closed position, whereby when the vehicle is tilted beyond said predetermined angle, only one of the two cylinders of the engine will become inoperative.

3. An automatic ignition control system for a boat, said system comprising: a two-cylinder engine mounted on the boat, each cylinder having its own ignition circuit; normally open list-responsive switch means mounted on the boat, said switch means assuming a closed position whenever the boat lists into an inclined position steeper than a predetermined angle; and means connecting said switch means to the ignition circuit of only one of the two cylinders for short-circuiting and thereby

rendering inoperative a component part of such ignition circuit whenever said switch means is in its closed position, whereby when the boat assumes a list steeper than said predetermined angle, only one of the two cylinders of the engine will become inoperative.

4. The system defined in claim 3 wherein said component part of the ignition circuit of said one cylinder is a circuit comprising the primary winding of a magneto coil, a condenser, and a distributor switch all connected in parallel with each other, said switch means being connected in parallel with said circuit.

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