May 18, 1965 R. C. HEIDNER 3,183,879

SPEED CONTROL DEVICE

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Fig. 1.

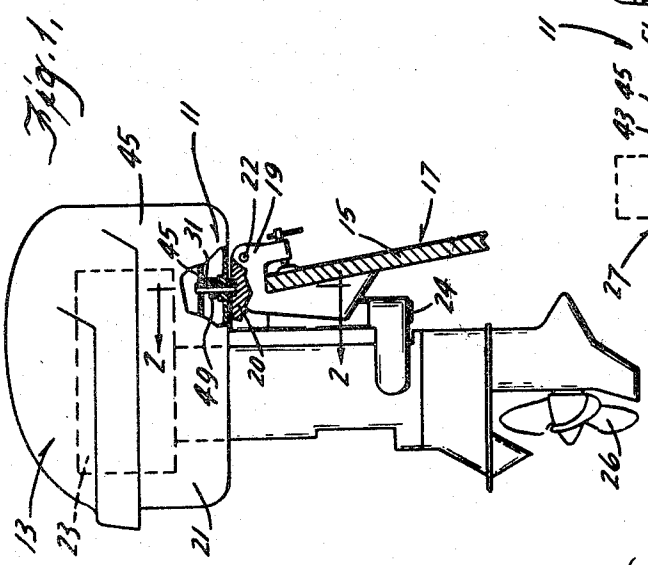
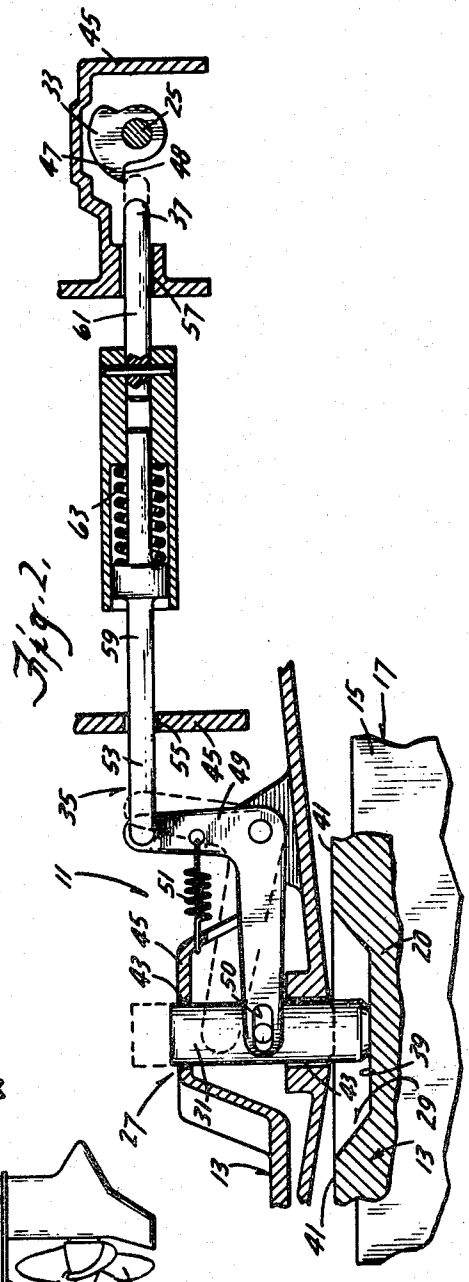


Fig. 2.



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SPEED CONTROL DEVICE

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The invention relates generally to engine speed or throttle controls and, more particularly, the invention relates to arrangements for controlling the speed or throttle setting of an engine, such as for example, an internal combustion engine or an electric motor, driving a maneuverable vehicle.

With respect to vehicles such as boats driven by internal combustion engines, and with particular respect to boats driven by outboard motors, certain of such boats can be capsized by sudden advancement of the throttle when the steering mechnaism is set for a relatively sharp turn. The control disclosed herein avoids this hazard by preventing advancement of the engine throttle from below to above a predetermined setting when the steering mechanism is disposed to effect turning of the boat at a rate above a preselected amount. The disclosed embodiment is incorporated in an outboard motor and includes a cam track on the swivel bracket in position to displace a follower which is carried by a dirgible propulsion unit and which is adapted to effect control of the throttle setting mechanism.

Because the danger of capsizing is not generally present if a boat is turned sharply after the engine has been advanced to full speed, the disclosed embodiment includes a linkage, between the follower and the throttle control member, incorporating an arrangement affording, when the throttle is advanced beyond the predetermined setting, movement of the linkage components relative to each other without affecting steering of the boat or the throttle setting of the engine.

Other advantages of the invention will become apparent by reference to the following description and the accompanying drawings of one embodiment in which:

FIGURE 1 is an elevational view, partially broken away and in section, of an outboard motor embodying various of the features of the invention; and

FIGURE 2 is an enlarged, somewhat diagrammatic view, partially in section, illustrating the throttle control arrangement embodied in the outboard motor shown in FIGURE 1.

The throttle control arrangement **11** shown in the drawings limits the setting of an engine throttle when an associated steering arrangement is in a turning disposition. Although the arrangement **11** is embodied in an outboard motor **13** mounted on the transom **15** of a boat **17**, the principles of the invention are not restricted to control of the setting of an outboard motor throttle.

The outboard motor **13** conventionally includes a transom bracket **19** which is releasably fixable to the transom **15**, a swivel bracket **20** which is carried by the transom bracket **19** for pivotal movement about a horizontal axis or pivot **22**, and a propulsion unit **21** which is carried by the swivel bracket **20** for pivotal movement relative thereto about a generally upright axis or swivel **24** in order to steer the boat. The propulsion unit **21** conventionally incorporates a powerhead or engine **23** which may be either an internal combustion engine or an electric motor, which engine is connected through power transmission means (not shown) to a propeller **26**. The engine **23** includes a throttle (not shown) which is adjustable by a throttle control member **25** (see FIGURE 2) to control the speed of the engine.

Limitation of the throttle setting, incident to shifting

of the propulsion unit **21** from a position affording straight-ahead movement of the boat, is provided by linkage means **27** including a cam track **29** on the swivel bracket **20**. Engaged by the cam track **29** is a follower **31** which is carried by the propulsion unit **21**. Also included in the linkage means **27** is a cam **33** mounted on the throttle controlling member **25** which, in the disclosed construction, is axially rotatable to control the throttle, and a sub-linkage **35** connected to the follower **31**. Included in the sub-linkage is a portion **37** which is normally disposed by the follower **31** in position for interfering engagement with the cam **33** to prevent subsequent increasing of the throttle setting from below to above a predetermined value when the propulsion unit **21** has been shifted from its position affording straight-ahead movement of the boat.

More particularly, the cam track **29** extends along an arc defined by the follower **31** incident to shifting of the propulsion unit **21** about its upright axis. The cam track **29** includes a central portion **39** which affords shifting of the propulsion unit through a limited central range extending on both sides of its straightahead position without disabling setting of the throttle through a full range of speeds. Also included in the cam track are relatively raised portions **41** extending from each side of the central portion, which raised portions **41** serve to actuate the follower **31** to limit increasing of the throttle setting beyond a predetermined level. The follower **31** is vertically slidably carried for engagement with the cam track **29** in a guideway **43** in the engine cover **45** of the propulsion unit **21**.

The throttle control member **25** is rotatable, in the disclosed construction, in a counterclockwise direction to advance the throttle setting and the cam **33** carried thereon includes a radially projecting lug or lobe **47** having an abutment surface **48** which is horizontally disposable incident to rotation of the cam **33** for engagement by the sub-linkage portion **37** to prevent counterclockwise rotation of the control member beyond a predetermined throttle setting. More specifically, the sub-linkage **35** includes a bell crank lever **49** which has one arm connected to the follower **31** through a horizontal lost motion connection, indicated at **50**, and is biased by a spring **51** to retain the follower **31** in engagement with the cam track **29**. Connected to the other arm of the lever **49** is a bar or rod **53** which is supported at **55** and **57** by the engine cover **45** and is shiftable by the lever **49** to position the portion **37** relative to the cam **33**. Thus, when the throttle is initially set below said predetermined value and the follower **31** is then engaged with either of the raised portions **41** of the cam track **29**, the sub-linkage portion **37** is positioned for interference with the abutment surface **48** of the cam lobe **47** to prevent increasing the throttle setting beyond said predetermined value.

The sub-linkage **35** is also arranged to permit shifting of the propulsion unit **21** from its central range of positions when the throttle setting is above said predetermined value. In this regard, the rod **53** includes two telescopic sections **59** and **61** which are movable relative to each other to afford movement of the sub-linkage portion **37** relative to the cam **33** on the throttle control member. The connection of the telescopic sections **59** and **61** includes means in the form of a spring **63** biasing the sections **59** and **61** away from each other. Accordingly, the spring permits movement of the telescopic sections **59** and **61** toward each other when the throttle has been previously set above said predetermined value and the propulsion unit is shifted from its central range. However, when the throttle setting is subsequently reduced below said predetermined value, the sub-linkage portion **37** is automatically positioned in its normal ex-

tended condition for interfering engagement with the cam lobe 47.

Various of the features of the invention are set forth in the following claims.

What is claimed is:

1. In an outboard motor including a bracket adapted to be mounted on a boat, a propulsion unit including a throttle control member movable between low and high speed positions, and means mounting said propulsion unit on said bracket for swinging movement of said unit relative to said bracket about a generally upright axis, the improvement comprising

means on said motor operably engageable with said throttle control member for limiting the movement of said throttle control member toward the high speed position when said propulsion unit is positioned remotely from a preselected position relative to said bracket.

2. An outboard motor including a bracket adapted to be mounted on a boat, a propulsion unit including a throttle control member movable between low and high speed positions, means mounting said propulsion unit relative to said bracket about a generally upright axis, and means on said motor operably engageable with said throttle control member for limiting the movement of said throttle control member toward the high speed position when said propulsion unit is positioned remotely from a preselected position relative to said bracket, said means for limiting the movement of said throttle control member including

a cam track on said bracket including a central part associated with said preselected position of said propulsion unit and extending parts projecting relative to said central part,

a follower mounted on said propulsion unit for movement along said cam track incident to swinging of said propulsion unit,

means biasing said follower against said cam track,

a cam on said throttle control member, and

a sub-linkage connected to said follower and including a portion positionable by said follower incident to engagement with said projecting parts for interfering engagement with said cam so as to prevent increasing the setting of said throttle control member above a predetermined value when said propulsion unit is remotely located from said preselected position and said throttle control member is initially set below said predetermined value.

3. An improvement in accordance with claim 2 in which

said linkage includes means for permitting resilient shifting of said portion relative to a normally extended condition positionable by said follower for interfering engagement with said cam, thereby permitting shifting of said propulsion unit from said preselected position when said throttle is set above said predetermined value.

4. The combination of

a vehicle,

an engine on said vehicle including a throttle controlling member adjustable between high speed and low speed settings,

means on said vehicle movable relative thereto for steering said vehicle, and

means on said vehicle actuated by said steering means and operably connectable with said throttle controlling member for limiting setting of said throttle from below to above a predetermined value incident to movement of said steering means from a preselected position.

5. An outboard motor including a bracket adapted to be mounted on a boat, a propulsion unit including a throttle control member movable between low and high speed settings, means mounting said propulsion unit on said bracket for swinging movement of said unit relative to said bracket about a generally upright axis through a range of movement including a centrally disposed segment, and means on said motor operatively engageable with said throttle control member for preventing movement of said throttle control member above a predetermined setting when said throttle control member is set below said predetermined setting and said propulsion unit is then swung remotely from said centrally disposed segment of the range of relative movement between said unit and said bracket.

6. An improvement in accordance with claim 5 wherein said means for preventing movement of said throttle control member includes a cam on said throttle control member and means on said motor positionable in response to swinging movement of said unit relative to said bracket beyond said centrally disposed segment for interfering engagement with said cam so as to prevent an increase in the setting of said throttle control member above said predetermined setting when said throttle control member is set below said predetermined setting and said propulsion unit is then swung relative to said bracket beyond said centrally disposed segment of movement.

7. An improvement in accordance with claim 6 wherein said means positionable for interfering engagement with said cam includes a cam engaging portion and means permitting resilient shifting of said cam engaging portion in the event said throttle control member is set above said predetermined setting when said unit is swung relative to said bracket beyond said centrally disposed segment.

8. An improvement in accordance with claim 5 wherein said means for preventing movement of said throttle control member includes a cam track on said bracket including a central part associated with said centrally disposed segment of propulsion unit movement relative to said bracket, and extending parts projecting relative to said central part, a follower mounted on said propulsion unit for movement along said cam track during swinging of said propulsion unit, means biasing said follower against said cam track, a cam on said throttle control member and a linkage connected to said follower and including a portion positionable by said follower incident to engagement with said projecting parts for interfering engagement with said cam so as to prevent an increase in the setting of said throttle control member above said predetermined setting when said throttle control member is set below said predetermined setting and said propulsion unit is then swung relative to said bracket beyond said centrally disposed segment of movement of said propulsion unit relative to said bracket.

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BROUGHTON G. DURHAM, *Examiner.*