

Oct. 9, 1962

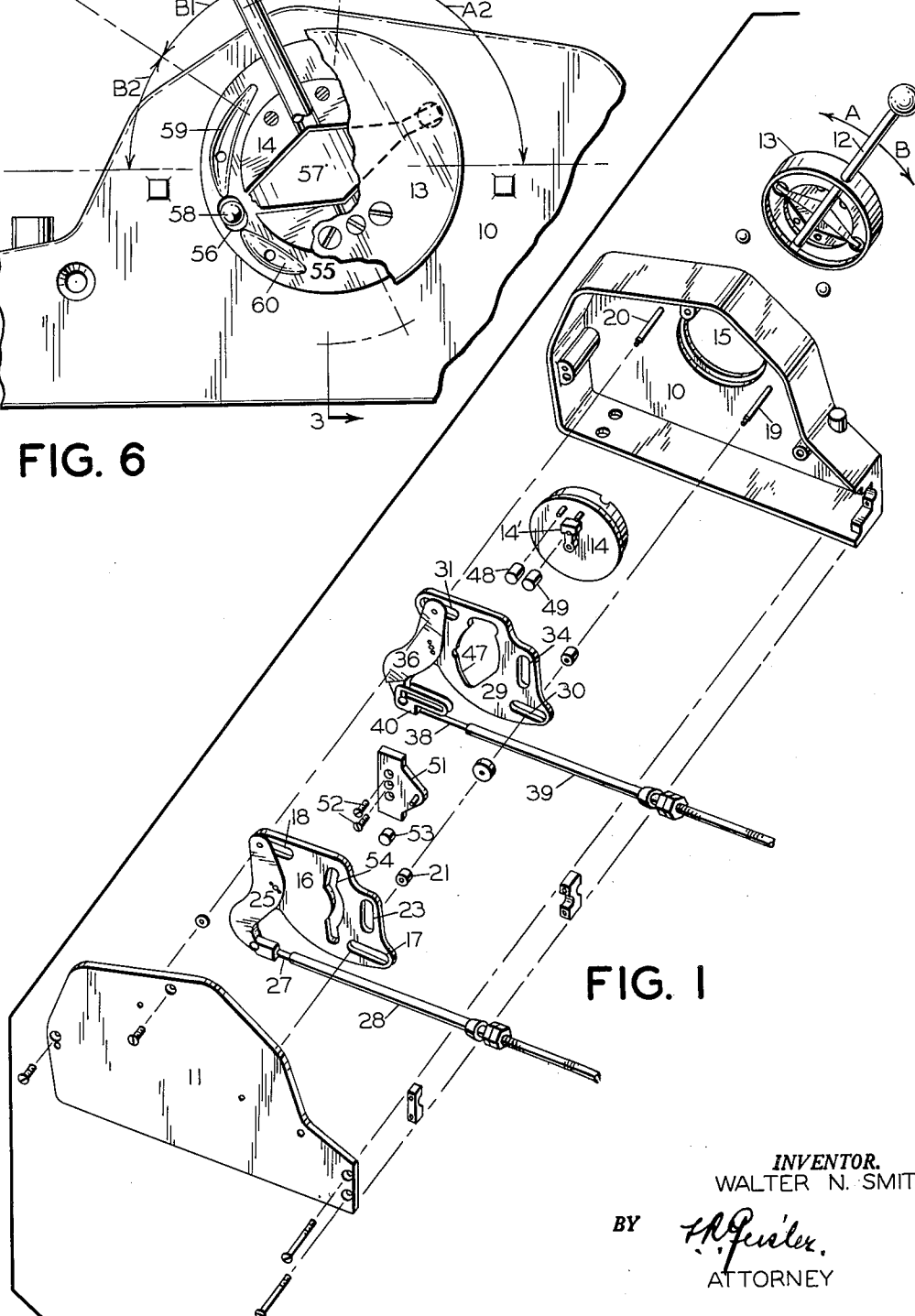
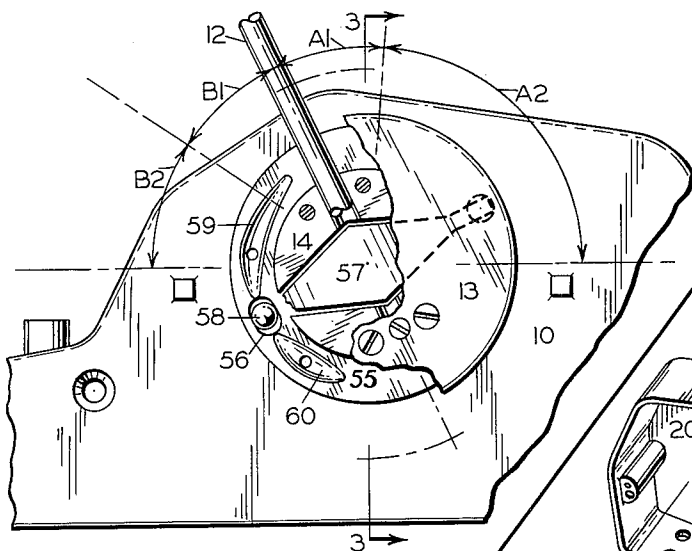
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3,057,221

SINGLE LEVER CONTROL MEANS FOR REMOTE PUSH-PULL MECHANISMS

Filed July 10, 1961

4 Sheets-Sheet 1



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SINGLE LEVER CONTROL MEANS FOR REMOTE PUSH-PULL MECHANISMS

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4 Sheets-Sheet 2

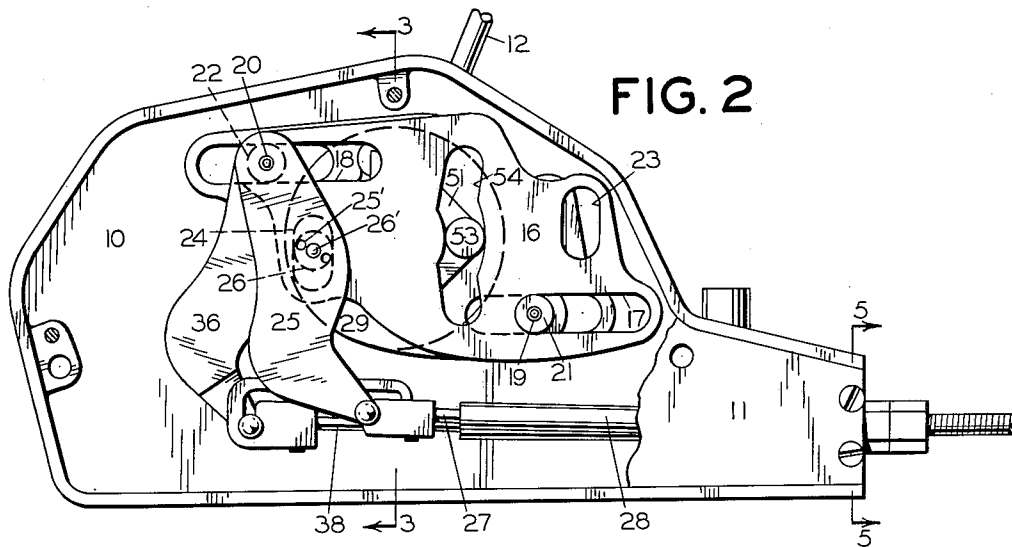


FIG. 2

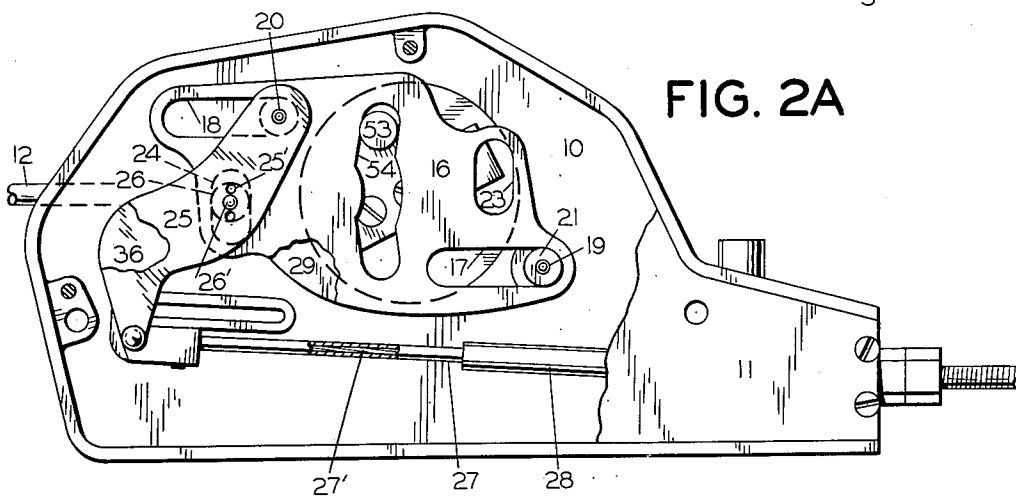


FIG. 2A

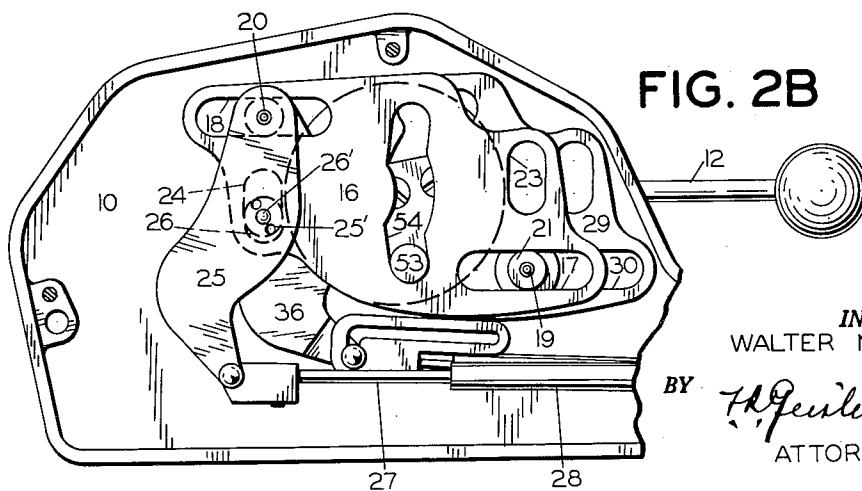


FIG. 2B

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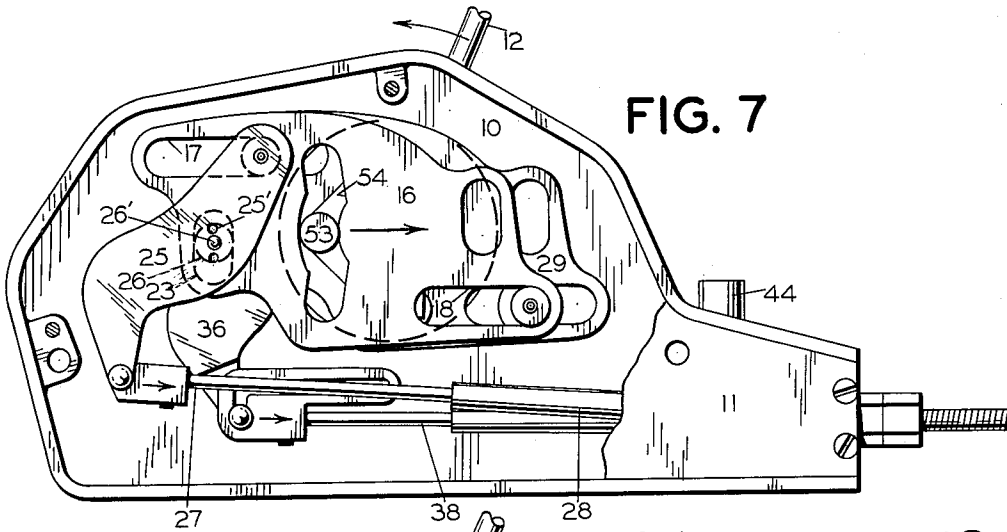


FIG. 7

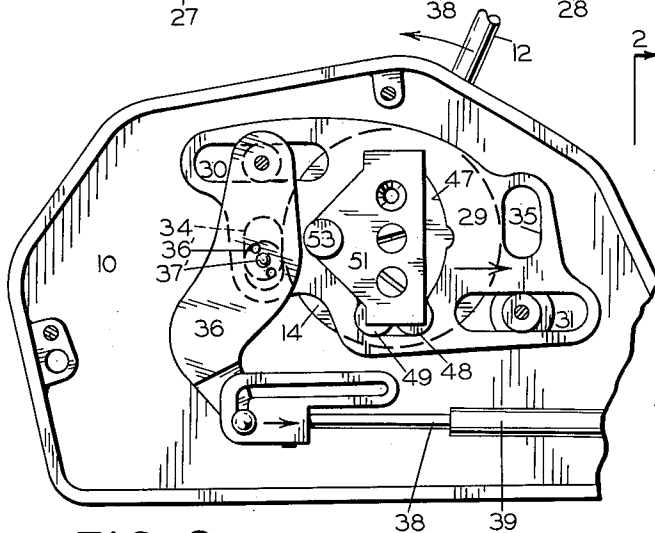


FIG. 8

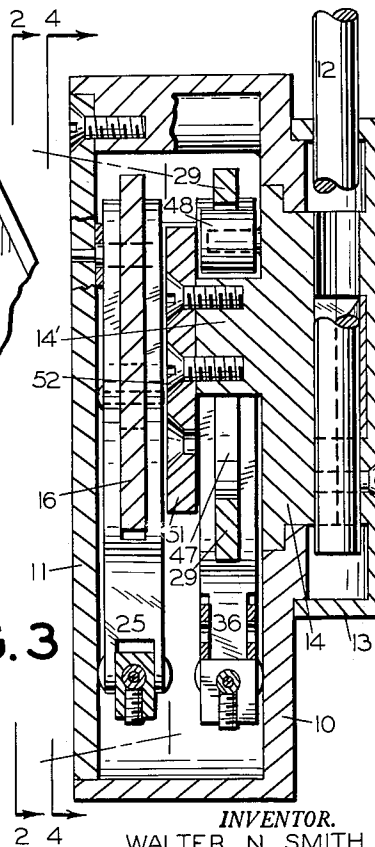


FIG. 3

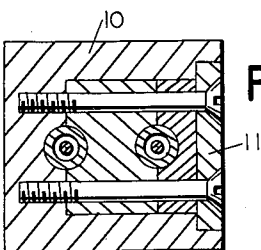


FIG. 5

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SINGLE LEVER CONTROL MEANS FOR REMOTE PUSH-PULL MECHANISMS

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4 Sheets-Sheet 4

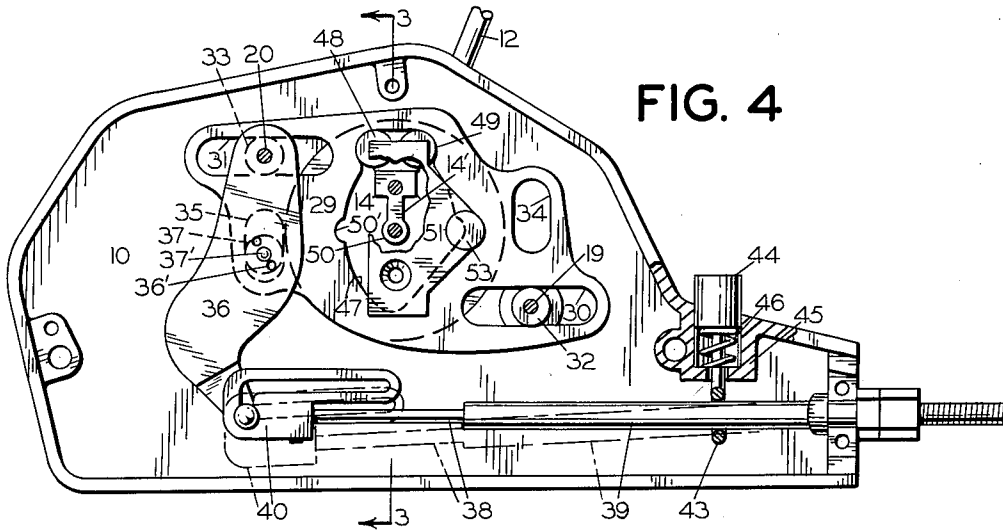


FIG. 4

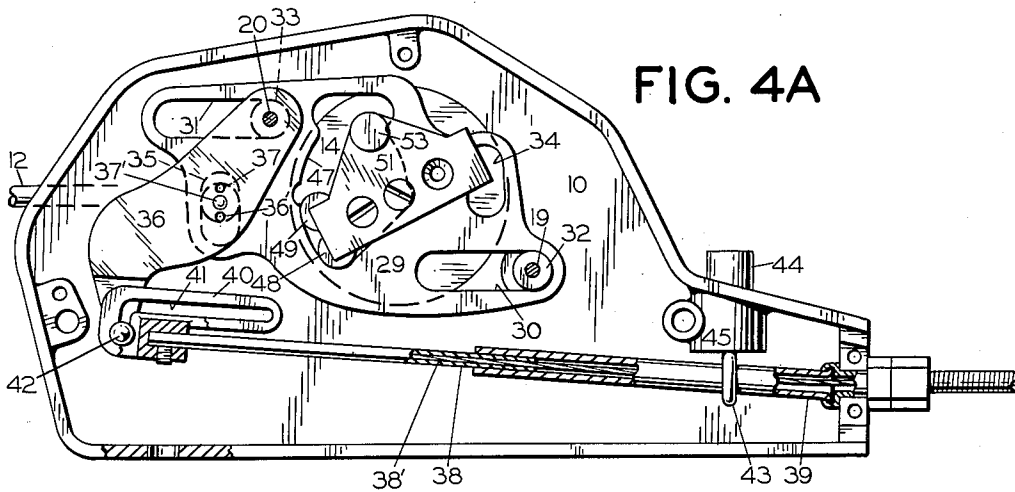


FIG. 4A

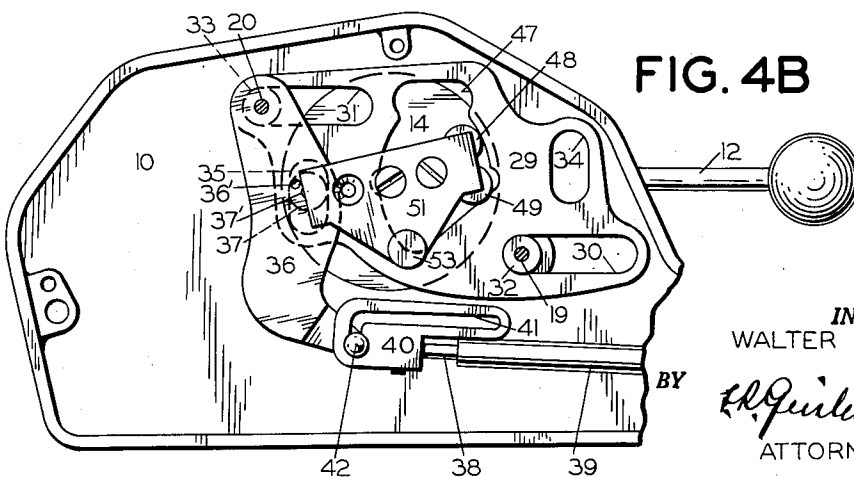


FIG. 4B

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3,057,221

SINGLE LEVER CONTROL MEANS FOR REMOTE PUSH-PULL MECHANISMS

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Filed July 10, 1961, Ser. No. 122,677

7 Claims. (Cl. 74—472)

This invention relates in general to control means for remote push-pull mechanisms, such as remote control means for an internal combustion motor, and, more especially, for a marine engine or outboard motor, in which control means a single operating lever serves for actuating both the engine gearshift cable and the engine throttle cable.

An object of the invention is to provide an improved single lever control mechanism, designed for the above mentioned purpose, in which mechanism the use of cams in place of gears and/or levers will enable the control mechanism to function more advantageously and also to be more simple and practical in construction.

Another object is to provide such a single lever control mechanism which will operate the motor gearshift only while the throttle is in idling position and which will advance the motor throttle from idling position only after the gearshifting of the motor from neutral to either forward or reverse position is completed, and with which the motor throttle will always be returned to idling position before the gearshifting of the motor begins from either forward or reverse running position to neutral.

A related object is to provide an improved single lever control in which the pick-up or advancing of the throttle occurs definitely and quickly after the gearshifting is completed and without any extensive swing of the operating lever, causing subsequent resulting changes of throttle position to lag and/or delay with respect to the control lever changes of position after the gearshifting for the motor is completed, and further to assure a uniform progression of throttle movement with such corresponding changes of the operating lever.

A further object is to provide a single lever throttle and gearshift control in which the gearshift control can momentarily be disconnected from the single operating lever by a simple push button release without the use of any auxiliary operating lever, enabling the control lever to be used for advancing the throttle while the motor gears remain in neutral.

Another related object is to provide a single lever control mechanism with a gearshift control release in which the gearshift control will automatically be re-engaged when the control lever is returned to neutral position.

An additional object is to provide an improved single lever control for selective operation of either the engine gear or engine throttle or both of them, but in which no movement of the control lever can be made to take place in which neither will be operated except during the actuation of the gearshift control release.

In a like manner a similar object is to provide an improved single lever control for selective direction power operation and regulations thereof for boats, ships, vessels, other power driven vehicles, power operated equipment and the like, but so arranged that no movement of the control lever can be made to take place in which the engine throttle will advance to some undesirable extent before the transmission gears or clutches are engaged sufficiently in order to carry the load applied, and conversely no movement of the control lever can be made to take place in which the engine will be at excessive throttle opening and thereby applying excessive power to the transmission when the transmission gears or clutches normally disengage.

A further and important object of this invention is to

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provide a novel and improved single lever remote control for use with different makes of marine or outboard motors in which the control lever will be moved in the direction in which it is desired to regulate the engine, regardless of whether the particular engine with which the control is connected requires operation of either a push or a pull on the wire of the gearshift cable for the motor to shift from reverse to neutral and to forward, or operation of either a push or a pull on the wire of the throttle cable for advancing the motor throttle position, and in which the other choice of the wire operation of the control mechanism with respect to the direction of movement imparted to the single control lever can be achieved by a simple change of assembly of certain members in the mechanism.

A still further object is to provide a single lever control mechanism of the kind above indicated in which simple spring-loaded elements act as guides for the manual positioning of the control lever itself so as to aid the operator in manipulating the lever and in maintaining the lever at set position regardless of vibration imparted to the mechanism from the motor or boat when the motor is running at advanced throttle.

The manner in which the objects and other advantages are attained through the medium of the present invention, the manner in which the improved control mechanism of the present invention is constructed, and the manner in which it functions, it will be briefly explained and described with reference to the accompanying drawings, wherein:

FIG. 1 is an exploded view in perspective showing the individual members of the control assembly separated from each other but arranged in their relative relation with respect to each other, the arrangement illustrated being that in which a pull on the gearshift cable is required to change the motor from neutral to forward and a pull on the throttle cable is required for advancing the throttle;

FIG. 2 is an elevation of the control assembly taken from the near side with respect to FIG. 1, taken from the side opposite that shown in FIG. 6, and taken on the line indicated at 2—2 in FIG. 3, but with the cover plate of the housing broken away—this view illustrating the position of the members of the mechanism with the gearshift in neutral position and the throttle at idle position;

FIG. 2A is a similar elevation, with the cover plate broken away, but showing the position of the members for driving the engine forwardly at full speed;

FIG. 2B is a corresponding elevation illustrating the position of the same members for driving the engine in reverse at partially advanced throttle;

FIG. 3 is a section on the line 3—3 of FIGS. 2, 4 and 6, drawn to a larger scale;

FIG. 4 is a section on line 4—4 of FIG. 3, drawn to the same scale as FIG. 2, with the device in neutral position;

FIG. 4A is a similar section with the device positioned for driving the engine forwardly at full speed, and thus in the same position as in the case of FIG. 2A;

FIG. 4B is a similar section with the device positioned for driving the engine in reverse at partially advanced throttle and thus in the same position as in the case of FIG. 2B;

FIG. 5 is a section on line 5—5 of FIG. 2 drawn to a larger scale;

FIG. 6 is an elevation of the device taken from the side opposite that shown in FIG. 2, and thus from the side which would be the more remote with reference to FIG. 1, with portions of the outside cap, in which the control lever is mounted, broken away;

FIG. 7 is an elevation similar to FIG. 2, with the device in neutral position but with certain members of

the device re-assembled to accommodate a marine engine in which the wires of the cables for the throttle and gearshift move in directions opposite those shown in FIG. 2, but with which the same movement of the control lever is desired; and

FIG. 8 is a section corresponding to FIG. 4 but with certain members of the device re-assembled for the reason as mentioned with reference to FIG. 7.

Referring first to FIGS. 1, 2, 3 and 6, the device includes a main housing 10 having a cover plate 11 for one side removably secured to the main housing by screws. A control lever 12 is carried by a cap 13 which is attached by screws to a shouldered disc 14 (FIGS. 1 and 6) rotatably mounted in a circular opening 15 in the housing 10.

A throttle-operating plate 16, shaped as shown in FIGS. 1 and 2, having a pair of oppositely-positioned identical horizontal slots 17 and 18, is slidably mounted on a pair of parallel stationary pins 19 and 20, the ends of which pins are supported in the housing 10 and cover plate 11. The pins 19 and 20 carry rollers 21 and 22 respectively (the roller 22 being indicated by broken lines in FIG. 2). These rollers are located in the slots 17 and 18 respectively of the plate 16, thus causing the plate 16 to be mounted for limited horizontal movement in a vertical plane.

The plate 16 also has a pair of oppositely-positioned vertical slots 23 and 24 (the slot 24 being indicated by broken lines in FIG. 2). An arm assembly 25, having an integral pair of arms located on opposite sides of the plate 16, is pivotally supported on the stationary pin 20. A roller 26 (indicated by broken lines in FIG. 2), carried on a pin 26' extending between the two arms of the assembly 25, is positioned in the vertical slot 24. A throttle cable tube 27 is pivotally connected with the lower end of this arm assembly and this tube 27 in turn is connected with the throttle cable wire 27' slidably carried in a guide tube 28. Thus, as apparent from the description thus far, sliding movement of the plate 16 results in movement of the throttle cable wire. A plurality of holes 25' are provided in the arm assembly 25 for the pin 26' to permit selective positioning of the pin 26'. In selecting the position for the pin for the throttle stroke the amount of the stroke at the control housing should be somewhat in excess of that required by the throttle at the motor in order to provide for slack at either end, slack of the wire in the conduit cable, and spring-back in materials.

A gearshift-operating plate 29 (FIGS. 1 and 4), of approximately the same outside size and shape as the throttle-operating plate 16, similarly has a pair of oppositely-positioned horizontal slots 30 and 31 through which the stationary pins 19 and 20 extend respectively, these pins carrying rollers 32 and 33 respectively located in the slots and thus causing the plate 29, like the plate 16, to be mounted for limited horizontal movement in the vertical plane. The gearshift-operating plate 29, also like the throttle-operating plate 16, has a pair of oppositely-positioned vertical slots 34 and 35. An arm assembly 36, having a pair of integral arms located on opposite faces of the plate 29, is pivotally supported on the stationary pin 20. A roller 37 (indicated by broken lines in FIG. 4), carried on a pin 37' extending between the two arms of the assembly 36, is positioned in the vertical slot 35. A gearshift cable tube 38 is connected with the arm assembly 36 and this tube in turn is secured to the gearshift cable wire 38' carried in the guide swivel tube 39.

In the gearshift arm assembly 36 a plurality of holes 36' are arranged for selective mounting of the pin 37'. By changing the position of the pin 37', for example, from the middle hole to an upper hole the stroke imparted to the gearshift tube 38 will be increased, and change to a lower hole will cause the stroke to be diminished. It is important with this device, as in other devices not using take-up springs in the gearshift cable, that the delivered

gearshift stroke at the far end of the cable should not be excessively more nor excessively less than required.

Ordinarily sliding movement of the plate 29, producing movement of the arm assembly 36, results in corresponding movement of the gearshift cable wire. However, the cable tube 38 is connected to the arm assembly 36 through the intermediary of a connecting element 40 provided with an L-shaped slot 41 for engagement with a pin 42 at the bottom of the arm assembly 36 (FIG. 4A). When the guide swivel tube 39, and therewith the cable tube 38, are in their normal raised position (shown in full lines in FIG. 4) the pin 42 will be at the bottom of the downwardly extending end of the slot 41, and consequently there can be no movement of the arm assembly 36 without movement of the cable tube 38. The guide tube 39 and cable tube 38 are normally held in this raised position by an eye bolt 43 attached to a plunger button 44 mounted for limited up and down movement in a socket 45 in the housing 10 and normally held in the raised full line position by the interposed compression coiled spring 46. As apparent from FIG. 4, when the button 44 is pressed downwardly against the force of the spring 46, the connecting element 40 will be lowered so as to bring the connecting pin 42 into the longitudinally extending upper portion of the slot 41, and, while this occurs, movement of the arm assembly 36, and therewith of the pin 42, may take place without causing any movement of the cable tube 38. With the button 44 released and as the pin 42 moves again to the junction of the two parts of slot 41, the spring 46 will act to return the connecting element 40 to normal raised position. The purpose of this arrangement, as explained further later, is to enable the control lever of the device to be moved temporarily (thus for the purpose of operating the engine throttle cable wire alone) without any operation of the engine gearshift cable.

The gearshift-operating plate 29 is provided with a specially shaped cam aperture 47, the shape of which is shown in FIGS. 1, 4, 4A and 4B. The operating disc 14, which is rotatably mounted in the wall of the housing 10 and with which the control lever is secured, carries a pair of companion crank cam rollers 48 and 49, rotatably mounted on pins secured on the disc 14 and which rollers are adapted, by engagement with the wall of the specially shaped aperture 47 in the plate 29, to provide horizontal movement of the plate 29 with partial rotation of the operating disc 14. The operating disc 14 has a raised portion 14' (FIGS. 1, 3 and 4) which, as shown in FIG. 4, has a rounded end 50 which is centrally positioned on the disc 14 and which, when the disc is rotated in one direction for causing shifting of the plate 29 to the right as viewed in FIG. 4, will engage a notch 50' in the wall of the cam aperture 47.

The manner in which the gearshift-operating plate functions can now be explained with reference to FIGS. 4, 4A and 4B. In FIG. 4 the control lever 12 and the attached disc 14 are shown in neutral position, the crank cam rollers 48 and 49 engaging the top of the wall in the special aperture 47 of the plate 29. When the control lever 12 and the disc 14 are rotated counterclockwise to the position illustrated in FIG. 4A (which, in the arrangement illustrated, moves the gears of the motor to forward driving position), causing the plate 29, arm assembly 36 and gearshift cable wire 38 to be moved to the left, and as the control lever 12 progresses toward the horizontal position illustrated in FIG. 4A, the crank rollers 48 and 49 will move along the left wall of the aperture 47 until the roller 48 reaches the bottom of the aperture. Then, as apparent from FIG. 4A, further rotation of the disc 14 and control lever in counter-clockwise direction is impossible. The gearshift plate 29 is returned to neutral position by rotating the control lever 12 and disc 14 clockwise back to the position of FIG. 4. In this assembly, when the motor gears are to be shifted from neutral to reverse, the control lever 12 and disc 14 are rotated clockwise approximately 30 degrees. In this operation the crank rollers 48

and 49 move part way along the right wall of the aperture 47 but the rounded end 50 (FIG. 4) of the raised portion 14' of the disc 14, due to the special shape of the aperture 47 in the plate 29, will engage the notch 50' in the aperture wall. This prevents further movement of the plate 29. The reason for enabling the control lever to be moved further for forward driving of the motor than for driving in the reverse will be referred to later.

A throttle crank member 51 (FIGS. 1, 3, 4 and 4A) is removably secured on the raised portion 14' of the disc 14 by a pair of screws 52 (FIG. 3). The crank member 51 carries a roller 53 which moves in a specially shaped slot 54 in the throttle-operating plate 16 (FIGS. 1, 2, 2A and 2B). The width of this slot corresponds approximately to the diameter of the roller 53 and the central portion of this slot is curved in such a manner that the center of curvature of this portion will be on the axis of rotation of the disc 14 and therewith of the crank member 51. Thus when the device is in the position shown in FIG. 2 (which, as previously mentioned, is in the neutral position), with the roller 53 in the center of the slot 54, a limited amount of rotation of the disc 14 and crank member 51 can take place in either direction without causing any change of position in the throttle-operating plate 16, since the roller 53 will be in the curved portion of slot 54. However, when the rotation of disc 14 and crank member 51, in either direction, is sufficient to move the roller 53 beyond this central curved portion of the slot 54 (as illustrated in FIGS. 2A and 2B), then, with this assembly, such further rotation will cause the plate 16 to move from right to left (as viewed in these figures), causing movement of the throttle cable tube 27 and therewith advancing of the engine throttle.

FIGS. 2 and 4 illustrate the position of the various members of the device when the control lever 12 is in neutral position, the gearshift plate 29 (FIG. 4) holding the gearshift cable tube 38 in the neutral position, and the throttle-operating plate 16 (FIG. 2) holding the throttle cable tube 27 in idling position. In FIG. 2 the relative position of the roller 53 with respect to the slot 54 of throttle plate 16, and in FIG. 4 the relative position of the rollers 48 and 49 with respect to the cam aperture 47 of gearshift plate 29 are arranged as shown in order to obtain desired timing exchange of drive from gearshift to throttle and conversely exchange of drive from throttle to gearshift. In actual operation when the engine is to be driven forwardly the moving of the gearshift plate 29 (to the left) occurs first before there is appreciable movement of the throttle-operating plate 16. In other words, the engine gears are first shifted before any opening of the throttle can take place. Then, upon further movement of the control lever 12 in the same direction (FIG. 2A) the throttle advances, the extent to which it advances being determined by the manipulation of control lever 12.

Similarly, when the engine is to be driven in reverse, the movement of the control lever 12 from the neutral position of FIGS. 2 and 4 clockwise (with respect to these figures) first moves the gearshift plate 29 (to the right) and then, upon continued movement of the control lever, moves the throttle-operating plate 16 (to the left) (FIG. 2B). Consequently the device prevents any gearshifting with the motor throttle partially advanced.

It has been noted that the control lever 12 is not moved as far in one direction (clockwise) as in the other direction. In actual practice throttle regulation is not critical when the engine is operating in reverse and does not require and should not, for the protection of some engines, permit fully opened throttle while in reverse. This is designed as an additional guide and aid to the operator to prevent inadvertent excess speed when backing.

The operation of the device as above described is illustrated in FIG. 6 in which the control lever 12 is shown in neutral position. In this figure clockwise movement of the control lever, indicated by the arc A1, causes the

gearshift to be changed from neutral to forward drive, while the throttle remains at idle, and, during further movement of the control lever, as indicated by the arc A2, the throttle is advanced while in forward drive. Similar movement of the control lever counter-clockwise, from neutral position to the extent indicated by the arc B1, causes the gearshift to be set for reverse drive while the throttle remains at idle, and continued movement of the control lever, as indicated by the arc B2, advances the throttle while in reverse drive.

At times, for example, when the motor is being warmed up, it may be desired to advance the throttle in order to speed up the motor while leaving the gearshift in neutral. This is accomplished by pressing down on the plunger button 44 while moving the control lever 12 (with the members assembled as in FIG. 4) backwardly. The movement of the plate 16 operates the throttle cable but the movement of the plate 29 does not then operate the gearshift cable tube 38, and the control lever 12, and therewith the two plates 16 and 29, must be brought back to idling and neutral position before any gearshifting can take place.

The cap 13 (FIG. 6) and the interposed bottom end of the control lever 12 are secured on the outer face of the disc 14 by screws. A detent guide ring 55 is moulded into the outside of the housing 10 inside cap 13 and concentric with the disc 14. This ring 55 has a pair of diametrically-opposite main pocket depressions, one of which is shown at 56 in FIG. 6. A curved spring element 57, shaped as indicated in FIG. 6, is held at its center within the cap 13 and its ends extend over the ring 55 at diametrically-opposite points. Each end of the spring element 57 is cupped for bearing on a small ball 58. The arrangement is such that, when the control lever 12 and spring element 57 are in the neutral position, shown in FIG. 6, the balls at the ends of the spring element 57 will be in the main pocket depressions 56 of the ring 55 and thus tend to hold the control lever in the neutral position. A pair of sloped recesses 59 and 60 are provided in the ring 55 on opposite sides of each main pocket 56, the recesses 59 being arranged to receive the balls 58 when the control lever is moved into forward driving position, and the recesses 60 being arranged to receive the balls when the control lever is moved into reverse driving position. The inclined slopes leading to the recesses 59 and 60 have a tendency to assist the balls along with the forces exerted by the spring element 57 so as to cause a rapid clutch engagement when moving the control away from neutral position. Thus the operator can determine, by the feel of the two ball detents at the limits of the main pockets 56, the neutral position of the control lever without even having to observe the indicated neutral position. Also at higher speeds additional spring loading will tend to hold the lever in position in the event the operator removes his hand from the lever.

In the description thus far it has been assumed that the marine motor with which the control assembly is connected is so arranged that the forward pull on the gearshift cable wire shifts the gear into forward drive while a reverse thrust on the gearshift cable wire from neutral position shifts the gears into reverse drive. This is usual with a number of marine engines and outboard remotely controlled motors, and the device as illustrated in the FIGS. 1 to 6 inclusive is so arranged for the operator's convenience that forward movement of the control lever 12 causes forward drive and rearward movement produces reverse drive. However with some motors the control cable wires are required to act oppositely so that a rearward push on the gearshift cable wire shifts the gears into forward. Nevertheless as a matter of standardization for the operator, it is necessary, with such motors, that a forward movement of the control lever 12 should also cause forward drive of the engine. A feature of the present control assembly is that it can be assembled for such situation. Opposite assembly is accomplished merely

by installing one or both plates 16 and 29 and one or both cranks 51 and 14 respectively rotated 180° about an axis perpendicular to the planes of the plates in the working planes as now explained.

In FIG. 7 the device is shown with the throttle-operating plate 16 and the throttle crank 51 assembled after being rotated 180° around on an axis perpendicular to plate 16 from the positions shown in FIG. 2. In FIG. 8 the gearshift-operating plate 29 and the disc 14 have been assembled after being rotated 180° around on an axis perpendicular to plate 29 from the positions shown in FIG. 4. By changing the position of the disc 14, so that it will be moved around 180° on its axis with respect to the control lever 12, the cam crank rollers 48 and 49 (FIG. 8) will be in the lowermost position when the device is in neutral position (instead of in the topmost position as shown in FIG. 4), and thus these rollers will then correspond to the rotated position of the plate 29 and of the lowered position of the cam aperture 47 as shown in FIG. 8. Similarly, by rotating the position of the throttle crank member 51 180° on its axis from the position of FIG. 4 to the position of FIG. 8, the driving roller 53 will be positioned for engagement with the slot 54 of the plate 16 when this plate is in the opposite position from that of FIG. 2.

From FIGS. 7 and 8 it will now be apparent that movement of the control lever 12 counter-clockwise from neutral, as viewed in these figures, will move the plates 16 and 29 backward, left to right, and thus oppositely from the forward movement of the control lever 12, whereas with the previously described arrangement (as shown in FIGS. 2 and 4) this same forward movement of the control lever 12 causes the plates 16 and 29 to move directly with the control lever.

Thus by simple reversal of the position of the two cable-operating plates and of the crank cam means for moving the plates, the device can be arranged to accommodate either direct drive gearshift or opposed drive gearshift, with either direct drive throttle or opposed drive throttle, depending upon the type of engine to be employed, and with the maintaining of the usual standard operation for the control lever 12. This is another important feature of the invention.

I claim:

1. A remote control device for operating a pair of separate related control mechanisms, said device including a housing, a pair of similarly shaped plates slidably mounted in said housing for horizontal reciprocal movement in parallel vertical planes, arm means pivotally mounted in said housing and operated by the first of said plates, connecting means connecting said arm means with one of said control mechanisms, said first plate having a substantially central cam aperture, an actuating assembly mounted in said housing for rotation on a horizontal axis perpendicular to said plates, said actuating assembly extending through said aperture, a cam element in said assembly positioned for engagement with the wall of said aperture and so arranged that partial rotation of said assembly in one direction will move said first plate horizontally in one direction while partial rotation of said assembly in the other direction will move said first plate horizontally in the opposite direction, similar arm means pivotally mounted in said housing and operated by the second of said plates, means connecting said last mentioned arm means with the other of said control mechanisms, the second of said plates having a cam slot, crank means on said assembly engaging said slot, said crank means in said slot so arranged that rotation of said assembly beyond a limited extent in either direction will cause said second plate to move horizontally in one direction, and an operating control lever secured to one end of said assembly on the outside of said housing.

2. A remote control device for operating a pair of separate related control mechanisms, said device including a housing, a pair of plates slidably mounted in said hous-

ing for horizontal reciprocal movement in parallel vertical planes, connecting means connecting the first of said plates with one of said control mechanisms, manually operable means for temporarily rendering said connecting means ineffective, said first plate having a substantially central cam aperture, an actuating assembly mounted in said housing for rotation on a horizontal axis perpendicular to said plates, said actuating assembly extending through said aperture, a cam element in said assembly positioned for engagement with the wall of said aperture and so arranged that partial rotation of said assembly in one direction will move said first plate horizontally in one direction while partial rotation of said assembly in the other direction will move said first plate horizontally in the opposite direction, means connecting the second of said plates with the other of said control mechanisms, said second plate having a cam slot, crank means on said assembly engaging said slot, said crank means in said slot so arranged that rotation of said assembly beyond a limited extent in either direction will cause said second plate to move horizontally in one direction, and an operating control lever secured to said assembly.

3. The combination set forth in claim 1 with the addition of a detent guide ring mounted on the outside of said housing co-axial with said assembly, and spring-controlled guide means secured to said control lever engaging said guide ring.

4. In a single lever control unit for the gearshift cable and the throttle cable of a marine engine and the like, an actuating member rotatably mounted in said housing, a control lever for rotating said member, a reversible gearshift-operating plate in said housing, means in said housing for supporting said plate for sliding reciprocal, substantially horizontal motion, means connecting said plate with the gearshift cable wire, said plate having a central cam aperture, crank cam means carried by said actuating member and positioned for engagement with the wall in said cam aperture, said cam aperture and said crank cam means so arranged that, when said plate is slidably mounted in said housing in one position, movement of said control lever will cause said plate to slide in the same direction as said control lever is moved, but when said plate is rotated 180° about an axis perpendicular to the plane of said plate and mounted in said housing in such rotated position and said cam crank means is correspondingly mounted in rotated or reversed position on its axis, movement of said control lever will cause said plate to slide in the opposite direction from that in which said control lever is moved, a throttle-operating plate, means in said housing for supporting said throttle-operating plate for sliding reciprocal motion in parallelism with said gearshift-operating plate, means connecting said throttle-operating plate with the throttle cable wire, said throttle-operating plate having a crank slot, and a crank assembly connected with said actuating member and rotated on the same axis as said actuating member, said crank slot formed with a central arcuate portion having the center of curvature on said axis, said crank assembly being so arranged that when said control lever is in neutral position said crank assembly will engage said throttle-operating plate in said arcuate portion of said slot but movement of said control lever a predetermined distance in either direction from neutral position will cause said throttle-operating plate to move in one direction.

5. In a single lever control unit for the gearshift cable and the throttle cable of a marine engine and the like, a housing, an actuating disc rotatably mounted in said housing, a control lever for said disc, a gearshift-operating plate in said housing, means in said housing for supporting said plate for sliding reciprocal, substantially horizontal motion, means connecting said plate with said gearshift cable wire, manually operable means for temporarily rendering said connecting means ineffective, said plate having a central cam aperture, crank cam means carried by said actuating disc and positioned for engagement with

the wall in said cam aperture and so arranged that movement of said control lever in one direction will move said plate in a given direction and movement of said control lever in the opposite direction will move said plate oppositely to said given direction, a reversible throttle-operating plate, means in said housing for supporting said throttle-operating plate for sliding reciprocal motion in parallelism with said gearshift-operating plate, means connecting said throttle-operating plate with the throttle cable wire, said throttle-operating plate having a crank slot, and a crank assembly connected with said actuating disc and rotated on the same axis as said actuating disc, said crank slot formed with a central arcuate portion having the center of curvature on said axis, said crank assembly and said slot so arranged that, when said throttle-operating plate is slidably mounted in said housing in one position and when said control lever is in neutral position, said crank assembly will engage said throttle-operating plate in said arcuate portion of said slot and movement of said control lever a predetermined distance in either direction from neutral position will cause said throttle-operating plate to move in a given direction, but, when said throttle-operating plate is rotated 180° about an axis perpendicular to the plane of said throttle-operating plate and mounted in said housing in such rotated position and said crank assembly is assembled in correspondingly rotated position of 180° on its axis with respect to said control lever then movement of said control lever said predetermined distance from neutral position in either direction will cause said throttle-operating plate to move oppositely to the last mentioned given direction.

6. In a single lever control unit for the gearshift cable and the throttle cable of a marine engine and the like, a housing, an actuating member rotatably mounted in said housing, a control lever for rotating said member, a reversible gearshift-operating plate in said housing, means in said housing for supporting said plate for sliding reciprocal, substantially horizontal motion, means connecting said plate with the gearshift cable wire, manually operable means for temporarily rendering said connecting means ineffective, said plate having a central cam aperture, crank cam means carried by said actuating member and positioned for engagement with the wall in said cam aperture, said cam aperture and said crank cam means so arranged that, when said plate is slidably mounted in said housing in one position, movement of said control lever will cause said plate to slide in the same direction as

said control lever is moved, but when said plate is rotated 180° on an axis perpendicular to the plane of said plate and mounted in said housing with said plate and said aperture in such rotated position, and said crank cam means is assembled in correspondingly rotated position on the axis of said actuating member, movement of said control lever will cause said plate to slide in the opposite direction from that in which said control lever is moved, a reversible throttle-operating plate similar to said gearshift-operating plate, means in said housing for supporting said throttle-operating plate for sliding reciprocal motion in parallelism with said gearshift-operating plate, means connecting said throttle-operating plate with the throttle cable wire, said throttle-operating plate having a crank slot, and a crank assembly connected with said actuating member and rotated on the same axis as said actuating member, said crank slot formed with a central arcuate portion having the center of curvature on said axis, said crank assembly and said slot so arranged that when said throttle-operating plate is slidably mounted in said housing in one position and when said control lever is in neutral position, said crank assembly will engage said throttle-operating plate in said arcuate position of said slot, and movement of said control lever a predetermined distance in either direction from neutral position will cause said throttle-operating plate to move in a given direction, but when said throttle-operating plate is rotated 180° on an axis perpendicular to said throttle-operating plate and mounted in said housing in such rotated position and said crank assembly is assembled in correspondingly rotated position with respect to said control lever on the axis of said actuating member, then movement of said control lever said predetermined distance from neutral position in either direction will cause said throttle-operating plate to move oppositely to said given direction.

7. The combination set forth in claim 6 with the addition of a detent guide ring on said housing co-axial with said actuating member, and spring-controlled guide means connected with said actuating member and with said control lever and engaging said guide ring.

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