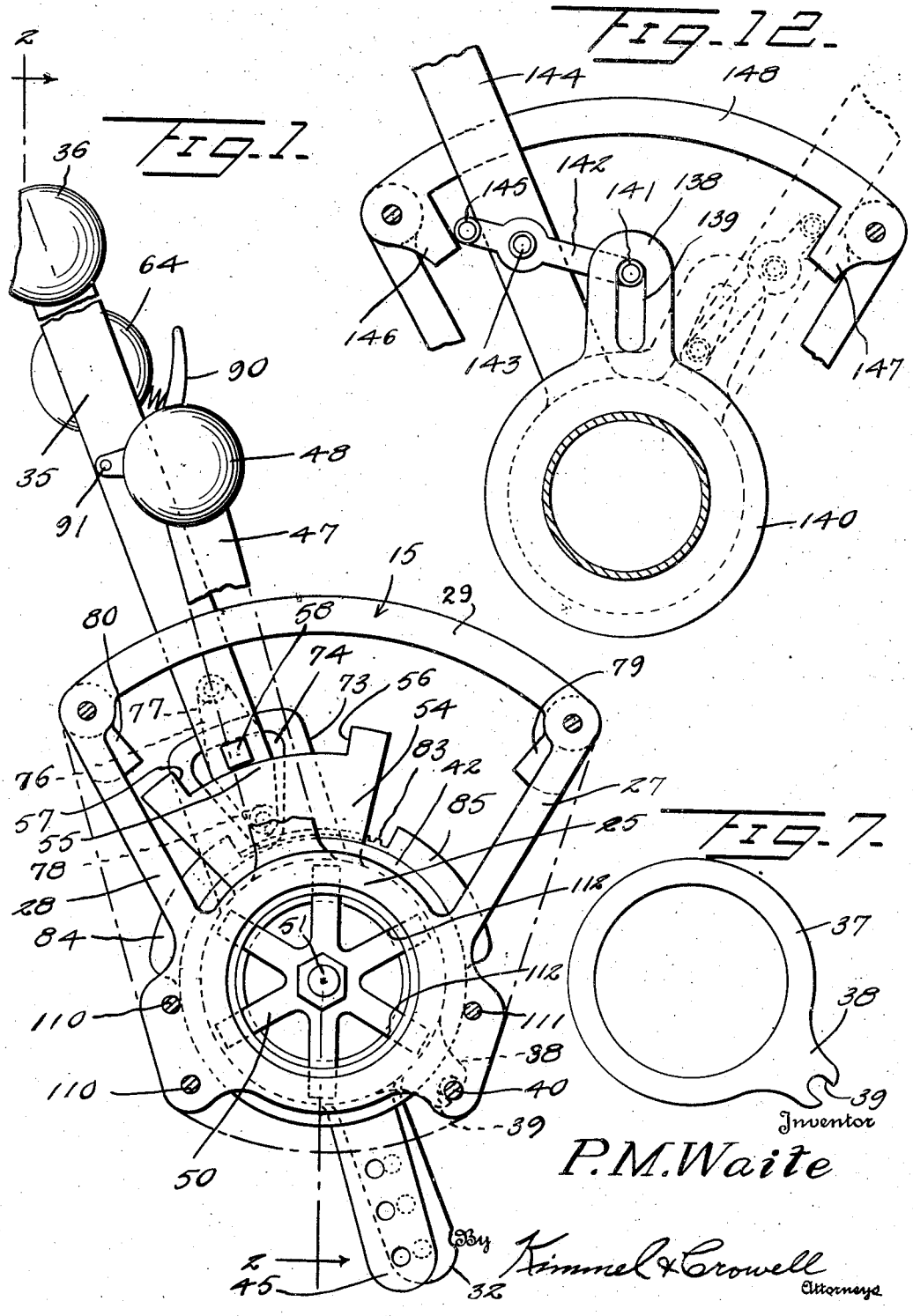
Aug. 20, 1946. P. M. WAITE 2,406,273

THROTTLE CONTROL

Original Filed Dec. 22, 1941 4 Sheets-Sheet 1



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THROTTLE CONTROL

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Fig. 2.

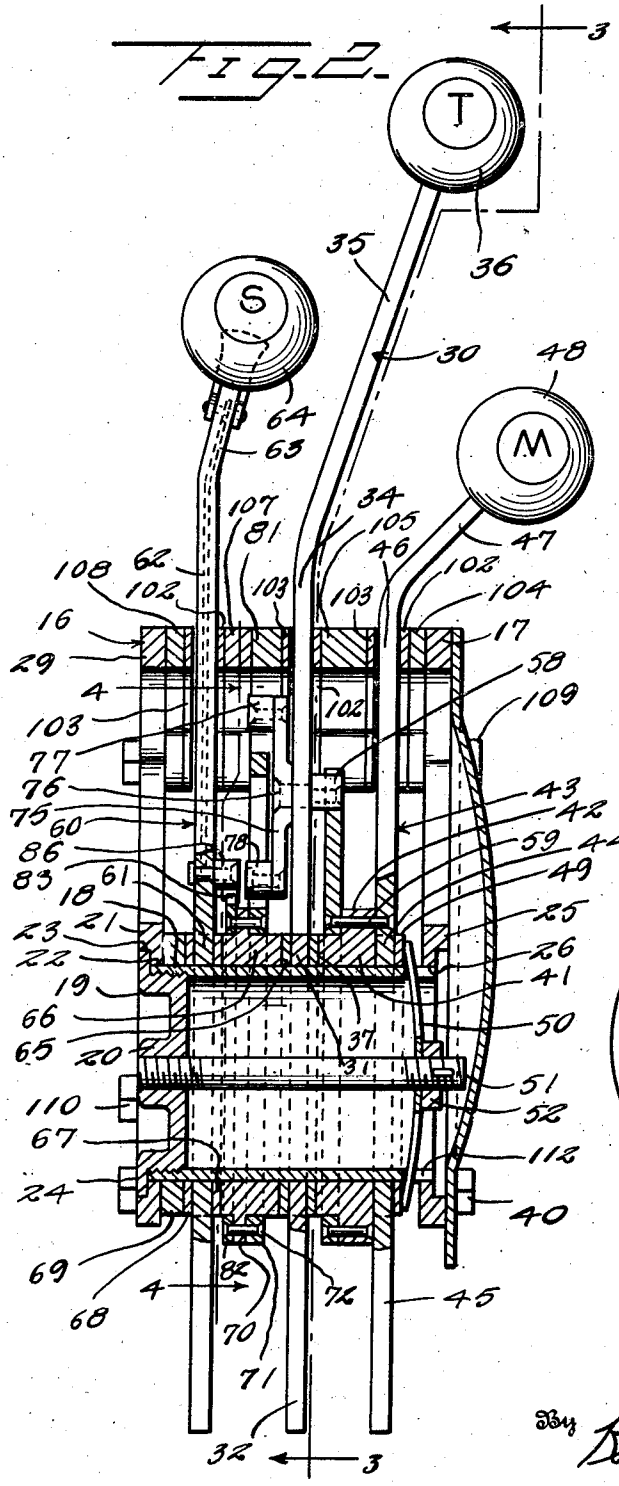


Fig. 5.

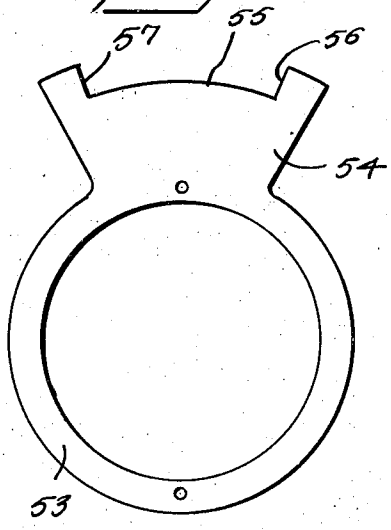
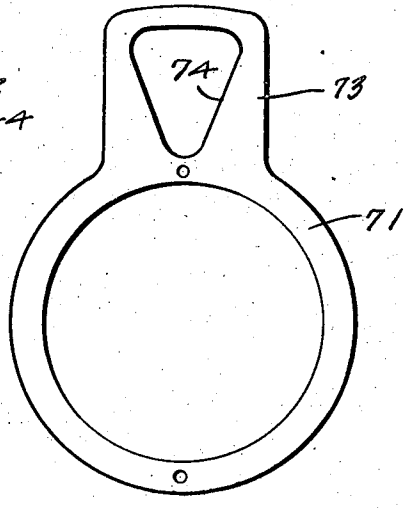


Fig. 6.



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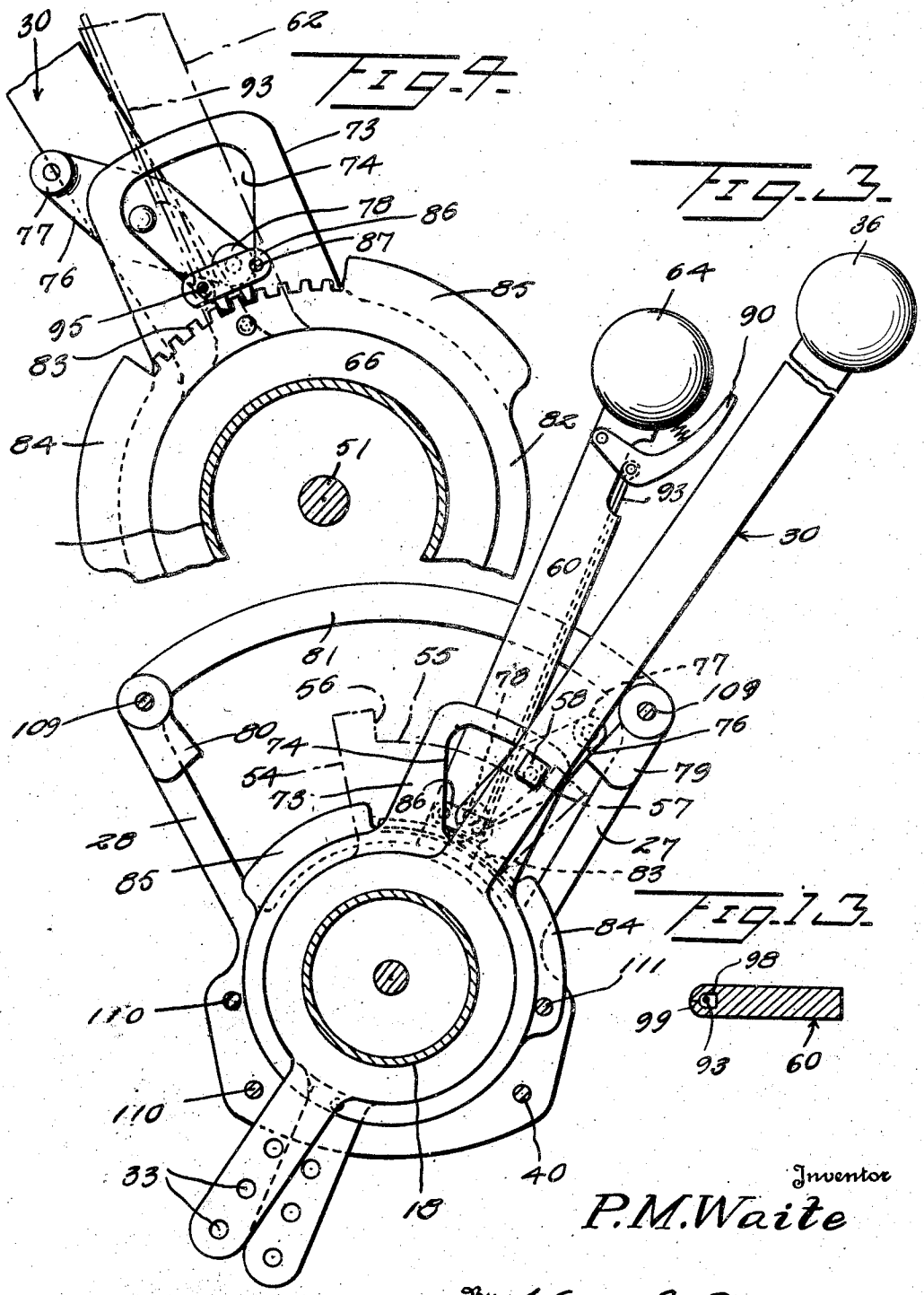


FIG. 4.

FIG. 3.

FIG. 13.

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THROTTLE CONTROL

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Fig. 9.

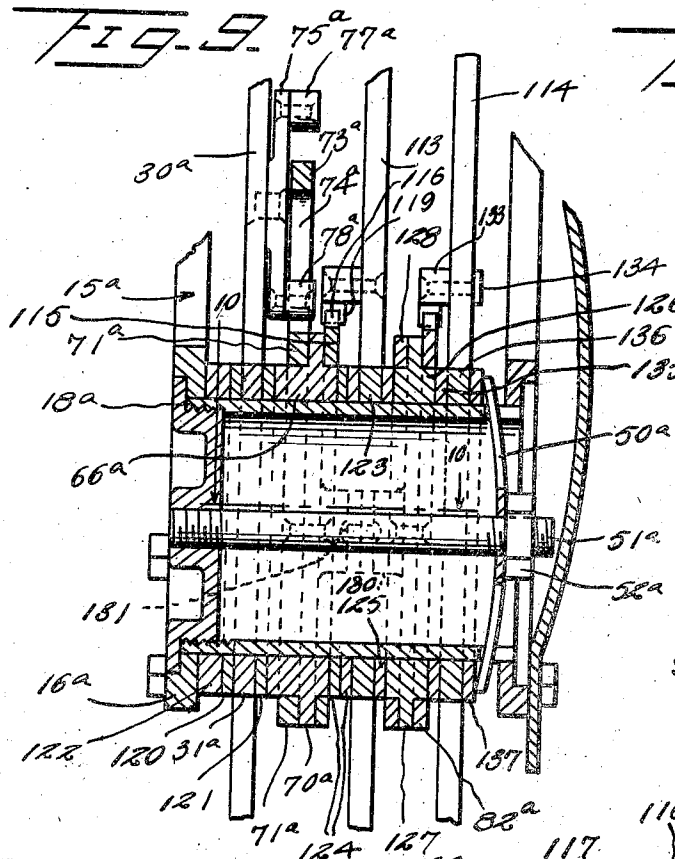


Fig. 8.

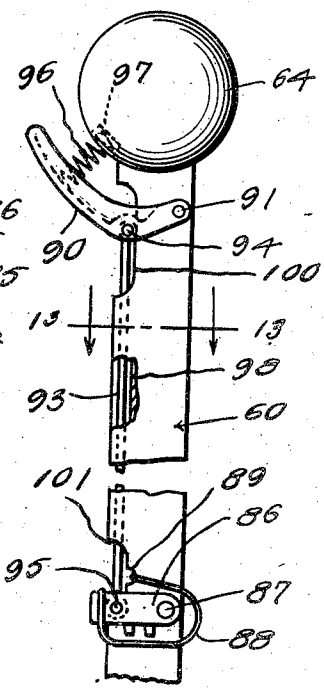


Fig. 10.

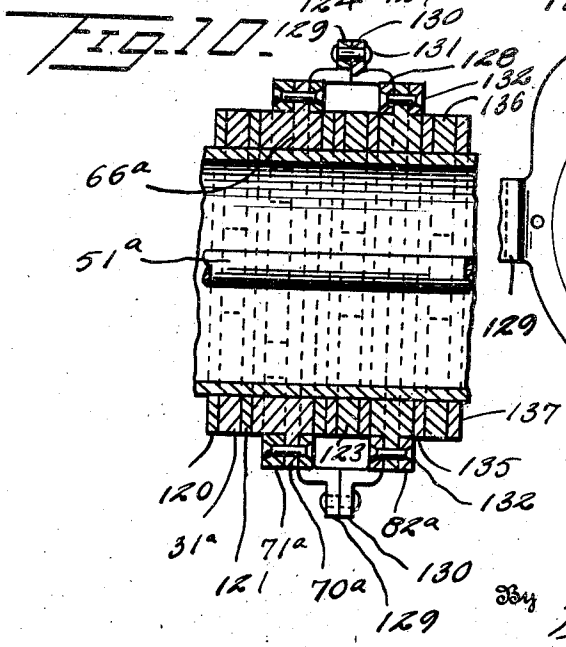
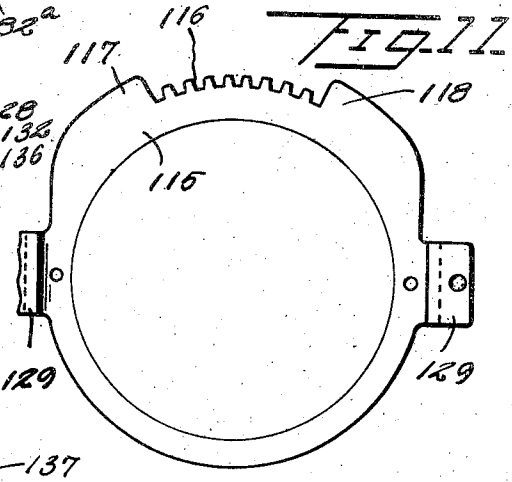


Fig. 11.



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UNITED STATES PATENT OFFICE

2,406,273

THROTTLE CONTROL

Philip M. Waite, Corry, Pa.

Continuation of application Serial No. 424,080, December 22, 1941. This application July 26, 1944, Serial No. 546,643

15 Claims. (Cl. 74—471)

1

This invention relates to controlling devices for airplane engines, and is a continuation of my copending application, Serial No. 424,080, filed December 22, 1941, for Throttle control.

An object of this invention is to provide a controlling means including a main controlling lever with lost motion means associated with the lever and additional levers for operating the additional levers after the first lever has been shifted.

Another object of this invention is to provide in a device of this kind a main or throttle controlling lever and an operative connection between this lever and another lever, whereby the other lever will be actuated after the first lever has been initially moved a predetermined distance and the other lever will have the movement thereof accelerated after the other lever has moved a predetermined distance.

A further object of this invention is to provide a device of this kind which is adapted to be mounted in airplanes so that the operator or pilot of the airplane can regulate the speed of one or more engines by a single controlling device.

A further object of this invention is to provide in a device of this kind a controlling means whereby the supercharger associated with the engine will be actuated after the main throttle has been operated a predetermined degree and initially the supercharger control will move at the same speed as the main throttle control, but will have the movement thereof accelerated prior to the time that the main control is in a fully open position.

A further object of this invention is to provide in a device of this kind means whereby the position of the additional levers with respect to the main throttle lever may be adjusted to any desired point so that the time of the movement of the additional lever or levers may be varied within a predetermined range.

A further object of this invention is to provide a controlling means of this kind which can be incorporated in certain portions of the present throttle controlling structure so that the improved or accelerated controlling means may be used as an attachment or substitute for the present controlling means.

To the foregoing objects and to others which may hereinafter appear, the invention consists of the novel construction, combination and arrangement of parts as will be more specifically referred to and illustrated in the accompanying drawings, wherein are shown embodiments of the invention, but it is to be understood that changes, variations and modifications may be resorted to which fall within the scope of the invention as claimed.

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In the drawings:

Figure 1 is a detail front elevation, partly broken away, of a throttle control constructed according to an embodiment of this invention.

Figure 2 is a sectional view taken on the line 2—2 of Figure 1,

Figure 3 is a sectional view taken on the line 3—3 of Figure 2,

Figure 4 is a fragmentary sectional view similar to Figure 3, but showing the control in the opposite or open position,

Figure 5 is a detail side elevation of one of the lever operators,

Figure 6 is a detail side elevation of another of the lever operators,

Figure 7 is a detail side elevation of one of the spacing washers,

Figure 8 is a fragmentary side elevation, partly broken away, of one of the control levers,

Figure 9 is a fragmentary vertical section of a modified form of this invention,

Figure 10 is a sectional view taken on the line 10—10 of Figure 9,

Figure 11 is a detail side elevation of the ratchet embodied in the form shown in Figures 9 and 10,

Figure 12 is a fragmentary vertical section of a further modification of this invention, and

Figure 13 is a sectional view taken on the line 13—13 of Figure 8.

Referring to the drawings, and first to Figures 1 to 8 inclusive, the numeral 15 designates generally a frame structure including a rear substantially sector-shaped frame member 16 and a front frame member 17 of substantially sector shape. A cylindrical hub 18 is fixedly mounted in the frame 15 being threaded into a central plate 19 which constitutes a clamping plate and is formed at its center with a boss 20. The rear frame member 16 is formed with a body 21 having an opening 22 within which the rear end of the hub 18 engages. The body 21 is also formed with a rabbet or annular recess 23 within which the outer annular flange 24 of the plate 19 engages. The frame member 17 is also provided with a body 25 having an opening 26 therein within which the forward end of the hub 18 engages.

The two frame members 16 and 17 are of like construction and each frame member is provided with a pair of upwardly divergent arms 27 and 28 extending from the bodies 21 and 25 thereof, and an upper longitudinally arcuate connecting bar 29 connects the upper ends of the arms 27 and 28 together. A main throttle or engine controlling lever generally designated as 30 is rockably mounted on the hub 18 and includes an annular hub engaging member 31 provided with a

downwardly extending arm or lever 32 formed with a plurality of openings 33 to which the connecting elements are adapted to be secured. The lever 30 also includes an upwardly extending arm or lever member 34 provided with an obtusely bent upper portion 35 having a knob 36 on the upper end thereof. A stationary washer 37 is disposed on the forward side of the hub or annulus 31 and, as shown in Figure 7, is provided with an outwardly extending ear 38 having a notch 39. The notch 39 is adapted to receive a frame holding bolt 40 extending through the lower portions of the frame members 16 and 17 so that the washer or wear member 37 will be held against rotation relative to the hub 31.

A rotatable spacing ring 41 is rotatably mounted on the hub 18 and is provided with an annular flange 42. A second or forward lever, generally designated as 43, is rotatably mounted on the hub 18 and includes a central ring-shaped hub 44 provided with a downwardly extending radial arm 45. The arm 45 is apertured similar to the arm 32 in order to permit attachment of connections from the desired element controlled by movement of the lever 43. The lever 43 also includes an upwardly extending radial arm 46 which is formed with a forwardly or obtusely bent extension 47 disposed upwardly and outwardly of the frame structure 15. The upper terminal end of the extension 47 has a knob 48 mounted thereon to facilitate movement of the lever 43. A forward friction washer 49 is mounted on the hub 18 bearing against the forward side of the annular hub 44 of the lever 43, and a spider-shaped spring member 50 is adapted at its outer end portions to bear against the forward side of the friction washer 49. The washer 49 is similar in construction to the washer 37 shown in more detail in Figure 7.

The spider 50 is mounted on a stationary axially disposed shaft or bolt 51 which is threaded at its rear end in the boss 20. A spider tensioning nut 52 is threaded on the forward end of the bolt 51 and bears against the spider 50 so that adjustment of the nut 52 will provide the desired tension against the forward washer 49 and against the other elements mounted on the hub 18. By providing the washer 37 stationary and the washer 49 also stationary, the two levers 30 and 43 may be frictionally held against movement and at the same time movement of the lever 30 will not effect a similar movement of the lever 43, except as hereinafter described.

In order to provide a means whereby the forward lever 43 may be partially rotated through a lost motion connection with the lever 30, I have provided an annulus 53 which is mounted on the spacer 41 rearwardly of the flange 42. The annulus 53 has formed integral therewith an upwardly extending sector-shaped body 54 which is formed in its upper edge with an elongated longitudinally curved recess 55. The opposite ends 56 and 57 of the recess 55 form abutments which are adapted to be engaged by a forwardly extending stud 58 fixed to the lever member 34 within the frame 15. The stud 58 is movable through the length of the recess 55, but when the stud 58 reaches either the abutment 56 or the abutment 57, the lever operating member 54 will rotate with the remaining movement of the lever 30. The annulus 53 is fixedly secured relative to the hub or annulus 44 of the lever 43 by means of one or more rivets or fastening members 59 which engage through the annulus 53, the flange 42 and also the annulus 44.

A rear lever generally designated as 60 is rockably mounted on the hub 18 rearwardly of the lever 30. The lever 60 includes an annular hub 61 which is rotatably mounted on the stationary hub 18 and also includes a radially disposed lever arm 62 terminating at its upper end in an obtusely and forwardly bent extension 63. The extension 63 at its upper terminal end has a knob 64 mounted thereon. A friction washer 65 is mounted on the hub 18 and bears at its forward side against the rear side of the hub 31 of the lever 30. The friction washer 65 is similar in every detail to the friction washer 37. An annular spacing member 66 is rotatably mounted on the hub 18 bearing at its forward side against the rear side of the friction washer 65. A friction washer 67 is interposed between the rear side of the annular spacing washer 66 and the forward side of the hub 61 of the lever 60.

A rear friction washer 68 bears against the rear side of the hub 61 of the lever 60 and also bears against the forward side of a rear spacing washer 69. The rear spacing washer 69 at its rear side bears against the forward side of the stationary frame member 21. The spacing member 66 is formed with an annular flange 70 intermediate the forward and rear ends thereof, and an annulus 71 is mounted on the spacing member 66 and bears against the forward side of the flange 70. The annulus 71 is fixed relative to the rotatable spacing member 66 by means of one or more rivets or fastening members 72 which engage through the flange 70. The annulus 71 has formed integral therewith a radially extending plate 73 which is formed with a V-shaped cam track 74.

An accelerating lever 75 is rockably mounted on a pivot member 76 which engages the lever 30, and the accelerating lever 75 is provided adjacent the opposite ends thereof with rearwardly extending rollers or studs 77 and 78. The stud or roller 78 is adapted to engage within the cam track 74, as shown in Figure 2. In order to provide a means whereby the plate 73 with the annulus or hub 71 may be rotated in an accelerated movement through a portion of the movement of the lever 30, I have provided a pair of stop or abutment members 79 and 80 which are fixed to a longitudinally arcuate connecting bar 81. When the lever 30 is moved clockwise, the roller or stud 77 will strike the abutment or stop 79 so that additional forward movement of the lever 30 will cause the lever 75 to rock on the pivot 76 whereupon the roller or stud 78 engaging within the cam track 74 will swing the plate 73 forwardly in an accelerated movement. The position of the pivot 76 with respect to the two rollers 77 and 78 will determine the degree of either acceleration or deceleration of the plate 73 with respect to the lever 30.

An annular member 82 is mounted on the spacer 66, bearing against the rear side of the flange 70 and the rivets or fastening members 72 engage through the annulus 82 so as to hold the annulus 82 against rotation relative to the spacer 66. The annulus 82 constitutes a ratchet member, being provided with a plurality of ratchet teeth 83. The annulus 82 is also formed with a pair of outwardly extending stop members or abutments 84 and 85 at opposite ends of the teeth 83, as shown in Figure 1. The abutments 84 and 85 provide a means whereby a toothed dog 86 which is pivotally mounted on a pivot 87 is limited in its circumferential adjustment with respect to the ratchet structure 82. The dog 86 is

mounted on the lever 60, as shown in Figure 8, and is constantly urged to a ratchet engaging position by means of a spring 88 having an end portion thereof anchored or fixed in a notch 89 formed in the lever 60.

The dog 86 is manually rocked to a released position to permit adjustment of the lever 60 with respect to the ratchet 82 by means of a dog releasing lever 90 which is pivotally mounted on a pivot 91 engaging through the lever 60 adjacent the upper end portion thereof. A flexible connecting member 93 is connected at its upper end, as at 94, with the lever 90 and is connected as at 95 with the dog 86. A spring 96 engages against the knob 64 being seated in a recess 97 formed in the knob 64 and bears at its outer end against the lever 90. The connecting member 93 is preferably in the form of a flexible wire and is substantially embedded within the lever 60. Preferably, the lever 60 is formed with a longitudinally extending channel 98 along one edge thereof within which the connecting member 93 loosely engages. In practice, the adjacent edge of the lever 60 and the forward side of the frame meming groove and the outer edges of the lever 60 on opposite sides of the groove are then bent inwardly as at 99 so as to close the groove and form the closed channel 98. The lever 60 adjacent the upper end portion of the channel 98 is formed with a cutout 100 and the lever 60 adjacent the dog 86 is also formed with a cutout 101.

In order to provide a means whereby the levers 30, 43 and 60 may be slidably maintained within the frame 15, a pair of friction bars 102 and 103 are disposed on opposite sides of each of the levers and are longitudinally curved similar to the bar 81. A spacer bar 104 is interposed between the rear side of the frame member 17 and the friction bar 102, and a spacer bar 105 is interposed between the spacer bar 103 and the adjacent bar 102 on the forward side of the lever 103. A spacer bar 107 is also interposed between the spacer bar 103 associated with the lever 30 and the spacer bar 102 associated with the lever 60. A rear spacer bars 104, 105, 106, 107 and 108. The lower spacer or friction bar 103 associated with the lever 60 is formed with a longitudinally extendber 16.

A pair of bolts 109 extend through the upper opposite portions of the frame members 16 and 17 and also engage through the opposite end portions of the spacer members 102 and 103 and the spacer bar 108 is interposed between the rear portions of the frame 15 are connected together by means of lower bolt members 110 and 111. The hub member 18 at its forward end is provided with a plurality of slots 112 within which the arms of the spider 50 loosely engage so that the adjustment of the nut 52 will place the desired pressure upon the friction washers and spacers engaging about the hub 18.

Referring now to Figures 9, 10 and 11, there is disclosed a modified form of this invention wherein the frame structure 15a is similar to the frame structure 15 and a cylindrical stationary hub 18a is mounted within the frame structure 15a. A throttle lever or controlling member 30a is rockably mounted on the hub 18a and additional levers 113 and 114 are rockably mounted on the hub 18a forwardly of the lever 30a. The lever 30a is constructed identical with the lever 30, being provided with a pivoted accelerating lever 75a which has mounted on the adjacent opposite ends thereof rollers or studs 77a and 78a.

The roller 78a engages within a cam track 74a of an accelerating member 73a similar to the member 73, shown in Figure 6, and the roller 77a extends above the member 73a for engagement with either of the abutments or lever operating members 79 and 80, shown in Figure 3.

The hub 71a of the accelerator member 73a is mounted on a spacer member 66a which is rotatable on the hub 18a and bears against a flange 70a formed integral with the spacer member 66a. A ratchet member 115 is mounted on the spacer member 66a and bears against the forward side of the flange 70a. The ratchet member 115 is provided with ratchet teeth 116 and a pair of abutments or stop members 117 and 118 for limiting the circumferential adjustment of the adjusting dog 119 which is pivotally carried by the rear side of the intermediate lever 113. The adjustment of the dog 119 is effected in a manner similar to the adjustment of the dog 86. A pair of friction washers 120 and 121 are disposed in opposite sides of the hub 31a of the lever 30a and are constructed identical with the friction washer 37 shown in Figure 7. A rear spacing member 122 is interposed between the forward side of the rear frame member 16a and the washer 120. The spacing member 66a bears against the forward side of the friction washer 121. The intermediate lever 113 is provided with an annular bearing or hub 123 rotatably engaging on the hub 18a, and a pair of friction washers 124 are interposed between the rear side of the bearing 123 and the forward side of the spacing member 66a. A friction washer 125 is also mounted on the hub 18a and bears against the forward side of the bearing member 123. A spacing washer or ring 126 is rotatably mounted on the hub 18a and bears at its rear side against the friction washer 125. The spacing member 126 is provided with an annular flange 127, and an annulus 128 is mounted on the spacer 126 and bears against the rear side of the flange 127. The ratchet member 115 is provided with a pair of diametrically opposed forwardly offset ears 129 and the annulus 128 is also provided with a pair of rearwardly offset ears 130. The ears 129 and 130 are connected together by means of fastening members 131 in the form of rivets or the like so that the annulus 128 will rotate with the ratchet member 115.

The annulus 128 is fixed relative to the spacing member 126 by means of one or more fastening members 132 in the form of rivets which extend through the annulus 128 and the flange 127 as shown in Figure 10. A ratchet member 82a which is identical with the ratchet 82 is mounted on the spacing member 126 and bears against the forward side of the flange 127. The ratchet member 82a is fixed relative to the flange 127 and also relative to the ratchet member 115 by the rivets 132 which extend through the flange 127, the annulus 128 and also the ratchet member 82a. A spring-pressed pivoted dog 133 which is similar in every detail to the dog 86 is pivotally mounted on a pivot member 134 carried by the lever 114. The dog 133 is manually rocked upwardly to a ratchet disengaging position by a lever similar to the lever 90, shown in Figure 8.

A friction washer 135 is mounted on the hub 18a and bears against the forward side of the ratchet 82a. The lever 114 is provided with an annular bearing member or hub 136 rotatably engaging on the hub 18a, and a forward friction washer 137 is mounted on the hub 18a and bears

against the forward side of the bearing or hub 136. The several friction washers 120, 121, 124, 135 and 137 are similar in every detail to the friction washer 37 shown in Figure 7. A spider-shaped tensioning member 50a is mounted on a bolt 51a and is tensioned by means of a nut 52a.

Referring now to Figure 12, there is disclosed a further modification of this invention which relates solely to the accelerator lever or member. As shown in Figure 12, the accelerator member 138 is formed with an elongated opening 139 which is radial with respect to the annular hub 140 of the accelerator member 138 and a roller 141 carried by one end of an accelerator lever 142 engages within the opening or slot 139. The lever 139 is pivotally mounted as at 143 on a throttle lever 144 similar to the lever 30. The opposite end of the lever 142 is provided with a roller 145 which is adapted to engage a pair of abutments 146 and 147 formed in the opposite ends of a longitudinally arcuate spacer bar 148. It will be apparent from the foregoing that the shape of the cam track, which in Figure 6 is shown as of substantially triangular configuration and in Figure 12 as an elongated slot, may be varied to provide for the desired lost motion between the main controlling lever and the associated levers which are to be accelerated in their movement with the main lever.

In the use and operation of this control means, the main throttle or controlling lever 30 may be initially disposed in the forward position as shown in Figure 3. When it is desired to accelerate the engine, the lever 30 is rocked counterclockwise or to the left as shown in Figure 3. During the initial rocking of the lever 30 in a counterclockwise movement, the accelerating lever or kicker 75 will rock counterclockwise at its upper end without movement of the accelerating member 73. As the lever 30 is rocked further in a counterclockwise movement, the accelerating member 73 will move therewith at the same speed for a portion of the additional rocking of the lever 30.

When the roller or stud 77 strikes the abutment or cam 80, the accelerating lever or kicker 75 will be rocked thereby effecting an increase in the rotary movement of the accelerator member 73. As the lever 60 is fixedly connected with the accelerating member 73 through the dog 86 and the ratchet 82, the lever 60 will have the rocking movement thereof increased during the latter portion of the rocking movement of the main lever 30.

At the same time that the lever 30 is being rocked rearwardly, the forward lever 43 will be rocked in a counterclockwise movement. The lever 43 on its forward side has fixed thereto the stud 58 which engages within the arcuate recess or notch 55 of the plate 54. When the stud 58 strikes the abutment 57, the plate 54 will rotate at the same speed as the lever 30. The length of the recess or notch 55 in the plate 54 will determine the extent of the lost motion between the plate 54 and the lever 30. As the lever 43 is fixedly connected with the plate 54 when the plate 54 rocks on the hub 18, the lever 43 will also rock therewith and at the same speed as the remaining rocking movement of the lever 30.

With the construction shown in Figures 9, 10 and 11, it will be apparent that a number of additional levers may be connected with the accelerated lever operated by the lever 30a so that a number of engines may be controlled from the main throttle lever, and these engines accelerate

in their operation in the same manner as the construction shown in Figures 1 to 8 inclusive.

What is claimed is:

1. An engine control comprising a frame, a main lever pivotally carried by said frame, a second lever pivotally carried by said frame, a lever accelerating means carried by said main lever, means fixed relative to said frame engageable with said accelerating means for effecting operation of said accelerating means upon movement of said main lever, and means fixed relative to said second lever engageable with said accelerating means for effecting accelerated movement of said second lever upon operation of said accelerating means by said second means.

2. An engine control comprising a frame, a lever pivotally carried by said frame, a second lever pivotally carried by said frame, and an accelerating means for effecting accelerated movement of said second lever upon movement of said first lever, said accelerating means including a pivoted member carried by said first lever, means fixed relative to said frame for rocking said member upon movement of said first lever, and means fixed relative to said second lever engageable with said member for effecting accelerated movement of said second lever upon rocking of said member.

3. An engine control comprising a frame, a lever pivotally carried by said frame, a second lever pivotally carried by said frame, and an accelerating means for effecting accelerated movement of said second lever upon movement of said first lever, said accelerating means including a pivoted member carried by said first lever, means fixed relative to said frame for rocking said member upon movement of said first lever, and means fixed relative to said second lever engageable with said member for effecting accelerated movement of said second lever upon rocking of said member, said latter means being so correlated with said member as to provide for initial movement of said first lever without movement of said second lever and initial movement of said second lever at the same speed as said first lever with final movement of said second lever at a greater speed than the movement of said first lever.

4. An engine control comprising a frame, a lever pivotally carried by said frame, a second lever pivotally carried by said frame, a swingable operator for said second lever pivotally carried by said first lever, a part pivotally carried by said frame engageable with said operator for rotating said part with at least a portion of the swinging of said first lever, a ratchet fixed relative to said part, and a spring pressed dog carried by said second lever engaging said ratchet for holding said second lever in circumferentially adjusted position relative to said part.

5. An engine control comprising a frame, a lever pivotally carried by said frame, a pair of levers also pivotally carried by said frame, means correlated with said frame, said first lever and one lever of said pair of levers providing a differential movement relative to said first lever and said one lever, means connecting said pair of levers together, said connecting means including means whereby the other lever of said pair of levers may be adjusted relative to said one lever.

6. An engine control comprising a frame, a lever pivotally carried by said frame, a pair of levers also pivotally carried by said frame, means correlated with said frame, said first lever and

one of said pair of levers providing a differential movement relative to said first lever and said one lever, means connecting said pair of levers together, said connecting means including means whereby the other of said pair of levers may be adjusted relative to said one lever, and means for adjusting said one lever relative to said first lever and to said other lever.

7. An engine control comprising a frame, a rockable controlling lever carried by said frame and movable in one direction to increase engine speed and movable in the opposite direction to decrease engine speed, a second rockable lever, a common pivot for said levers and correlated means carried by said frame and said levers for effecting accelerated movement of said second lever in the same direction as and upon the movement of said controlling lever during a portion of the movement of said controlling lever in either direction.

8. An engine control comprising a frame, a rockable controlling lever carried by said frame and movable in one direction to increase engine speed and movable in the opposite direction to decrease engine speed, a second rockable lever, a common pivot for said levers, correlated means carried by said levers for effecting delayed movement of said second lever with movement of said first lever in either direction during a portion of the movement of the latter, and means carried by said frame engageable with a portion of said first means for effecting accelerated movement of said second lever during another portion of the movement of said first lever in either direction.

9. An engine control comprising a frame, a rockable controlling lever carried by said frame and selectively movable in opposite directions, a second rockable lever carried by said frame, a common pivot for said levers, correlated means carried by said levers for effecting a delayed movement of said second lever at the same speed and in the same direction as said first lever, and stationary means carried by said frame engageable with said first means for effecting an increase in the speed of said second lever after said first and second levers have moved a predetermined distance at the same speed.

10. An engine control comprising a frame, a controlling lever rockably carried by said frame, a second lever rockably carried by said frame, an elongated operator for said second lever, means pivotally mounting said operator between the ends thereof on said first lever, a part fixed to said frame engageable with one end of said operator whereby to swing the opposite end of the latter inwardly toward the axis of said second lever after said first lever has moved a predetermined distance in one direction, and means fixed relative to said second lever engageable with the opposite end of said operator whereby inward swinging of said opposite end of said operator will effect accelerated movement of said second lever in the same direction as the movement of said first lever.

11. An engine control comprising a frame, a controlling lever rockably carried by said frame, a second lever rockably carried by said frame, an elongated operator for said second lever, means pivotally mounting said operator between the ends thereof on said first lever, a part fixed to said frame engageable with one end of said operator whereby to swing the opposite end of the latter inwardly toward the axis of said second lever after said first lever has moved a predetermined distance in one direction, and means fixed relative to said second lever engageable with the opposite end of said operator whereby said first lever will initially move in one direction without movement of said second lever, and whereby subsequently said first and second levers will move at the same speed and in the same direction, said latter means upon engagement of said operator with said part effecting accelerated movement of said second lever in the same direction as the movement of said first lever.

12. An engine control comprising a frame, a rockable controlling lever carried by said frame and movable in one direction to increase engine speed and movable in the opposite direction to decrease engine speed, a second rockable lever, a common pivot for said levers, correlated means carried by said levers, so constructed and arranged that said first lever will initially move in one direction without movement of said second lever, said means effecting subsequent movement of said second lever at the same speed as said first lever with said first lever in advance of said second lever and means engageable with said first means for effecting movement of said second lever at an accelerated speed with respect to said first lever during the final movement of said first lever.

13. An engine control comprising a frame, a rockable controlling lever carried by said frame and movable in one direction to increase engine speed and movable in the opposite diretcion to decrease engine speed, a second rockable lever, a common pivot for said levers, correlated means carried by said levers so constructed and arranged that said first lever will initially move in either direction without movement of said second lever, said means effecting subsequent movement of said second lever at the same speed as said first lever with said first lever in advance of said second lever and means engageable with said first means for effecting movement of said second lever at an accelerated speed with respect to said first lever during the final movement of said first lever.

14. A control device comprising a frame, a main lever pivotally carried by said frame and having selective clockwise or counter-clockwise movement, a secondary lever pivotally carried by said frame, a common pivot for said levers, and means, including at least a portion pivotally carried by said frame, correlated with both of said levers to provide a lost motion between said secondary lever and the main lever in at least one phase of movement of said main lever in either direction and for effecting differential movement of said secondary lever with respect to said main lever in another phase of movement of said main lever in the same direction, said secondary lever moving in the same direction as said main lever in either the clockwise or counter-clockwise movement of said main lever said correlated means effecting equal movement of said secondary lever in the same direction as and with said main lever in a second phase of movement of said main lever, and said correlated means including a fixed part carried by said frame for effecting differential movement of said secondary lever in the same direction as and with said main lever in a third phase of the movement of said main lever.

15. A control device as set forth in claim 14 in which said correlated means includes a rockable cam element.

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