Aug. 25, 1970 P. E. OLSON 3,525,272

MULTIPOSITION CONTROL HANDLE HAVING DETENT MEANS

Filed Oct. 20, 1967 3 Sheets-Sheet 1

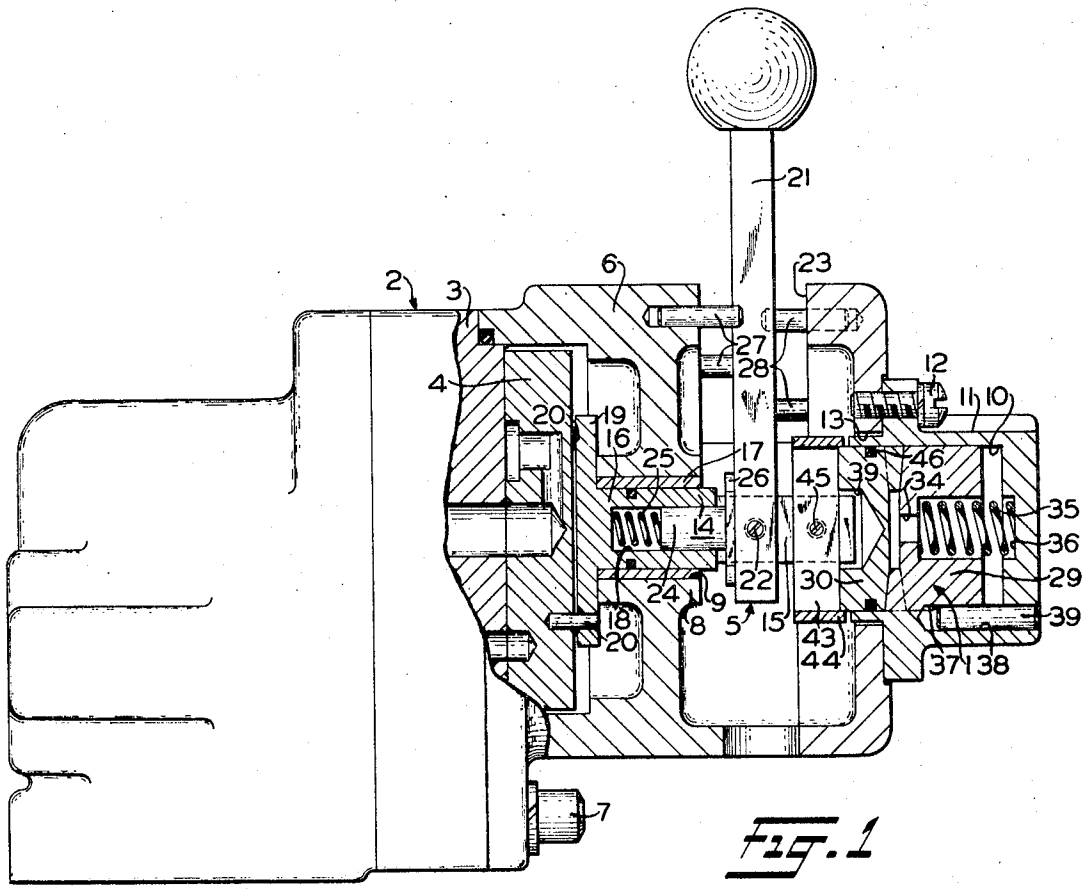


Fig. 1

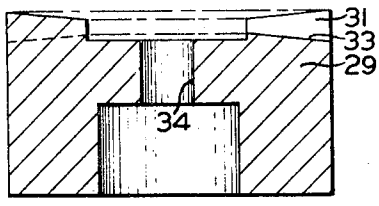


Fig. 2

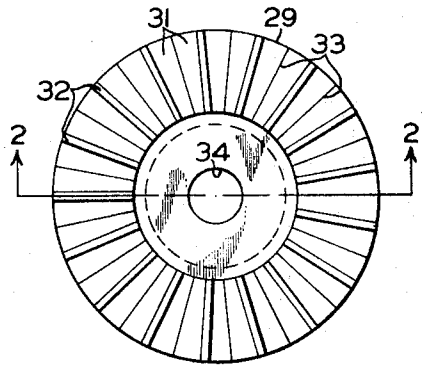


Fig. 3

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MULTIPOSITION CONTROL HANDLE HAVING DETENT MEANS

Filed Oct. 20, 1967 3 Sheets-Sheet 2

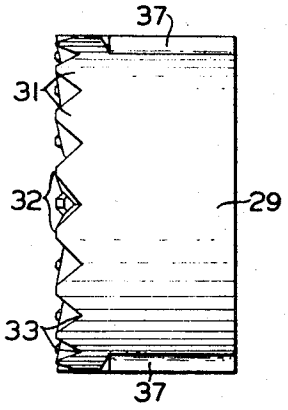


Fig. 4

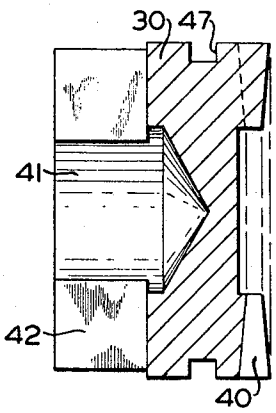


Fig. 5

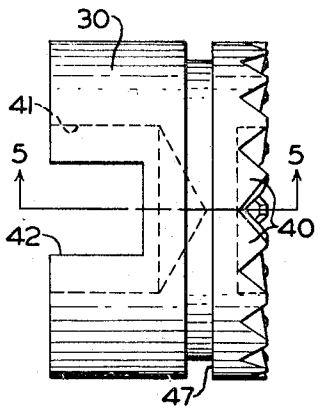
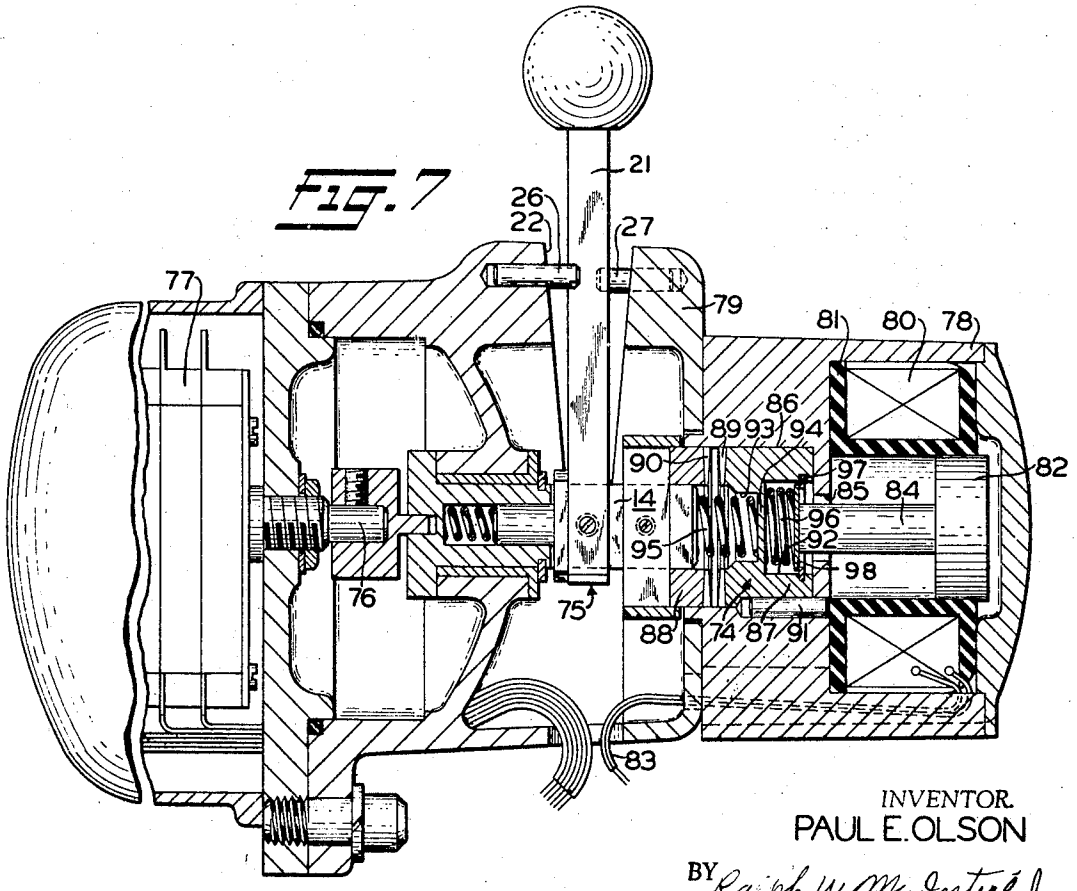


Fig. 6

Fig. 7



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MULTIPOSITION CONTROL HANDLE HAVING DETENT MEANS

Filed Oct. 20, 1967 3 Sheets-Sheet 3

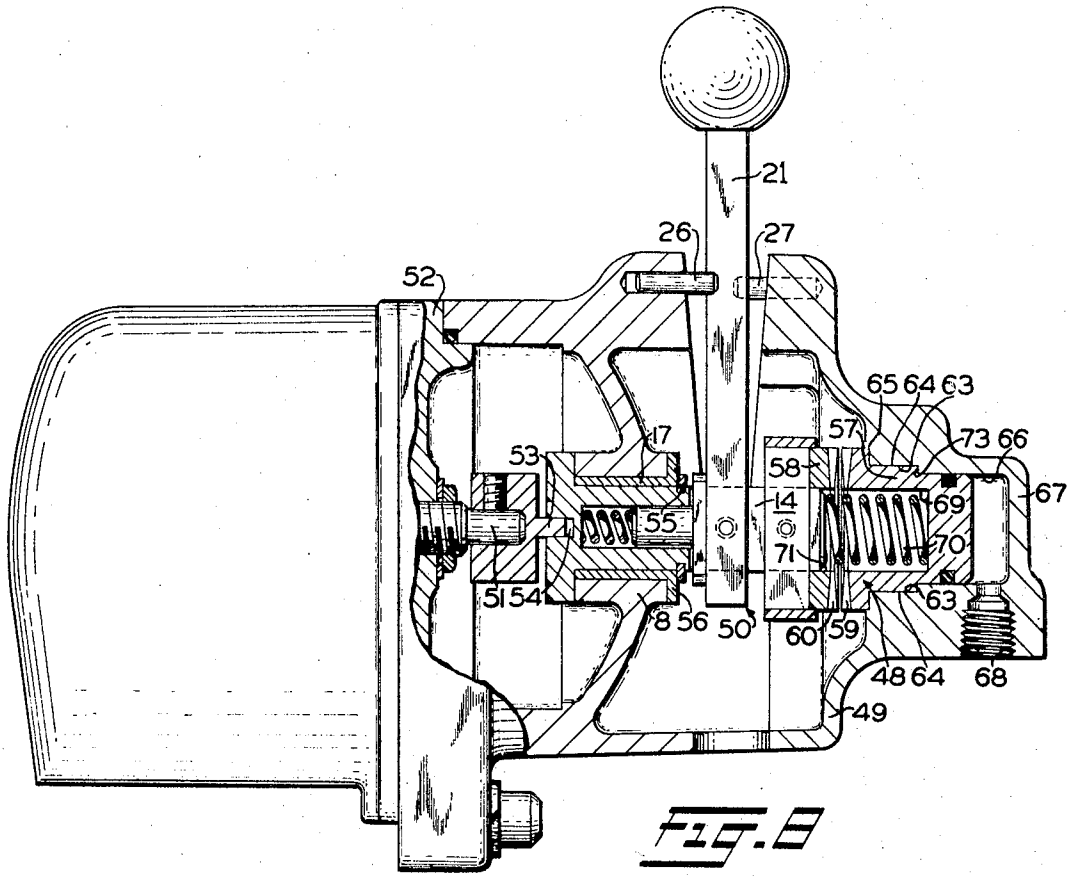


Fig. 8

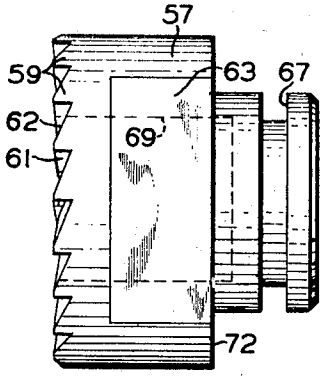


Fig. 9

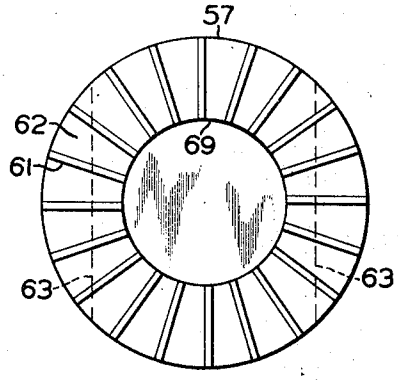


Fig. 10

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United States Patent Office 3,525,272
Patented Aug. 25, 1970

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MULTIPOSITION CONTROL HANDLE HAVING DETENT MEANS

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Int. Cl. G05g 5/06
U.S. Cl. 74—530 4 Claims

ABSTRACT OF THE DISCLOSURE

A multiposition control handle having detent means in which a handle operated control shaft in a housing is detented for axial rotation to different control positions by a pair of axially toothed detent members, one member of which is nonrotatably mounted in the housing and axially movable into intermeshed engagement with the other member which is coaxially disposed on the shaft for axial rotational movement therewith. In one embodiment the teeth on the detent members are V-shaped so that rotation of the shaft in either direction cams the housing-mounted member oppositely relative to a constantly applied bias to provide overriding, sliding or ratcheting movement between the teeth as the shaft is moved from one control position to the other. In other embodiments the detent members are normally biased apart and the teeth are of saw-tooth shape to provide only uni-directional rotation of the shaft when the clutch members are electrically or pneumatically engaged.

Heretofore, when a handle operated control device was to be mounted upon appartus to be controlled at different speeds of operation, it has been difficult to provide handle detenting which would maintain the handle in selected positions in opposition to vibration of the operating apparatus, and yet provide relatively easy shifting of the control mechanism from one position to another.

Accordingly, it is the object of the present invention to provide in a handle operated control device a detenting mechanism providing a relatively large detenting force while providing easy movement from one control position to the other.

In the present invention, this object is achieved by disposing in a housing a handle operated multiposition control shaft detented for axial rotation to different control positions by a pair of axially toothed detent members, one member of which is non-rotatably mounted in the housing and axially movable into toothed engagement with the other member which is coaxially disposed on the shaft for axial rotational movement therewith. The teeth on each member are axially extending and are arranged in a circular train concentric with the axis so that when the members are biased into engagement, rotary movement of the shaft is effected from one detented position to another by applying to the handle a shaft rotating force, having a component transmitted by the pitch of the teeth to oppose and exceed the bias, for effecting overriding sliding or ratcheting movement of the teeth of the shaft-mounted member relative to the teeth of the housing-mounted member during movement of the shaft to a different rotary position.

In one embodiment the detent members are biased into engagement and the teeth are V-shaped to provide detented bidirectional rotary movement of the shaft. In other embodiments the teeth are saw-tooth shaped and the members are biased to separate until the occurrence of certain operating conditions in the controlled apparatus whereupon the members are electrically or pneumatically engaged so that the saw teeth provide detenting which

permits rotary movement of the shaft in only one direction.

This and other objects of hte invention will become more readily apparent in the following description, taken with the drawing in which:

FIG. 1 is an elevational view taken partly in section, of a handle operated control device showing my invention;

FIG. 2 is a cross-sectional view of one of the detent members shown in FIG. 1, as taken along line 2—2 of FIG. 3;

FIG. 3 is a top view of the detent member shown in FIG. 2;

FIG. 4 is a side elevational view of the toothed member shown in FIG. 2;

FIG. 5 is a cross-sectional view of another detent member as shown in FIG. 1;

FIG. 6 is a side elevational view of the detent member of FIG. 5;

FIG. 7 is an elevational view, taken partly in section, of another embodiment of the invention;

FIG. 8 is an elevational view, taken partly in section, of yet another embodiment of the invention;

FIG. 9 is a side elevational view of one of the detent members shown in FIG. 8; and

FIG. 10 is a top plan view of the detent member shown in FIG. 9.

In order to illustrate the applicability of the present invention to a particular multiposition controlled device, reference is made to FIGS. 1–6 of the drawing showing the detenting assembly **1** of the present invention in cooperative environmental association with a rotary valve device **2**. The cooperating structure and function of the stator **3** and rotor **4** of the rotary valve are intended merely as illustrative of one of many types of multiposition control devices, and since the details thereof are not necessary to the understanding of the invention, such description is omitted as immaterial, it being necessary to note only that the rotor **4** is selectively positionable in any one of a plurality of rotary control positions in accordance with the position of the multiposition control assembly **5**. However, reference is made to Pat. No. 3,048,675, patented Aug. 7, 1962 by P. E. Olson et al., for a detailed description of such structure and its particular utility, for example, to operate a fluid motor which in turn may operate a power transmission.

Referring now to FIG. 1 in particular, it will be seen that a housing **6** is attached to one side of the aforementioned stator **3** by any suitable means such as screws **7**, only one shown, which housing encloses therein the aforementioned rotor **4** engaging the stator, and a support member **8** having a central through bore **9** supporting the aforementioned control assembly **5**. The aforementioned detenting mechanism **1** is disposed in a bottomed bore **10** in an auxiliary housing **11** attached to the side of housing **6** by any suitable means such as screws **12**, only one shown, with the left end of the auxiliary housing extending within housing **6** through an aperture **13** centrally disposed in the right end of the housing so as to dispose the bottomed bottom bore **10** in coaxial alignment with bore **9** in support **8**.

The control assembly **5** includes an axially rotatable shaft member, generally indicated at **14**, comprised of three integral portions, of which, a first or right end portion comprises a pair of transversely spaced axially extending members **15**, only one being shown, a second or intermediate cylindrical portion **16** disposed in a bearing **17** fixed in bore **9** and having therein an axially extending bottom bore **18** opening between the aforementioned pair of members **15**, and a third or left end portion **19** comprising a transverse flange overlying the left end of support member **8** and attached to the rotor **4** by means

of pins **20** so that axial rotation of the shaft member **14** effects corresponding axial rotation of the rotor.

In order to provide axial rotation of the shaft member, an operating handle **21** has one end disposed between the pair of members **15** and pivotally attached thereto by a transverse pin **22** extending through the handle and the shaft pair of members **15**, with the other end of the handle extending exteriorly of the housing through a transverse slot **23** in one side of housing **6**.

In order to provide for resiliently disposing the handle **21** in a predetermined pivotal position about pin **22** so as to extend transversely of the shaft member through the slot in a laterally centered position transversely of the slot, as shown, there is provided a handle return assembly comprising a cylindrical member **24** biased to the right in bore **18** of the shaft member **14** by a spring member **25**, and an integral transverse member **26** on one end thereof laterally extending between the pair of members **15** in longitudinal engagement with the handle **21**, the opposite ends of the transverse member providing handle return leverage when the handle is released after being pivoted about pin **22** in either direction for a purpose hereinafter described.

In order to provide a setting for each control position of the operating handle **21**, the housing is provided with a first row of pins **27** extending rightwardly into the slot **23** and a second row of pins **28** extending leftwardly into the slot, with the pins spaced along the slot length so that the pins of each row are staggered relative to the other. Each pair of pins **27**, **28** are spaced along the slot a distance slightly greater than the thickness of the handle **21** to thus define therebetween an operating position for the handle, and the free ends thereof are transversely spaced a distance less than the thickness of the handle to prevent movement of the handle along the slot **23** from one operating position to the other, unless the handle is moved to the left or right or from the aforementioned centered position against the bias of the handle return mechanism to clear the rightwardly extending or leftwardly extending row of pins, respectively.

In now describing a first embodiment of the detenting means for holding the shaft **14** and handle **21** in any setting in opposition to vibration tending to move the handle and shaft, it will be observed by reference to FIGS. 1–6 that the shaft detenting assembly **1** comprises a pair of cylindrical detent members **29**, **30** cooperating to provide detenting of the axially rotatable shaft member **14** relative to the housing **6**.

Referring now to FIGS. 2, 3 and 4 of the drawing, it will be seen that detent member **29** is generally cylindrical in form and includes on one end face thereof a series of identical V-shaped teeth **31** disposed circumferentially around the outer edge of the end face. The flat crests **32** of the teeth are axial extensions of the detent member relative to the valleys **33** between the teeth and are each longitudinally disposed in a radial direction relative to the axis of the detent member. The slope of each tooth face is constant throughout the breadth of the tooth so that the sides of valleys and crests of the teeth are oppositely sloped relative to a plane transversely intersecting the axis of the detent member so as to be disposed along radii of a single point disposed in the plane and on the axis of the detent member, in known manner, to facilitate maximum engagement of the teeth faces of one detent member with the corresponding teeth faces of the other detent member during camming movement therebetween. An axially disposed pressure balancing through bore **34** in detent member **29** is provided with a counterbore so that when the detent member **29** is installed in bore **10** of auxiliary housing **11**, as shown in FIG. 1, a spring member **35** is compressed between the bottom of the counterbore of bore **34** and a depression **36** in housing **11** to bias the detent member axially leftwardly, as shown. An axially extending groove **37** is provided exteriorly of the member, as best seen in FIG. 4, which

groove, when the member **29** is installed in auxiliary housing **11**, longitudinally registers with a corresponding groove **38** in the wall of bore **10** to form a bore into which a pin **39** is inserted to comprise a key mechanism preventing axial rotation of detent member **29** relative to bore **10** while at the same time providing for free axial movement of the detent member **29**.

Referring now to FIGS. 5 and 6, it is seen that detent member **30** is generally cylindrical in form and includes on one end face thereof a series of teeth **40** having a form and relative disposition identical to that of teeth **31** on the above-described detent member **29** to facilitate intermeshing of teeth **31** with teeth **40**, in the manner shown in FIG. 1. In order to fix the detent member **30** to the right end portion **15** of the shaft member **14** for axial rotation therewith, the end face opposite the teeth **40** is provided with an axially disposed bottomed bore **41** transversely intersected by a groove **42** of rectangular cross-section and having a width less than the diameter of the bore **41**, as best seen in FIG. 6, so that when a correspondingly shaped pin member **43** (as seen in FIG. 1) is disposed in the groove **42**, a space is provided in bore **41** on each side of the pin **43** sufficient to receive therein the laterally spaced pair of members **15** in straddling relationship relative to pin member **43**. A cylindrical member **44** is press fitted over the end of cylindical detent member **30** to hold the pin **43** fixed in the detent member **30**. A pin member **45** extends through the cylindrical member **44**, pin **43** and detent member **30** to complete the assembly of the detent member **30** on the end of shaft **14**. An O-ring seal member **46** is disposed in an annular groove **47** to prevent the intrusion of dirt into bore **10** in auxiliary housing **11**.

In now describing the operation of the device of FIGS. 1–6, as above described, it is assumed that the handle **21** is in the position shown so that the rotor **4** is in a rotary position relative to the stator **3** effecting a control operation, such as to operate a power transmission, not shown, in one of its operating conditions. If vibration of the vehicle engine or motion of the vehicle should oscillate the handle **21** in a direction transversely of slot **23** tending to periodically dispose the handle so as to laterally clear the pins **26** or **27**, and tend to rotate the rotor **4** relative to the stator **3**, the biasing force of spring **35** engages teeth **31** of detent member **29** with teeth **40** of detent member **30**, thus holding the shaft **14** in the rotary position shown.

If now it is desired to rotate shaft **14** to another rotary position to thereby rotate rotor **4** to a different control position, that is for example, to shift the power transmission to another gear range, the handle **21** is first manually moved to the left or right to clear a pin **27** or **28**, respectively, depending on the desired rotary direction of shaft **14**, and thereafter a force is applied to the handle to move the handle along slot **23** to the next pin **27** or **28**. When the shaft rotating force is applied to the handle, the teeth **40** of detent member **30** transversely apply to teeth **30** of detent member **29** a shear sheer force having a vertical component of force which cams detent member **29** rightward in overriding opposition to biasing spring **35** whereupon detent member **29** moves rightwardly until the crests of teeth **40** slide past the crests of teeth **31** whereupon further rotary movement of shaft **14** provides a gradual intermeshing of the teeth via reverse action of biasing spring **35** until the teeth are fully intermeshed to complete one camming cycle. The aforementioned camming cycle and overriding sliding engagement of teeth **40** relative to teeth **31** repeatedly occurs at the rate of one camming cycle for each movement of the shaft through a distance of one tooth width until the handle is disposed laterally against the next pin **27** or **28**, whereupon the handle is again moved leftwardly or rightwardly to clear the pin **27** or **28**, and thereafter is further moved back until finally centered between a pair of the pins **27**, **28** in another control position. The handle is re-

leased, whereupon the handle return mechanism **24**, **25** and **26** disposes the handle in the neutral position, as shown in FIG. 1, between the selected pair of pins **27**, **28**, and the detent members **29**, **30** are fully reengaged via operation of biasing spring **35** to thereby hold the handle in the newly selected position. From the foregoing, it will be seen that the V-shaped cross-section of the teeth **31** and **40** provides for movement of the handle and shaft in both rotary directions of the shaft.

Referring now to FIGS. 8, 9 and 10 of the drawing, there is shown a second embodiment of the invention in which a modified detenting assembly generally indicated at **48** is disposed in housing **49**, **52** to effect detenting action relative to the control assembly generally indicated at **50**, the latter being disposed in housing **49** to axially rotate a rotor member **51** relative to a stator member not shown.

In this embodiment, the rotor **51** and stator each carry a plurality of electrical contacts, not shown, which, when the rotor is axially rotated, make or break in different combinations to provide different electrical control signals in accordance with the axial position of the rotor relative to the stator, such as for electrically shifting gears in a power transmission in a manner heretofore known in the art. Since the particular structure of the contacts is not a part of the invention and is not necessary to the understanding of the invention, the detailed description thereof is omitted. Moreover, it is readily seen that the contacts of the present embodiment and the rotary valve device of FIG. 1 are readily interchangeable merely as a matter of choice, without affecting the invention.

The control assembly **50** is substantially identical to the corresponding assembly of FIG. 1 and accordingly will not again be described except with respect to differences in structure. Specifically, the connector means between the control assembly **50** and the rotor **51** in the present embodiment comprises a transversely disposed axially protruding tab member **53** on the rotor **51** engaged in a correspondingly shaped slot **54** in the left end of the shaft member **14** previously described in FIG. 1 of the drawing. The shaft member **14** is prevented from moving axially relative to support member **8** by way of a snapring **55** disposed in a groove on shaft **14** to overlie a radial lip **56** on previously described bearing member **17**.

The detenting mechanism **48** of the present embodiment comprises, as before, a pair of coaxially disposed detent members **57**, **58** each having a series of teeth **59**, **60**, respectively, on the adjacent end faces for intermeshing engagement. However, in this embodiment the aforementioned teeth are saw-tooth shaped in cross-section, rather than V-shaped, and the detent members are normally biased apart, as shown in FIG. 8, so that the teeth are completely disengaged.

Referring now to FIGS. 9 and 10 in particular, it is seen that detent member **57** is generally cylindrical in form and comprises a left portion carrying the aforementioned saw-tooth shaped teeth **59** on the end face thereof, each tooth having an axially extending vertical side **61** and a sloped side **62**. Thus it is seen that the teeth **59** are arranged on the end face in a manner similar to the teeth described in the embodiment of FIG. 1, except that the teeth are saw-tooth in cross-section rather than V-shaped, for purposes hereinafter described. A pair of transversely opposing flats **63** are provided on the right end portion for mating with a corresponding pair of oppositely disposed flat surfaces **64**, respectively, in a counterbore **65** of bore **66** disposed in a right extension **67** of housing **49**, so that detent member **57** is disposed for axial and non-rotatable movement relative to extension **67**. The right end portion of detent member **57** is smaller in diameter and comprises a piston slidably received in the aforementioned bore **66** and carries on its periphery an O-ring seal for pressure sealing the right end of bore **66**. A fluid pressure passage **68** in extension **67** communicates with bore **66** for pressurization of the bore to move the detent member **57** leftward under certain conditions, as hereinafter described. A bottom bore **69** is provided in the left end of clutch member **57** to receive one end of a biasing spring **70**.

The detent member **58** includes on the right end surface teeth **60** identical in structure to teeth **59** on detent member **57**, and is attached to the right end of shaft **14** in the same manner as previously described detent member **30** in the embodiment of FIG. 1. The central bore **71** in clutch member **58** is a through bore coaxially aligned with bottom bore **69** in detent member **57** so that the left end of spring **70** axially engages the right end of shaft **14**. Since shaft **14** is axially immovable in support member **8**, spring **70** biases detent member **57** rightwardly to the position shown in which the shoulder **72** between the right and left portions of detent member **57** axially engages shoulder **73** formed between bore **66** and counterbore **65**, in which position the teeth **59**, **60** of detent members **57** and **58** are completely disengaged, as shown in FIG. 8.

In now describing the operation of the embodiment of FIGS. 8, 9, and 10, it is assumed that the fluid pressure in bore **66** is at a minimum or zero so that the greater force of spring **70** biases detent member **57** rightwardly to the position shown to completely disengage teeth **59** and **60**. Under this condition, handle **21** is freely movable along the rows of pins **26** and **27**, in the manner previously described, to axially rotate shaft **14** in either rotary direction to effect different control operations, with positioning of the shaft in any selected position being effected solely by pins **26** and **27**.

If now it is assumed that bore **66** is pressurized to such an extent as to provide a force overriding the bias of spring **70**, detent member **57** is moved leftwardly to intermesh teeth **59** with teeth **60** of clutch member **58**. Under this condition, when manual force is applied to the handle to rotate shaft **14** and detent member **58** in a direction to press the sloped sides of teeth **60** on detent member **58** laterally against the correspondingly sloped sides **62** of teeth **59** on detent member **57**, detent member **57** is cammed rightwardly, in the manner previously described with respect to FIG. 1, to provide overriding sliding or ratcheting movement of teeth **60** relative to teeth **59** as the handle is moved to the new control position. It is to be specifically noted, however, that if manual force is applied to handle **21** to rotate shaft **14** and detent member **58** in the opposite rotary direction, the horizontal sides of teeth **60** press against the horizontal sides **61** of teeth **59** at a right angle relative to the rotary force, thereby preventing the occurrence of any horizontal component of force operable to cam clutch member **57** rightwardly. Therefore, detent member **58**, shaft **14** and handle **21** are locked relative to reverse rotary movement.

In now describing one practical application of the embodiment of FIGS. 8, 9, and 10, it will be assumed that the electrical contacts of the stator, not shown and rotor **51** are connected to control a conventional power transmission, not shown, on a motor vehicle, not shown, in various gear ranges in accordance with the axially rotated position of the rotor **51** relative to the stator, not shown. As is well-known, when the engine of a vehicle is operating at a speed commensurate with the selected gear range, the associated conventional power transmission assumes a "lock-up" condition, during which condition a down-shifting operation of the transmission to a lower gear range could cause damage to the vehicle or the transmission. It is also well-known that certain passage means in the transmission are pressurized only during this condition. Accordingly, when the passage or port **68** in housing extension **67** is connected via piping, not shown, to the aforementioned pressurizable passage means in the transmission, fluid pressure will be applied to bore **66** to effect engagement of clutch members **57**, **58** during, and only during, the occurrence of the "lock-up"

condition. Therefore, by arranging the operating positions of handle **21** in a sequence to provide progressive upshifting operation of the transmission in the hereinbefore described ratcheting direction of movement of detent member **58** relative to detent member **57**, the saw-tooth configuration of teeth **59** and **60** assures that upshifting from any forward gear to another is always possible, while downshifting from any forward gear to another is prohibited only during the "lock-up" condition. When the "lock-up" condition is eliminated, such as occurs when the speed of the vehicle reduces due to heavier engine loading, the bore **66** is accordingly depressurized, detent member **57** is then disengaged from detent member **58** via operation of biasing spring **70**, whereupon the handle **21** and shaft **14** are freed for movement in either rotary direction and may now be moved in the opposite rotary direction, that is, in the downshifting direction to select a more appropriate lower gear range, as desired.

Referring now to FIG. 7 of the drawing, there is shown yet another embodiment of the invention, in which a modified detenting assembly, generally indicated at **74**, controls movement of a rotary control assembly **75** which in turn controls an electrical contact assembly comprised of a rotor **76** and a stator **77**.

The rotor **76**, stator **77** and control assembly **75** are identical to the corresponding parts described above with respect to FIGS. 8, 9, 10, and accordingly reference is made to the description of those figures for details of construction.

The detent assembly **74** of this embodiment serves the same function as the detent assembly above described with respect to FIGS. 8, 9, 10, but is of a different structure so as to be operable in response to an electrical signal rather than a fluid pressure signal.

Accordingly, a solenoid housing **78** is attached to the right end main housing **79** by any suitable means, not shown, and includes therein a solenoid comprised of coils **80** wound on a spool **81**, and a plunger member **82** disposed in the center of the spool to move leftwardly in response to energization of coils **80** by an electrical signal transmitted thereto through wires **83**. An axially extending plunger extension **84** extends leftwardly through an aperture **85** in solenoid housing **78** into a coaxially disposed bore **86** to operate the detent mechanism in the manner hereinafter described.

The detent assembly comprises a pair of detent members **87**, **88**, each having on one end face thereof saw-tooth shaped teeth **89**, **90**, respectively, having the configuration and arrangement identical to the hereinbefore described teeth **59**, **60** on the detent members **57**, **58** as shown in FIGS. 8, 9, and 10 of the drawing.

Detent member **88** is identical to detent member **58** of FIG. 8 and is attached to the right end of shaft **14** in the same manner.

Detent member **87** is cylindrical in form and is disposed for axial movement in bore **86**. A pin **91** disposed between the housing **78** and detent member **87** prevents axial rotation of the detent member relative to the housing in the same manner as shown in FIG. 1 of the drawing. A pair of axially opposing bottom bores **92**, **93** are centrally disposed in detent member **87** separated by a transverse wall **94**. A spring **95**, disposed in bore **93**, is compressed between the right end of shaft **14** and wall **94** to normally bias detent member **87** rightwardly to the position shown to disengage the detent members **87**, **88**. A spring member **96** is disposed in bore **92** in compression between wall **94** and a plate **98** transversely disposed relative to and normally in abutting relationship with the left end of plunger extension **84**. A snap ring **97** placed within bore **92** rightwardly overlies the periphery of plate **98** to limit spring **96** relative to detent member **87** so that when the solenoid is deenergized, detent member **87** is biased to the rightward limit by spring **95** as shown, and plunger **82** is biased to the rightward position by spring **96**, as shown,

In now describing the operation of the embodiment of FIG. 7, it is assumed that the solenoid is deenergized, and that detent members **87**, **88** are disengaged, as shown in FIG. 7. Under this condition, handle **21** may be moved in either direction along slot **23** to axially rotate shaft **14** in either rotary direction to selectively perform different control operations, such as changing gear ranges in a power transmission, as described above with respect to FIG. 8.

It it is now assumed that a "lock-up" condition occurs within the transmission, a fluid pressure operated electrical switch, not shown, will provide a corresponding electrical current in wires **83** to energize solenoid windings **80**. Plunger **82** and plunger extension **84** are urged leftwardly to compress spring **96**, providing a leftward force transmitted by wall **94** to compress spring **95** so that detent member **87** is moved leftwardly into engagement with detent member **88**. Under this condition, upon the application of manual force to handle **21** to effect rotary movement of detent member **88** in the previously described upshift direction relative to detent member **87**, that is, in the ratcheting direction in which the sloped sides of teeth **90** are pressed laterally into engagement with the sloped sides of teeth **89**, detent member **87** is cammed rightwardly, compressing spring **96** against the end of plunger extension **84** as teeth **90** override teeth **89**. It is seen that spring **96** provides for resilient reciprocable axial movement of detent member **87** relative to the plunger extension **84** during the aforementioned camming action while the plunger **82** and extension **84** remain in a fixed leftwardly extended position established by energization of the solenoid windings.

By analysis with the practical application described for the operation of the embodiment of FIG. 8, it will be seen that so long as the windings **80** are energized by the "lock-up" condition in the transmission, movement of the handle **21** and shaft **14** in the previously described downshift direction is prohibited by engagement of the horizontal sides of the saw-teeth **89**, **90** on clutches **87**, **88** respectively.

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

1. A multiposition control means having detent means, comprising:

(a) shaft means axially rotatable relative to a support means for selective disposition in a plurality of rotary control positions;

(b) a detent means comprising first and second detent members each having teeth thereon axially intermeshable with the other;

(c) said first detent member concentrically fixed to said shaft means;

(d) said second detent member disposed on said support means for coaxial movement into detenting engagement with said first detent member;

(e) means preventing axial rotational movement of said second detent member relative to said support means;

(f) means for axially biasing said second detent member into detenting engagement with said first detent member;

(g) said teeth having a configuration such as to cam apart said first and said second detent members in overriding opposition to said biasing means when said shaft is rotated about its axis;

(h) spring means normally biasing said detent members to disengage;

(i) said means for biasing said detent members into axial engagement disposed to opposingly override said spring means; and

(j) said teeth have a configuration such that when intermeshed prevent axial rotation of said first detent member relative to said second detent member for one direction of axial rotation of said first detent member.

2. A multiposition control means having detent means, as recited in claim 1, in which said means for biasing said detent members into axial engagement comprises:

(a) a fluid pressure chamber on said support means; and

(b) fluid pressure operated piston means on said second detent member operable for movement into axial engagement with said first detent member in response to pressurization of said fluid chamber.

3. A multiposition control means having detent means, as recited in claim 1, in which:

(a) said means for biasing said first and said second detent members into axial engagement comprises a solenoid mounted on said support, and;

(b) said solenoid including a plunger operable to axially move said second detent member into engagement with said first detent member when the solenoid is energized.

4. A multiposition control means having detent means, as recited in claim 3, in which, a spring means is disposed between said plunger and said second detent member.

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