Jan. 5, 1943. E. J. MASTNEY 2,307,285

MECHANICAL PRESELECTOR

Filed May 27, 1939 2 Sheets-Sheet 1

Fig. 1.

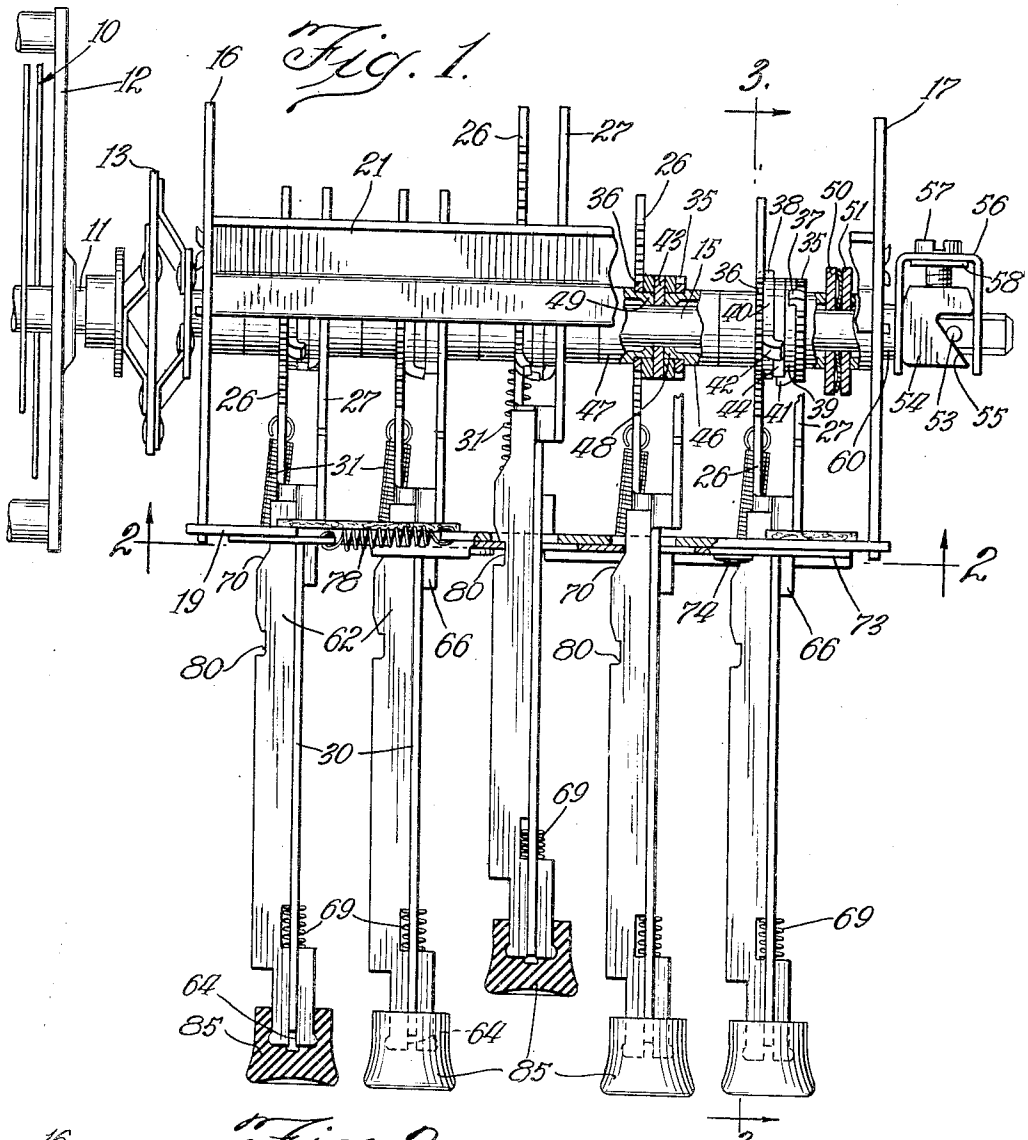
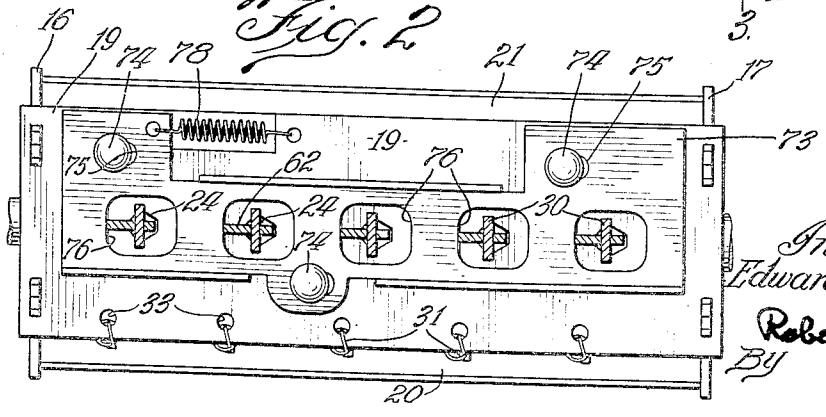


Fig. 2.



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Filed May 27, 1939 2 Sheets-Sheet 2

Fig. 3.

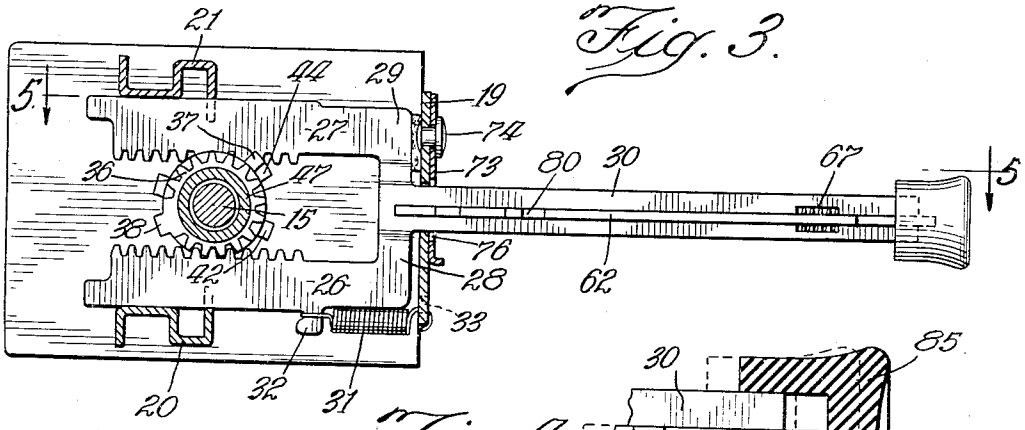


Fig. 4.

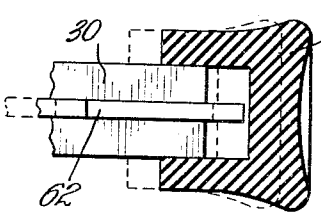


Fig. 5.

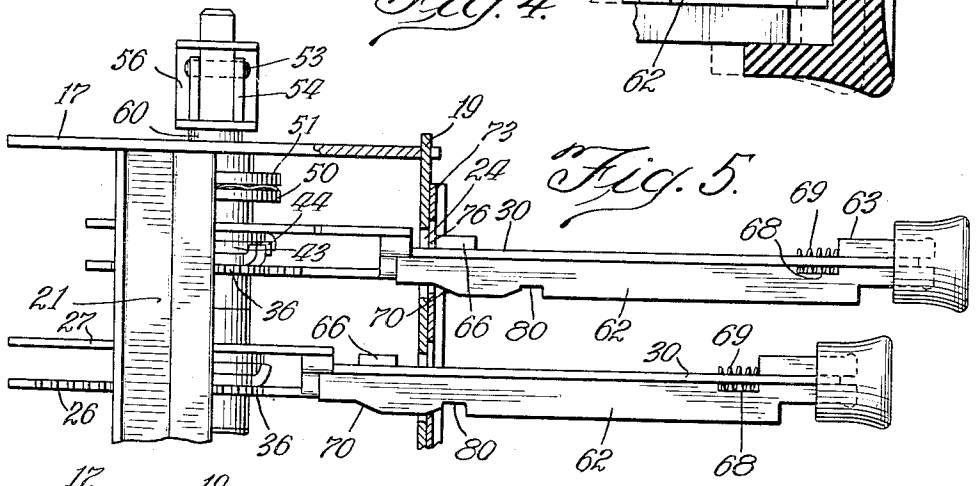


Fig. 6.

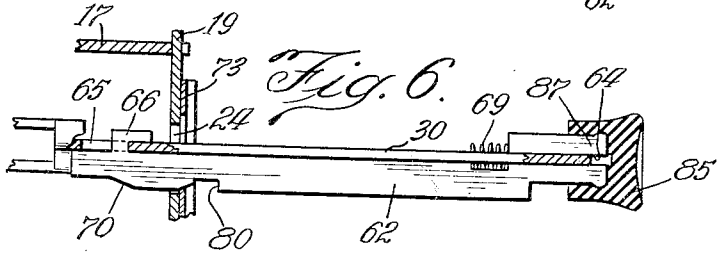


Fig. 8.

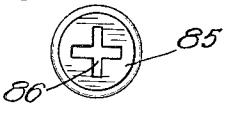
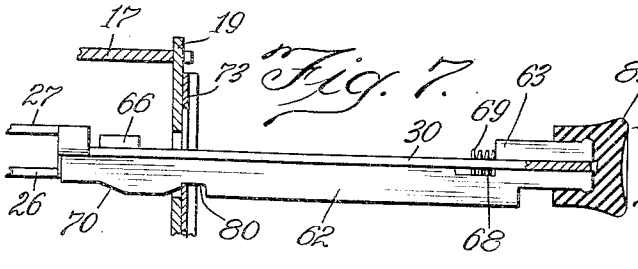


Fig. 7.



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UNITED STATES PATENT OFFICE

2,307,285

MECHANICAL PRESELECTOR

Edward J. Mastney, Berwyn, Ill., assignor to Oak Manufacturing Company, a corporation of Illinois

Application May 27, 1939, Serial No. 276,171

4 Claims. (Cl. 74—483)

This invention relates to a mechanical preselector and is an improvement upon the preselector disclosed and claimed in Patent No. 2,161,183 granted June 6, 1939. In the patent referred to, there is disclosed a preselecting means wherein a pair of opposed racks operating as a unit, mesh with gears and turn them simultaneously in opposite directions. These gears are each provided with a finger or other means extending toward each other. Between these gear fingers, an adjustable finger, ordinarily rigid with respect to an operating shaft, is adapted to be turned to a predetermined position. Such a device finds ready application for use in connection with radio receivers and similar devices wherein it is desired to turn a shaft to one of a definite number of predetermined positions. In order to increase the angular operating range of this construction, there is disposed between each gear and the adjustable finger ordinarily rigid with respect to the operating shaft, one or more intermediate rotating members having a finger adapted to be engaged by the gear finger and rigid finger.

Each pair of gears is adapted to be operated by a suitable push-button. It is desirable in some instances to have means for retaining a push-button in a depressed or operated position to be released by the subsequent operation of a different button. It is also desirable in some instances to permit each button to return to its normal position without any restraining means. This invention aims to devise a simple apparatus which will selectively retain a push button in depressed position immediately after operation or permit such operated push-button to return to its normal position immediately after operation. While shown and described in connection with the specific preselector shown, it is understood that the locking means is of general application.

Referring to the drawings:

Figure 1 shows a view of the preselecting mechanism with certain parts broken away and other parts in section;

Fig. 2 is a sectional view on line 2—2 of Fig. 1;

Fig. 3 is a sectional detail on line 3—3 of Fig. 1;

Fig. 4 is a detail of a push-button and the rods upon which it is mounted;

Fig. 5 is a view of a portion of a preselector with the levers in different positions;

Fig. 6 is a detail view of one of the push-button elements in one position;

Fig. 7 is a similar view showing the push-button element in a locked position; and

Fig. 8 is a bottom view of one of the buttons.

Any suitable mechanism upon which the preselecting means will operate may be used and in this particular instance, there is shown a gang condenser 10 having a shaft 11 mounted upon a base 12. Shaft 11 is provided with any suitable universal joint 13 which is coupled to the preselector shaft 15 rotatably supported in side plates 16 and 17. Side plates 16 and 17 are maintained rigidly in spaced parallel position by a front plate 19 and a pair of side struts 20 and 21. The entire frame is maintained intact in any suitable fashion such as by having ears of metal project through apertures and staked as shown for example in Fig. 2.

Front plate 19 has a plurality of apertures 24 therein at regular spaced intervals each corresponding to one section of the preselector. Inasmuch as each section is the same as the other section a detailed description of only one section of the preselector will be given.

Thus for example referring in detail to Figs. 1, 3 and 5 the operating means for one section includes a pair of racks 26 and 27 in spaced parallel planes off-set from and opposed to each other. These racks are rigidly joined together by suitable cross-arms 28 and 29 which unite to form a single flat push-rod member 30 which extends through slot 24 in front plate 19. As is clearly seen in Fig. 3 the racks 26 and 27 are guided transversely against transverse movement by suitable slots cut in side members of the frame 20 and 21. The entire rack unit is adapted to be maintained normally in the position shown in Fig. 3 by means of a coil spring 31. This coil spring is disposed between an ear 32 on the rack unit and an apertured portion 33 in the front plate 19. Rack portion 27 is adapted to mesh with a pinion 35 while cooperating rack 26 meshes with a pinion 36. Pinions 35 and 36 are each provided with a finger 37 and 38 respectively. Between pinions 35 and 36 are a pair of washers 39 and 40 each having fingers 41 and 42 respectively. Between these washers 39 and 40 is a single washer 43 having a finger 44.

Single washer 43 as seen in Fig. 1, is adapted to rotate with shaft 15, while the additional washers and pinions are rotatably mounted on sleeves 46 and 47. These sleeves 46 and 47 have bearing portions 48 and 49 upon which the additional pinions and washers are mounted and have shoulders 50 and 51 against which the outer surfaces of the pinions normally bear. It might be added that by means hereinafter described, the center washer 43 is normally adapted to be clamped in predetermined position between op-

posed edges of sleeves 46 and 47 and thus the center washer and its finger 44 constitutes a finger rigidly disposed with respect to shaft 15 in a predetermined angular position.

The remaining washers 39 and 40 together with the pinions 35 and 36 are freely rotatable at all times. As is evident from Figs. 1 and 3, operation of the pair of racks 26 and 27 turns the pinions in opposite direction simultaneously. The various fingers engage each other and finally engage the finger 44 of the central washer to determine a position where the opposing forces turning the pinion are equal and opposite.

In order to maintain the various sleeve portions 46 and 47 tightly against end plate 16, a pair of spring plates 50 and 51 are provided around shaft 15. The entire series of sleeve sections may be adjustably clamped by the means shown beyond plate 17. Shaft 15 carries a pin 53 rigidly disposed therein. A cam block 54 having a cam surface 55 adapted to cooperate with pin 53 is movably mounted on a U-shaped member 56. As is clearly evident in Figs. 1 and 5, shaft 15 is normally threaded through the opposing branches of cam block 54 and U-shaped member 56. An adjusting screw 57 is locally mounted in member 56 and normally tends to engage a suitably threaded portion in cam block 54. A collar portion 58 on screw 57 is normally adapted to bear against the inside of U-shaped member 56.

It is clear that by turning screw 57 it is possible to draw up as seen in Fig. 1, cam block 54 so that pin 53 tends to force the cam block to the left as seen in this figure. This block normally bears against a sleeve 60 passing through end-plate 17 and bearing against the aligned sleeves 46 and 47.

Thus it will be seen that when cam block 54 is moved to the left as seen in Fig. 1, that the various movable sleeves 46 and 47 are forced against end plate 16 to maintain the various assemblies tightly in position and lock the central washers 43 of each preselector unit with respect to shaft 15. When cam block 54 is permitted to move to the right, as seen in Fig. 1, by turning screw 57 down, then the various sleeve members 46 and 47 will be permitted to have some play subject to the tension in spring members 50 and 51 so that the central washers 43 of each preselector section may move with respect to the shaft 15.

In order to provide a selective action with regard to locking or unlocking the various rods 30, the following additional mechanism is provided. At right angles to each actuating rod 30 is provided an auxiliary locking rod 62. Auxiliary rod 62 has a head portion 63 which is adapted to pass through a suitable slot 64 in rod 30 to provide a cross effect. At the portion of rod 30 near racks 26 and 27 a second slot 65 is provided and through this second slot a finger 66 of auxiliary rod 62 projects and overlies rod 30 so that auxiliary rod 62 is maintained tightly against rod 30 while slidable with respect thereto. A cutout 67 in rod 30 cooperates with a suitable recess 68 in auxiliary rod 62 to provide space within which a coil spring 69 is disposed. Normally coil spring 69 biases auxiliary rod 62 with respect to rod 30 so that auxiliary rod 62 is normally in the position shown in Fig. 5.

Auxiliary rod 62 has a cam surface 70 near front plate 19. As seen in Fig. 2, front plate 19 has a generally cruciform slot 24 through which rods 30 and 62 pass. On the outer face of front plate 19 a sliding plate 73 is mounted. This plate is maintained on front plate 19 by rivets 74 cooperating with elongated slots 75 in plate 73. Sliding plate 73 has a large cutout 76, one edge 77 of which normally is pressed against cam surface 70 of rod 62 by means of a spring 78 between sliding plate 73 and front plate 19. Beyond cam surface 70 toward the handle part of the rod, a slot 80 is provided in rod 62. It is clear that if rod 62 is depressed sufficiently, slide plate 73 will first be pushed aside because of cam surface 70 and then be permitted to return to its normal biased position when slot 80 is in position. Hence sliding plate 73 will lock a rod system in the down position.

Ordinarily the stiffness of spring 68 between rod 30 and auxiliary rod 62 is such that downward pressure on rod 63 operates the rack and pinion unit first. Thus a button 85 having a cruciform slot 86 is tightly disposed on the end 87 of auxiliary rod 62 while loosely slidable on rod 30. Hence initial pressure on button 85 operates the rack and pinion unit first to the bottom of its stroke, additional pressure on button 85 will move rod 62 against spring 68 and operate the lock. In the absence of this additional pressure on button 85, the rods will return because of spring 31.

It is understood of course that when any rod is locked, the downward movement of another rod will cause sliding plate 73 to move to an unlocking position and release the previously locked rod.

When any one actuating rod 30 is maintained locked by virtue of the action of the locking rod 62, it is clear that the shaft 15 will be locked in position. This is desirable in a radio receiver where a manual turning means for a condenser shaft is generally provided in addition to the push-button control disclosed herein. When any one station is selected by a push-button and locked, the manual control is obviously inoperative since that is merely some wheel on the condenser shaft.

What is claimed is:

1. In an apparatus of the class described, a frame, an actuating rod mounted for reciprocating movement and an auxiliary locking rod therefor extending substantially coextensively with said actuating rod and in interengaging relationship therewith, said rods being movable in said frame between a released and locked position, means for biasing said actuating rod to its released position, secondary biasing means extending between said rods of greater force than said first biasing means and connections between said rods permitting relative longitudinal movement therebetween, means for moving forward said locking rod from its released position towards its locking position to carry therewith said actuating rod for a limited range and to move independently of said actuating rod against the force of said secondary biasing means beyond said range, and means cooperating with said auxiliary locking rod to lock the same in actuated position near the end of the forward reciprocating movement thereof.

2. In an apparatus of the class described, a frame, an actuating rod mounted for reciprocating movement and an auxiliary locking rod therefor extending substantially coextensively with and transverse to said actuating rod and in interengaging relationship therewith, said rods being movable in said frame between a released and

locked position, means for biasing said actuating rod to its released position, secondary biasing means extending between said rods of greater force than said first biasing means and connections including slots in said actuating rod and projections of lesser extent on said auxiliary locking rod for permitting relative longitudinal movement therebetween, means for moving forward said locking rod from its released position towards its locking position to carry therewith said actuating rod for a limited range and to move independently of said actuating rod against the force of said secondary biasing means beyond said range, and means cooperating with said auxiliary locking rod to lock the same in actuated position near the end of the forward reciprocating movement thereof.

3. In an apparatus of the class described, a frame, a plurality of control units mounted in said frame, each control unit comprising an actuating rod mounted for reciprocating movement and an auxiliary locking rod therefor extending substantially coextensively with said actuating rod and in interengaging relationship therewith, said rods being movable in said frame between a released and locked position, means for biasing said actuating rod to its released position, secondary biasing means extending between said rods of greater force than said first biasing means and connections between said rods permitting relative longitudinal movement therebetween, means for moving forward said locking rod from its released position towards its locking position to carry therewith said actuating rod for a limited range and to move independently of said actuating rod against the force of said secondary biasing means beyond said range, and interlocking means common to all of said units cooperating with said auxiliary locking rod to lock the same in actuated position near the end of the forward reciprocating movement thereof and to release any previously locked auxiliary locking rod.

4. In an apparatus of the class described, a frame, a plurality of control units mounted in said frame, each control unit comprising an actuating rod mounted for reciprocating movement and an auxiliary locking rod therefor extending substantially coextensively with and transverse to said actuating rod and in interengaging relationship therewith, said rods being movable in said frame between a released and locked position, means for biasing said actuating rod to its released position, secondary biasing means extending between said rods of greater force than said first biasing means and connections including slots in said actuating rod and projections of lesser extent on said auxiliary locking rod for permitting relative longitudinal movement therebetween, a push button mounted on the end of said locking rod for moving said locking rod from its released position towards its locking position to carry therewith said actuating rod for a limited range and to move independently of said actuating rod against the force of said secondary biasing means beyond said range, and interlocking means movable on said frame controlled selectively by cooperating edges on said auxiliary locking rods to lock the same in actuated position near the end of the reciprocating movement thereof and to release any previously locked auxiliary locking rod.

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