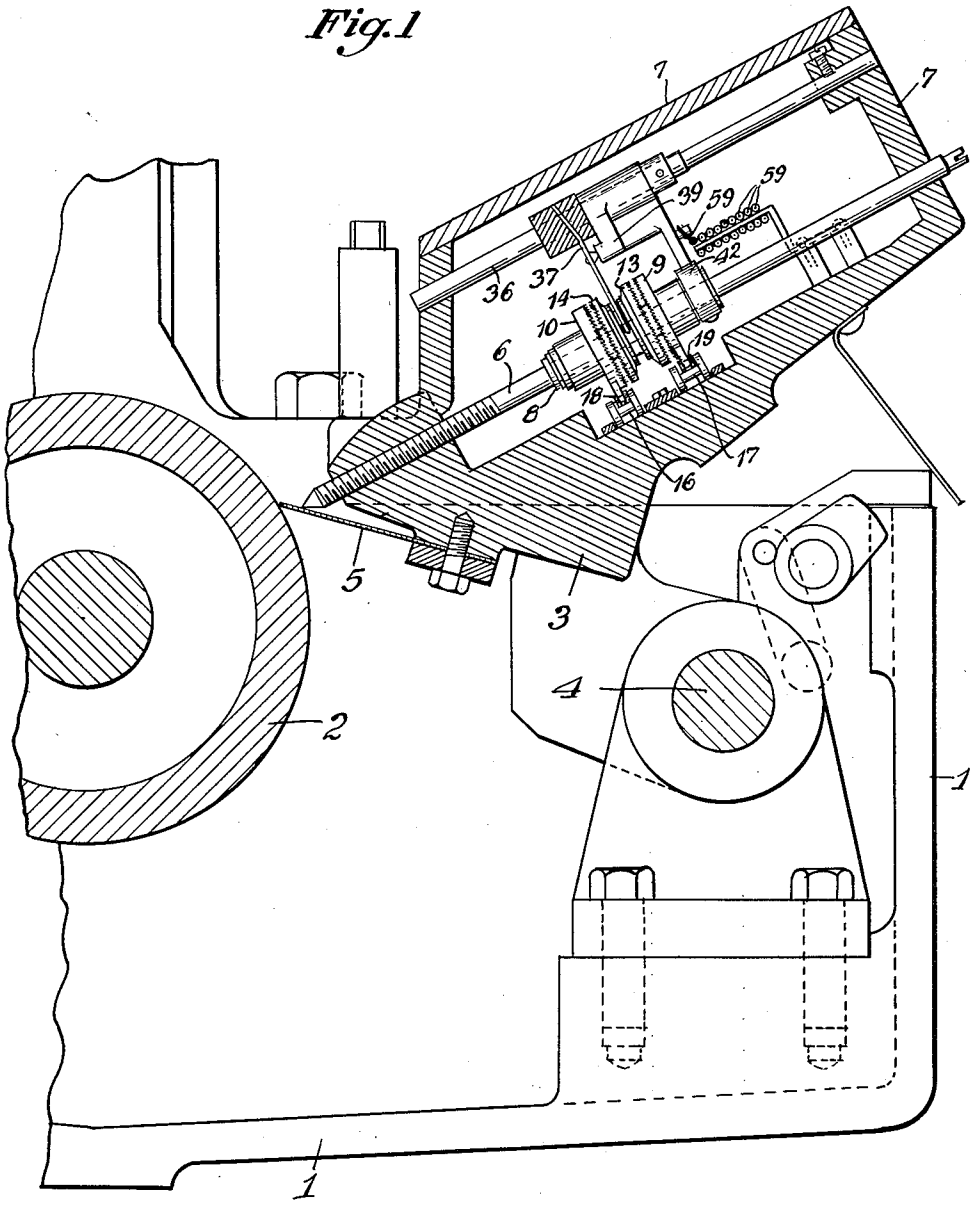
July 17, 1962 K. A. KLINGLER 3,044,314

CONTROL MECHANISM

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Fig. 1



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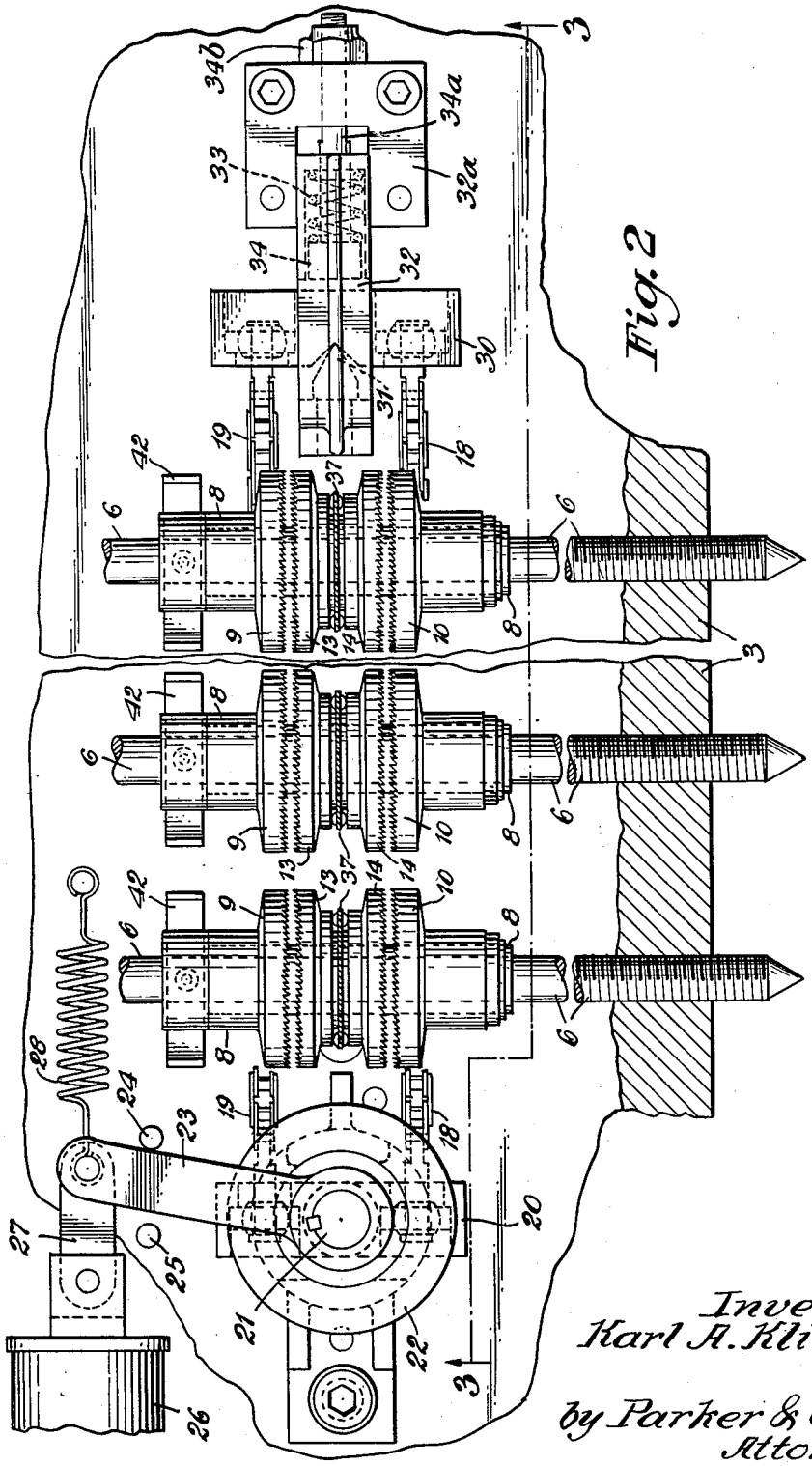


Fig. 2

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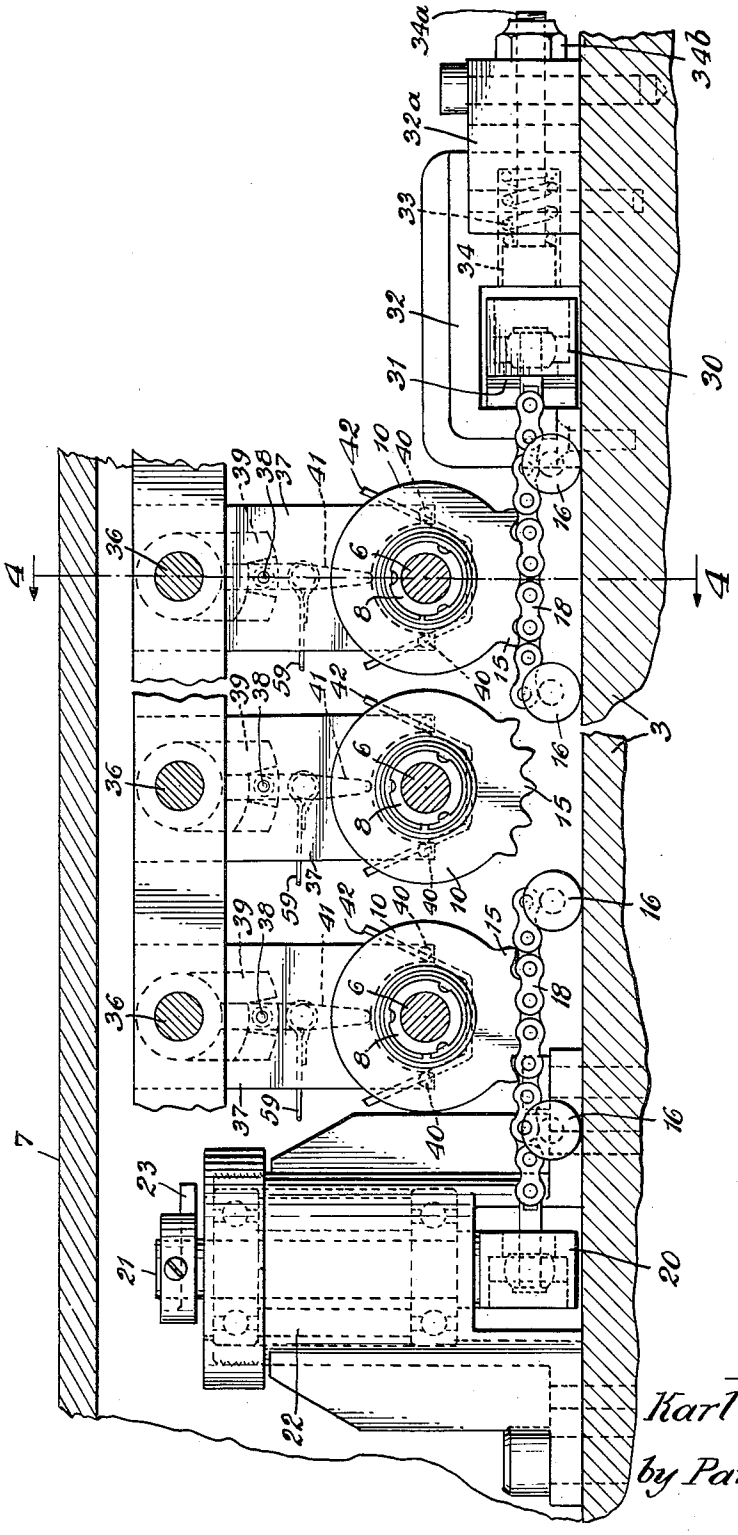


Fig. 3

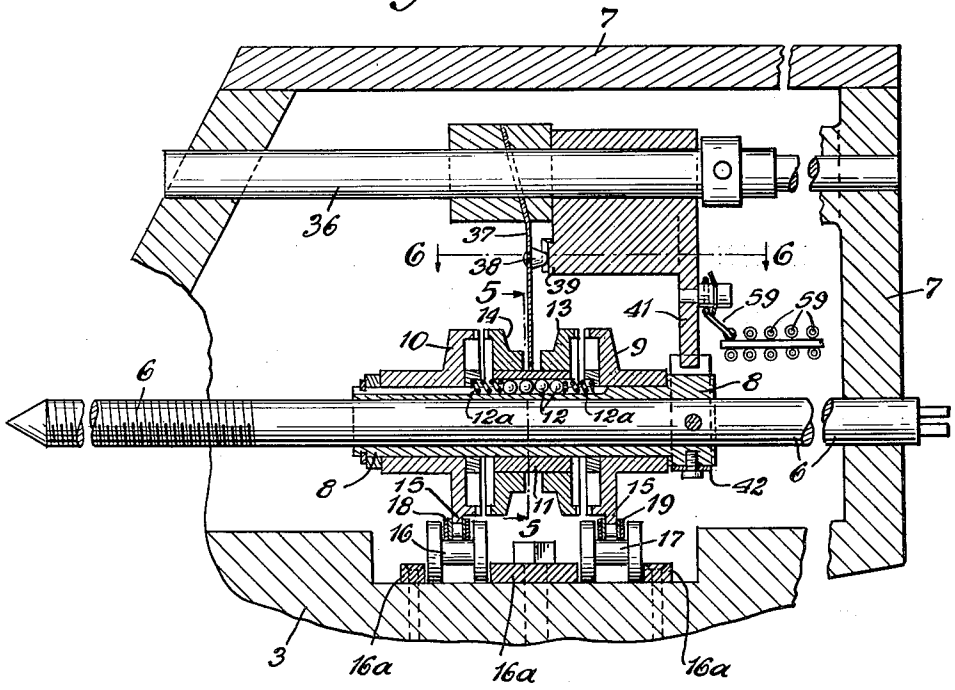
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CONTROL MECHANISM

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Fig. 4



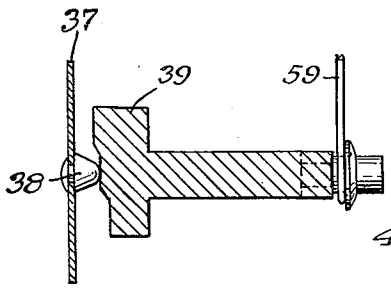


Fig. 6

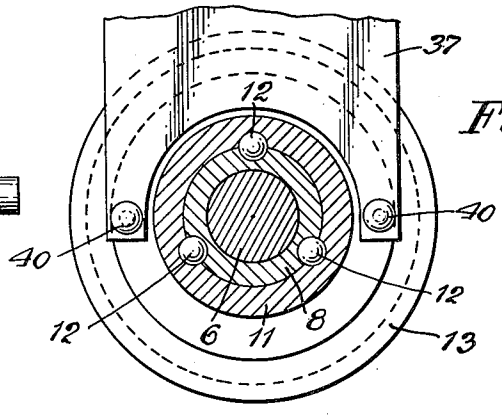


Fig. 5

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3,044,314

CONTROL MECHANISM

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5 Claims. (Cl. 74—131)

My invention relates to improvements in control mechanism and has for one object to provide means to permit an operator, from a central position, to positively and accurately, within a very narrow range of variation, control the operation of a plurality of movable elements. My invention, for example, may well be used to control or adjust a doctor bar or ink fountain adapted to supply ink to a printing press.

Another object of the invention is to provide a single station, multi-element, remote control mechanism.

Another object of my invention is to provide in combination with a single control station remote control mechanism which will control micrometrically the position or operation of a plurality of control elements.

Another object of my invention is, by remote control, to control the angular rotation of a shaft which may be threaded for longitudinal movement or may carry an element, the angular position of which requires adjustment.

Another object of my invention is to impart to a rotatable shaft with micrometric precision a step by step controlled angular movement.

Another object of my invention is to provide a control mechanism whereby any one or a number of separate actuating elements may be separately controlled to operate in forward or reverse position, all under the control of the operator, at a single station.

Another object of my invention is to provide means for automatically stopping the movement of the controls independent of the operator when a predetermined excursion has been made.

Other objects will appear from time to time throughout the specification and claims.

My invention is illustrated more or less diagrammatically in the accompanying drawings, wherein:

FIGURE 1 is a detail section through a printing press with parts omitted illustrating an application of my invention;

FIGURE 2 is a plan view with parts omitted of a battery of adjusting screws and the drive mechanism embodying my invention;

FIGURE 3 is a section along the line 3—3 of FIGURE 2;

FIGURE 4 is a section along the line 4—4 of FIGURE 3;

FIGURE 5 is a section along the line 5—5 of FIGURE 4;

FIGURE 6 is a section along the line 6—6 of FIGURE 4;

Like parts are indicated by like characters throughout the specification and drawings.

I have for convenience and clarity illustrated my invention as applied to a printing press but I want it understood that my invention is not limited to such application.

Referring to FIGURE 1, 1 is the frame of a printing press carrying the roller 2. 3 is the doctor bar frame supported at 4 on the press frame 1 and carrying a flexible doctor bar 5 which may contact the roller 2. Adjusting screws 6 are spaced along the doctor bar 5 and the points of the screws are adapted to engage the doctor bar adjacent the roller and urge the flexible doctor bar toward the roller. The spring of the doctor bar would normally bias it away from the roller and the pressure of the adjusting screws overcomes that bias to position the doctor bar with respect to the roller.

Screws 6 are threaded in the doctor bar frame adjacent the doctor bar and rotatably mounted in the supporting yoke 7 which is carried by the doctor bar frame 3. Each screw has rigidly attached thereto a sleeve 8. Rotatably mounted and held against longitudinal movement on each sleeve are opposed driving clutch discs 9, 10 angularly toothed in opposite directions. Sliding on the sleeve 8 is a clutch sleeve 11, held against angular displacement with respect to the sleeve 8 by a plurality of balls 12 held in position by springs 12*a* and free to move very easily longitudinally of the sleeve 8 while being positively held against angular displacement with rsspect thereto. Fixed on the sleeve 11 are driven clutch discs 13, 14 toothed in opposition respectively to the driving clutch discs 9 and 10. The ratchet teeth between discs 9 and 13 cause drive in one direction, those between discs 10 and 14 cause drive in the opposite direction. The hubs of the discs 13, 14 are spaced apart to provide a slight clearance for the clutch displacing lever as will later appear.

Downwardly depending from each of the discs 9 and 10 is a toothed gear segment extension 15. Rollers 16, 17 fixed in position and supported between and below the clutch discs by brackets 16*a* support parallel roller chains 18 and 19 meshing with gear segments 15. As the chains are moved longitudinally the driving clutch discs 9 and 10 will rotate. The rollers hold the chains in proper engagement with the toothed gear segments.

Each chain 18 and 19 is anchored to the opposite ends of a lever 20, keyed to a shaft 21 in bearing 22 and carrying at its upper end an actuating lever 23 limited to movement between stops 24, 25. 26 is a driving solenoid connected to the lever 23 by a link 27 in opposition to a tension spring 28. In the starting position the spring 28 biases the lever against stop 24. The solenoid 27 can move the lever 23 into engagement with the stop 25.

The opposite ends of the chains 18, and 19 are anchored on a lever 30 fulcrumed at 31 on a stirrup member 32 slidable in the support 32*a*. The spring 33 is compressed between the upper end of the stirrup 32 and the head 34 of the tension screw 34*a*, tension being adjusted by the nut 34*b* to hold the chains tight to operate as racks in mesh with the gear segments 15. Actuation of the solenoid moves the chain 19 in a right hand direction and the chain 18 in a left hand direction viewed in FIGURE 2, thus rotating the driving discs 9 and 10 in opposite directions through a very small angular excursion. Assuming that the driven discs 13, and 14 are in the neutral position, movement of the chain will have no driving effect on the screws. The clutch discs 13 and 14 being both rigid on the sleeve 11 move in unison. If moved to the left in FIGURE 4, drive is by the chain 18 in one direction. If moved to the right in FIGURE 4, drive is by the chain 19 in the opposite direction.

Fixed in frame 7, immediately above each screw 6 is an abutment shaft 36 which supports a flexible clutch lever 37 bifurcated at its lower end to penetrate between the clutch discs 13 and 14. A button 38 on each lever is yieldingly pressed against the end of the three step cam body 39, rotatable on the shaft 36. When the button 38 is in engagement with the central step, the clutch is in neutral. When in engagement with the lower step in FIGURE 6, the lever throws the clutch 14 into engagement. When in engagement with the upper step in FIGURE 6, the lever 37 throws the clutch 13 into engagement. The bias of the spring lever 37 to the right insures contact of button 38 with the cam surfaces. Buttons 40 on the bifurcated ends of the spring lever 37 are of such size as to fill the space between the clutch discs 13 and 14.

The actuating finger **41** extends radially from the cam body **39** and is in general alignment with the end of the sleeve **8**. Limit fingers **42** are positively attached to the enlarged end of the sleeve **8** and extend upwardly on each side of the sleeve into the path of the finger **41** as shown in FIGURE 3 so that when the sleeve **8** rotates in either direction to bring the finger **42** into engagement with the finger **41**, it will move the cam **39** back to the neutral position, thus disengaging the clutch and leaving the screw **7** in its position of maximum angular displacement. Thus every time the solenoid is energized the two chains or racks move a short distance in opposite directions imparting angular movement in opposite directions to the gear segments in mesh with them. If the clutches are all in neutral no rotation of any of the screws would occur, but with respect to any clutch in driving position the screw associated with the clutch will be rotated in consonance with the rack movement. Since each clutch pair can be separately and independently moved out of the neutral position in either direction, the clutches can be set to cause each screw to be retracted or withdrawn as desired. The cam body **39** may be set or rotated to the desired control position by any suitable control device such as the push-pull wire cable terminating at finger **41** and actuated from a distant control point.

I claim:

1. In combination, a shaft mounted for rotation, opposed ratchet toothed driving clutch members free to rotate on and held against longitudinal movement with respect to the shaft, a ratchet toothed driven clutch member in opposition to each of the driving members free to move longitudinally along the shaft but held against rotary movement with respect thereto, the driven members being adjacent to and back to back, an actuating lever terminating in a contact element between and in simultaneous contact with both the driven members, the actuating lever comprising spring plate biased in clutching direction with respect to one of the driven members.

2. In combination, a shaft mounted for rotation, opposed ratchet toothed driving clutch members free to rotate on and held against longitudinal movement with respect to the shaft, a ratchet toothed driven cluch member in opposition to each of the driving members free to move longitudinally along the shaft but held against rotary movement with respect thereto, the driven members being adjacent to each other and back to back, an actuating lever terminating in a contact element between and in simultaneous contact with both the driven members, the means for holding the driven member against rotary movement on the shaft comprising registering segmental channels longitudinal of the shaft between the shaft and the driven member, balls extending between the shaft and the driven member interlocking with the channels and yielding means holding said balls against longitudinal movement in the channels.

3. In combination, a shaft mounted for rotation, a driving clutch member free to rotate on but held against longitudinal movement with respect to the shaft, a driven clutch member in opposition thereto, free to move longitudinally but held against rotary movement on the shaft, a clutch lever adapted to reciprocate the driven member, means for rocking the lever including a rotary cam member, a finger extending from the cam member toward and terminating just short of the shaft, a stop plate rigidly mounted on the shaft in the path of the finger adapted to rotate the cam to neutral position upon contact of stop member and finger.

4. In combination, a shaft mounted for rotation, a driving clutch member free to rotate on but held against longitudinal movement with respect to the shaft, a driven clutch member in opposition thereto, free to move longitudinally but held against rotary movement on the shaft, a clutch lever adapted to reciprocate the driven member, means for rocking the lever including a rotary cam member, a finger extending from the cam member toward and terminating just short of the shaft, a stop plate rigidly mounted on the shaft in the path of the finger adapted to rotate the cam to neutral position upon contact of stop member and finger, the means for holding the driven member against rotary movement on the shaft comprising registering segmental channels longitudinal of the shaft between the shaft and the driven member, balls extending between the shaft and the driven member interlocking with the channels and yielding means holding said balls against longitudinal movement in the channels.

5. In combination, a threaded adjustment pin and driving means for selectively rotating it in forward and reverse direction, control means for such driving means including a rotary element adjacent the pin, limiting stop means mounted on and rotatable with the pin adapted when the pin reaches the limit of its rotary excursion in either direction to positively move the control means into the neutral position, the control means including a finger projecting toward the pin, the stop means including a plate rotatable with the pin in the path of the finger.

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