

May 27, 1952

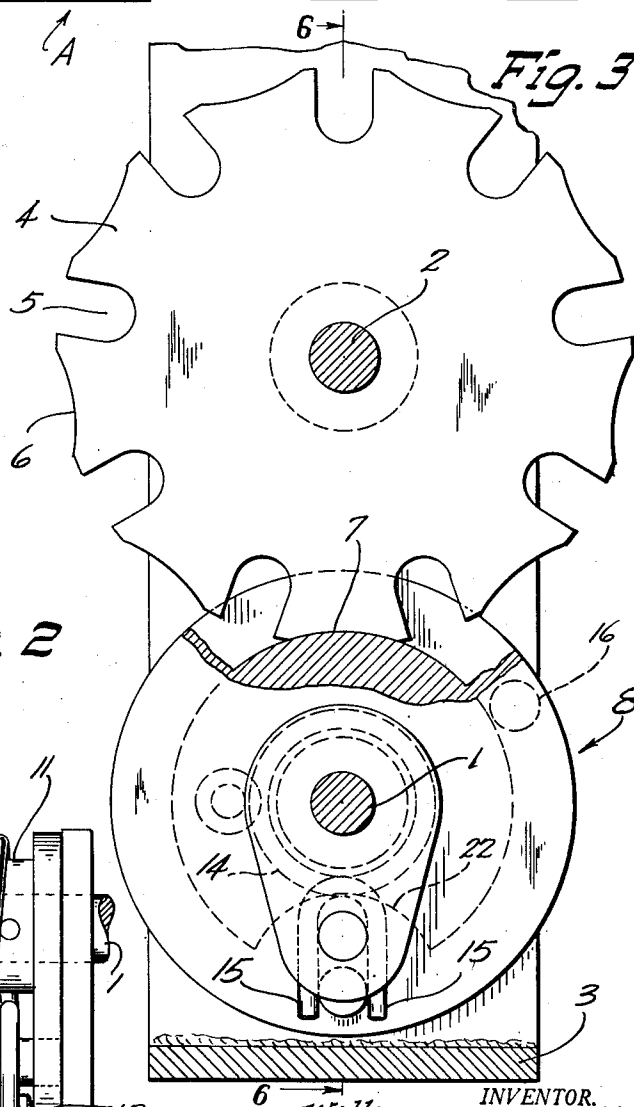
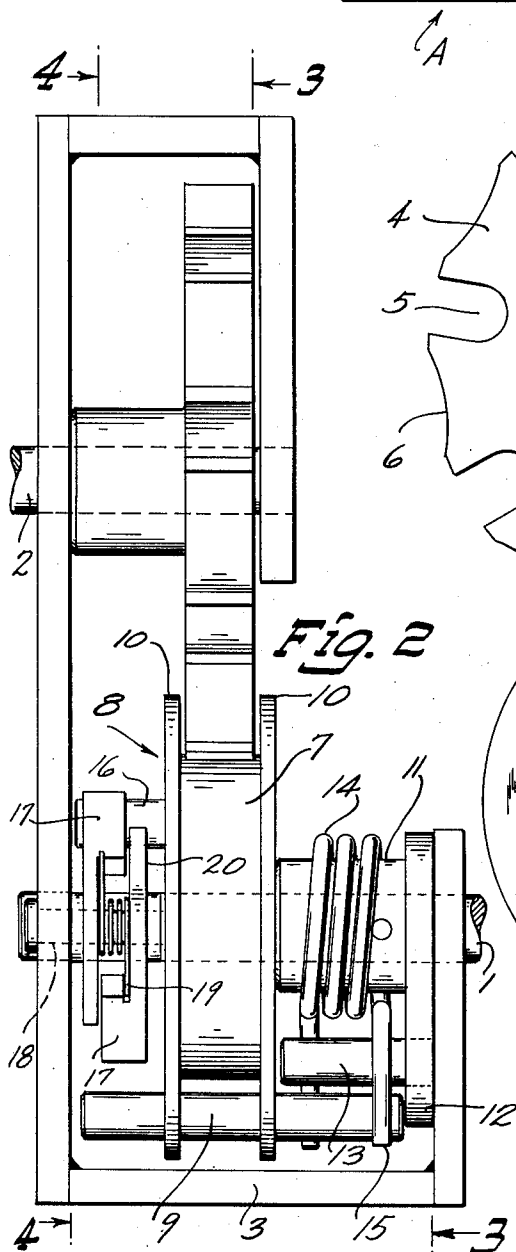
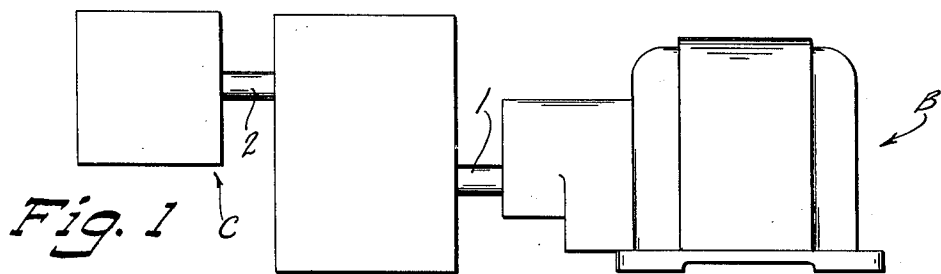
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2,598,448

OPERATING MECHANISM FOR MULTIPLE POINT SWITCHES.

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3 Sheets-Sheet 1



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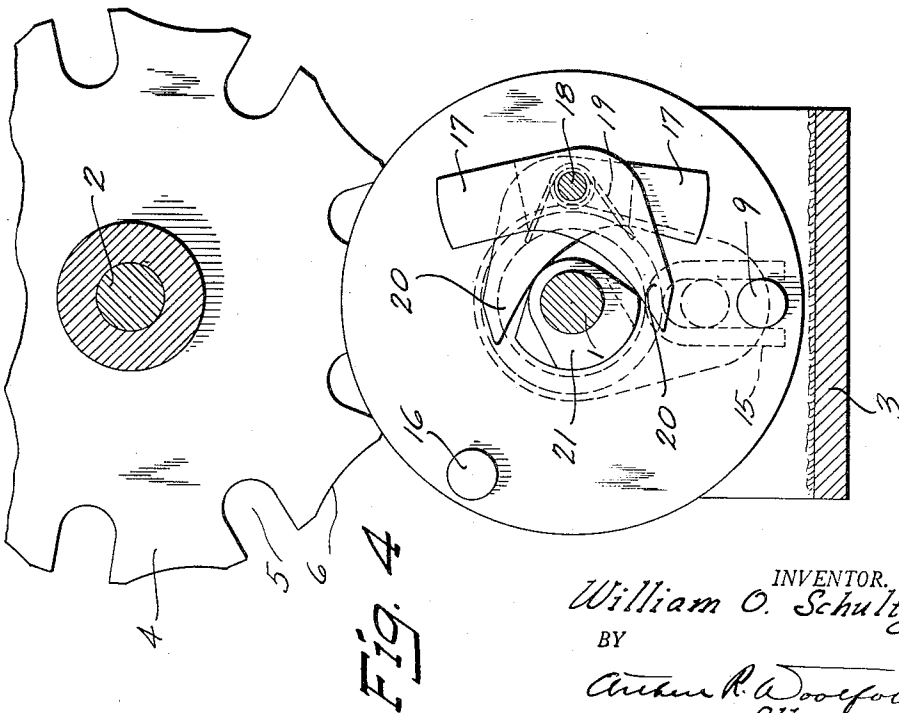
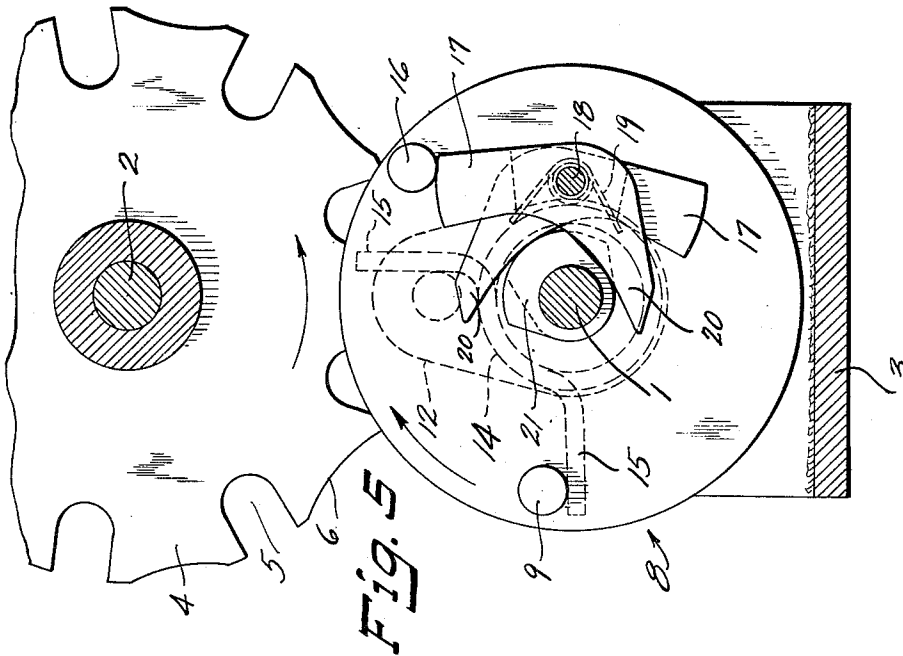
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OPERATING MECHANISM FOR MULTIPLE POINT SWITCHES

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3 Sheets-Sheet 2



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OPERATING MECHANISM FOR MULTIPLE POINT SWITCHES

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3 Sheets-Sheet 3

Fig. 7

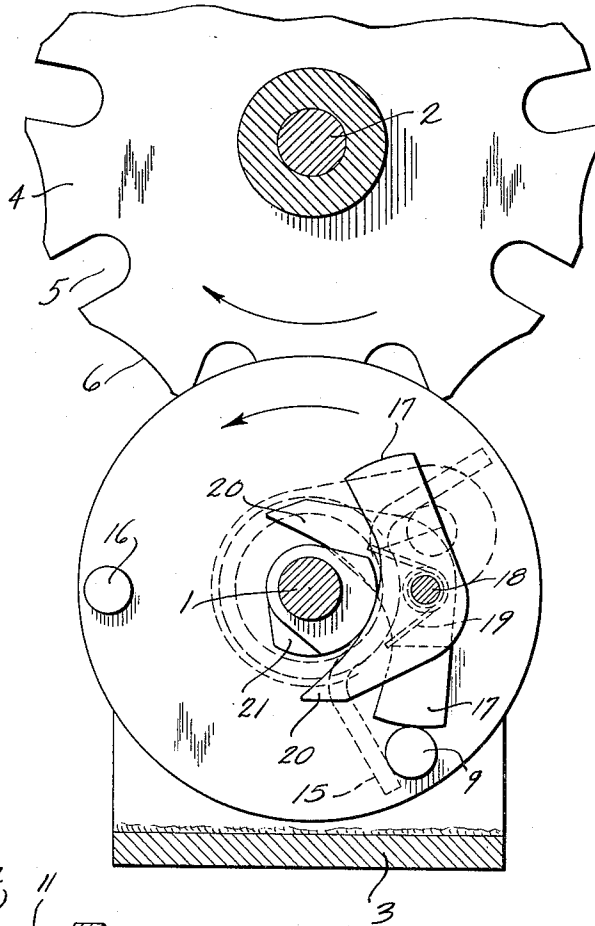
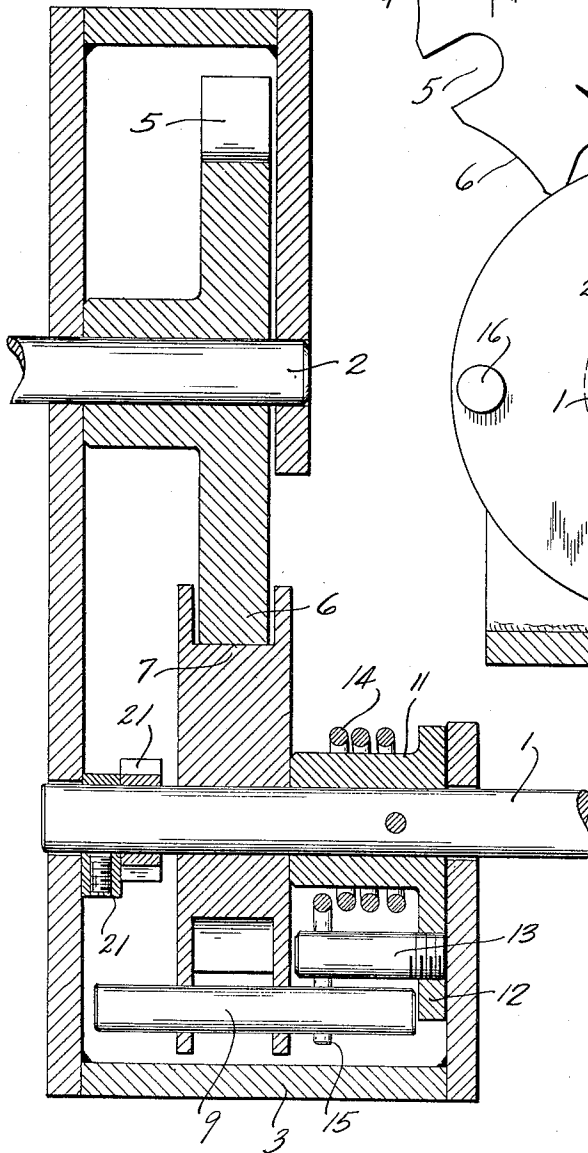


Fig. 6



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OPERATING MECHANISM FOR MULTIPLE
POINT SWITCHES

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2 Claims. (Cl. 74-436)

1

This invention relates to operating mechanism for a multiple point switch and is particularly directed to mechanism arranged to be interposed between the driving motor and the driven portion of the multiple point switch.

Objects of this invention are to provide an operating mechanism for a multiple point switch such as a tap changer, capacitor type switch, or other type of switch wherein a movable member is arranged to be moved over a plurality of stationary contact points and which is adapted to be rotated and locked in position in engagement with any desired stationary contact.

Further objects are to provide a novel form of operating mechanism in which spring means is interposed between a driving shaft and a driven Geneva pinion with the Geneva pinion arranged to drive and interlock with a Geneva gear so that a very quick motion is imparted to the Geneva gear and thereafter the Geneva gear is locked in position after each step or operation of the Geneva pinion, the Geneva gear being carried by a driven shaft adapted to be operatively connected to the multiple point switch mechanism, suitable interlocking means being provided and being released by cam means when the spring means for driving the Geneva pinion has been tensioned a predetermined amount and when the operating shaft has arrived at a predetermined position with reference to the Geneva pinion, to thereby provide positive and quick operation of the switch mechanism from the Geneva gear with an ample amount of energy supplied to overcome any tendency of the switch mechanism to stick.

Further objects are to provide a novel form of driving mechanism for a multiple point switch in which a considerable time delay is provided by means of a Geneva pinion and coacting Geneva gear and that this mechanism is associated with spring driving means which insures a quick motion of the Geneva gear for each successive step.

An embodiment of the invention is shown in the accompanying drawings, in which:

Figure 1 is a more or less block or diagrammatic view of the apparatus showing it in the relative position between the driving means and the switch mechanism.

Figure 2 is a side elevation of the driving mechanism with the driving and driven shafts broken off.

Figure 3 is a sectional view, approximately on the line 3-3 of Figure 2.

2

Figure 4 is a sectional view approximately on the line 4-4 of Figure 2.

Figure 5 is a view corresponding to Figure 4 showing the position of the parts an instant before operation occurs.

Figure 6 is a sectional view on the line 6-6 of Figure 3.

Figure 7 is a view corresponding to Figure 5 showing the position of the parts an instant before operation of the mechanism when the mechanism is driven in the reverse direction from that shown in Figure 5.

Referring to Figure 1 it will be seen that the operating mechanism has been shown as a block diagram and is indicated by the reference character A. It is interposed between the driving means such as the electric motor B provided with a reduction mechanism and the multiple point switch indicated generally at C. The driving shaft is indicated by the reference character 1 and the driven shaft by the reference character 2.

The device comprises a stationary frame 3 which is secured in any suitable manner, not shown. This frame revolubly supports the driving shaft 1 and the driven shaft 2. The driven shaft 2 is provided with a rigidly attached Geneva gear 4 which, in accordance with the usual construction, is provided with cut-out portions 5 and locking portions 6 whose outer surface is rounded to fit the cylindrical portion 7 of the Geneva pinion 8 to thereby temporarily lock the Geneva gear 4 against operation after each successive operation of the Geneva pinion.

The Geneva pinion is provided with a pin or driving portion 9 which is adapted to enter the appropriate notch or cut-away portion 5 of the Geneva gear and to thus rotate the Geneva gear one step. It is to be noted that the Geneva pinion 8 is provided with a pair of flanges 10 between which the cylindrical portion 7 of the Geneva pinion is positioned. The pin 9 is carried by the flanges 10 as is evident from Figure 2.

The driving shaft 1 is provided with a hub portion 11 which has a rigidly attached arm 12 which is provided with a driving pin 13 for driving or tensioning the spring 14. This spring 14 is loosely coiled about the hub 11 of the driving shaft 1 and has oppositely projecting hair-pin-like end portions 15 between which the pins 9 and 13 are positioned. In this connection, it is to be noted that a second pin 16, see particularly Figure 2, is provided and is carried by the Geneva pinion. However, the pin 16 does not project between the flanges of the Geneva pinion, but projects only to the left of the left-hand

3

flange 10 as viewed in Figure 2. The left-hand projecting portion of the pin 9 in Figure 2 and the projecting pin 16 constitute stops which are engaged temporarily by latches 17.

The latches 17 are pivotally carried by a pin 18 which in turn is rigidly carried by the frame 3. The latches 17 and 17 are urged towards latching position by means of a spring 19 and are each provided with cam extensions 20 which are positioned on opposite sides of a cam member 21. The cam member 21 is rigid with the driving shaft 1.

The operation of the apparatus is as follows:

When the driving shaft 1 is rotated in a clockwise direction, as viewed in Figure 5, the cam 21 releases the appropriate latch 17 and frees the latch from the stop 16. Prior to this, the spring 14 has been tensioned and consequently the Geneva pinion 8 executes a very rapid, partial rotation and releases the Geneva gear and rotates it one notch, thereafter locking the Geneva gear in place. It is to be noted that the cylindrical portion 7 of the Geneva pinion 8 is provided with a cut-out portion 22 adapted to accommodate the projecting portions 6 when the Geneva gear is released.

It will be seen that a very simple type of operating mechanism has been provided for a multiple point switch which insures a positively quick and powerful action of the driving mechanism to move the multiple point switch one step.

It will be seen further that a considerable time delay is afforded by the successive steps as the Geneva pinion has to execute a considerable portion of a rotation before response of the Geneva gear is obtained and that the Geneva pinion when rotated in the same direction has to rotate a complete revolution between each step of the Geneva gear.

Although this invention has been described in considerable detail, it is to be understood that such description is intended as illustrative rather than limiting, as the invention may be variously embodied and is to be interpreted as claimed.

I claim:

1. Operating mechanism for a multiple point switch comprising a driving shaft and a driven shaft, a Geneva gear carried by said driven shaft,

4

a Geneva pinion loose on said driving shaft and coacting with said gear to alternately drive and lock said gear in a step-by-step manner in either direction, spring means operatively interposed between said driving shaft and said pinion for driving said pinion from said driving shaft in either direction, a pair of latch means for restraining said pinion against rotation in opposite directions, and cam means carried by said driving shaft for selectively tripping said latch means after said spring means has been tensioned in opposite directions.

2. Operating mechanism for a multiple point switch comprising a driving shaft arranged to rotate a large number of times in either direction and a driven shaft, a Geneva gear carried by said driven shaft, a Geneva pinion loose on said driving shaft and coacting with said gear to alternately drive and lock said gear in a step-by-step manner, a pair of latch members, stops carried by said pinion and arranged to respectively engage said latch members when said pinion is rotated in opposite directions, a spring operatively positioned between said driving shaft and said pinion, and cam means carried by said driving shaft and arranged to selectively release said latches from said stops when said driving shaft is rotated in opposite directions, said driven shaft being arranged to be rotated by said Geneva gear to any one of a plurality of positions in either direction.

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