

Nov. 6, 1951

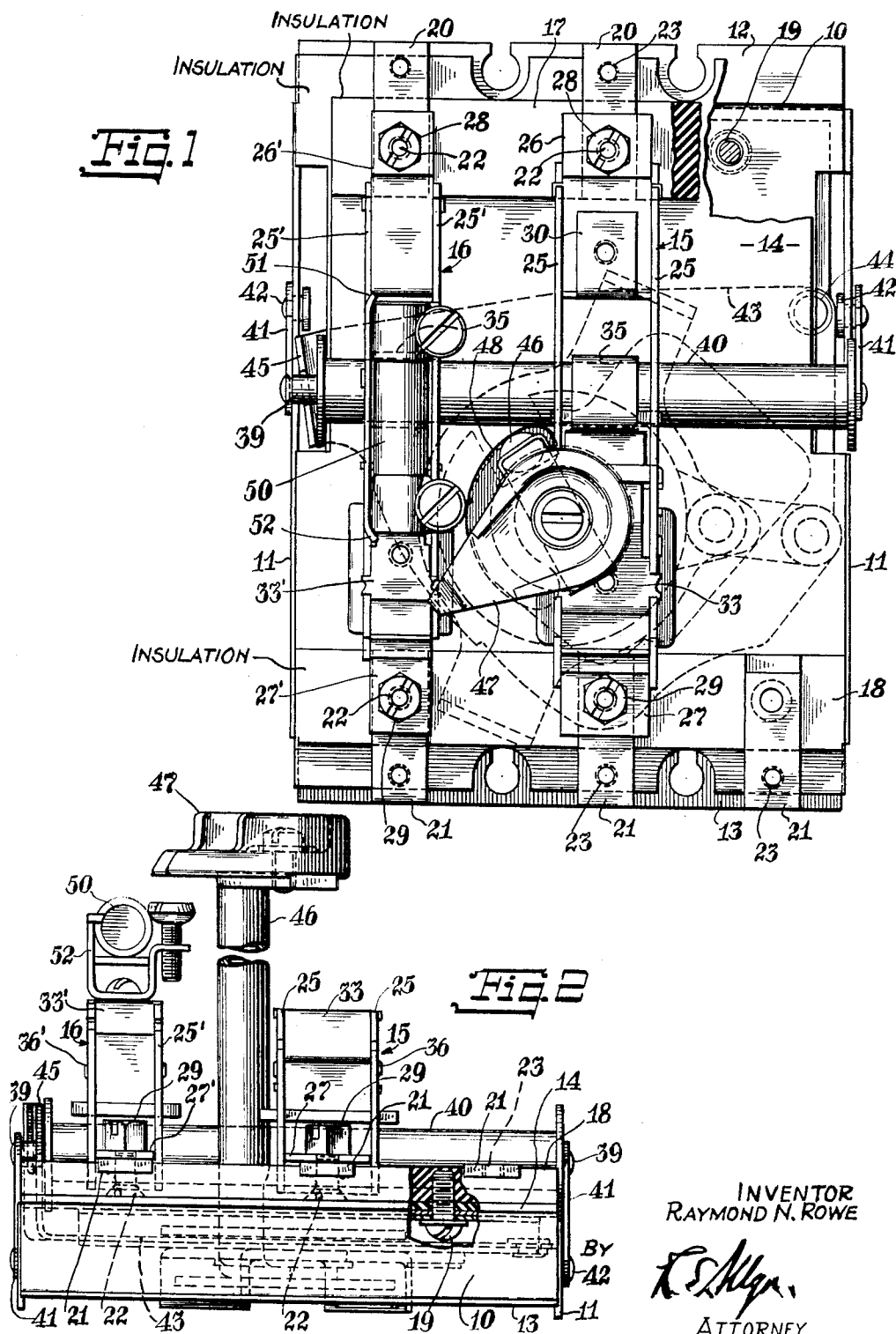
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MULTIPLE UNIT SWITCH WITH SINGLE ACTUATOR

Filed Jan. 16, 1947

2 SHEETS—SHEET 1



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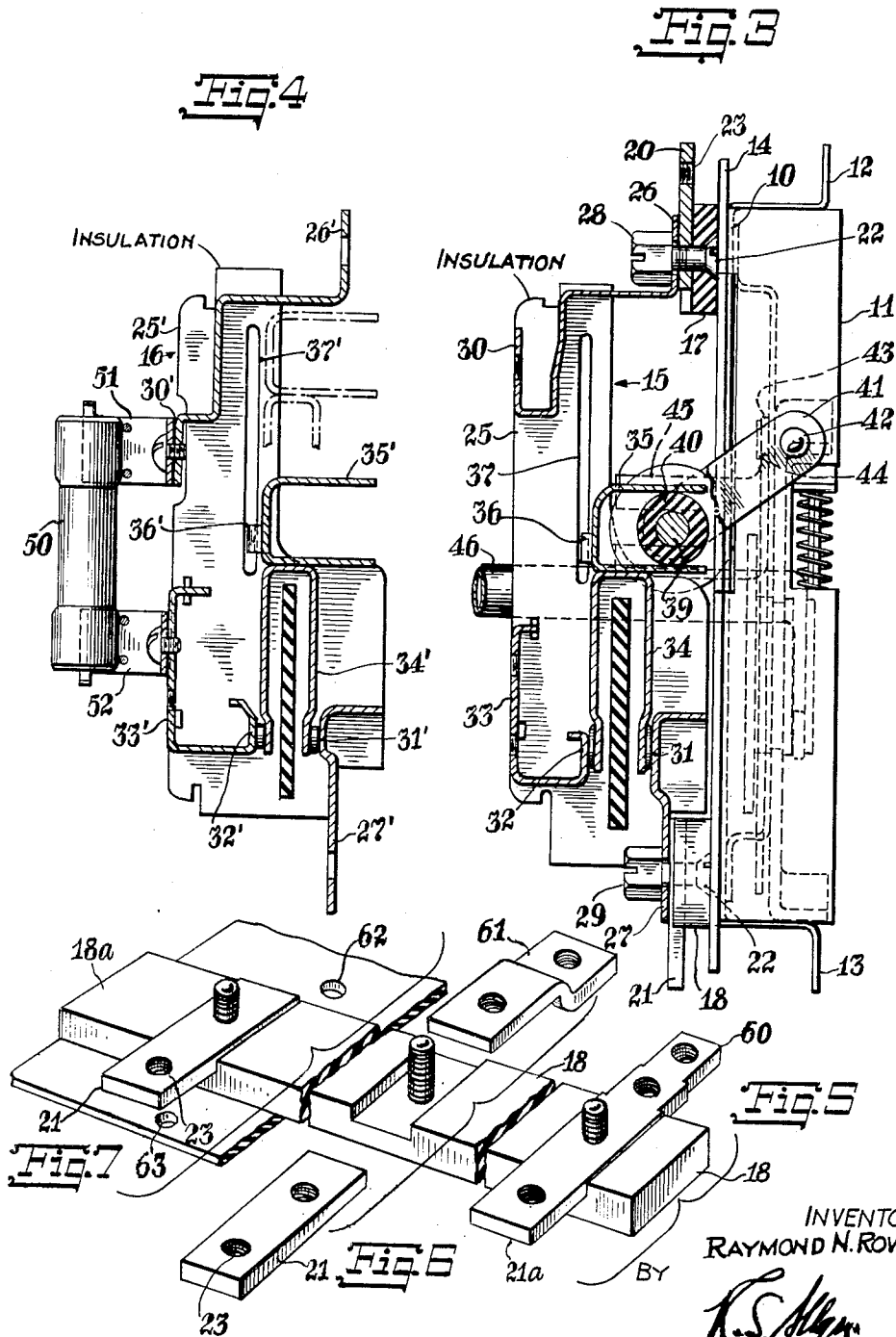
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2 SHEETS—SHEET 2



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2,574,290

MULTIPLE UNIT SWITCH WITH SINGLE ACTUATOR

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2 Claims. (Cl. 200—76)

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In certain types of electrical switches, principally those used as machine tool controls, it is highly desirable to have a flexibility of poles of different amperage, voltage, and sometimes A. C. or D. C. operated simultaneously by a single switching handle or mechanism. Furthermore, the number of poles to be operated may vary in number from time to time depending upon the type of machine which it is desired to control.

The present invention provides means whereby the number, rating, fusible characteristics, etc. of various poles on a switch may be varied or altered during assembly of the switch or in the field after manufacture. This is accomplished by building the switch out of a structure of individual pole units, each one of which has similar mounting details, at least on one end, and identical location and extent of throw of the switch operating mechanism, although their fusible characteristics and their interrupting ability may be different one from another.

In the accompanying drawings and description I have shown and described a manually operable switch with quick make and break or snap-action mechanism but these features are not essential to the broader aspects of the invention.

Fig. 1 is a front view of one construction embodying my invention adapted to a three-pole system but showing only two different pole units in place.

Fig. 2 is an end view of the same.

Fig. 3 is a side view and partial section of the same showing the parts of the larger unit in the closed circuit position.

Fig. 4 is a side view of the smaller pole unit.

Fig. 5 is a perspective view of a fragment of a supporting terminal strip with an extension.

Fig. 6 is an exploded perspective view of a fragment of a terminal strip with a separate extension.

Fig. 7 is a perspective view of another arrangement for the terminal strip.

The form of the invention herein shown and described is intended for mounting within a receptacle and has a supporting base or frame consisting of a top plate 10 having depending sides 11, 11 and ends 12 and 13, the latter being adapted for attachment to some suitable foundation such as the bottom of a receptacle (not shown). The front of the frame is preferably overlaid with a plate of insulating material 14. A number of discrete switch units such as 15 and 16, one for each pole, are detachably mounted on the front of the frame and snap-action mechanism such for instance as is fully shown and de-

scribed in my application Serial Number 713,194 filed November 30, 1946, now Patent No. 2,494,314 dated January 10, 1950, is mounted beneath the frame within the boundaries of the side and end members.

Mounted across the upper and lower ends of the frame are insulating cross bars 17 and 18 secured by screws 19.

Upon these bars 17 and 18 are mounted terminal strips 20, 20 and 21, 21 respectively secured by bolts or studs such as 22. These strips support the switch units and also afford means for attachment of cable or conductor lugs at 23 so that the stresses applied by these lugs do not affect the switch units.

The construction shown provides for three switch units, only two of which are shown. All may be alike or unlike as to details of construction and fusing but each is provided with means for securing it to the terminal strips and means for coaction with the switching mechanism. The particular construction of switch unit shown is more fully shown and described in my application Serial Number 708,375 filed November 7, 1946, now Patent No. 2,468,235 dated April 26, 1949.

In the form shown each switch unit has two insulating side plates such as 25, 25 which support all of the conducting parts including the terminals 26 and 27 which are detachably mounted on the bolts or studs 22 on the cross bars 17 and 18 and secured by nuts 28 and 29 respectively. Fuse terminal 30 is integrally connected to circuit terminal 26. Switch contact 31 is integral with the circuit terminal 27. The other switch contact 32 is integral with the other fuse terminal 33. The movable switch member 34 is forked and slides between the contacts 31 and 32. Switch member 34 is secured to a saddle or yoke 35 which has ears 36 guided in slots 37 in the opposite side plates 25 of the unit. This yoke 35 is of U-shape and designed to facilitate application to a transverse actuating bar 39 and its insulating sleeve 40 which extend across the front of the supporting frame and are carried by two arms 41, 41 which are hinged at 42, 42 to the opposite sides of the frame.

An actuating lever 43 positioned behind the top plate is hinged at 44 and has a forked arm 45 which engages one end of the bar 39. An actuating rod or shaft 46 has a handle or knob 47 and extends through an arcuate slot 48 in the front of the supporting frame. The lower end of the rod 46 is connected to the lever 43 through snap action mechanism in the back of suitable type such as shown and claimed in my former

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application so that by moving the rod through slot 48 the lever 43 may be rotated on its axis and thus move the bar 39 and its sleeve 40 up and down to open and close the circuit by the movement of the switch member 34.

In Figs. 2 and 4, I have shown a switch unit 16 basically like switch unit 15 but in this case of a smaller size intended to provide for a different current from unit 15. The same reference numerals are used as in describing unit 15 but prime marks are used. For instance, the circuit terminals 26' and 27' correspond with terminals 26 and 27 of unit 15, altho terminal 27' may be shorter than terminal 27 as will be later understood.

In Figs. 2 and 4, I have shown a small cartridge type fuse 50 mounted in clips 51, 52 on the fuse terminals 30', 33'.

In case the over-all length of a switch unit is less than the distance between the upper and lower studs 20, 21 there are various ways of mounting the switch unit as shown in Figs. 5, 6 and 7. For instance, in Fig. 5 I have shown the terminal strip 21a as provided with an integral extension 60 upon which the switch terminal connected with the switch contact may be mounted and suitably secured by a bolt or screw in a conventional manner. Such an arrangement could for instance accommodate a 30, 60 or 100 ampere switch unit.

In Fig. 6 I have shown a separate extension 61 which can be mounted on top of terminal 21 and provided with means for supporting a switch unit. Such extensions may have provision for accommodating one or more different lengths of units.

In Fig. 7 I have shown a fragment of an insulating cross bar 18a with a terminal strip 21 mounted upon it. Such a cross bar or a part of it can be itself arranged to be adjusted or secured to the support at different distances from the cross bar 17 so as to accommodate one or more switch units of the desired lengths. For this purpose the bar 18a may be secured by one or more bolts in additional holes such as 62 or 63. It will be understood however that the switch units for a given supporting and actuating structure must all have the same length from the supports on cross bar 17 to the switch contacts so that all of the switch members will be actuated simultaneously when the crank shaft 39 is moved up and down.

It will thus be seen that switches designed for fuses of different characteristics and sizes may be interchangeably mounted on the frame and actuated simultaneously by the same mechanism.

In the manually operable snap action type here shown it will be seen that by offsetting the actuating rod or shaft 46 from the central axis of the snap action mechanism, I am able to locate the customary three switch units symmetrically of the base, one in the center and one on each side so that the switch units will be in the most convenient spots for wiring in conventional boxes.

Each fuse or other protective device can be easily removed or replaced independently of the

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others and each switch unit can be removed, added or replaced independently of all the others.

The snap action mechanism herein shown is claimed in my application Serial Number 713,194 filed November 30, 1946, now Patent No. 2,494,314 dated January 10, 1950.

I claim:

1. An electric switch having a base frame, snap action mechanism having a movable hub rotatably mounted at the back of said base frame with its rotational axis perpendicular to said base, said base having an arcuate slot concentric with said axis, and an actuating rod having an axis eccentric to said hub and movable in said slot and having its rear end secured to the hub of said snap action mechanism.

2. A quick make and break switch construction comprising a base plate having side flanges, snap action mechanism mounted on the back of said plate between said flanges, an insulating cross bar detachably mounted across each end of said plate at the front thereof, line and load circuit terminal members detachably mounted on said insulating bars, discrete switch units each having terminal feet detachably mounted on the respective terminal members and being removable independently from said terminal members, a crank member hinged to said flanges and extending across the front of said base plate between said cross bars and being operatively connected with said snap action mechanism beneath the base plate, each switch unit having a switch member slidable between said cross bars and each slidable switch member having a yoke removably connected with said crank member, and means for manually actuating said snap action mechanism from the front of said base plate, said switch units being individually removable without disturbing the line and load circuit connections or the crank member or snap action mechanism or the actuating means.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,824,137	Hammerly	Sept. 22, 1931
1,838,020	Hammerly	Dec. 22, 1931
1,856,448	Wadsworth	May 3, 1932
1,863,523	Hammerly	June 14, 1932
1,889,515	Hammerly	Nov. 29, 1932
1,892,854	Sachs	Jan. 3, 1933
1,894,543	Rowe	Jan. 17, 1933
2,050,378	Randall	Aug. 11, 1936
2,168,747	Christensen	Aug. 8, 1939
2,178,600	Miller-master	Nov. 7, 1939
2,216,298	Rowe	Oct. 1, 1940
2,263,760	Currie	Nov. 25, 1941
2,394,090	McFarland, Jr.	Feb. 5, 1946
2,467,307	Hammerly	Apr. 12, 1949
2,468,235	Rowe	Apr. 26, 1949
2,515,449	Hammerly	July 18, 1950