Jan. 12, 1937. R. N. SAXBY 2,067,246

MOUNTING ARRANGEMENT FOR ELECTRICAL APPARATUS

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Fig. 1.

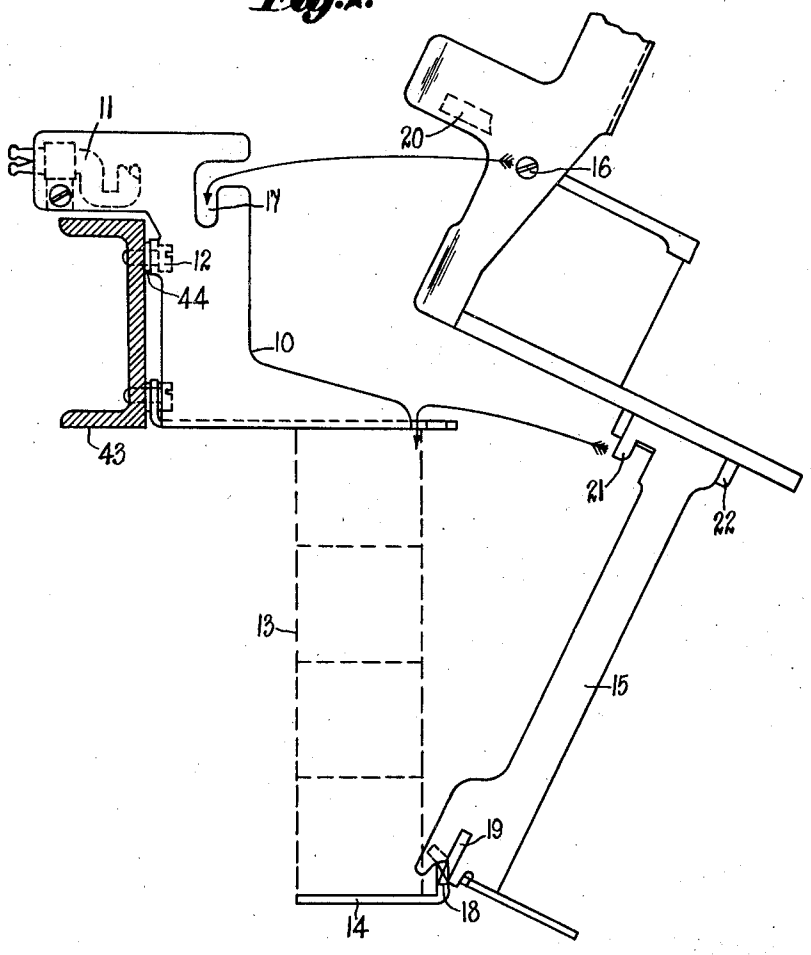

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Fig. 2.

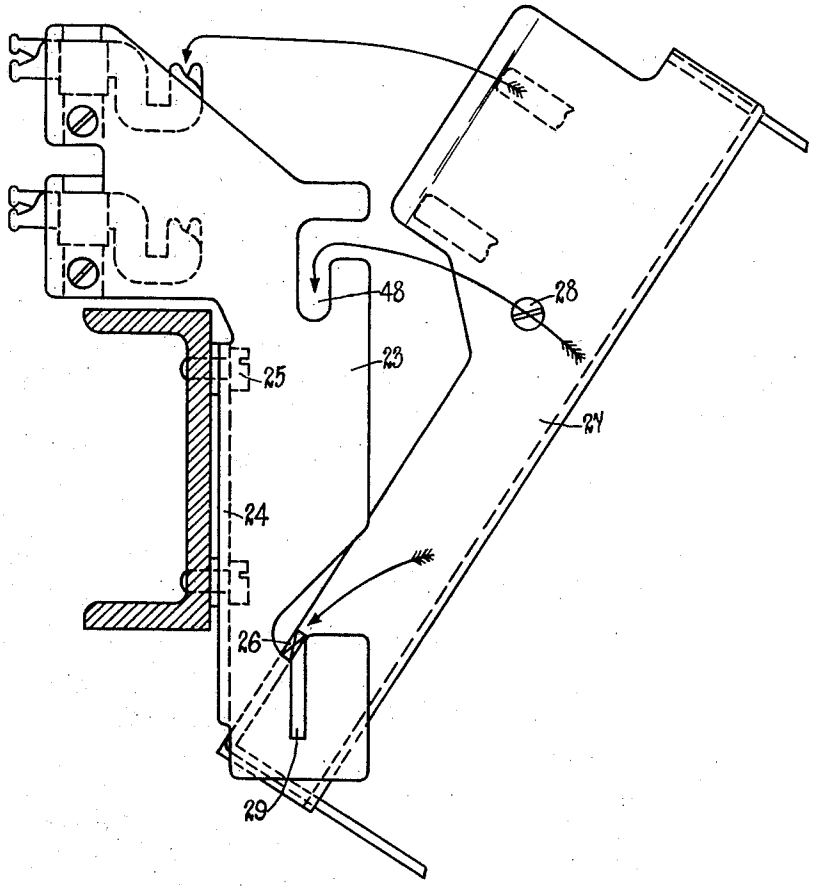

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Fig. 3.

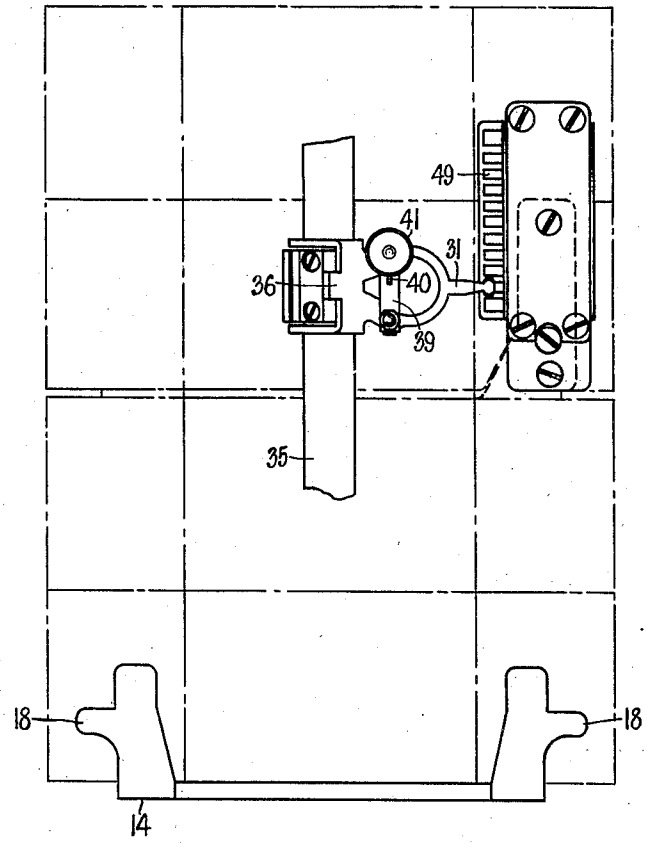


Fig. 4.

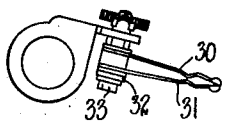
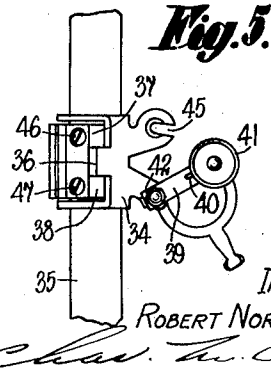


Fig. 5.



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Patented Jan. 12, 1937 2,067,246

UNITED STATES PATENT OFFICE

2,067,246

MOUNTING ARRANGEMENT FOR ELECTRICAL APPARATUS

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Application January 2, 1935, Serial No. 171
In Great Britain January 5, 1934

4 Claims. (Cl. 179—91)

The present invention relates to mounting arrangements for a number of pieces of electrical apparatus which may be of similar nature and more particularly automatic switches and similar apparatus as used in telephone systems.

One arrangement widely adopted hitherto has been to mount pieces of apparatus along a metal shelf member provided at regularly spaced intervals with suitable apertures or the like, adapted to register with the fixing means of the pieces of apparatus to support them in their mounted positions. This method of mounting is unsuitable in cases where a very definite degree of accuracy in location is required owing to unavoidable variation in the dimensions of the commercial shelfing material used. The chief object of the invention is the provision of an improved mounting arrangement of the above type in which the degree of accuracy required can be obtained with ordinary methods of manufacture without resort to special materials or special care in construction.

According to one feature of the invention therefore, each piece of apparatus is supported by a single individual mounting member secured to a common support independently of the piece of apparatus.

According to another feature of the invention the supporting member is provided with guides about which a piece of apparatus being placed in position performs a movement of rotation.

The invention will be better understood from the following description of one method of carrying it into effect, reference being had to the accompanying drawings comprising Figs. 1–5.

Fig. 1 shows a mounting arrangement according to the invention suitable for a switch substantially identical with that disclosed in my application Serial No. 634,265 filed 22nd September 1932 now Patent No. 2,028,689, Jan. 21, 1936. Only sufficient of the framework of this switch as is necessary for the understanding of the invention has been shown in the drawings, and the switch is illustrated in the act of being swung into its mounted position.

Fig. 2 shows a corresponding mounting arrangement for a group of telephone relays or like apparatus not involving a mechanism.

Fig. 3 is a front view of part of the arrangement shown in Fig. 1 and illustrates particularly an improved vertical wiper adapted to be carried by the switch shaft and to co-operate with a vertical bank of contacts fastened to the right hand side of the main bank assembly. As is well-known, vertical wipers and banks are ordinarily provided when the switch is required to perform a vertical selecting function, as for example in the case of line finders, and the particular feature of this construction is that the wiper blades can be hinged out of engagement with the bank to enable the full advantages of the novel mounting arrangement to be obtained.

Figs. 4 and 5 show additional details of this vertical wiper construction.

Referring now to Fig. 1, the supporting or cradle member 10 comprises a substantially U-shaped pressing having sides bent up at right angles and with their free ends connected together by means of the shelf jack 11 shown dotted. One such cradle member is provided for each of the pieces of apparatus to be mounted and these members are fastened to the channel shelf member 43 by means of screws 12 passing through three lugs pressed up from the cradle, that is, one from each of the side members and one from the platform member of the cradle. Washers 44 are provided behind the lugs and the screws thread into the shelf member. The advantage of this type of three-point suspension is that it avoids distortion and also facilitates the adoption of a flexible anti-microphonic mounting if this should be required. The main contact bank assembly 13 represented by the dotted rectangles is rigidly fastened to the platform of the cradle and has secured to its lower end a bracket 14 (the shape of which is better seen from Fig. 3) which traps the lower portion of the switch when in its mounted position and also functions as a guide on which the switch pivots while it is being swung into position. It will be understood that this bracket is not part of the lowermost contact bank but is bolted thereto as a separate element thereby avoiding the necessity for stocking different kinds of banks.

When the switch is to be mounted in position, the side members 15, which it will be understood support the wiper carriage and shaft (not shown), are rested on the bracket member 14 as shown in the drawings, and the whole switch is then swung forward until the cheese-head screws 16 on each side of the cast frame enter the bayonet slots 17 in the cradle member. In this position the horizontal pivot members 18 of the bracket 14 are in line with the slots 19 in the side members of the switch which may then be lowered until the switch jack 20 (portion only of which is shown dotted) engages with the shelf jack 11 to complete the circuit connections. At the same time the pegs 21 which form part of the side members of the switch enter holes

in the platform of the cradle member as indicated by the arrow and provide a still further means of holding the switch securely in its mounted position.

It should be explained here that the weight of the switch is taken partly by the screws **16** which register with the bayonet slots and partly by a rectangular block **22** which is moulded to the base of the cast frame and rests on the platform of the cradle member. Ample clearance is provided in the slots **19** and pegs **21** of the side members of the switch to enable this to take place. The resting position of the switch is therefore solely dependent upon the shape of the cast frame and the shape of the accurately-dimensioned cradle.

The relay group mounting shown in Fig. 2 makes use of a generally similar cradle member, only in this case the platform is not required and the side plates **23** are bent up at right angles to the back plate **24**. Three point suspension is again employed by means of screws **25** passing through triangular positioned holes in the back plate and provision is made for two sets of jacks as shown. Again the apparatus is pivoted into its mounted position only in this case it is more convenient for the projections **26** to be provided on the side of the relay group frame while the slots **29** with which they register are provided in the cradle member **23**. When the group is swung into position the cheese head screws **28** projecting from the side of the mounting plate come into engagement with the bayonet slots **48** in the cradle member and the group is then lowered into position so that the spring jacks come into engagement to complete the circuit connections. In this case the group is supported solely by means of the cheese head screws **28** and is trapped at its lower end by the projections **26** which are located in the slots **29** in the cradle member.

With this construction it is also possible for the relay group to be hung on the shelf in a leaning position as shown by reason of the lower part of the mounting plate jamming against the back of the cradle as the group is pivoted forward, and this feature is particularly useful during testing since it enables the group to be completely disconnected electrically without removing it from the shelf.

Referring now to Figs. 3, 4, and 5 which show the construction of the vertical wiper, it will be seen from Fig. 4 that this comprises a pair of spring blades **30** and **31** which are secured together and to the fibre strip **32** by means of nuts and bolts **33** so as to form a rigid unit and in such manner that the blades establish electrical contact with each other but are insulated from the fastening bolts. The vertical bank **49** with which the wiper co-operates is double-sided and comprises two rows of ten contacts arranged down opposite sides of a block of insulating material and these are connected together in pairs by the blades **30** and **31** depending upon the level selected. The bracket **34** which carries the wiper assembly is supported on the shaft **35** as shown in Figs. 3 and 5 so that it is free to rotate thereon but is caused to share its vertical movement owing to the turned-over tongue **36** engaging between the split collars **37** and **38** which are rigidly clamped to the shaft by screws **46** and **47**.

As will be seen from Fig. 5, the lower clamping bolt of the wiper assembly, which functions as a pivot, is secured to the bracket by means of an ordinary hexagon nut while the upper clamping bolt is fastened by means of a finger screw **41** provided on its underside with a tapered collar which when screwed home seats itself in the countersunk hole of the bracket so as to lock the wiper assembly accurately in position. It will be noticed that a slot **45** communicates with the countersunk hole of the bracket to permit the hinging movement of the wiper assembly when required.

In order to guard against subsequent loosening of the assembly owing to vibration during operation, the fastening bolts are bridged by a flat springy strip of metal **39** provided with an indentation or rib **40** which engages with knurling on the underside of the finger screw **41** thus locking it in position. The opposite end of the springy strip **39** terminates in a tanged portion **42** which is bent up at right angles against one of the faces of the hexagon nut thus locking this also in position. This locking tang is important since as the lower bolt is to function as a pivot it is desirable that the hexagon nut shall only be fingertight.

When it becomes necessary to disengage the wiper blades from the bank the knurled finger screw **41** is slackened off sufficiently to remove the tapered collar clear of the countersunk hole in the bracket and the wiper assembly can then be hinged downwards as shown in Fig. 5 until the blades **30** and **31** disengage the bank contacts. This will be a normal preliminary to removing a switch from the shelf and involves considerably less trouble and risk of injury to the vertical wiper than if the switch had to be raised until the wiper was clear of the vertical bank.

I claim:

1. In a mounting arrangement, an electrical switch having a shaft carrying wipers, a mounting member carrying a bank of vertically disposed contacts for engagement by the wipers one after another as the shaft is vertically moved, means comprising bayonet and slot combinations for mounting the switch on the member, and means for rotating the wipers in a vertical plane independent of the shaft for disengaging the wipers from the bank before the switch is removed from the member.

2. A mounting arrangement such as claimed in claim 1 in which the wipers comprise two Y-shaped members pivoted for vertical rotation on one of the legs of the Y.

3. A mounting arrangement comprising an apparatus unit and a support unit, a bayonet on the lower end of one unit and a slot on the lower end of the other unit, a pin in the upper end of the apparatus unit and an L-shaped slot in the upper end of the support, said bayonet and the mouth of said first slot acting as a pivot point about which the apparatus is rotated until the pin enters the horizontal part of the L-shaped slot, said apparatus movable vertically after said rotary movement to cause the bayonet to enter its slot and said pin to move in the vertical part of the L-shaped slot to lock the units together.

4. A mounting arrangement such as claimed in claim 3 in which there is another bayonet and slot at the center point of the two units which engage only when the apparatus unit moves vertically.

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