Nov. 1, 1955 G. J. MUCHER 2,722,585

ELECTRIC RESISTOR

Filed Aug. 2, 1952

Fig. 2

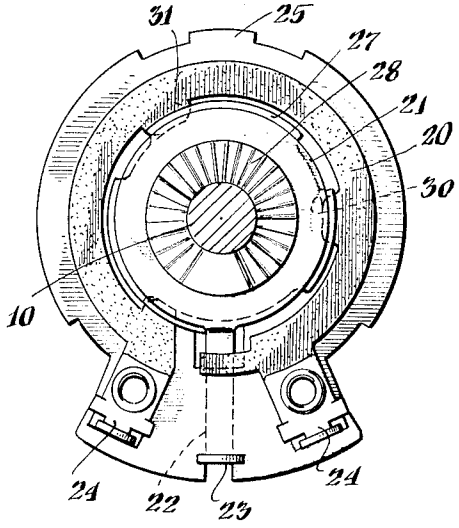


Fig. 1

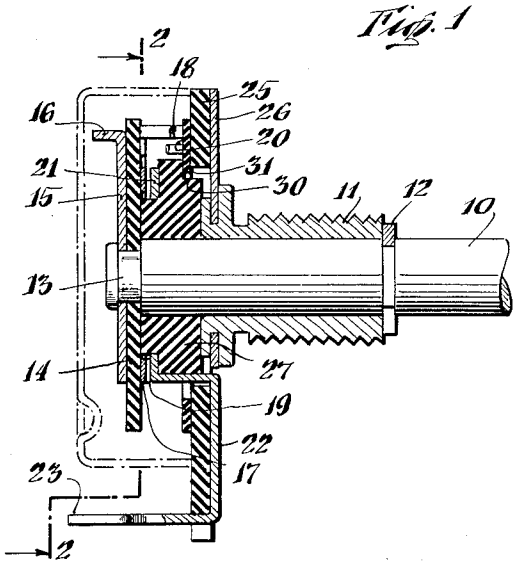


Fig. 3

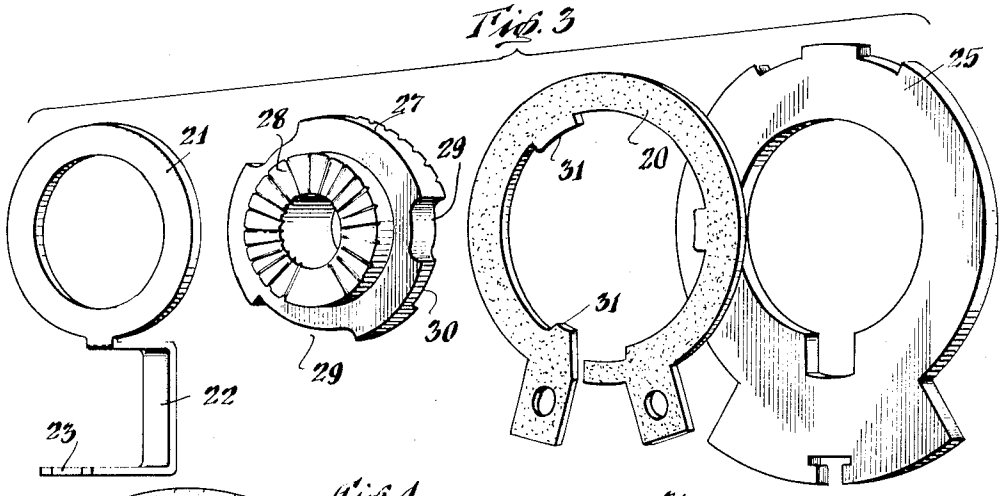
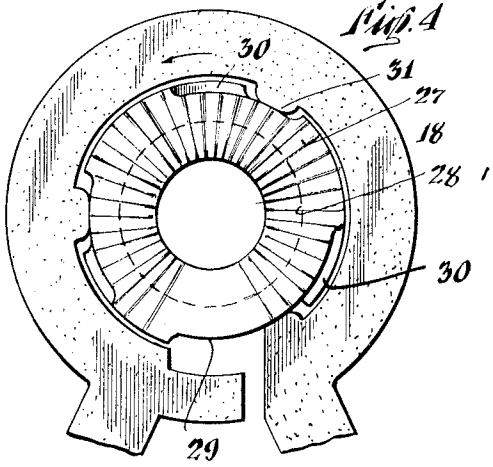


Fig. 4



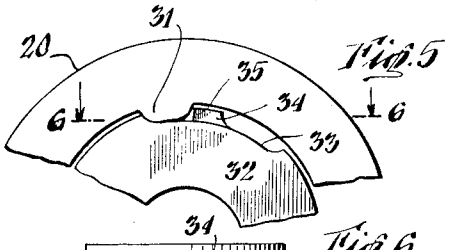


Fig. 5

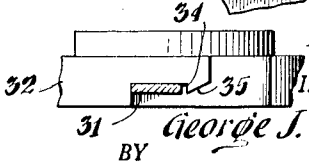


Fig. 6

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ELECTRIC RESISTOR

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Application August 2, 1952, Serial No. 302,449

5 Claims. (Cl. 201—55)

This invention relates to a structure to be embodied in an electrical control and by means of which structure improved results are obtained.

It is a primary object of the invention to furnish an assembly by means of which the resistance element and the collector ring of an electrical control are properly positioned and maintained.

A further object is that of providing a design which will reduce the danger of current leakage and will also serve to assure uniform current flows under identical settings of the duplicate controls.

Still another object is that of providing a control structure of simple design which may be readily produced and the parts of which may be assembled with the expenditure of minimum effort and time.

With these and other objects in mind, reference is had to the attached sheet of drawings illustrating practical embodiments of the invention and in which:

Fig. 1 is a sectional side view of a control embodying the present teachings;

Fig. 2 is a sectional face view taken along the line 2—2 and in the direction of the arrows as indicated in Fig. 1;

Fig. 3 is an exploded perspective view of the main parts providing the stationary portions of the assembly;

Fig. 4 is a reverse view of the resistance and the mounting therefor as included in the present structure;

Fig. 5 is a fragmentary face view showing an alternative form of structure over that shown in Fig. 4; and

Fig. 6 is a sectional view taken along the line 6—6 and in the direction of the arrows as indicated in Fig. 5.

Referring primarily to Fig. 1, the numeral **10** indicates an operating shaft which is rotatably supported within a bushing **11** and may be retained against axial movement in one direction with respect to the latter by means of a split ring **12** or other desired expedient. The inner end of shaft **10** provides a non-circular portion **13** which extends through openings of corresponding outline formed in an insulating disk **14** and a stop plate **15** which are secured to this shaft portion by conveniently heading over the extreme end of the same. Stop plate **15** preferably embraces an outward extension **16** cooperating with an inwardly extending portion forming a part of the cover of the assembly as shown in dot and dash lines in Fig. 1. Suitably secured against movement with respect to plate or disk **14** is a conducting member **17** which may take the form of a ring. This unit has extending from it spring arms **18** terminating in contacts to traverse a resistance and further arms **19** terminating in contacts to engage a wiper ring.

A resistance of any desired character may form a part of the control. Conveniently, it includes a coated strip or element **20** having a diameter corresponding to the path traversed by arms **18**. A collector ring **21** has a diameter corresponding to the path defined by the wiper arm or arms **19**. Preferably integral with ring **21** is an extension **22** continued in the form of a terminal **23**. Terminals **24** are connected one to each of the ends of resistance **20**. Resistance strip **20** is supported upon or

bears against an insulating body **25** conveniently of ring shape and which is in turn supported by a backing plate **26** preferably formed of metal. That plate is as shown secured to bushing **11**. The extension **22** of terminal **23** and ring **21** projects through openings and notches forming a part of the insulating body or mounting **25**. The terminals **24** are likewise secured to that body and in turn retain resistance strip **20** with respect to the same.

Interposed between the rotor assembly and the insulating support **25** is a unit in the form of a washer **27** constructed of non-conducting material. This washer presents on one face an upstanding collar or flange **28** encircling and defining its central aperture. The edge of the washer is formed with a suitable number of notches **29**. As shown especially in Fig. 4, these notches, in addition to extending through the entire periphery of the washer, also communicate with recesses **30** presenting bearing surfaces formed in the body of that periphery to one side of the notches. At this time, it is to be noted that the collar or flange **28**, while being preferably continuous as shown, might be interrupted if desired at any suitable number of points. In many respects it is preferred to have it continuous in that it will serve the function of a barrier where so constructed. Also as shown, various surfaces of the washer may be knurled while others may be smooth. This will enable the operator either visually or by touch to locate the washer in desired position within the assembly. It is again apparent that these surfaces might be modified as desired.

The resistance strip **20** is formed with inwardly extending projections **31**. These spacing and areas of the latter correspond to the notches **29**. Therefore, the washer may be passed through the space defined by the resistance strip or element with the protrusions **31** permitting of this by movement through these notches. With the projections **31** disposed in line with the periphery of washer **27** at points intermediate the side faces of the latter, that washer may be turned in a counterclockwise direction as viewed in Fig. 4. With such turning, the projecting portions **31** will be received within notches **30** and engage the bearing surfaces furnished thereby. Under these circumstances, the washer will be retained against axial displacement.

As in Figs. 5 and 6 a resistance element **20** corresponding in structure to that aforedescribed may be used. The washer **32** in this instance will be formed with notches **33** corresponding to notches **29**. However, the entrance to the recesses **34** receiving the protuberances **31** will be defined by inclined surfaces terminating in shoulder portions. These, in effect, will furnish latches. Therefore, with the same turning of the washer effected with respect to the resistance, it follows that the projections **31** will cam over the surfaces **35** and ride into the spaces **34** to be retained therein against any accidental subsequent turning of the washer. With the latching action effected as the projections ride over the shoulders at the ends of surfaces **35** the operator would be aware that the parts have assumed their proper relative positions.

By bearing against the resistance strip, the washer serves to retain the same in proper position against the face of insulating ring or disk **25**. Thus, any tendency of the resistance strip to curl or warp will be prevented and the strip will receive proper support independent of that offered by the terminals **24**. This washer through its collar **28** or equivalent structure also provides a proper bearing surface in contact with the inner face of the insulating disk **14**. Additionally, it properly supports the collector ring **21**, and also serves to maintain that ring in properly centered position by means of the flange **28** or its equivalent.

Accordingly, the collector ring does not have to depend

for centralization upon its extended terminal portion as heretofore resorted to. Additionally by means of an element such as the washer, it is practicable to provide a preliminary or sub assembly and only thereafter apply the washer over the shaft. By such an expedient, the rotor may be inserted prior to the time that all elements are brought together. Aside from avoiding damage to the parts, this enables an operator to more readily complete the assembly.

Thus, among others, the several objects of the invention are shown; obviously, numerous changes in the structure and rearrangement of the parts might be resorted to without departing from the spirit of the invention as defined by the claims.

I claim:

1. A sub-assembly for use in an electrical control, said assembly including in combination a collar member, a resistance member encircling the same, one of said members being formed with a notch in that edge which is adjacent the other member and with a bearing face to one side of said notch, a projection extending from the adjacent edge of said other member and which projection moves from a position adjacent one face of the notched member and into that notch as said members are shifted towards each other into substantially the same plane, said members being thereupon relatively rotatable to cause said projection to engage with said bearing surface and prevent movement of said members away from each other.

2. An assembly as specified in claim 1, such collar member being formed with a plurality of notches and the bearing surfaces to one side of the same, said resistance member being formed with a corresponding number of projections, each to enter one of said notches and to engage adjacent bearing surfaces.

3. An assembly as specified in claim 1, and latch means forming parts of said members, said latch means cooperating as said bearing surface is engaged by said projection to resist relative rotation of said members in a direction reversed to that aforenamed.

4. An assembly as specified in claim 1, said notch being formed in said collar member and a collector ring overlying said one face of said member and obstructing the notch formed therein.

5. An assembly as specified in claim 4, an insulating body underlying said resistance member and also formed with a notch and an extension of said collector ring extending from the latter, past said collar and resistance member and through the notch of said insulating body.

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