

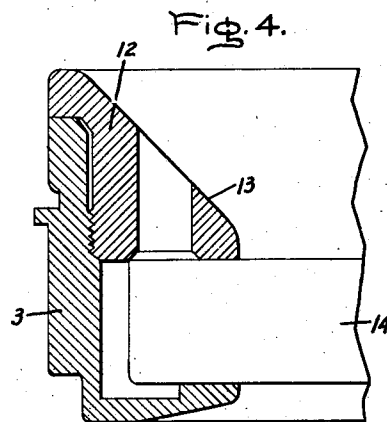
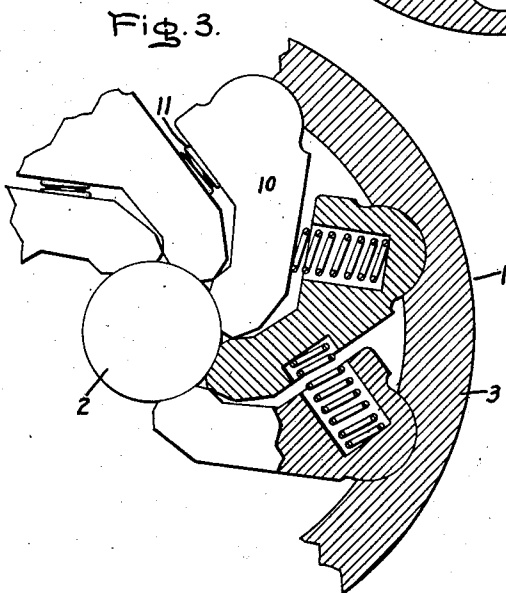
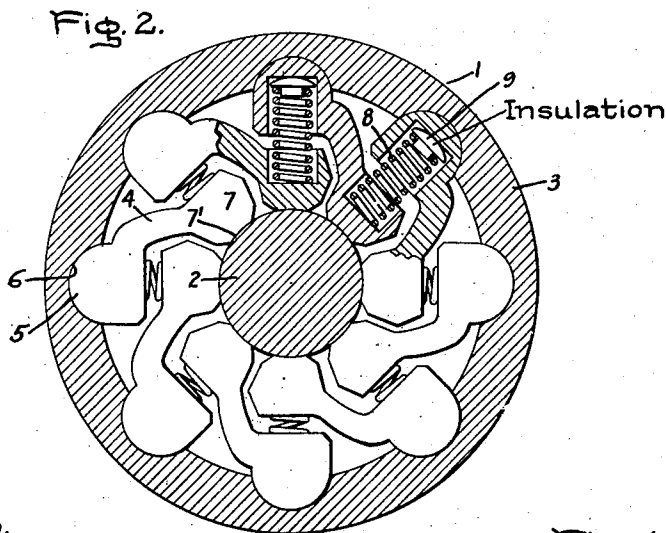
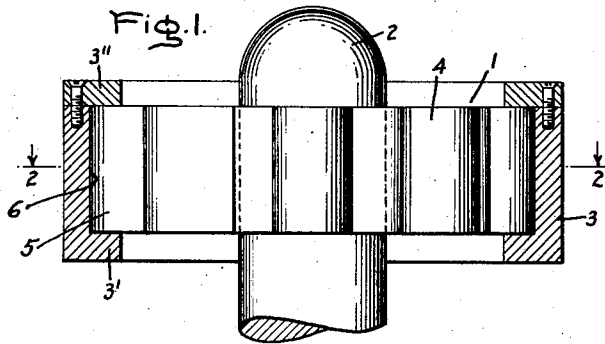
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O. LEOPOLD

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ELECTRIC CONTACT

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Inventor:
Otto Leopold,
by *Harry E. Sunham*
His Attorney.

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ELECTRIC CONTACT

Otto Leopold, Berlin-Neukölln, Germany, assignor to General Electric Company, a corporation of New York

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8 Claims. (Cl. 173—363)

My invention relates to electric contacts, and more particularly to electric contacts of the multiple element, or segmental type, such as, for example, those used in electric circuit breakers wherein a movable rod contact coacts with a socket contact formed by a plurality of radially positioned segments which are resiliently biased into contact engagement with the rod contact.

The principal object of my invention is the provision of an improved electric contact of the aforesaid character that is efficient electrically, simple, rugged and compact in construction and which has a minimum number of parts.

My invention will be more fully set forth in the following description referring to the accompanying drawing, and the features of novelty which characterize my invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

Referring to the drawing, Figs. 1 and 2 are elevational and plan views, respectively, partly in section of an electric contact construction embodying the present invention; Fig. 3 is a view similar to Fig. 2 showing a modified form of the contact construction, and Fig. 4 is a fragmentary sectional view illustrating a further modification.

Referring more particularly to Figs. 1 and 2, the terminal members to be interconnected comprise relatively movable contact structure including a fixed socket type contact structure 1 and a coacting movable contact rod 2 movable concentrically with respect to the socket contact along a rectilinear path. The fixed socket contact in the present instance comprises a contact carrier or support 3 which may consist of a cylinder or sleeve of conducting material forming one terminal of a switch. The support 3 is provided with a retaining flange 3' at one end and a detachable flange 3'' at the other end for holding the contact elements 4 hereinafter described in proper position.

Referring to Fig. 2 which is in part a sectional view along the line 2—2 of Fig. 1, each contact element or segment 4 is provided with a contact portion 5 of cylindrical contour engaging the contact support 3 in a corresponding recess 6. The element 4 therefore can rotate about its seat while maintaining good contact engagement therewith. The opposite end of the element 4 also comprises a contact portion 7 having a contact surface at 7' adapted to engage and wipe the rod contact 2. It will therefore be apparent that when the contact portions 5 and 7 of each element are biased into good contact engagement with the terminal members 3 and 2 respectively

a circuit is completed between the terminals of the switch.

For the purpose of simplifying and also rendering more effective the biasing means for obtaining proper contact pressure, particularly for large power currents, the contact elements are overlapped as illustrated and a single resilient element such as a spring 8 is utilized for each pair of elements so as to establish contact pressure between the contact portion 5 of one element and its seat, and also contact pressure between the portion 7 of the overlapping element and the rod contact 2. In order to eliminate the spring as a current conductor, one seat of the spring is provided with an insulating member 9.

In the arrangement shown, each contact portion 7 is urged by a radial spring force into engagement with the rod contact 2, and each contact portion 5 is similarly urged into contact engagement with the support or terminal member 3, the number of springs required for obtaining proper contact pressure at both ends of each contact element 4 being equal to the number of said elements. This construction is therefore not only very efficient by reason of the complete utilization of spring tension, but also is very simple by reason of the comparatively few springs required, and the absence of flexible conductors or "pig-tails" entailing soldered or bolted joints generally used for connecting the resiliently biased segments to the fixed terminal portion.

When the rod contact 2 is moved to the open circuit position by downward movement, as viewed in Fig. 1, the elements 4 act as stops for each other so that the inner circular space formerly occupied by the rod 2 is merely restricted in area. The rounded end of the contact rod in the circuit-closing operation is therefore effective by cam action on the elements 4 to compress the springs 8 and move to the closed circuit position shown.

In Fig. 3 there is shown a generally similar arrangement wherein the contact elements 10 are biased in the manner above described by springs 11 so that the contact surfaces of the elements 10 are urged by tangential force into contact with the rod 2. In certain cases this may produce a wipe action tending to clean the contact surfaces. The contact elements are otherwise biased by a spring common to each pair of elements in the manner described in connection with Figs. 1 and 2.

Fig. 4 illustrates a modification of the contact support wherein the socket contact is used is a gas blast circuit breaker. In this case the

gas exhaust is preferably of nozzle shape, and the contact support 3 is accordingly provided with a flanged ring 12 having a desired flared contour 13 for the gas exhaust. The contact elements indicated at 14 can be mounted in the support in any suitable manner for coaction with a rod contact (not shown).

It will be noted that the contact arrangement above described includes not only a resilient element or spring common to each pair of contact elements, so that the entire spring force is utilized for obtaining contact engagement, but also that each contact element is acted on by two separate springs at its two contacting surfaces respectively. When the contact elements are overlapped as shown, this results in a very compact and efficient socket contact requiring no soldered or bolted joints for flexible conductors and involving a minimum of contact surfaces which are maintained clean by the wipe action thereat.

It should be understood that my invention is not limited to specific details of construction and arrangement thereof herein illustrated, and that changes and modifications may occur to one skilled in the art without departing from the spirit of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. An electric contact for interconnecting two relatively movable members disposed in concentric arrangement comprising a plurality of elements disposed between said members and each electrically engaging said members respectively, and means coacting with any two adjacent elements for resiliently biasing a portion of each element into engagement with said members respectively.

2. An electric contact for interconnecting two relatively movable members comprising a plurality of conducting elements each biased into contact engagement at its opposite ends with said members respectively, and mounted with respect to one of said members for limited movement, and a compression spring mounted between ends of adjacent contact elements for biasing said ends into engagement with said relatively movable members respectively.

3. An electric contact for interconnecting a pair of terminal members disposed in concentric arrangement comprising a plurality of conducting elements each electrically engaging said members respectively, said elements being arranged in a circle between said members, and spring means common to any two adjacent elements for biasing each element into contact engagement with both said members respectively.

4. An electric contact for interconnecting a pair of terminal members including a cylindrical conductor and a rod conductor adapted to be positioned concentrically thereof, comprising a plurality of conducting elements radially positioned about said rod, each element engaging said terminal members respectively, and a spring coacting with each pair of said elements for biasing a portion of one element into contact engagement with said cylindrical conductor and a por-

tion of said other element into contact engagement with said rod arranged so that each element is correspondingly biased at its opposite ends by springs equal in number to the number of said elements.

5. An electric contact of the socket type for interconnecting relatively movable plug and socket members comprising a plurality of conducting elements concentrically positioned around said plug member and within said socket member, and a plurality of springs corresponding in number to said elements for biasing said elements into contact engagement with said members respectively, said springs arranged between said elements so that each element is biased at its two contact surfaces by separate springs and so that each spring acts on a pair of contact elements.

6. An electric contact for interconnecting a pair of terminal members including a cylindrical conductor in which a rod conductor is concentrically positioned, comprising a plurality of conducting elements mounted within said cylinder and surrounding said rod, each element being seated for rotative movement in said cylinder and adapted to engage in wipe contact said rod, said elements being positioned in overlapping relation, and a plurality of resilient members corresponding in number to said elements coacting with said elements, so that each element is biased into contact engagement at its seat of rotation and at its rod contacting surface by individual resilient members and each pair of elements is acted upon by a resilient member common thereto.

7. An electric contact of the socket type comprising a generally circular conducting contact support, a plurality of conducting elements circumferentially arranged within said support, each element being in movable contact engagement with said support and adapted also to engage a centrally disposed coacting contact rod, said elements being in overlapping relation so that the rod contacting portion of one element substantially overlies the support contacting portion of an adjacent element and a spring for each pair of elements positioned between said contacting portions for biasing the same radially into current carrying contact engagement.

8. An electric contact of the socket type comprising a generally circular conducting contact support, a plurality of conducting elements circumferentially arranged within said support, each element being in movable contact engagement with said support and adapted also to engage a centrally disposed coacting contact rod, said elements being in overlapping relation so that the rod contacting portion of one element substantially overlies the support contacting portion of an adjacent element and a spring for each pair of elements positioned between said contacting portions for biasing one element into contact engagement with said support and the other element in a tangential direction into contact engagement with said rod.

OTTO LEOPOLD.