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PUSH-BUTTONS

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Fig. 1

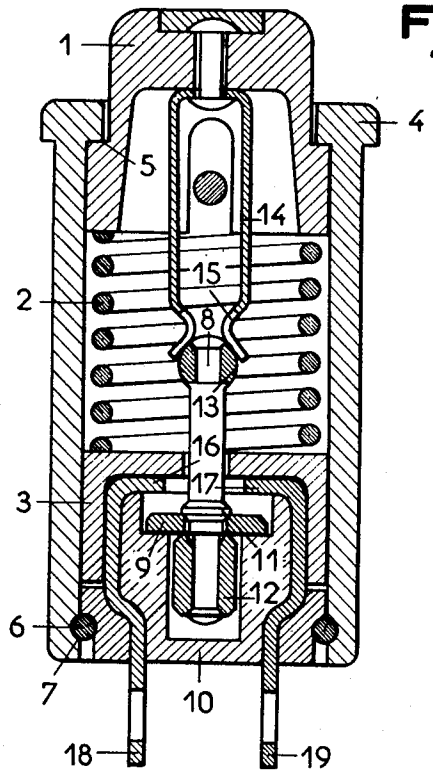
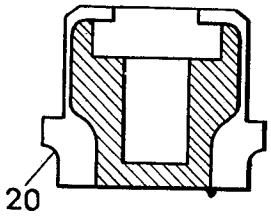


Fig. 2



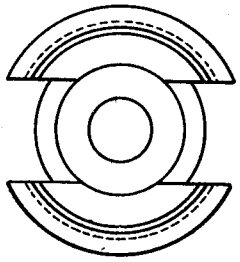
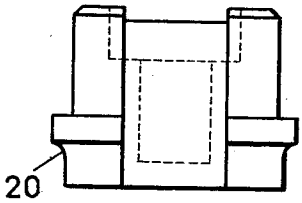


Fig. 3

Fig. 4



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PUSH-BUTTONS

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The invention relates to push-buttons, more particularly to push-button contactors, and its main purpose is to provide a muscular sensation to indicate that the contact has been effectively accomplished.

Another aim of the invention is a push-button contactor in which the closing and opening of the contacts is effected very abruptly.

The push-button according to the invention comprises a movable member carrying the junction member of two fixed contacts or, if necessary, the movable contact, the said movable member being provided with a spherical or cylindrical surface or, more generally, a curved surface having a symmetry plane and, on both sides respectively of the symmetry plane, a tangential plane parallel to the symmetry plane and two springs one on each side of the said symmetry plane, the said springs exerting a pressure in such manner that the axial component changes its direction when the contact points pass the tangential points of the said tangential planes parallel to the symmetry plane.

In the accompanying drawings:

Figure 1 is a vertical section on the symmetry plane of the operating surface of a push-button according to the invention;

Figures 2, 3 and 4 are detailed views of a member of the said push-button.

In Figures 1, 2, 3 and 4, **1** designates the button on which the action is exerted against the action of a coil spring **2** which bears on a member **3**. The totality is housed in a cylindrical casing **4** comprising a shoulder **5** which forms a stop for the button **1**, and a semi-cylindrical groove **6** for the packing ring **7**.

For the purpose of easy assembly the member **3** is preferably formed in two symmetrical parts.

The mobile member **8** carries the conducting bridge **9** which simultaneously constitutes a supporting surface by means of which the member **8** seats on the member **10**. The shoulder **11** of the member **8** maintains the bridge **9** on the shank **8** against the guide member **12** but with sufficient clearance to allow the bridge the few degrees of oscillation necessary for the contact to be free.

The movable member **8** carries the operating surface **13** on which are symmetrically supported two leaf-springs **14** which are fixed in any suitable manner to the button **1**.

The surface **13** is pherical or cylindrical, the axis of the cylinder thus being perpendicular to the plane of the figure, the springs **14**, which may be helical or of the leaf type, being supported on the cylindrical surface **13** in the manner of a generatrix. The springs **14** are shaped at their ends in such manner as to have a cambered portion **15** in order to create an axial component of the pressure exerted in opposite directions on both sides of the symmetry plane of the cambered portion. There may be provided in the region of the cambered portion a gap to facilitate the passage of the shank **8**.

The operation is as follows:

When the button **1** is pressed, the axial component of the pressure exerted on the surface **13** by the springs **14** tends to press the member **8** on to its seating; when the cambered portion passes by the dead centre the change of direction of the axial component causes the mobile member **8** to move strongly upwards and the bridge **9** will close the circuit abruptly by joining the terminals **16** and **17**. The travel of the button is limited by the stop **21**.

When the button **1** is released, the spring **2** returns the springs **14** upwards while urging the bridge **9** against the terminals during the initial period of travel. When the dead centre has been passed, the axial component causes the member **8** abruptly to descend and separates the bridge **9** from the terminals, thus opening the circuit.

The simplicity of the construction is due to the special shape of the member **10**. The latter is provided for the purpose of locking the flat conductors **18**, **19** between itself and the bell-shaped member **3**.

However, the member **10** might be provided for the purpose of locking the flat conductors between itself and the casing **4**.

The said member **10** comprises a moulding **20** forming a shoulder for the packing ring **7**. It likewise comprises suitable gaps which correspond to the thickness of the conductors. The terminals **16** and **17** are obtained by merely bending the conductors between the members **3** and **10**. The member **10** further has groovings suitable for the bridge **9** and for guiding the member **12**.

Assembly is easily effected.

After an easy assembly of the members **8**, **9**, **12**, then of **3**, **10**, **18**, **19**, the whole is pushed against the action of the spring **2** until the packing ring can be placed in position, while dismantling is also easy, it being sufficient to release the packing ring.

The simplicity of assembly is therefore obtained by using the action of the opposing spring of the button **1** for the purpose of bearing the stop of the said opposing spring and bearing the contact-carrier member against a key member, for example a packing ring.

I claim:

1. In an electrical push button having a housing through which centrally thereof the axis of the push button extends generally vertically, a movable shank in said housing coaxial with said push button and comprising at one extremity a curved surface having a symmetry plane and two tangential planes parallel to said symmetry plane and to said axis, said shank having guide means and carrying a contact member at a remote distance from said curved surface, said push-button carrying a pair of springs disposed parallel to said tangential planes, said springs exerting a yielding pressure in opposite directions on said curved surface.

2. In an electrical push button switch having a housing through which centrally thereof the axis of the push button extends generally vertically, a movable shank in said housing coaxial with said push button and comprising at one extremity a curved surface having a symmetry plane and two tangential planes parallel to said symmetry plane and to said axis, said shank carrying guide means and carrying a contact member at a remote distance from said curved surface, said push button carrying a pair of springs disposed parallel to said tangential planes, said springs having a curved portion in front of said curved surface and exerting by means of said curved portion a yielding pressure in opposite directions on said curved surface.

3. In an electrical push button switch having a housing through which centrally thereof the axis of the push button extends generally vertically, a movable shank in said housing coaxial with said push button and com-

prising at one extremity a sphere and carrying a contact member at a remote distance from said sphere, guide means for said shank, said push button carrying a pair of springs disposed tangentially to said sphere, said springs exerting a yielding pressure in opposite directions on said sphere.

4. In an electrical push button switch having a housing through which centrally thereof the axis of the push button extends generally vertically, a movable shank in said housing coaxial with said push button and comprising at one extremity a sphere and carrying a contact member at a remote distance from said sphere, guide means for said shank, said push button carrying a pair of springs disposed tangentially to said sphere, said springs having a curved portion in front of said sphere and exerting by means of said curved portion a yielding pressure in opposite directions on said sphere.

5. In an electrical push button switch having a housing through which centrally thereof the axis of the push button extends generally vertically, a movable shank in said housing coaxial with said push button and comprising at one extremity a cylindrical surface having its axis perpendicular to said first axis and carrying a contact member at a remote distance from said cylindrical surface, guide means for said shank, said push button carrying a pair of springs tangential to said cylindrical surface and exerting a yielding pressure in opposite directions on said cylindrical surface.

6. In an electrical push button switch having a housing through which centrally thereof the axis of the push button extends generally vertically, a movable shank in said housing coaxial with said push button and comprising at one extremity a cylindrical surface having its axis perpendicular to said first axis and carrying a contact member at a remote distance from said cylindrical surface, guide means for said shank, said push button carrying

a pair of springs disposed tangentially to said cylindrical surface, said springs having a curved portion in front of said cylindrical surface and exerting by means of said curved portion a yielding pressure in opposite directions on said cylindrical surface.

7. An electrical push button switch comprising in combination a cylindrical housing, a push button having its axis extending into said housing, stop means to limit the movement of said push button, a cylindrical hollow and closed body of insulating material disposed in said housing, a spring in said housing between said hollow body and said push button, a movable shank coaxial with said casing and having a part extending into said hollow body and comprising at its extremity outside of said hollow body a curved surface having a symmetry plane and two tangential planes parallel to said symmetry plane and to the axis of the push button, said shank carrying a contact member on the part inside of said hollow member, guide means for said shank, said hollow member having fixed terminals therein to co-operate with said contact member, said push button carrying a pair of springs parallel to said two tangential planes, said springs having a curved portion in front of said curved surface and exerting by means of said curved portion a yielding pressure in opposite directions on said curved surface.

8. An electric switch as claimed in claim 7, the hollow body having a cylindrical member, the terminals being locked between said cylindrical member and said hollow member, said cylindrical member having a coaxial groove co-operating with the shank in its axial movement.

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