Oct. 17, 1967 R. SCHEIDIG 3,348,174

BLADE ARMATURE CONTACT IN SEALED HOUSING

Filed March 1, 1966

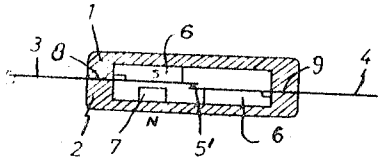


Fig. 1

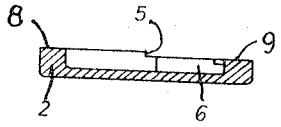


Fig. 2

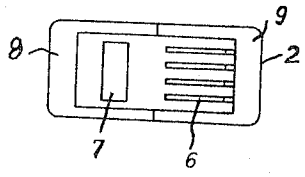


Fig. 3

United States Patent Office 3,348,174 Patented Oct. 17, 1967

3,348,174

BLADE ARMATURE CONTACT IN SEALED HOUSING

Rudolf Scheidig, Stuttgart-Feuerbach, Germany, assignor to International Standard Electric Corporation, New York, N.Y., a corporation of Delaware

Filed Mar. 1, 1966, Ser. No. 530,879
Claims priority, application Germany, Mar. 16, 1965, St 23,519
3 Claims. (Cl. 335—153)

The invention relates to magnetically operable contacts and particularly to multiple contacts including contact blades sealed in an insulated housing.

The requirements prevailing in telephone engineering and in other fields for relay contacts of uniform quality, which also have a very long lifetime, are met by inserting contacts into sealed housings which are either filled with protective gas or evacuated of air. The thus sealed contacts are actuated by magnetic fluxes. Aside from the contact making quality of such contacts, the problem of economical production is of importance. Particular difficulties which arise during production concern adjustment of contact blades and settings of operating air-gaps, respectively.

The U.S. patent specification 2,535,400 discloses an arrangement in which the operating air-gap is set by the particular shape of a base portion of the housing. To this end, the base portion is equipped with two ridges of different heights against which the contact blades rest after assembly of the housing. The difference in height of the ridges, less one contact plate thickness, results in an operating air-gap. A disadvantage of such an arrangement is that both ridges of the selected portion are manufactured during production exactly to measurements and it has been found that the longer contact plate must be embedded. Thereby solely in the base portion, variations in dimension may occur, concerning the stops as well as the contact plate material which cannot be corrected afterwards, so that the precision of the air-gap is in question.

It is an object of the invention to provide a blade armature contact device which is economical to produce, which provides multiple contacts in a miniature construction, and the housing of which is formed in such a manner that the operating air-gaps need no further adjustment. This is achieved, according to the invention, by use of a separating space in the housing formed by a step between two parallel plane surfaces, which may be grooved to leave upstanding ribs, onto which the blades are placed as flat punched-out parts. The height of the step determines the operating air-gap without the necessity of adjustment.

It is particularly favorable for production of uniform parts are used as housing top and housing bottom and are put together correspondingly.

The contact can be modified into a break-contact by employing a permanent magnet. Preferably a ceramic magnet is used which, according to a further embodiment of the invention, is arranged in one housing portion so that it effects all contact blades simultaneously, if several contacts are juxtaposed, and keeps them in a closed position.

The invention will now be described with the aid of

the accompanying drawings which show advantages resulting from production according to the invention. The accompanying drawings show:

In FIG. 1, a sectional view of a blade armature, or relay, contact including the housing according to an embodiment of the invention,

FIG. 2 shows a sectional view of the bottom part of the housing of the blade armature contact shown in FIG. 1, and

FIG. 3 shows a view of the bottom part of the housing shown in FIG. 2, as seen from above, but including the permanent magnet shown in FIG. 1.

In FIG. 1 the two parts of the housing are marked **1** and **2**. The housing may consist of glass, ceramics or plastics. The upper part of the housing **1** and the lower part of the housing **2** are separated by a space or step between two parallel flat surfaces, **8** and **9**, the faces of which lie in parallel planes. The faces of ribs **6** lie in the planes of surfaces **8** and **9** to support the blade armatures **3** and **4** as flat punched-out parts. The surfaces are spaced apart by a step **5**, which determines by its height, the operating air-gap without adjustment. Spaces, not shown, may be provided along and between the surfaces **8** and **9** of the housings **1** and **2** to accommodate the contact armatures, or blades, **3** and **4**. The surfaces **8** and **9** can be formed by pressure with sufficient exactness in the small dimensions of the provided parts. If very high requirements with regard to the exactness of dimensions must be met, mechanical grinding is possible after the initial formation. The contact according to the invention may have a number of contact blades side by side. This type is particularly suitable for the installation of a permanent magnet **7**, which effects several blades simultaneously and which keeps them closed in the non-operative position. In a complete operative switch a second magnet (not shown) may be placed outside the housing to open the normally closed contacts. Either an electromagnet in the form of a coil or a movable permanent magnet can be used as the second magnet. If the housing is made of ceramics, the parts **1** and **2** may be connected through a suitable glaze.

FIG. 2 shows the bottom part of the housing in detail with the step **5**, determining the operating air-gap between parallel surfaces **8** and **9** of the respective parts of the housings **1** and **2**. The ribs **6** serve as supports for contact blades, or contact armatures, and determine the airspace **5'** to be equal to the step or space **5**, less the thickness of the blades **3** and **4**.

FIG. 3 shows the position of the permanent magnet **7** in the bottom part of the housing **2**, seen from the top. Moreover, the arrangement of the ribs is shown. It will be recognized that the housing **2**, with its ridges **6** will, in a preferred embodiment, be duplicated for use as the top element **1** either with or without the permanent magnet **7**.

What is claimed is:

1. A multiple contact comprising:

a sealed housing formed by two hollow parts,

each hollow part including an opening bounded by a a pair of parallel flat surfaces spaced apart by means of a fixed step,

said flat surfaces on one part of the housing mating with similar flat surfaces on the second part of the housing to form two parallel boundaries for said housing separated by said fixed step,

a plurality of ribs supported within each hollow part and having faces parallel to one of said boundaries, and

a plurality of flat contact blades sealed through said housing and positioned to fit along the flat surfaces of said ribs,

whereby said contact blades are paired off and the spacing between each pair of contact blades is a fixed gap determined by the size of said step and the thickness of the contact blades.

2. A contact device as claimed in claim **1**, in which the two parts of the housing are identical and are sealed together along said parallel flat surfaces and said step.

3. A contact device as claimed in claim **1**, in which a permanent magnet is positioned in one of said hollow parts, and said permanent magnet provides a magnetic field common to all the contact blades to keep them closed in the absence of other magnetic fields.

References Cited

UNITED STATES PATENTS

2,898,422	8/1959	Peek.	
3,240,897	3/1966	Anderson.	
3,254,188	5/1966	Lohs	200—166

BERNARD A. GILHEANY, *Primary Examiner.*

J. J. BAKER, R. N. ENVALL, *Assistant Examiners.*