(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 921 539 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
09.06.1999 Bulletin 1999/23

(51) Int. Cl.[6]: **H01F 27/04**, H01F 27/29

(21) Application number: **98203865.5**

(22) Date of filing: **18.11.1998**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **19.11.1997 IT MI972577**

(71) Applicant:
ABB Trasformatori S.p.A.
20025 Legnano (Mi) (IT)

(72) Inventor: **Lanciano, Giovanni**
20025 Legnano (Mi) (IT)

(74) Representative:
Giavarini, Francesco
ABB Ricerca S.p.A.
Viale Edison, 50
20099 Sesto San Giovanni (MI) (IT)

(54) Low-voltage contacts for high- and very high-intensity currents, particularly for electric transformers

(57) A low-voltage contact for high- and very high-intensity currents, particularly for electric transformers, comprising a body (2) made of aluminum and/or alloys thereof which has a substantially constant transverse cross-section and a length which is a function of the intensity of the current that affects the low-voltage contact.

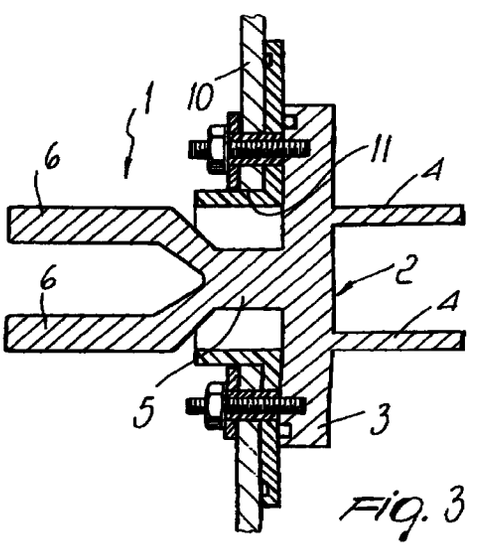

Fig. 3

EP 0 921 539 A2

Description

[0001] The present invention relates to a low-voltage contact for high- and very high-intensity currents, particularly for electric transformers.

[0002] It is known that low-voltage electric contacts for high and very high currents, i.e., for currents above 10,000 amperes, are currently made of copper with a shape which is a function of the different dimensions, since it is necessary to provide a structure which is mechanically strong.

[0003] Said contacts are usually produced by casting in suitable moulds.

[0004] This technology entails many drawbacks which arise for example from the presence of holes or hollow regions in the parts that have not solidified perfectly, causing a consequent localized increase in losses and a reduction in the mechanical strength of the assembly.

[0005] Additionally, these contacts are very heavy, in some case weighing several hundred kilograms, entailing consequent difficulties in assembly, which requires special tools and considerable stresses on the supports.

[0006] Another drawback is furthermore constituted by the fact that it is possible to standardize only the production of a limited number of contacts for various levels of current, due to the extremely high costs of the moulds required to produce each type of contact. The moulds must also he replaced after a limited number of castings, further increasing costs.

[0007] The aim of the present invention is to eliminate the above drawbacks, by providing a low-voltage contact for high- and very high-intensity currents, particularly for electric transformers, in which it is possible to drastically reduce the weight of the contact, thus facilitating its handling during installation on the transformer and consequently reducing all the mechanical stresses that affect the structures of the transformer.

[0008] Within the scope of this aim, a particular object of the present invention is to provide a low-voltage contact which does not require the manufacture of moulds according to the different types of contact but can be produced in each case according to the contingent requirements, without thereby entailing further constructive complexities.

[0009] Another object of the present invention is to provide a low-voltage contact which has a highly uniform internal structure without holes or cavities, thus increasing the mechanical strength of the assembly and reducing electrical losses.

[0010] Another object of the present invention is to provide a low-voltage contact which by virtue of its particular constructive characteristics is capable of giving the greatest assurances of reliability and safety in use and is also competitive from a purely economical point of view.

[0011] This aim, these objects and others which will become apparent hereinafter are achieved by a low-voltage contact for high- and very high-intensity currents, particularly for electric transformers, according to the invention, characterized in that it comprises a body made of aluminum and/or alloys thereof, which has a substantially constant transverse cross-section and a length which is a function of the intensity of the current that affects the low-voltage contact.

[0012] Further characteristics and advantages of the present invention will become apparent from the following detailed description of a preferred but not exclusive embodiment of a low-voltage contact for high- and very high-intensity currents, particularly for electric transformers, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a schematic perspective view of a low-voltage contact according to the invention;
Figure 2 is a schematic perspective view of the low-voltage contact of the invention applied to a transformer;
Figure 3 is a sectional view of the connection between the contact and the tank of the transformer.

[0013] With reference to the above figures, the low-voltage contact for high- and very high-intensity currents, particularly for electric transformers, according to the invention, generally designated by the reference numeral 1, comprises a body 2 which is made of aluminum and/or aluminum alloys by extrusion and therefore always has a constant cross-section.

[0014] The body 2 substantially has a coupling plate 3 from which internal arms 4, for connection to the low-voltage winding, protrude substantially with right angles.

[0015] The plate 2 is fixed, by means of bolts and by interposing electrically insulating means, to the wall 10 of the tank of a transformer, at an opening 11 from which the outer part of the contact protrudes. Such outer part advantageously has a stem 5 from which Y-shaped arms 6 protrude, allowing the connection of the various external electrical users.

[0016] The relevant characteristic of the invention is constituted by the fact that the electric contact always has the same cross-section, so that it can be easily manufactured by extrusion, and has a length which is a function of the intensity of the current that affects the low-voltage contact. Substantially, therefore, it is possible to adapt to the various levels of current that affect the contact simply by changing the length of the contact, without thereby requiring the provision of complex dies and allowing to provide, for each individual user, a contact which has the correct dimensions without having to produce individual moulds as currently occurs.

[0017] Another important aspect is further constituted by the fact that the use of aluminum, which is particularly suitable for extrusion of the contact, also allows to considerably reduce the weight of the contact, with all the related advantages in terms of use of labor, installa-

tion and mechanical stresses on the tank.

[0018] From the above description it is therefore evident that the invention achieves the intended aim and objects; in particular, the relevant fact is that the adoption of a solution which entails producing the contact by using extruded aluminum allows a considerable technological advantage, as regards both design and the possibility of providing customized contacts for each installation.

[0019] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept.

[0020] All the details may also be replaced with other technically equivalent elements.

[0021] In practice, the materials employed, as well as the contingent shapes and dimensions, may be any according to requirements.

Claims

1. Low-voltage contact for high- and very high-intensity currents, particularly for electric transformers, characterized in that it comprises a body made of aluminum and/or alloys thereof which has a substantially constant transverse cross-section and a length which is a function of the intensity of the current that affects the low-voltage contact.

2. Low-voltage contact according to claim 1, characterized in that said body is formed by extrusion.

3. Low-voltage contact according to claims 1 and 2, characterized in that said body has a plate for coupling to a tank of a transformer from which internal arms for connection to the winding of the transformer and external arms for connection to external users protrude.

4. Low-voltage contact according to one or more of the previous claims, characterized in that said arms are arranged in a Y-shaped configuration and form a stem for connection to said plate.

5. Low-voltage contact according to one or more of the previous claims, characterized in that said plate is connected to the wall of the tank of the transformer through the interposition of electrically insulating material.

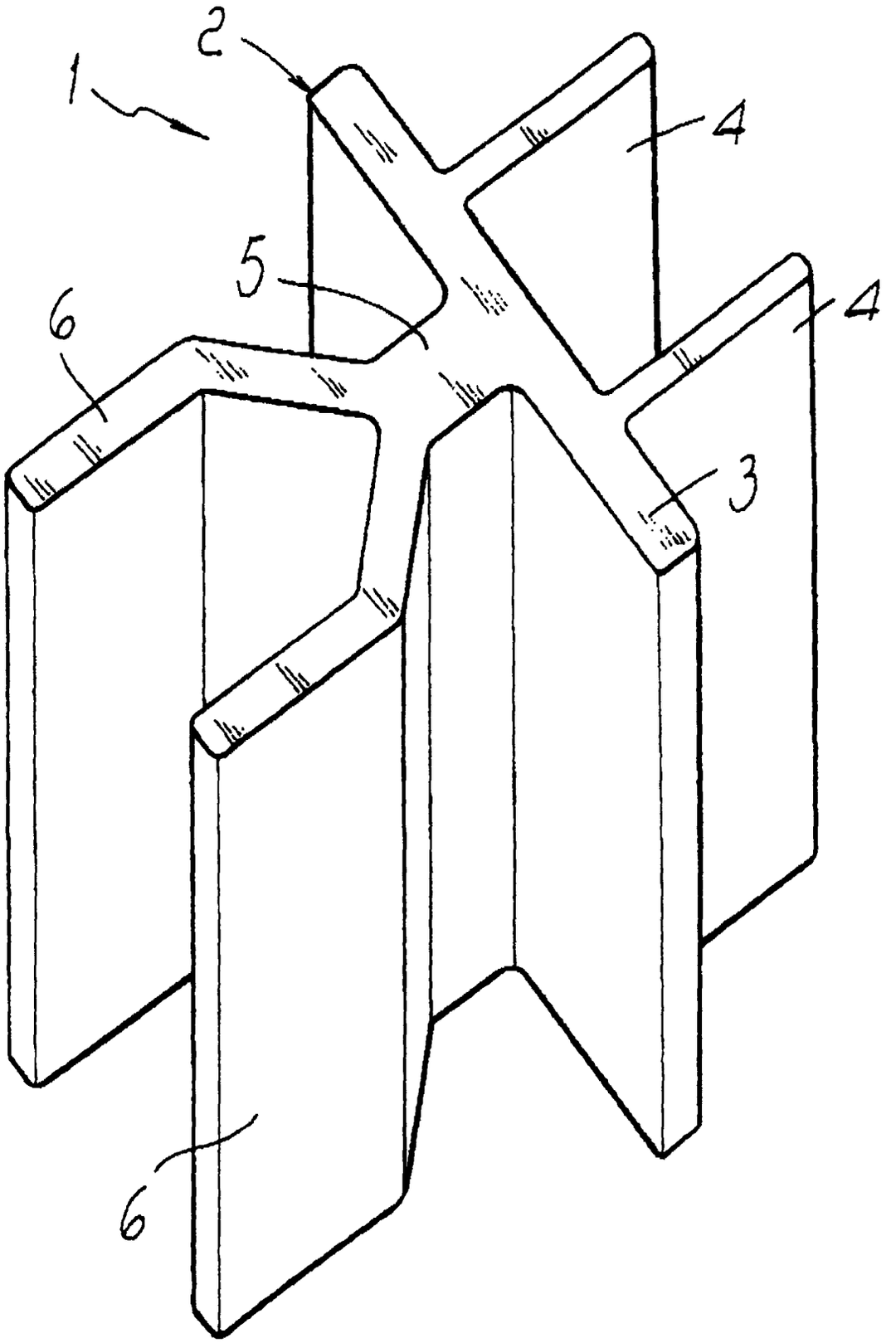

Fig. 1

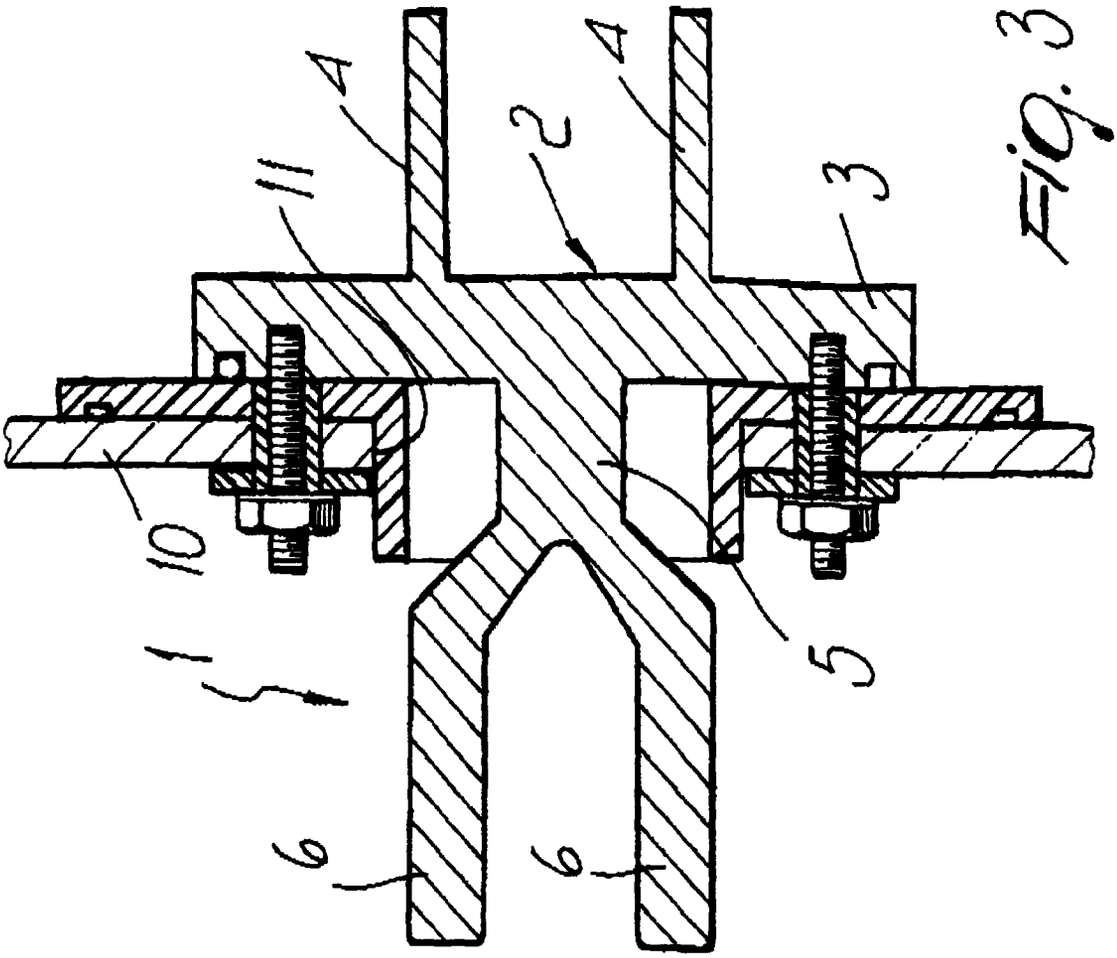

Fig. 3

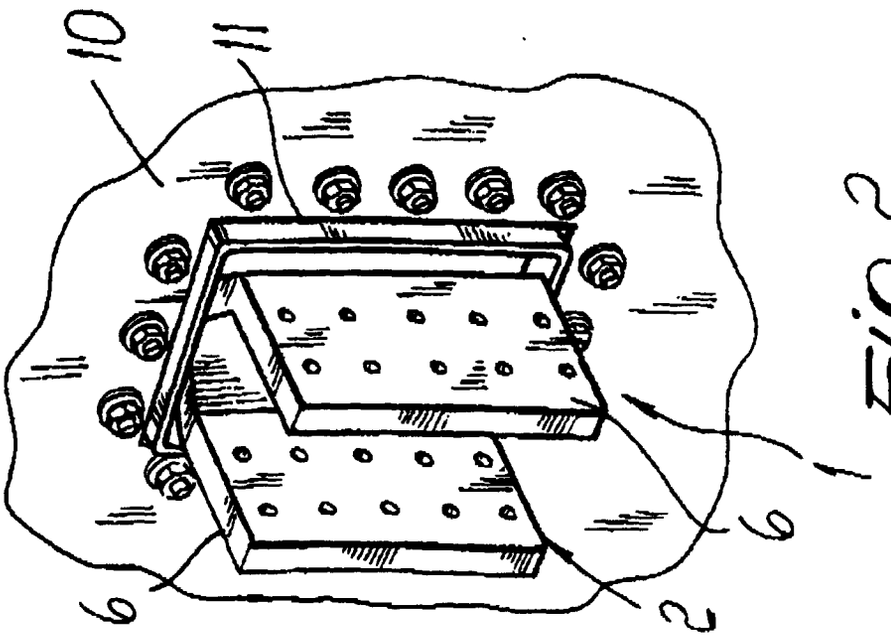

Fig. 2