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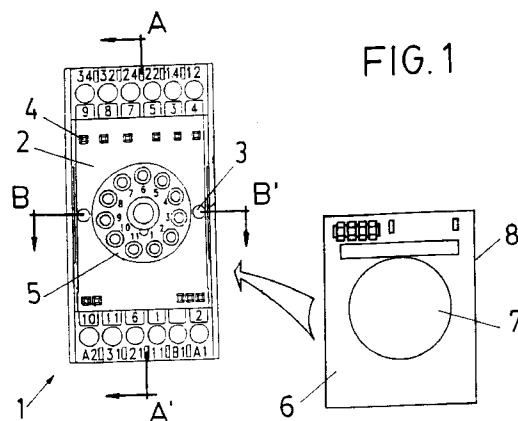
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(54) **Base for a relay.**

(57) A base for a relay comprises a main body (1) which has a central boss (5) bearing a socket for receiving the pins of a relay. A module (6) has a central aperture (7) and is received within a recess surrounding the boss (5). The module (6) contains electronic circuits which are coupled to the main body (1) through complementary electrical coupling means (4). The aperture (7) is dimensioned to receive the boss (5) whilst allowing a relay to be plugged therein.

In another embodiment, the module (6) is provided with raised portions for containing additional circuitry.



The present invention relates to a base for a relay.

There is a large variety of relays designed to perform different functions in existence on the market. From the point of view of their connection they are subdivided into two major groups: non-plug-in relays and plug-in relays.

All relays have external terminals, connected internally to components of the relay, such as coils and contacts. It is generally accepted that the terminals connected to the coil are called "input terminals" while those connected to the contacts are called "output terminals"

Non-plug-in relays are connected to the operating circuit by directly soldering their terminals to a printed circuit or circuit wiring.

Plug-in relays are connected directly to bases equipped with terminals and terminal sockets, connected together within the base so that a connection is provided between the terminals of the relay and the terminals.

There is a large variety of plug-in base, which correspond to different types of relays. Here we refer by way of example to a standard model general-purpose baseplate which can accept relays with eight or eleven pins, in a circular arrangement. Nevertheless its applications as explained below are also appropriate for models other than the one mentioned.

Initially relays were used as simple electromechanical components, but since the appearance and development of control circuits containing semiconductors, relays have fulfilled a complementary purpose in these circuits and have to be capable of acting without causing damage to the associated semiconductors.

For this purpose it is necessary that means of protection be provided in the coil and contact circuits in order to avoid transient overvoltage peaks or radio-frequency emissions which can effect behaviour or even destroy delicate electronic logic circuits.

The trend in current technology with regard to the use of relays is to incorporate various electronic circuits within the relay itself or within its base to carry out the protective task described above, and also to incorporate more complex electronic circuits which control the operation of the relay in a specific way, such as delay circuits, sensor amplifiers, phase fault detectors and, in general, all types of logic circuits, so that the relay acts as a resulting output from this logic.

All this diversity of electronic circuits offering this possibility is referred to below as "auxiliary circuits".

There are three main ways of providing protection:

1) Installing these components within the relay in a fixed manner. This practice is widespread at the present time and does not require any work for the fitter, but the protection system cannot be replaced. It is only possible to fit very simple cir-

cuits because of the small amount of space available.

2) Through the use of a circuit in module form, equipped with plug-in terminals which can be associated with the internal terminals of the relay. This arrangement makes it possible to replace the protective circuit immediately if necessary, in the place where it is in use, but it has the disadvantage of the same space problem as the previous method.

3) Inserting the auxiliary circuit in the plug-in base. This arrangement consists of providing the circuit in a container module provided with terminals which plug in to the input terminals of the base through openings made in the upper wall of the body of the baseplate, establishing a connection with the relay coil.

The module is plugged in to the small space available between the body of the relay and the block of base connection terminals with the result that with more complex auxiliary circuits this space is insufficient and it is necessary to construct a narrow and vertically elongated module.

This arrangement is precarious because it provides a space which is in any event insufficient to house given components of a specific volume and also gives rise to great instability in the connection when carelessly handled during maintenance, and also through vibrations caused by operation of the equipment itself.

It is also impossible to establish a connection between the relay input (coil) and output (contacts), as is necessary in some cases.

The purpose of this invention is to take advantage of the undoubted advantages of the intermediate module, i.e. the non-existence of external connections, its possibility for almost immediate functional replacement, fitting the standard dimensions for base and overcoming their observed disadvantages, difficulty of handling and frequent sensitivity to impact, above all.

According to the present invention, there is provided a base for a relay, comprising a main body having a raised socket portion for receiving the pins of a plug-in relay and an electronic module releasably coupled to the main body and provided with an aperture through which the socket portion extends, wherein the main body and the module are provided with complementary electrical coupling means for connecting circuit elements in the electronic module to circuit elements in the main body.

Preferably, the module is received within a recess in the main body. The module may be provided with lateral flanges which overhang the main body to assist removal of the module therefrom. With this arrangement, when various bases are fitted together a tunnel-shaped space is obtained between two adjacent baseplates, with sufficient space for housing the

direct connection wires between the input and output terminals of the baseplate.

Additional space for electronic circuitry may be provided by arranging for the module to include one or more raised portions extending away from the main body.

Either the main body or the module may carry the male part of the electrical coupling means. It is also envisaged that the main body and module may be provided with complementary mixes of male and female coupling parts as circumstances dictate..

Relay bases are typically fixed by screws which lock the base to a support. The module is fitted over these screws with the advantage of providing active safety.

The module may also have an identification system, for the logic or control function which it performs, on its front face, in the form of a label holder or plastic characters.

The aperture in the module, which matches the plug-in base of the relay, also serves to centre the module on the base and as a central support therefor.

By comparison with the grip shape of modules located in the box in the lower part of the base, it provides the following advantages: a double upper and lower arrangement of the connecting pins, widely spaced and in opposite rows, against a single wire and lateral connection. This wider spacing of the connection pins, plus the greater surface area of contact between walls of the main body and the module and the reinforcing support, together with the advantage of centering, and the cylinder supporting the female connections of the base with respect to the module plate, show the improvements due to this invention over conventional known arrangements.

Embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 shows a front view of a base and a module, with the box receiving the module and its corresponding internal connections;

Figure 2 shows both side elevations of the base of Figure 1, in which a cut-out on the side reveals the internal housing of the module;

Figure 3 shows another view of the base of Figure 1, but in this case with the module incorporated into the body of the base;

Figure 4 shows cut away views of both side elevations of the base of Figure 1;

Figure 5 shows a side elevation of the base of Figure 1 with of the module supplemented by two parallel blocks, located at its ends;

Figure 6 shows an aligned arrangement of various bases, in which the intermediate tunnels housing the wires may be seen.

Referring to Figures 1 to 4, a base 1 for a relay has a rectangular prismatic main body 2 located on its front face which incorporates a cylindrical boss 5 cor-

responding to the projection of the supporting base for a relay, bounded by the two side walls of the main body 2 and the protective wall for the two opposing external connection wires.

The intermediate module 6 has a rectangular body with a central aperture 7 for receiving the boss 5.

A front plate 8, with its boss 9 of the same dimensions as the plug on the opposite face of the main body 2, serves as a grip and stop, and means for identification of the type of circuit is provided thereon by means of label holders or standard plastic characters 10.

The base plate itself has the two rows of openings 4 required for connection of the terminal pins of the module 8, and two holes 3, intermediate between the two rows for location of supporting screws.

This module 8 has two large opposing volumes tangential to the aperture 7, longitudinal on the outside and circular on the inside, and another two small volumes at right angles thereto with their tangents to the aperture 7, and therefore also perpendicular thereto. This more than doubles the available space and provides sufficient space for passing connections from one large volume to the other.

Referring to Figures 5 and 6, in those cases where the space occupied by the components of the module requires it, it may be extended outwards, in parallel with the layout of the relay, by means of symmetrical towers 11 located at the short sides of module 6.

This description has no need to be more extensive given that anyone skilled in the art has sufficient information to understand the scope of the invention and its resulting advantages, and to proceed with reproducing the same.

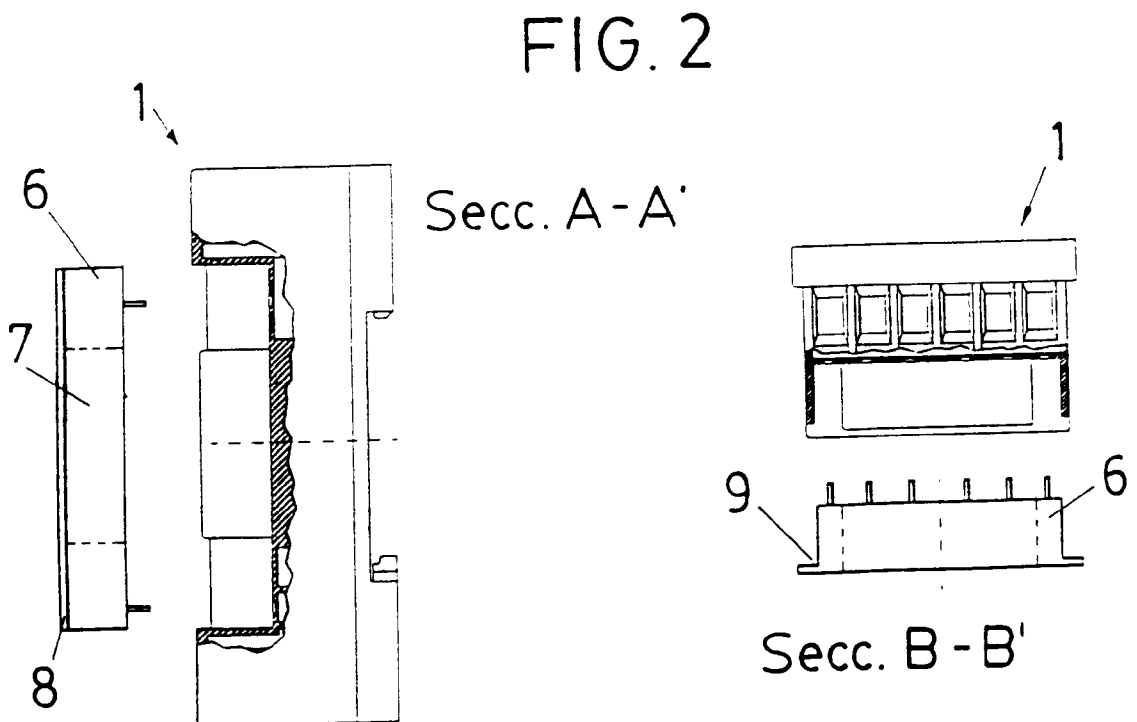
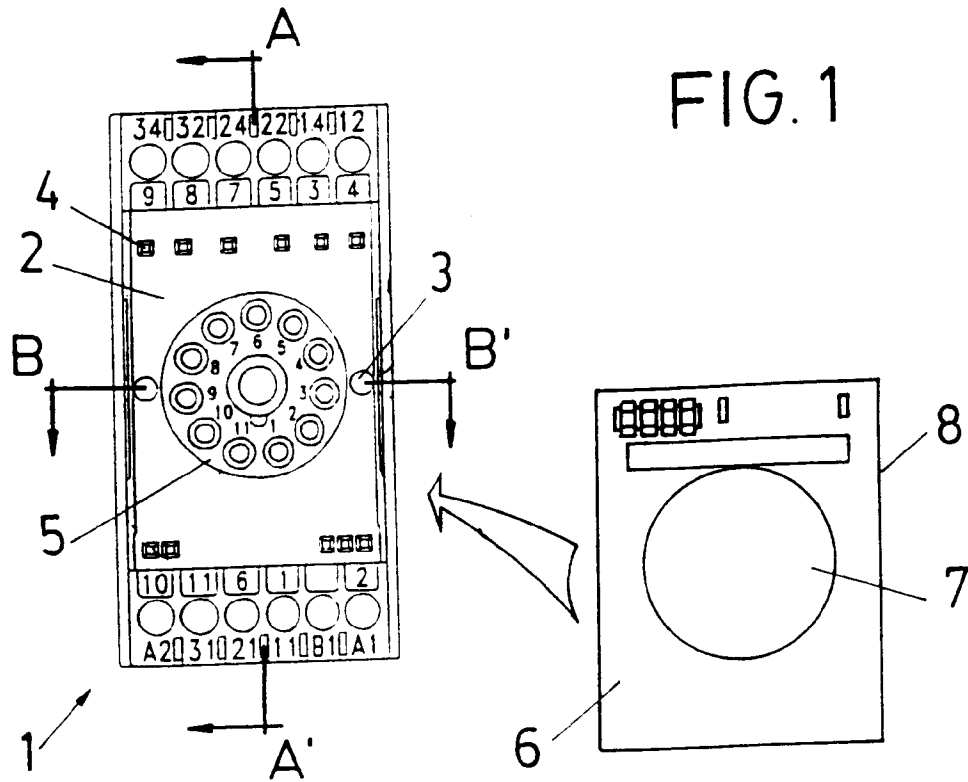
It is to be understood that, although this does not alter the essence of the invention, both the materials and the shape, size and arrangement of the components are susceptible to variation.

Claims

1. A base for a relay, comprising a main body having a raised socket portion for receiving the pins of a plug-in relay, and an electronic module releasably coupled to the main body and provided with an aperture through which the socket portion extends, wherein the main body and the module are provided with complementary electrical coupling means for connecting circuit elements in the electronic module to circuit elements in the main body.
2. A base according to claim 1, wherein the module is received within a recess in the main body.

3. A base according to claim 2, wherein the module is provided with lateral flanges which overhang the main body to assist removal of the module therefrom. 5
4. A base according to claim 1, 2 or 3, wherein the module includes a raised portion extending away from the main body.
5. A baseplate for a relay with an interposed electronic module of the type comprising a baseplate rebated for insertion of the module, essentially characterised in that the module, despite being incorporated in the box, comprises an intermediate module between the relay and the baseplate (1), occupies the entire frontal surface thereof, except for the area of the external connections of the baseplate and the location for fitting the relay, the baseplate having a rectangular housing (2), two attachment holes (3) on opposite sides, the openings (4) necessary for passage of the terminal pins of the module, located conveniently to plug into the internal terminals of the baseplate box from which there arises a cylindrical boss 95) for connection of the relay, the intermediate module (6) comprising a rectangular body with a central opening (7) and having a frontal plate (8) with a lateral projection (9) providing a grip and stop for the module and support for the external wiring, housing (10) being provided therein for insertion of standard plastic characters and two small adjacent perforations for the insertion of a rectangular label identifying the whole. 10
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6. A baseplate for a relay with an interposed electronic module according to the foregoing claim, characterised in that the plate of the intermediate module has up to two prismatic bodies (11) located on one or both of the short sides for the incorporation of additional components of the module circuits within their internal space. 35
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7. A baseplate for a relay with an interposed electronic module. 45
8. A base for a relay substantially as hereinbefore described with reference to Figures 1 to 4 of the accompanying drawings.
9. A base for a relay substantially as hereinbefore described with reference to Figures 5 and 6 of the accompanying drawings. 50

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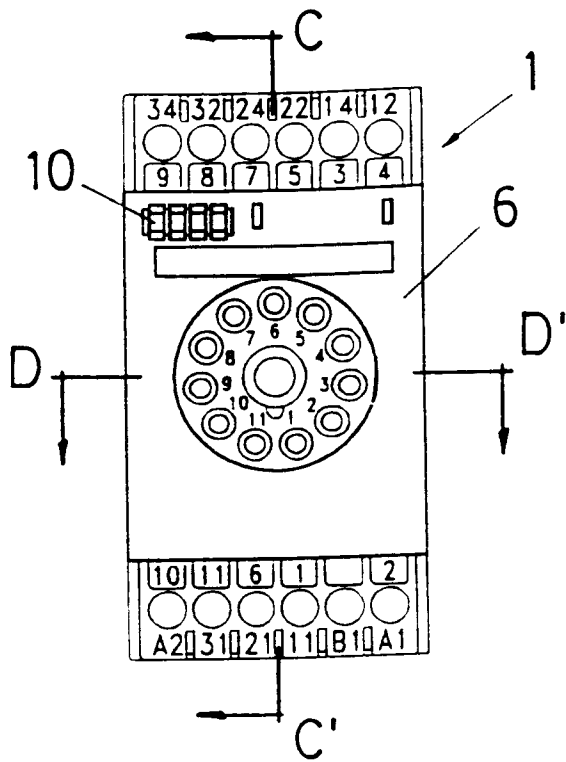
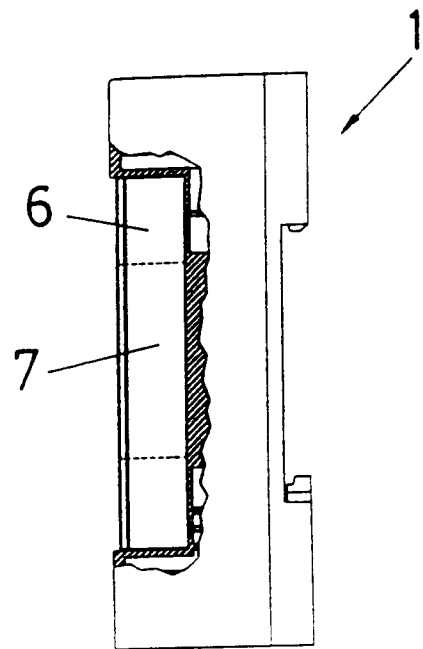
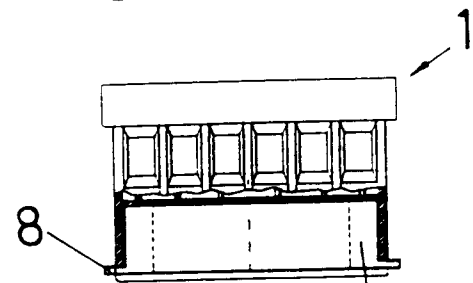


FIG. 4

FIG. 3



Secc. C-C'



Secc. D-D'

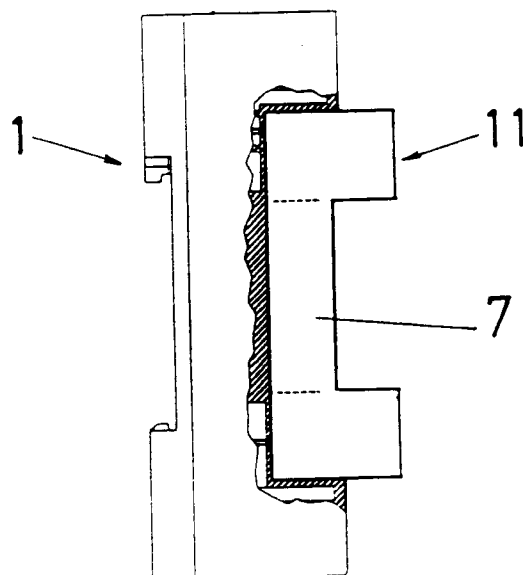


FIG. 6

