

The present invention generally relates to electrical sockets and to electrical connection systems comprising sockets.

As is known, such electrical sockets generally comprise two or three contact elements, each one adapted to receive one of the pins of a
5 corresponding plug. The present invention relates in particular to the case where a safety shutter bars the access to these contact elements, so as to control that access.

An electrical socket is known from European patent application EP-A-539 093 which has three contact elements, each one adapted to receive
10 one of the pins of a corresponding plug, with a safety shutter barring the access to two of these contact elements, which are destined to be connected to an electrical supply, the safety shutter being mounted so as to be movable between a closed position, in which it prevents access to the two contact elements, and an open position, in which it permits such access.

15 The safety shutter has the general form of a T and comprises a central part formed of two parallel elastic legs and two side wings for preventing the access to the two contact elements.

The two parallel legs are provided with at least one hook for cooperating with a fixed abutment. Moreover, a compression spring constantly
20 urges the shutter towards the closed position.

When a plug is introduced into the electrical socket, the earth pin of the plug penetrates an opening in the electrical socket and engages with the hook or hooks so as to separate the parallel legs from each other and to move them clear of the abutment. The pins that are destined to be connected to an electrical

supply, and that are shorter than the earth pin, then act on ramped surfaces of the side wings so as to displace the shutter towards the open position.

When the plug is withdrawn, the shutter is returned by the spring towards the closed position.

5 Each hook then cooperates once again with the fixed abutment so as to lock the shutter in the closed position.

The general object of the invention is to improve the structural and functional characteristics of such a shutter. The object of the invention is also to increase the safety of such an electrical socket.

10 More precisely, the subject of the invention is an electrical socket, of the kind comprising two contact elements destined to be connected to an electrical supply and an earth contact element, each of the contacts being adapted to receive one of the pins of a corresponding plug, with a safety shutter barring the access to the contact elements destined to be connected to an
15 electrical supply, this safety shutter being mounted so as to be movable between a closed position, in which it prevents access to the contact elements destined to be connected to an electrical supply, and an open position, in which it permits such access, the shutter, moreover, being held in a closed position such that it can be freed and then urged towards the open position by the
20 corresponding plug when this is introduced into the electrical socket, and elastic return means, which act constantly to urge the safety shutter towards the closed position, characterized in that the safety shutter is held in the closed position by the earth contact element which is adapted to undergo elastic deformation due to the introduction of the earth pin of the corresponding plug and making it

possible to free the safety shutter.

By virtue of this arrangement, it is possible to implement a safety shutter of which no part deforms. It is thus more rigid and thereby also less fragile. Moreover, it is not subject to the risk of permanent deformation caused
5 by a loss of elastic properties of the material. The only component subject to elastic deformation is in fact the earth contact element, which, as it is made from metal, does not present the inherent weaknesses of a component destined to undergo elastic deformation that is made from plastics material, as is the case for example in relation to the safety shutter of the state-of-the-art
10 document mentioned above.

Furthermore, the return of the shutter to its closed position occurs very rapidly and with a minimum of effort, by virtue of the absence of any deformation of the shutter.

Such a socket also proves to be more economic to manufacture,
15 particularly due to the reduction in the number of components required for its production.

Finally, it offers an increased level of safety as the freeing of the safety shutter is only possible when the earth connection has actually been established.

20 For convenience of manufacture and assembly, the earth contact element comprises a substantially U-shaped element adapted to cooperate with the safety shutter by means of corresponding forms that engage one into the other provided on the side branches of the U and on the safety shutter, the side branches being adapted to be separated from each other, through elastic

deformation of the substantially U-shaped element by means of the earth pin of the corresponding plug when this is inserted into the electrical socket, in order to free the safety shutter.

Preferably, in the case of this embodiment, the safety shutter has
5 the general form of a T and comprises a central stem and two side wings for preventing access to the two contact elements destined to be connected to an electrical supply, the corresponding forms comprising at least one side hook on the central stem and at least one opening in one of the side branches of the substantially U-shaped element.

10 According to another embodiment, the earth contact element has the general form of a U and comprises two side branches abutting against the safety shutter in the closed position in order to hold it in that position, and adapted to be separated from each other, through elastic deformation by means of the earth pin of the corresponding plug when this is inserted into the electrical
15 socket, in order to free the safety shutter.

In this case the safety shutter preferably comprises a central stem and two side wings for preventing access to the two contact elements destined to be connected to an electrical supply, the central stem abutting, in the closed position, the edge portion of the side branches of the earth contact element that
20 is situated at the free end of the side branches.

To enable the pins of the corresponding plug to urge the safety shutter towards the open position, the front surface of the side wings oriented towards the openings in the electrical socket for accessing the contact elements destined to be connected to an electrical supply, is, preferably, cut back by with

a bevel on each wing which is adapted to cooperate with a pin of the corresponding plug destined to be connected to an electrical supply, in order to urge the shutter towards the open position.

Preferably too, the elastic return means comprises a spring acting
5 in compression between the safety shutter and an abutment means of the electrical socket.

To house the spring, the central stem or central branch preferably comprises a housing for the spring.

To prevent any displacement of the safety shutter towards the
10 open position after the introduction of a single pin into an access opening of one of the contact elements destined to be connected to an electrical supply, the safety shutter is advantageously mounted on the electrical socket with the possibility of the side wings rocking forwards and backwards and vice-versa, and stops for blocking the rectilinear displacement of the safety shutter towards
15 the open position are provided in the electrical socket at right angles the surface that extends between the front and back surfaces of the side wings, on the opposite side to the bevels, such that if a single of the side wings is pushed it will rock from front to back and so be blocked against a stop.

As a variant, in order to be able to use the socket conforming to
20 the invention to supply an electrical appliance from a specific electricity supply network, in particular a well-controlled network, the socket comprises at least one inclined plane disposed on the shutter such that the urging of the shutter towards the open position after it has been freed is subject to the presence of an adaptor provided on the corresponding plug and having at least one

actuating pin capable of urging the shutter towards the open position by cooperation with the inclined plane.

The shutter can thus only be actuated by a particular actuating pin of a plug from a specific network.

5 It is thereby possible to reserve this network for the specific supply of appliances for which the network has been created, by preventing other electrical appliances that are not intended for the network from being connected in error. In fact, for certain electronic appliances, such as calculators for example, it is desirable to have an electrical supply network of higher quality
10 having in particular a more stable voltage and a good level of protection against micro power-cuts. The connection to this network of an electrical appliance that is not intended for the network can affect its stability or add noise to it. The means according to the invention defined above make it possible to avoid this kind of incorrect connection. Moreover, by virtue of the implementation of an
15 add-on adapter, it is not necessary to replace the standard moulded plugs by special plugs.

In addition, holding the safety shutter in the closed position by means of the earth contact element ensures that this error-proof system is safe.

Moreover, the preferred characteristics of both the above
20 embodiments can be implemented in relation to the present variant. In particular, it is possible to provide two inclined planes formed by two extensions of the wings extending on each side of the central stem of the shutter having the general form of a T or to implement two inclined planes formed by the bottom of two cavities each one hollowed out of a side wing of the shutter comprising a

central stem and two side wings.

The surface of the side wings, on the side of the shutter that is opposite to that presenting the inclined planes, is, advantageously, cut back by a bevel on each wing, which is intended to cooperate with the pin of a
5 corresponding plug destined to be connected to an electrical supply, in order to urge the safety shutter towards the open position.

The same shutter can thus serve to produce two different types of socket. The shutter simply has to be placed with one side or the other oriented towards the pin entry holes in the socket, in order to produce either a
10 conventional safety socket, or a safety socket for a specific electricity supply network.

Moreover, the invention also relates to an electrical connection system for a specific electricity supply network, comprising a socket as disclosed above and a three-pin plug provided with an adapter also as
15 disclosed above.

When the socket shutter comprises two inclined planes, this adaptor comprises a thin wall provided with three holes for the passage of the pins of the corresponding plug and two actuating pins projecting from the thin wall.

20 The invention will be better understood from a reading of the following detailed description which refers to the accompanying drawings, given by way of example only, and in which :

- Figure 1 is a partially cut away perspective view of an electrical socket according to a first embodiment conforming with the invention ;

- Figures 2 to 4 are schematic perspective views of the freeing of the safety shutter of the socket of Figure 1 by means of the pins of a corresponding plug ;
- Figure 5 is a perspective view schematically illustrating an attempt to actuate
5 the safety shutter by the introduction of a single pin through an access opening of a contact element destined to be connected to an electrical supply ;
- Figure 6 is a view in the direction of the arrow VI of Figure 6 ;
- Figure 7 is a partially cut away perspective view of an electrical socket
10 according to a second embodiment conforming with the invention ;
- Figures 8 and 9 are schematic perspective views of the freeing of the safety shutter of the socket of Figure 7 ;
- Figure 10 is a partially cut away perspective view of an electrical socket according to a variant of the first embodiment conforming with the invention ;
- 15 - Figure 11 is a perspective view of a plug with adaptor intended for cooperation with the socket of Figure 10 ;
- Figures 12 and 13 are schematic perspective views of the freeing of the safety shutter of the socket of Figure 10 by means of the pins of the plug of Figure 11 ;
- 20 - Figure 14 is a partially cut away perspective view of an electrical socket according to a variant of the second embodiment conforming with the invention ; and
- Figures 15 to 17 are schematic perspective views of the freeing and actuation of the safety shutter of the socket of Figure 14 by means of the pins of a

corresponding plug provided with an adaptor .

In the embodiment shown in Figure 1, the electrical socket 10 according to the invention comprises, in a manner known per se, a casing 11 formed from a casing body 12 and a cover 13.

5 In a manner also known per se, it comprises, in the casing body 12, two contact elements destined to be connected to an electrical supply, commonly known as female connectors, each adapted to receive one of the pins of a corresponding plug, the pins of which are seen in Figures 3 and 4.

These contact elements are not in themselves involved in the
10 present invention, and they are therefore not described here or illustrated in the drawings relating to this embodiment.

Suffice it to say that for this embodiment the cover 13 of the casing 11 comprises two openings adjacent to these contact elements, of which the outline corresponds to the cross-section of the pins of the associated plug, and
15 that these openings are not visible in Figure 1 because the cover 13 is shown partially cut away.

Note also that the electrical socket 10 shown in Figure 1 comprises an earth contact element 14, of which the characteristics will be described in more detail hereinafter, and which is intended to receive an earth
20 pin of a three-pin plug. It should further be noted in this regard that the electrical socket 10 is, in this case, designed to receive three pins of rectangular or circular section of a British standards three-pin plug 15-17 (see Figures 3 and 4 in which only the pins of the plug are shown). The electrical sockets according to the invention are however not limited to this type of pin and can

equally be designed to receive three pin plugs having any other suitable form, or even a combination of pins having different forms.

In a manner also known per se, the electrical socket 10 according to the invention comprises a safety shutter 18 barring the access to the contact
5 elements that are destined to be connected to an electrical supply.

In practice, in the embodiment represented in Figures 1 to 6, this safety shutter 18 operates under the cover 13 within a cavity 19 of the electrical socket 10, on the bottom 20 of which it may be displaced rectilinearly. Furthermore, this bottom extends parallel to the cover 13.

10 According to a first embodiment of the invention, the safety shutter 18 has the general form of a T and comprises a central stem 21 and two side wings 22 for preventing access to the two contact elements of the electrical socket 10 that are destined to be connected to an electrical supply.

The central stem 21 comprises a seat 23 for a spring 24 acting in
15 compression between the safety shutter 18 and an abutment surface 25 of the electrical socket 10. This spring thus continuously urges the safety shutter 18 towards the closed position, in which the side wings 22 prevent access to the two contact elements that are destined to be connected to an electrical supply.

Moreover, a hollow 26 in which the spring 24 is housed is
20 provided, at right angles to the seat 23.

On each side of the central stem 21 the front or upper surface of the side wings 22 that is oriented towards the openings in the cover 13 for accessing the contact elements is, on the side of this central stem 21, bevelled on each wing, the bevel extending obliquely towards the rear or lower surface of

these side wings 22.

These functional surfaces formed in this manner are, in a manner known per se, and as will be seen in more detail below, adapted to cooperate with the pins of the corresponding plug to urge the safety shutter 18 towards an open position, in which the side wings 22 permit access to the contact elements destined to be connected to an electrical supply.

On the edge of each bevel 27 is a projection 28 which, if a standard three pin plug with round pins is introduced into the openings for accessing the contact elements destined to be connected to an electrical supply, makes it possible to urge the safety shutter 18 towards the open position.

According to a first embodiment of the invention, this safety shutter 18 is locked in a closed position by snap engagement by means of a latch formed by the earth contact element 14 and adapted to be operated by elastic deformation by means of the earth pin 17 of the corresponding plug, in order to free the shutter and to permit the two other pins 15 and 16 that are shorter than the earth pin 17, to urge the safety shutter 18 towards the open position, by acting on the bevels 27 of the side wings 22.

More specifically, in the embodiment shown, the earth contact element 14 is a metallic component substantially in the form of a U of which the side branches 29 are adapted to be separated from each other by elastic deformation of the element 14 on introduction of the earth pin 17 of the corresponding plug.

To perform the snap engagement, corresponding forms are

provided on the side branches 29 and on the central stem 21 of the safety shutter 18.

In this particular case, the central stem 21 comprises a head 30 at its free end provided with two side hooks 31 adapted to be engaged in
5 corresponding openings 32 formed in the side branches 29 of the earth contact element 14 which forms the aforementioned latch (see Figure 4 in particular).

Thus, provided that the corresponding plug is not introduced into the electrical socket, the safety shutter 18 is joined by snap engagement to the earth contact element 14 forming the latch (see Figures 1 and 2).

10 When the corresponding plug is introduced into the socket, the earth pin 17, which is longer than the pins 15 and 16 destined to be connected to an electrical supply, separates the side branches 29 from each other by elastic deformation of the latch having the form of a U. This permits the side hooks 31 to be disengaged from the corresponding openings 32, and thus to
15 free the safety shutter 18 from the latch. The safety shutter 18 nevertheless remains in place under the action of the spring 24.

Next, the two pins 15 and 16 destined to be connected to an electrical supply come into play in place of the earth pin 17, by cooperating with the bevels 27 of the side wings 22, so as to displace the safety shutter 18
20 towards the open position, in which these side wings 22 do not prevent access to the contact elements of the electrical socket 10 destined to be connected to an electrical supply. This position is shown in Figure 4 and enables contact to be made between the pins 15 and 16 and the contact elements of the electrical socket 10, adapted to receive them.

It should be noted with respect to this that the cooperation of the pins 15-17 of the corresponding plug with the associated elements and structures of the electrical socket 10 is facilitated by the fact that the free ends of the pins are generally bevelled.

5 When the corresponding plug is withdrawn, the safety shutter 18 is returned by the spring 24 to its closed position. The side hooks 31 are then locked again in their associated openings 32 of the latch formed by the earth contact element 14, in order to hold the safety shutter 18 in its closed position.

10 In this position, in the embodiment shown in Figures 1 to 6, the side wings 22 abut stop surfaces 33 of the casing 12, that are perpendicular to the bottom 20.

As we have just seen, the displacement of the safety shutter 18 towards the open position is obtained by the simultaneous pushing of the pins 15 and 16 on the bevels 27.

15 To prevent the displacement of the safety shutter by pushing on a single of the bevels 27, and thereby to increase the level of safety, the safety shutter 18 is mounted on the electrical socket 10 with the possibility of the side wings 22 rocking from front to back and vice-versa.

20 Moreover, as shown in Figures 1, 5, and 6, back stops 34 for preventing the rectilinear displacement of the safety shutter 18 towards the open position, are provided in the electrical socket 10 at right angles to the surface 35 extending between the front and back surfaces of the side wings 22 on the side opposite to the central stem 21, such that pushing on only one of the side wings 22 causes that wing 22 to be rocked from front to back and be

blocked against the corresponding back stop 34.

This result is illustrated in Figures 5 and 6 by the pushing of a round pin 36 on the right wing 22 of the safety shutter 18.

To achieve this result, the side wings 22 are tapered towards their
5 free ends on their rear surface that is oriented towards the bottom 20.

Furthermore, a rounded projection 37 integrally moulded in plastics material with the safety shutter 18 extends along the central stem 21, on the side opposite to the hollow 26 that receives the spring 24.

The back stops 34 that are on the bottom 20 can be fixed to it, as
10 is the case for the embodiment shown, or may be integrally moulded with the bottom in plastics material.

In Figures 7 to 9 a second embodiment of the electrical socket according to the invention is shown.

As before, the electrical socket 10' of Figure 7 also comprises a
15 casing 11' formed from a casing body 12' and a cover 13'. Furthermore it also comprises, in the casing body, the contact elements destined to be connected to an electrical supply which are not shown in Figures 7 to 9, and an earth contact element 14'.

The cover 13' comprises two openings adjacent to these contact
20 elements, of which the outline corresponds to the cross-section of the pins of the associated plug, these openings not being visible in Figure 7 because the cover 13' is shown partially cut away.

The electrical socket 10' also comprises a safety shutter 18' barring the access to the contact elements destined to be connected to an

electrical supply.

This safety shutter 18' also operates here under the cover 13' in a cavity 19' of the electrical socket 10', on the bottom 20' of which it can be displaced rectilinearly. This bottom extends parallel to the cover 13'.

5 According to a second embodiment of the invention, the general shape of the safety shutter 18' is cruciform, and the safety shutter 18' comprises a central stem 21' formed from a hollow cylinder, as well as two side wings 22' that are adapted to prevent access to the two contact elements of the electrical socket 10' that are destined to be connected to an electrical supply.

10 At one of its ends the central stem 21' comprises a transverse wall 23' forming a seat for a spring 24' operating in compression between the safety shutter 18' and a projection 25' in the form of a hook for the spring 24'.

The spring 24' thus continuously urges the safety shutter 18' towards a closed position, in which the side wings 22' prevent access to the two
15 contact elements destined to be connected to an electrical supply.

Moreover, in the embodiment shown in Figures 7 to 9, the projection 25' is moulded integrally with the bottom in plastics material, and the central stem 21' is cut back as a half cylinder for substantially half its length in order not to be blocked by the projection 25' during its rectilinear displacement
20 on the bottom 20'.

The central stem 21' is also opened on the side of the cover 13' over the remaining half of its length.

On each side of the central stem 21', the front or upper surface of the side wings 22' that is turned towards the openings in the cover 13' for

accessing the contact elements, is, on the side opposite to that which is turned towards the earth contact element 14', cut back by a bevel 26' on each wing 22', which extends obliquely in the direction of the lower or back surface of the side wings 22'.

5 Each bevel 26' is extended by a projection 27' for guiding the two round pins towards the bevels 26'. The electrical socket 10' can thus be implemented equally with a plug with three pins of rectangular section 15'-17' (see Figure 8) or with a plug with three round pins.

 According to the second embodiment of the invention, the safety
10 shutter 18' is held in the closed position by the earth contact element 14' which is adapted to be operated by elastic deformation by means of the earth pin of the corresponding plug, in order to free the shutter 18'.

 More particularly, in the embodiment shown in Figures 7 to 9, the earth contact element 14' is a metallic component with the general form of a U
15 and comprises two side branches 28' joined to each other by a bottom 29' having a rectangular section which is open where the bottom 29' joins the side branches 28'.

 In order to facilitate the introduction of the earth pin, the side branches 28' flare outwardly on the side of the cover 13' and are slightly arcuate
20 over a portion of their length.

 In the form of the embodiment shown, the bottom 29' comprises a hole 30' for the passage of a means for fixing the earth contact element 14' to the electrical socket 10'. This fixing means can also be used to connect an electrical earthing wire to the earth contact element 14'.

In the closed position (see Figure 7), the semi-circular edge 31' of the central stem 21' of the safety shutter 18' abuts the edge portion 32' of the side branches 28' that is situated at the free end of the side branches.

When the corresponding plug is introduced into the socket, the earth pin, which is longer than the pins 15' and 16' that are destined to be connected to an electrical supply, acts to separate the side branches 28' from each other by elastic deformation of the earth contact element 14', as shown in Figure 8. This makes it possible to free the safety shutter 18' which nevertheless remains in place under the action of the spring 24'.

Next, the two pins 15' and 16' destined to be connected to an electrical supply come into play in place of the earth pin 17', by cooperating with the bevels 26' of the side wings 22', so as to displace the safety shutter 18' towards the open position, in which these side wings 22' do not prevent access to the contact elements of the electrical socket 10' destined to be connected to an electrical supply. This position is shown in a perspective view from below in Figure 9 and enables contact to be made between the pins 15' and 16' and the contact elements of the electrical socket 10', adapted to receive them.

In this position, a portion of the central stem 21' is engaged in the free space situated between the two side branches 28'.

When the corresponding plug is withdrawn, the safety shutter 18' is returned towards the closed position shown in Figure 7 by the spring 24'.

In this position, the side wings 22' and the wall 23' of the safety shutter 18' abut stop surfaces of the casing 12', that are perpendicular to the bottom 20' (not shown on Figure 7).

As the central stem 21' is formed from a cylinder and as the side wings 22' are diametrically opposed on the central stem 21', the possibility for the side wings 22' to rock from front to back and vice-versa is also provided by the second embodiment of the invention.

5 Front stops 33' for preventing the rectilinear displacement of the safety shutter 18' towards the open position, similar to the back stops 34 of the first embodiment, are also provided in the electrical socket 10'. It is therefore also possible here to prevent the displacement of the safety shutter 18' on pushing on only one of the bevels 26'.

10 Two variants of the embodiments disclosed above will now be described.

For the variant of the first embodiment, the reference numbers of Figures 1 to 6, to which the number 100 has been added, have been used for identical or similar elements to those of the first embodiment. Similarly, for the
15 variant of the second embodiment (Figures 14 to 17), the reference numbers of Figures 7 to 9 have been used for identical or similar elements to those of the second embodiment, to which the number 100 has been added.

The socket 110 shown in Figure 10 is different from that in Figure 1 in that the shutter 118 has a form similar to that of the shutter 18' in Figure 7.
20 Nevertheless, it still comprises the openings 132 in the side branches 129 into which enters the upper disc 131 of a head in the form of a mushroom 130 which forms part of the central stem 121 of the shutter 118. Note that the disc 131 fulfils the same role here as the side hooks 31 of the embodiment of Figures 1 to 6.

25 The form of the shutter 118 also differs from that of the shutter 18 of the first embodiment in that it is formed from a hollow cylindrical structure in

which a spring 124 is housed, the spring continuously urging the safety shutter 118 towards the closed position, in which the side wings 122 prevent access to the two contact elements destined to be connected to an electrical supply and in which the disc 131 is engaged in the openings 132.

5 The hollow cylindrical structure comprises, moreover, a transverse end wall forming a seat 123 for the spring 124.

Furthermore, the head in the form of a mushroom 130 projects from the face of that end wall opposite to the face forming a seat 123 for the spring 124.

10 It should also be understood that the cylindrical structure projects partially above the upper flat surface of the side wings 122 as shown in Figures 10 to 13, so as to form a rounded protrusion.

As for the first embodiment, one side of the side wings 122 (the side that is not visible in Figure 10) presents bevels 127 (see Figures 12 and 15 13) on the edges of which there are projections.

By contrast, the other side of the side wings 122 (the side that is visible in Figure 10) is formed by a horizontal plane 140 that is extended, on both sides of the central stem 121, by an inclined plane 141 which continues towards the opposite side (the side that is not visible in Figure 10).

20 The cover 113 of the socket 110 further comprises two openings for providing access to the inclined planes 141, these openings not being visible in Figure 10 because the cover 113 is shown partially cut away.

These openings are adapted to receive two actuating pins 142, of which the front face is oblique, of an adaptor 143 added on to a plug 144 having

three pins 115-117 of rectangular section (see Figure 11).

This adaptor 143 is a component moulded in plastics material, and is formed from a thin wall 145 provided with holes for the passage of the pins 115-117. The actuating pins 142 are integrally formed with the thin wall 145
5 and project perpendicularly from it. Their length is slightly greater than that of the pins 115 and 116 of the plug destined to be connected to an electrical supply but slightly less than that of the earth pin 117 of the same plug. It should be noted in this connection that, in other embodiments, the extremity of the actuating pins 142 could be, for example, rounded, and the section of the pins
10 could be different.

In order to be connected to the plug 144 in a suitably solid manner, the rear face of the wall 145 may for example be provided with a layer of glue. This may for example be applied in the form of a layer having two adhesive surfaces, of which the other surface is temporarily protected by a
15 peelable layer.

Referring again to the socket 110, it should further be noted that the contact elements 146 and 147 destined to be connected to an electrical supply are shown on Figures 12 and 13.

These contact elements are of the same conventional type as
20 those implemented in the sockets of the first and second embodiments.

In other respects, the socket 110 is identical to that of Figure 1.

Thus from the same shutter 118 it is possible to produce a conventional safety shutter and a safety shutter for a specific electricity supply network.

The freeing and the actuation of the shutter 118 with its specific network side turned towards the holes provided for passage of the pins are shown in Figures 12 and 13.

At rest, this shutter 118 is held in the earth contact element 114,
5 as in the first embodiment.

On the introduction of the earth pin 117, the earth contact element 114 is deformed and thus frees the head 130. The shutter nevertheless remains in place under the action of the spring 124 (see Figure 12).

Furthermore, pushing on a single horizontal plane 140 causes the
10 shutter 118 to rock and so be blocked against one or other of the back stops 134.

In addition, if the adaptor 143 is not in place on the plug 144, the live and neutral pins 115 and 116 abut against the two horizontal planes 140 and do not therefore cause displacement of the shutter 118.

15 By contrast, through the simultaneous pushing of the actuating pins 142 of the adaptor 143 on the inclined planes 141, the shutter 118 is displaced, so unblocking the access to the contact elements 146 and 147 destined to be connected to an electrical supply (see Figure 13). When the plug 144 is completely inserted, contact is established between the pins 115-117 and
20 the contact element 114, 146 and 147.

On withdrawing the plug 144 from the socket 110, the shutter 118 is pushed back under the action of the spring 124 towards its locked position, and abuts the front stops 133.

The variant of Figures 14 to 17 implements the locking system of

the second embodiment, which is to hold the shutter in its resting position by means of the edge 132' of the earth contact element 114'.

The shutter 118' is not, however, reversible, but only comprises the following error-proof system on one side of the side wings 122' of the shutter
5 118'.

The upper or front side of each side wing 122' comprises a plane 140' that is inclined towards the free extremity of each side wing 122'. Each inclined plane 140' stops at the location of a cavity having an inclined bottom 141' hollowed out of the side wing 122. Each of the inclined bottoms 141' is
10 adjacent to the central stem 21' and forms an inclined plane adapted to cooperate with an actuating pin of the adaptor, of which only the actuating pins 142' are visible on the Figures 15 to 17. This adaptor is similar to the adaptor 143 of Figure 11. It differs from it simply in relation to the position of the actuator pins 142' which are disposed between the holes through which pass
15 the live and neutral pins. As in the previous case, this adaptor is also adapted to be added on to a corresponding plug of which only the pins 115'-117' are shown on Figures 15 to 17.

For this purpose, the cover 113' of the socket 110' naturally comprises holes through which pass the actuator pins 142', suitably disposed.

20 Note once again that the underside of the side wings 122' is tapered in the direction of their free extremities.

In other respects, this variant is identical to the second embodiment.

Suffice it to say that only the actuator pins 142' are capable of

urging the shutter 118' towards its open position through cooperation with the inclined planes 141' after the shutter 118' has been freed by the separation of the side wings 128' of the earth contact element 114' by means of the earth pin 117' (see Figures 16 and 17).

5 Naturally the present invention is not limited to the embodiments described and illustrated, but includes any variant for its implementation

 In particular, the earth contact element 14 can be continued with a tab that extends into a cavity communicating with the cavity 19, and making it possible to connect the element 14 to an earthing wire.

10 Moreover, the cover 13 may be provided with a rib for maintaining the spring in the hollow 26.

 It may also be envisaged to provide elastic means for permanently biasing the side branches 29 towards their locking position.

 The adaptor of Figure 11 could also be replaced by a mechanical
15 equivalent, such as an end piece in which conductors are incorporated each comprising a tubular portion opening onto an end face of the end piece, in order to receive the pins of the plug and a substitute pin projecting from the other end face of the end piece, and at least one actuator pin projecting from the said other end face.

20 Of course, when the shutter is mounted in an electrical socket with the possibility of the side wings rocking from front to back and vice-versa, two actuating pins will be provided adapted to cooperate with the two inclined planes in such a manner that a force exerted from top to bottom on these inclined planes tends to separate the side wings of the safety shutter from the

openings of the socket provided for receiving the live and neutral pins of a corresponding plug.

CLAIMS

1. An electrical socket (10 ; 10' ; 110 ; 110'), of the kind comprising two contact elements destined to be connected to an electrical supply and an earth contact element (14 ; 14' ; 114 ; 114'), each of the contacts being adapted to receive one of the pins (15-17 ; 15'-17' ; 115-117 ; 115'-117') of a corresponding plug, with a safety shutter (18 ; 18' ; 118 ; 118') barring the access to the contact elements destined to be connected to an electrical supply, this safety shutter (18 ; 18' ; 118 ; 118') being mounted so as to be movable between a closed position, in which it prevents access to the contact elements destined to be connected to an electrical supply, and an open position, in which it permits such access, the shutter (18 ; 18' ; 118 ; 118'), moreover, being held in a closed position such that it can be freed and then urged towards the open position by the corresponding plug when the pins thereof are introduced into the electrical socket (10 ; 10' ; 110 ; 110'), and elastic return means (24 ; 24' ; 124 ; 124'), which act constantly to urge the safety shutter (18 ; 18' ; 118 ; 118') towards the closed position, the safety shutter (18 ; 18' ; 118 ; 118') being held in the closed position by direct contact of the earth contact element (14 ; 14' ; 114 ; 114') upon the safety shutter (18 ; 18' ; 118 ; 118'), which earth contact element (14 ; 14' ; 114 ; 114') is adapted to undergo elastic deformation due to the introduction of the earth pin (17 ; 17' ; 117 ; 117') of the corresponding plug to break the contact between the earth contact element (14 ; 14' ; 114 ; 114') and the shutter (18 ; 18' ; 118 ; 118'), thereby allowing the safety shutter (18 ; 18' ; 118 ; 118') to move towards an open position.

2. An electrical socket according to Claim 1, characterized in that the earth contact element (14 ; 114) comprises a substantially U-shaped element adapted to cooperate with the safety shutter (18 ; 118) by means of

corresponding forms (31, 32, 131, 132) that engage one into the other provided on the side branches (29 ; 129) of the U and on the safety shutter (18 ; 18'), the side branches (29 ; 129) being adapted to be separated from each other through elastic deformation of the substantially U-shaped element by means of
5 the earth pin (17 ; 117) of the corresponding plug when this is inserted into the electrical socket (10, 110), in order to free the safety shutter(18 ; 118).

3. An electrical socket according to Claim 2, characterized in that the safety shutter (18 ; 118) has the general form of a T and comprises a central stem (21 ; 121) and two side wings (22 ; 122) for preventing access to the two
10 contact elements destined to be connected to an electrical supply, the corresponding forms comprising at least one side hook (31 ; 131) on the central stem (21 ; 121) and at least one opening (32 ; 132) in one of the side branches (29 ; 129) of the substantially U-shaped element.

4. An electrical socket according to Claim 1, characterized in that
15 the earth contact element (14' ; 114') has the general form of a U and comprises two side branches (28' ; 128') abutting against the safety shutter (18' ; 118') in the closed position in order to hold it in that position, and adapted to be separated from each other through elastic deformation by means of the earth pin (17', 117') of the corresponding plug when this is inserted into the electrical
20 socket (10' ; 110'), in order to free the safety shutter(18' ; 118').

5. An electrical socket according to Claim 4, characterized in that the safety shutter (18' ; 118') comprises a central stem (21' ; 121') and two side wings (22', 122') for preventing access to the two contact elements destined to be connected to an electrical supply, the central stem (21' ; 121') abutting, in the

closed position, the portion (32', 132') of the edges of the side branches (28' ; 128') of the earth contact element (14' ; 114') that is situated at the free end of the side branches (28' ; 128').

6. An electrical socket according to Claim 3 or 5, characterized in
5 that the front surface of the side wings (22 ; 22') oriented towards the openings in the electrical socket (10 ; 10') for accessing the contact elements destined to be connected to an electrical supply, is cut back by a bevel (27) on each wing which is adapted to cooperate with a pin (15, 16 ; 15', 16') of the corresponding plug destined to be connected to an electrical supply, in order to urge the
10 shutter (18 ; 18') towards the open position.

7. An electrical socket according to Claim 6, characterized in that the safety shutter (18 ; 18') is mounted on the electrical socket (10 ; 10') with the possibility of the side wings (22 ; 22') rocking forwards and backwards and vice-versa, and stops (34 ; 33') for blocking the rectilinear displacement of the
15 safety shutter (18 ; 18') towards the open position are provided in the electrical socket (10 ; 10') at right angles to the surface (35) that extends between the front and back surfaces of the side wings (22 ; 22'), on the opposite side to the bevels (27 ; 26'), such that if a single of the side wings (22 ; 22') is pushed it will rock from front to back and so be blocked against a stop (34 ; 33').

20 8. An electrical socket according to any one of Claims 1 to 7, characterized in that the elastic return means comprises a spring (24 ; 24') acting in compression between the safety shutter (18 ; 18') and an abutment means (25 ; 25') of the electrical socket (10 ; 10').

9. An electrical socket according to Claim 8 and any one of

Claims 3, 5, 6 and 7, characterized in that the central stem (21) or central branch (21') comprises a housing (26) for the spring (24 ; 24').

10. An electrical socket according to Claim 1, characterized in that the socket (110 ; 110') comprises at least one inclined plane (141 ; 141')
5 disposed on the shutter (118 ; 118') such that the urging of the shutter towards the open position after it has been freed is subject to the presence of an adaptor (143) provided on the corresponding plug (144) and having at least one actuating pin (142 ; 142') capable of urging the shutter (118 ; 118') towards the open position by cooperation with the inclined plane (141 ; 141').

10 11. An electrical socket according to Claims 3 and 10, characterized in that two inclined planes (141) formed by two extensions of the wings (122) extending on each side of the central stem (121) of the safety shutter (118) having the general form of a T.

12. An electrical socket according to Claims 5 and 10,
15 characterized in that two inclined planes (141') are formed by the bottom of two cavities each one hollowed out of a side wing (122') of the shutter (118') comprising a central stem (121') and two side wings (122').

13. An electrical socket according to Claim 11 or 12, characterized in that the surface of the side wings (122), on the side of the shutter (118) that is
20 opposite to that presenting the inclined planes (141), is cut back by a bevel on each wing (122, which is intended to cooperate with the pin (115, 116) of a corresponding plug (144) destined to be connected to an electrical supply, in order to urge the safety shutter (118) towards the open position.

14. An electrical socket according to any one of Claims 11 to 13,

characterized in that the safety shutter (118 ; 118') is mounted on the electrical socket (110 ; 110') with the possibility of the side wings (122 ; 122') rocking forwards and backwards and vice-versa, and stops (134 ; 133') for blocking the rectilinear displacement of the safety shutter (118 ; 118') towards the open
5 position are provided in the electrical socket (100 ; 110'), such that pushing on a single of the side wings (122 ; 122') will cause it to rock from front to back and to be blocked against a stop (134 ; 133').

15. An electrical socket according to any one of Claims 10 to 14, characterized in that the elastic return means comprises a spring (124 ; 124')
10 acting in compression between the safety shutter (118 ; 118') and an abutment means (125 ; 125') of the electrical socket (110 ; 110').

16. A system of electrical connection for a specific electricity supply network, comprising a socket according to any one of Claims 10 to 15 and a plug (144) having three pins (115-117 ; 115'-117') provided with an adaptor
15 (143) as claimed in claim 10.

17. A system according to Claim 16, characterized in that the adaptor comprises a thin wall (145) provided with three holes for the passage of the pins (115-117) of the corresponding plug and two actuating pins (142) projecting from the thin wall.