

## **IMPROVED ELECTRICAL SOCKET**

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### **FIELD OF THE INVENTION**

The present invention relates to an improved electrical socket. The electrical socket has improved functions, such as ease of use and replacement, versatility,  
10 and the protection of an appliance attached to the socket from damage due to current leakage or shock current.

### **BACKGROUND TO THE INVENTION**

15 The design and construction of conventional electrical sockets are well-known. They consist of a socket with socket apertures for connecting 2-pin or 3-pin plugs and an On/Off switch. The disadvantages of these sockets is that plugs connected to the socket can be unintentionally dislodged when a pulling force acts on the plug in a direction away from the socket. Further, once an electrical socket  
20 is damaged and/or burnt out, the whole socket needs to be replaced. The person replacing the socket requires knowledge of electrical wiring, in order to make the appropriate connections of the live, neutral and earth wires. The wires must be meticulously screwed into the electrical contacts of the new socket.

25 Also, the appliance attached to the conventional socket may be damaged as a result of current leakage or current overload. Even where the damage is prevented by a central fuse box, it may be difficult to tell which of the appliances in the house or factory premises caused the tripping of the fuse box. Sometimes, a small fuse may conventionally be inserted into a plug. When there is a current  
30 overload, the fuse will cut off the electrical connection. The problem is that the user must open up the plug and replace the fuse. This is inconvenient. Finally, if too many appliances are connected to a conventional socket, too much heat

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may be generated which will damage the socket. The invention seeks to overcome the above disadvantages of conventional electrical sockets.

### **OBJECTIVE OF THE INVENTION**

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The present invention was developed with a view to providing an improved electrical socket which can prevent a plug from being unintentionally dislodged when in connection with the socket. It is a further objective of this invention to make it easy to replace the socket with a new socket or different configuration of  
10 socket without having to rewire the socket. It is a still further objective of this invention to provide an internal circuit-breaker mechanism for such electrical socket so that each appliance attached to the electrical socket is protected in the event of current leakage or electrical overload. The electrical supply can be restored simply by pushing buttons on the circuit-breaker. Where too many electrical  
15 appliances are connected to the socket and the temperature of the socket rises unacceptably, the user will be prompted to prevent damage or burn-out of the socket.

According to one aspect of the invention there is provided an electrical  
20 socket for a plug having a plurality of pins, comprising a socket face plate having at least one set of apertures therein for receiving respective ones of the pins of the plug, and having means for preventing withdrawal of the pins from the face plate when the pins have been received in the apertures.

Preferably, the means for preventing withdrawal of the pins comprises a  
25 formation of the socket face plate which is adapted to engage a cooperating formation provided on the pins.

Preferably, the means for preventing withdrawal further comprises a screen having plurality of apertures therein for receiving the pins of the plug, and the screen is movable between a first position in which at least one of the screen  
30 apertures is out of alignment with the socket plate apertures, and a second position in which the screen apertures are in alignment with the socket plate apertures. Preferably also, the screen is movable from the first position to the

second position under the pressure of the plug pins when the plug is inserted into the socket. Thus, the screen can prevent access to the interior of the socket, when the plug is not plugged in.

5 In a preferred embodiment, the screen is provided with an operating member, which may be in the form of a lever, for manually moving the screen from the first position to the second position.

It is desirable that the screen is biased towards the first position so that said screen formations are biased into engagement with said pin formations when the plug is received in the socket.

10 According to another aspect of the invention there is provided an electrical socket comprising: a socket support having at least live and neutral connectors which are adapted to be electrically connected to a mains electrical supply; a socket face plate having at least live and neutral connectors, the face plate having at least one set of apertures adapted to receive corresponding pins on a plug,  
15 whereby the pins on the plug are brought into electrical connection with respective ones of the live and neutral connectors of the face plate when the plug pins are received in the set of apertures ; and securing means to releasably secure the face plate to the support, the arrangement being such that when the face plate is secured to the support by the securing means, the live and neutral electrical  
20 connectors on the face plate are brought into electrical connection respectively with the live and neutral connectors on the support.

This arrangement will ensure that the face plate is firmly secured to the support plate when the socket is in use, but makes it possible for the face plate to be easily released from the support and replaced with a further face plate having  
25 a different size and or configuration of face plate apertures.

Usually, the support will be further provided with an earth connection which is adapted to be connected to a mains electrical supply. Furthermore, the face plate is usually provided with an earth connection which is brought into contact with the earth connection of the support when the face plate is secured to the  
30 support, whereby an earth pin of the plug can be brought into electrical contact with the earth connection of the face plate through a respective one of the set of apertures in the face plate.

Preferably the face plate is provided with at least two of said sets of apertures. The face plate may be provided with three, four, or more, of said sets of apertures. Preferably, the size and/or configuration of one of said sets of apertures is different from the size and/or configuration of another of the sets of apertures, whereby the face plate is adapted to receive at least two different types of plug.

In one embodiment, the electrical connectors on the face plate each comprises a projection, and the electrical connectors on the support each comprise a recess, each projection being received in a respective recess when the face plate is secured to the support.

In another embodiment, the electrical connectors on the support each comprises a projection, and the electrical connectors on the face plate each comprise a recess, each projection being received in a respective recess when the face plate is secured to the support.

Most preferably, the electrical connectors on the support are provided in the form of a female connector and the electrical connectors on the face plate are provided in the form of a male connector. It will, of course, be appreciated that it would instead be possible to provide the electrical connectors on the support in the form of a male connector and to provide the electrical connectors on the face plate in the form of a female connector. In a preferred embodiment, the connectors are three poles connectors.

In a preferred embodiment, the electrical socket further comprises a circuit breaker for disconnecting the electrical connection between the mains supply and any plug received in the or each set of apertures in response to a current leak or current overload. It is also preferable that the circuit breaker includes a thermostat for establishing a connection to an indication means to indicate that there is a heat overload or for disconnecting the electrical connection between the mains supply and any plug received in the or each set of apertures in response to a temperature in excess of a predetermined level, such as 105°C.

A cover is desirably provided for the socket support, the cover being releasably securable to the support when the socket face plate has been released from the support, the cover serving to prevent access to the electrical connections

of the support.

In one embodiment, the socket support is adapted to be fixed to a structure, such as a wall, and the electrical connections of the socket support are adapted to be directly connected to the mains wires installed in the structure. This fixing  
5 may be substantially permanent. By means of this arrangement, the electrical socket according to the invention functions in the same way as a conventional wall mounted socket, except that a variety of face plates can be used with the socket support in order to provide electrical access for a variety of sizes and or configurations of plugs. Thus, this configuration obviates the necessity to use a  
10 conventional adapter plug with a wall socket.

In another embodiment the electrical socket further comprises an electrical connector lead, and a plug, the electrical connector lead being secured at one end to the electrical connections of the socket support, and being secured at the other end to the plug. The plug may then be plugged into a conventional wall-mounted  
15 electrical socket, or to a wall mounted socket according to the invention. This embodiment allows the socket according to the invention to be used to provide an electrical extension lead.

The socket support preferably further comprises a housing within which the electrical connectors are disposed, and the securing means secures the face plate  
20 to the housing. The circuit breaker may be carried on the face plate in such a way that it is received within the support housing when the face plate is secured to the support.

According to another aspect of the invention there is provided an electrical plug comprising a plug housing having a plurality of pins extending therefrom the  
25 pins being adapted to be received in respective ones of a plurality of aperture provided in an electrical socket, wherein the pins are adapted to interact with the socket, when received in the apertures in such a way that removal of the pins from the apertures is prevented.

Preferably, the pins are provided with formations adapted to interengage  
30 with cooperating formations in the socket, in order to prevent removal of the pins from the apertures.

According to another aspect of the invention there is provided an electrical socket for a plug having plurality of pins, the socket comprising: a socket face plate having at least one set of apertures therein for receiving respective ones of the pins of the plug; a circuit breaker adapted to cut off any current supply to the plug in the event of current leakage or electrical overload; and reset means for manually resetting the current supply to the plug after activation of the circuit breaker wherein:

- (i) the electrical socket is adapted to be fixed to a structure, and the socket has electrical connections which are adapted to be directly connected to mains wires installed in the structure; or
- (ii) the electrical socket further comprises an electrical connector lead, and a plug, the electrical connector lead being secured at one end to electrical connections in the socket, and being secured at the other end to the plug to the plug.

Preferably the reset means comprises a reset switch. Desirably, the circuit breaker includes a thermostat for cutting of the current supply to the plug if the temperature in the socket exceeds a predetermined level, such as 105°C.

In one embodiment, the electrical socket further comprises a socket support which is adapted to be fixed to the structure, and the socket face plate is removably secured to the support. In this embodiment, the fixed structure may be, for example a wall of building, and the socket support may be substantially permanently fixed to the structure.

In another embodiment, the electrical socket further comprises a socket support to which the electrical connector lead is adapted to be connected, and the socket face plate is removably secured to the support.

The invention further provides a combination of the electrical socket and plug described above.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

In order to facilitate a more comprehensive understanding of the nature of the invention, a preferred embodiment of the electrical plug device in accordance with

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

Figure 1 is a perspective view of an electrical socket according to the preferred  
5 embodiment of this invention.

Figure 2 is a perspective view of an electrical socket according to another preferred embodiment of this invention, wherein the electrical socket is attached to an extension cable.

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Figure 3 is the front view of the face plate of the electrical socket of Figure 1.

Figure 3A is a side view of the electrical socket of Figure 3 taken along the line A-A.

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Figure 4 is a perspective view of the pin of a plug and plastic cover only, without the face plate of the electrical socket.

Figure 5 is the perspective view of the socket bracket when separated from the  
20 face plate.

Figure 6 is the rear view of the socket bracket of Figure 5.

Figure 7 illustrates the safety cover which can be used to cover the socket bracket  
25 when the face plate is not attached thereto.

Figure 8 illustrates the face plate of the electrical socket without the socket bracket, wherein the circuit-breaker assembly and 3-point pin assembly are revealed.

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Figure 9 is a rear view of the face plate of Figure 8 illustrating the 3-point pins.

Figure 10 is a cross-sectional view of the circuit-breaker assembly showing the internal construction of the same.

### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

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Figure 1 illustrates the preferred embodiment of an improved electrical socket (1) in accordance with the invention. In this embodiment, a socket bracket (3) is attached to the face plate (2) by means of screws or snap-on means. On the face plate (2) are a plurality of socket apertures (16) for receiving plug-pins (35).

10 Corresponding to each set of socket apertures (16) is an on/off switch (4) for turning the current on or off. Also associated with and located behind each socket aperture (16) on the inside of the face plate (2) is a plastic cover (37) which has a plastic cover lever (5).

15 The electrical socket (1) also has a circuit breaker (6), which from an external view, consists of a shock bulb (7), reset button (8), current cut-off bulb (9), start button (10) and overload light bulb (11). The details of the operations of these features will be elaborated on below. Optionally, the face-plate may also include a night light (12) which can be switched on at night.

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In the embodiment of the invention shown in Figure 1, at the rear of the socket bracket are plug pins (13) for connection to a main power source (not shown). In the second preferred embodiment of the invention shown in Figure 2, the electrical socket (1) has an extension cable (14) so that the electrical socket (1) may act as an electrical extension. Figures 1 and 2 illustrate designs which enable the electrical socket (1) to have multiple sets of socket apertures in different configurations, and the apertures can receive different types of plugs from countries such as the United States, United Kingdom, Japan, Australia, Taiwan and India without limitation.

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Figure 3 is the front view of the face plate (2), showing the socket apertures (16), plastic cover lever (5) and on/off switch (4). Figure 3A is a cross-sectional view

of the face plate taken at line A-A of Figure 3. In this preferred embodiment of the invention, the face plate (2) includes a snap-on notch (15) at the rear of the face plate (2). The said snap-on notch (15) is meant for engagement with a corresponding bracket notch (23) formed on the socket bracket (3). It would be  
5 apparent to a person skilled in the art that other engagement means, such as screws, may also be used alone and/or with the snap-on means to connect the face plate (2) to the socket bracket (3).

Figure 4 illustrates the interaction of the plastic safety cover (37) and the pin of a  
10 plug (35). When no plug is inserted into the socket aperture (16), the plastic cover (5) prevents access to the internal parts of the socket. The plastic safety cover (37) is biased downwards by means of a torsion spring or other similar device. In this biased position, the plastic cover apertures (38) are out of alignment with the socket apertures (16). The plastic safety cover (37) will thus prevent access to the  
15 internal electrical components. Before inserting the plug (not shown) into the socket aperture (16), the plastic safety cover (37) and plastic cover lever (5) are forced upwards using the plastic cover lever (5) to align the plastic cover aperture (38) with the socket aperture (16) to allow the plug to be inserted. Alternatively, the use of a plug-pin (35) with a tapered end will automatically lift the plastic safety  
20 cover (37) during insertion. Once the plug is fully inserted, the plastic safety cover (37) catches the notch (36) on the plug-pin (35), thereby securing the plug-pin (35) to the socket aperture (16). As a result, a pulling force on the plug will not remove it from its inserted position. In order to remove the plug, the plastic cover lever (5) must be pushed upwards in order to release the plastic safety cover (37) from  
25 locking connection with the notch (36) and allow the plug to be pulled out.

Figure 5 illustrates a third preferred embodiment of the invention, with an "in-box" socket bracket (17). The "in-box" socket bracket (17) may be secured into a wall or other permanent fixture. The "in-box" socket bracket (17) includes holes for  
30 screws (18) or it may include other means to secure the "in-box" socket bracket (17) to the wall or other permanent fixture.

The socket bracket (3 or 17) includes a 3-poles connector (39) for mating combination with corresponding 3-pole pins (25) on the face plate (2). The 3 poles correspond to the live wire (20), earth wire (21) and neutral wire (22) of an electrical connection. The said wires (20, 21 and 22) are secured to the 3-poles connector (39) by the use of screws, electrical clips or other means during  
5 installation of the socket bracket (17) to the wall. Once the socket bracket (17) has been properly installed, there is no need to remove it again even when the face plate (2) needs to be replaced.

10 Figure 6 shows the rear of the same socket bracket (17) wherein the wire (20, 21 and 22) extend outwards through holes pre-formed on the socket bracket. The bracket notch (23) for snap-on connection with the face plate (2) is also shown. Further, Figure 7 illustrates the safety cover (24) which can be used to cover the socket bracket (17) when the electrical socket (1) is not in use and the face plate  
15 (2) is removed therefrom. The safety cover conceals the internal wiring of the socket bracket (17), and may also be designed as a decorative item with different colours.

Figures 8 and 9 illustrate the 3-pole pins (25) to the rear of the face plate (2) for  
20 convenient mating combination with the 3-pole connector (39) of the socket bracket 3 or (17). The 3-pole pins (25) are made of electrically conductive material. It is simple to connect the socket apertures (16) of the face plate (2) to the electrical wiring connection, because the connection is formed when the 3-pole pins (25) are inserted into the 3-pole connector (39), when the face plate (2) is  
25 joined to the socket bracket (3 or 17).

It is apparent from the above description that the invention improves versatility because socket brackets of different configurations (eg 3 or 17) may be matched or substituted with face plates (2) of different configurations without a need for the  
30 user to re-wire the socket.

Figure 10 is a cross-sectional view of the circuit breaker (6) assembly illustrating the mechanism of the circuit breaker. The circuit breaker (6) includes a shock bulb (7), reset button (8), current cut-off bulb (9), start switch (26), start button (10) and overload light bulb (11), each with its separate function.

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The set-up of the wiring according to the preferred embodiment of this invention is shown in Figure 10. Briefly, the live wire (20) and neutral wire (22) are wound around the current transducer coil (27) two or three times and are connected to the N/C contact switch (29). The earth wire (21) is connected to the shock bulb (7). Another lead of the neutral wire (22) is connected to the shock bulb (7), current cut-off bulb (9) and overload light bulb (11) in sequence. The function of the shock bulb (7), which lights up upon a current leakage or overload, is to absorb any leakage or shock current so as not to damage the appliance. As shown in Figure 10, the shock bulb (7) is earthed.

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Any leakage or shock current down to as low as 50 watts is sufficient to trigger the N/C contact switch (29). Upon being triggered by a leakage or shock current, the N/C contact switch (29) will activate the lever A (30) and push lever B (31) until the spring lever C (32) is released from lever A (30). Then lever D (33) will be triggered and the reset button (8) will be pushed forward. The extension pin (34) will then push lever A (30) back to its normal position and depress the N/C contact switch (29) to its normal position.

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Simultaneously, the start button (10) will also be pushed out and the current cut-off bulb (9) will light up, preferably in red in the preferred embodiment. At this time, the power supply from the electrical source is totally cut off. The overload light bulb (11), will also light up (preferably in orange in the preferred embodiment), which indicates that the socket (1) is overloaded.

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To restart the appliance, the user should first push the reset button (8) to its depressed position, and then depress the start button (10). As a result, the start switch (26) will close the circuit connection.

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To protect the electrical socket (1) from damage due to current overload when too many electrical appliances are connected to it, a thermostat (28) is used. The thermostat (28) will only be activated at a certain temperature (say 105°C), at which the electrical socket (1) is safe from damage. At a temperature greater than  
5 the pre-determined temperature, the thermostat (28) will close the electrical connection of the live wire (40) connecting the overload light bulb (11) to the thermostat, to thermostat (28). As a result, the overload light bulb (11) will light up warning the user before damage, such as the melting of the electrical socket (1) occurs. Alternatively, in another embodiment, the thermostat (28) can instead be  
10 used to cut off the electrical connection from the mains supply to the plug inserted into the electrical socket (1).

The invention described herein is susceptible to variations, modifications and/or additions other than those specifically described and it is to be understood that the  
15 invention includes all such variations, modifications and/or additions which fall within the spirit and scope of the above description.



**CLAIMS:**

1. An electrical socket (1) for a plug having a plurality of pins (35), comprising a socket face plate (2) having at least one set of apertures (16) therein for receiving respective ones of the pins (35) of the plug, and having means for preventing withdrawal of the pins (35) from the face plate (2) when the pins (35) have been received in the apertures (16).
2. An electrical socket (1) according to claim 1, wherein the means for preventing withdrawal of the pins (35) comprises a formation of the socket face plate (2) which is adapted to engage a cooperating formation (36) provided on at least one of the pins (35).
3. An electrical socket (1) according to claim 2, wherein the means for preventing withdrawal further comprises a screen (37) having a plurality of apertures (38) therein for receiving the pins (35) of the plug, and wherein the screen (37) is movable between a first position in which at least one of the screen apertures (38) are out of alignment with the socket plate apertures (16), and a second position in which the screen apertures (37) are in alignment with the socket plate apertures (16).
4. An electrical socket (1) according to claim 3, wherein the screen (37) is movable from the first position to the second position under the pressure of the plug pins (35) when the plug is inserted into the socket (1).
5. An electrical socket (1) according to claim 3 or 4, wherein the screen (37) is provided with an operating member (5) for manually moving the screen (37) from the first position to the second position.
6. An electrical socket (1) according to claim 3, 4, or 5, wherein the screen (37) is biased towards the first position so that said screen formations are biased into engagement with said pin formations (36) when the plug is received in the



socket (1).

7. An electrical socket (1) according to any preceding claim, wherein the face plate (2) is provided with at least two of said sets of apertures (16).

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8. An electrical socket (1) according to claim 7, wherein the size and/or configuration of one of said sets of apertures (16) is different from the size and/or configuration of another of the sets of apertures (16), whereby the face plate (2) is adapted to receive at least two different types of plug.

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9. An electrical socket (1) according to any preceding claim, further comprising a socket support (3) having at least live and neutral connectors (20,22) which are adapted to be electrically connected to a mains electrical supply, and securing means to releasably secure the face plate (2) to the support (3), and wherein the socket face plate (2) has at least live and neutral connectors, whereby the pins (35) on the plug are brought into electrical connection with respective ones of the live and neutral connectors of the face plate (2) when the plug pins (35) are received in the set of apertures (16), the arrangement being such that when the face plate (2) is secured to the support (3) by the securing means, the live and neutral electrical connectors on the face plate (2) are brought into electrical connection respectively with the live and neutral connectors (20,22) on the support (3).

10. An electrical socket (1) according to claim 9, wherein the support (3) is further provided with an earth connection (21) which is adapted to be connected to a mains electrical supply.

11. An electrical socket (1) according to claim 10, wherein the face plate (2) is further provided with an earth connection which is brought into contact with the earth connection (21) of the support (3) when the face plate (2) is secured to the support (3), whereby an earth pin of the plug can be brought into electrical contact with the earth connection of the face plate (2) through a respective one of the set



of apertures (16) in the face plate (2).

12. An electrical socket (1) according to any one of claims 9 to 11, wherein the electrical connectors on the face plate (2) each comprises a projection, and the  
5 electrical connectors (20,22) on the support (3) each comprise a recess, each projection being received in a respective recess when the face plate (2) is secured to the support (3).

13. An electrical socket (1) according to any one of claims 9 to 11, wherein the  
10 electrical connectors (20,22) on the support (3) each comprises a projection, and the electrical connectors on the face plate (2) each comprise a recess, each projection being received in a respective recess when the face plate (2) is secured to the support (3).

15 14. An electrical socket (1) according to any one of claims 9 to 13, wherein the securing means comprises a snap-fit connection provided between the support (3) and the face plate (2).

15. An electrical socket (1) according to any one of claims 9 to 14, further  
20 comprising a circuit breaker for disconnecting the electrical connection between the mains supply and any plug received in the or each set of apertures (16) in response to a current leak or current overload.

16. An electrical socket (1) according to any one of claims 9 to 15, wherein the  
25 circuit breaker includes a thermostat (28) for establishing a connection to an indication means (11) to indicate that there is a heat overload or for disconnecting the electrical connection between the mains supply and any plug received in the or each set of apertures (16) in response to a temperature in excess of a predetermined level.

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17. An electrical socket (1) according to claim 15 or 16, further comprising reset means (8) for manually reconnecting the electrical connection between the mains



supply and the plug.

18. An electrical socket (1) according to claim 17, wherein the reset means (8) comprises a reset button.

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19. An electrical socket (1) according to claim 17 or 18, wherein the reset means is provided in the face plate (2).

20. An electrical socket (1) according to any one of claims 9 to 19, wherein a  
10 cover (24) is provided for the socket support (3), the cover (24) being releasably securable to the support (3) when the socket face plate (2) has been released from the support (2), the cover (24) serving to prevent access to the electrical connections (20,22) of the support (3).

15 21. An electrical socket (1) according to any one of claims 9 to 20, wherein the socket support (3) further comprises a housing (19) within which the electrical connectors (20,22) are disposed, and the securing means secures the face plate (2) to the housing (19).

20 22. An electrical socket (1) according to claim 21, when dependent upon claim 15 or 16, wherein the circuit breaker is carried on the face plate (2) in such a way that it is received within the support housing (19) when the face plate (2) is secured to the support (19).

25 23. An electrical socket (1) according to any one of claims 9 to 22, wherein the socket support is adapted to be fixed to a structure, and the electrical connections of the socket support are adapted to be directly connected to the mains wires installed in the structure.

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24. An electrical socket (1) according to any one of claims 9 to 22, wherein the electrical socket further comprises an electrical connector lead, and a plug, the electrical connector lead being secured at one end to the electrical connections of the socket support, and being secured at the other end to the plug.

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25. An electrical socket (1) according to any one of claims 9 to 24, wherein the electrical connectors on the support (3) are provided in the form of a female connector (39) and the electrical connectors on the face plate (2) are provided in the form of a male connector (25).

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26. An electrical socket (1) according to any one of claims 9 to 24, wherein the electrical connectors on the support (3) are provided in the form of a male connector and the electrical connectors on the face plate (2) are provided in the form of a female connector.

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27. An electrical socket (1) comprising: a socket support (3) having at least live and neutral connectors (20,22) which are adapted to be electrically connected to a mains electrical supply; a socket face plate (2) having at least live and neutral connectors, the face plate (2) having at least one set of apertures (16) adapted to receive corresponding pins (35) on a plug, whereby the pins (35) on the plug are brought into electrical connection with respective ones of the live and neutral connectors of the face plate (2) when the plug pins (35) are received in the set of apertures (16); and securing means to releasably secure the face plate (2) to the support (3), the arrangement being such that when the face plate (2) is secured to the support (3) by the securing means, the live and neutral electrical connectors on the face plate (2) are brought into electrical connection respectively with the live and neutral connectors (20,22) on the support (3).

28. An electrical socket (1) according to claim 27, wherein the support (3) is further provided with an earth connection (21) which is adapted to be connected to a mains electrical supply.

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29. An electrical socket (1) according to claim 27, wherein the face plate (2) is further provided with an earth connection which is brought into contact with the earth connection (21) of the support (3) when the face plate (2) is secured to the support (3), whereby an earth pin of the plug can be brought into electrical contact  
5 with the earth connection of the face plate (2) through a respective one of the set of apertures (16) in the face plate (2).

30. An electrical socket (1) according to claim 27, 28 or 29, wherein the face plate (2) is provided with at least two of said sets of apertures (16).  
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31. An electrical socket (1) according to claim 30, wherein the size and/or configuration of one of said sets of apertures (16) is different from the size and/or configuration of another of the sets of apertures (16), whereby the face plate (2) is adapted to receive at least two different types of plug.  
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32. An electrical socket (1) according to any one of claims 27 to 31, wherein the electrical connectors on the face plate (2) each comprises a projection, and the electrical connectors (20,22) on the support (3) each comprise a recess, each projection being received in a respective recess when the face plate (2) is secured  
20 to the support (3).

33. An electrical socket (1) according to any one of claims 27 to 31, wherein the electrical connectors (20,22) on the support (3) each comprises a projection, and the electrical connectors on the face plate (2) each comprise a recess, each  
25 projection being received in a respective recess when the face plate (2) is secured to the support (3).

34. An electrical socket (1) according to any one of claims 27 to 33, wherein the securing means comprises a snap-fit connection provided between the support (3)  
30 and the face plate (2).



35. An electrical socket (1) according to any one of claims 27 to 34, further comprising a circuit breaker for disconnecting the electrical connection between the mains supply and any plug received in the or each set of apertures (16) in response to a current leak or current overload.

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36. An electrical socket (1) according to any one of claims 27 to 35, wherein the circuit breaker includes a thermostat (28) for establishing a connection to an indication means (11) to indicate that there is a heat overload or for disconnecting the electrical connection between the mains supply and any plug received in the  
10 or each set of apertures (16) in response to a temperature in excess of a predetermined level.

37. An electrical socket (1) according to claim 35 or 36, further comprising reset means (8) for manually reconnecting the electrical connection between the mains  
15 supply and the plug.

38. An electrical socket (1) according to claim 37, wherein the reset means (8) comprises a reset button (8).

20 39. An electrical socket (1) according to claim 37 or 38, wherein the reset means is provided in the face plate (2).

40. An electrical socket (1) according to any one of claims 27 to 39, wherein a cover (24) is provided for the socket support (3), the cover (24) being releasably  
25 securable to the support (3) when the socket face plate (2) has been released from the support (2), the cover (24) serving to prevent access to the electrical connections (20,22) of the support (3).

41. An electrical socket (1) according to any one of claims 27 to 40, wherein the  
30 socket support (3) further comprises a housing (19) within which the electrical connectors (20,22) are disposed, and the securing means secures the face plate (2) to the housing (19).



42. An electrical socket (1) according to claim 41, when dependent upon claim 35 or 36, wherein the circuit breaker is carried on the face plate (2) in such a way that it is received within the support housing (19) when the face plate (2) is secured to the support (19).

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43. An electrical socket (1) according to any one of claims 24 to 42, wherein the socket support is adapted to be fixed to a structure, and the electrical connections of the socket support are adapted to be directly connected to the mains wires installed in the structure.

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44. An electrical socket (1) according to any one of claims 24 to 42, wherein the electrical socket further comprises an electrical connector lead, and a plug, the electrical connector lead being secured at one end to the electrical connections of the socket support, and being secured at the other end to the plug.

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45. An electrical socket (1) according to any one of claims 24 to 44, wherein the electrical connectors on the support (3) are provided in the form of a female connector (39) and the electrical connectors on the face plate (2) are provided in the form of a male connector (25).

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46. An electrical socket (1) according to any one of claims 24 to 44, wherein the electrical connectors on the support (3) are provided in the form of a male connector and the electrical connectors on the face plate (2) are provided in the form of a female connector.

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47. An electrical socket (1) according to any of claims 24 to 46, which includes an electrical shock absorption means (7) to absorb electricity from the earth connection of the electrical appliance attached to the electrical socket (1) in the event of current leakage or electrical overload to prevent damage to the electrical  
30 appliance.



48. A electrical socket (1) for a plug having plurality of pins (35), the socket (1) comprising : a socket face plate (2) having at least one set of apertures (16) therein for receiving respective ones of the pins (35) of the plug; a circuit breaker adapted to cut off any current supply to the plug in the event of current leakage or  
5 electrical overload; and reset means (8) for manually resetting the current supply to the plug after activation of the circuit breaker, wherein :

- (i) the electrical socket is adapted to be fixed to a structure, and the socket (1) has electrical connections which are adapted to be directly connected to mains wires installed in the structure; or  
10 (ii) the electrical socket further comprises an electrical connector lead, and a plug, the electrical connector lead being secured at one end to electrical connections in the socket (1), and being secured at the other end to the plug.

15 49. An electrical socket (1) according to claim 48, wherein the reset means (8) comprises a reset switch (8).

50. An electrical socket (1) according to claim 48 or 49, wherein the circuit breaker includes a thermostat (28) for establishing a connection to an indication  
20 means (11) to indicate that there is a heat overload or for cutting of the current supply to the plug if the temperature in the socket (1) exceeds a predetermined level.

51. An electrical socket (1) according to claim 48, 49 or 50, further comprising  
25 a socket support (3) which is adapted to be connected to the fixed structure, and wherein the socket face plate (2) is removably secured to the support (3).

52. An electrical socket (1) according to claim 48, 49 or 50, further comprising  
30 a socket support to which the electrical connector lead is adapted to be connected, and wherein the socket face plate is removably secured to the support.



53. An electrical socket comprising an electrical socket (1) according to any preceding claim, wherein the support (3) includes pins for a plug (13) for electrical connection of the electrical socket (1) to a mains or other power supply with corresponding apertures to receive the same.

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54. An electrical socket and plug combination comprising a electrical socket (1) according to any preceding claim in combination with a plug comprising a plug housing having plurality of pins (35) extending therefrom, the pins (35) being receivable in respective ones of the apertures (16) of the face plate (2).

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55. An electrical plug comprising a plug housing having a plurality of pins (35) extending therefrom the pins (35) being adapted to be received in respective ones of a plurality of apertures (16) provided in an electrical socket, wherein the pins (35) are adapted to interact with the socket (1), when received in the apertures (16) in such a way that removal of the pins (35) from the apertures (16) is prevented.

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56. An electrical plug according to claim 55, wherein the pins are provided with formations adapted to interengage with cooperating formations in the socket (1), in order to prevent removal of the pins (35) from the apertures (16).

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