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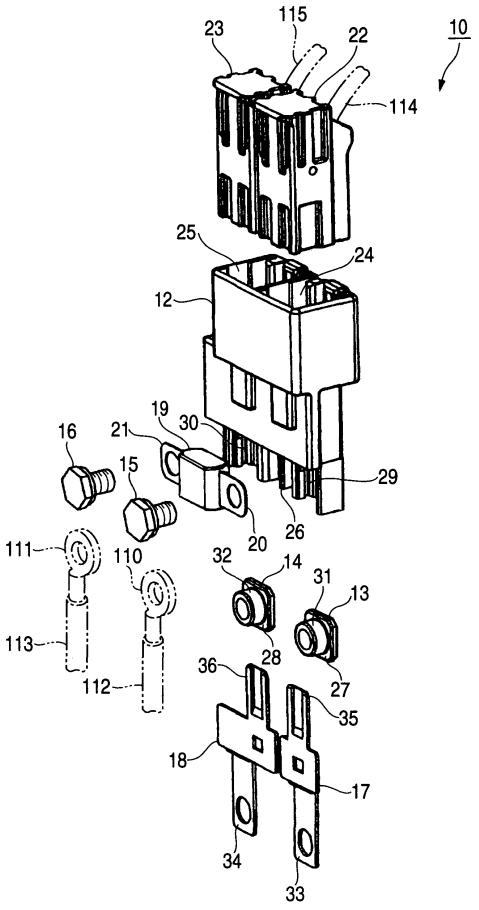
(54) Fuse block

(57) A fuse block 10 having a fusible link 19 fitted thereto and adapted to be attached to a junction box for connection of a wire harness 112 to the fusible link 19, wherein the fuse block 10 is detachably attached to the junction box while allowing LA terminals 110, 111 connected to wire harnesses 112, 113 and connectors 22, 23 connected to wire harnesses 114, 115 to be fitted therein thereto such that the terminals 110, 111 attached to the wire harnesses 112, 113 are electrically connected to the fusible link 19 at one part of the fuse block 10, whereas the connectors 22, 23 attached to the wire harnesses 114, 115 are electrically connected to the fusible link 19 at the other part of the fuse block 10.

FIG. 2



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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to a fuse block which attaches a fusible link that is connected between a power supply side and a load side of an automobile to a junction box.

2. Related Art

[0002] As one of conventional fuse blocks, there are known fuse blocks in which a first screw seating of a lower case is passed through respective first guide holes in a connector block, a J/B bottom cover and a J/B main body (for example, refer to JP-A-10-080039 (Pages 2 to 4, Fig. 1)).

[0003] In a fuse block disclosed in JP-A-10-080039, a connector block, a lower case, a J/B bottom cover and a J/B main body are positioned and are guided in a superposing direction by passing a first screw seating of the lower case through first guide holes in the connector block, the J/B bottom cover and the J/B main body, thereby improving the workability for assemblage. In addition, the lower case, the connector block, the J/B bottom cover and the J/B main body are joined together in the superposing direction so as to constitute a junction box, whereby the lateral enlargement of the junction box is prevented so as to realize the saving of space on a mount side.

[0004] In addition, as another example of the conventional fuse blocks, there are known fuse blocks in which a bolt is inserted in a bolt accommodation chamber for connection (for example, refer to JP-A-10-247450 (Pages 4 to 5, Fig. 1)).

[0005] In a fuse block disclosed in JP-A-10-247450, since a bolt is inserted in a bolt accommodation chamber for connection, the connecting work is facilitated, and since the bolt is fitted in such a state that a threaded portion of the bolt is passed through an electric wire side terminal, the electric wire side terminal is dislodged later in no case, thereby the fixing of the terminal to the fuse block being ensured.

[0006] Additionally, as a further example of the conventional fuse blocks, there are known fuse blocks in which a female or internal thread portion in which a bolt is screwed for attachment when a fusible link is accommodated is provided at a location on a bottom surface of an accommodation chamber which corresponds to each bolt pass-through hole, and a tubular bolt inductive portion is provided which induces a bolt as deep as each of the female thread portions (for example, refer to JP-A-2000-332446 (Pages 3 to 4, Fig. 1)).

[0007] In a fuse block disclosed in JP-A-2000-332446, since a male or external thread portion coincides with a female or internal thread portion by allowing a bolt to be inserted in a bolt insertion portion, the necessity of work is obviated in which the bolt is aligned with a bolt screw attachment portion, thereby screw attachment work being performed with ease.

[0008] As the other example of the conventional fuse blocks, there are known fuse blocks in which a nut holding portion in which a bolt is fittingly screwed is provided at a terminal fixing portion, and a guide is provided in the vicinity of the nut holding portion which guides an electric wire terminal to be fitted to a proper position by bypassing the nut holding portion (for example, refer to JP-A-8-279332 (Pages 4 to 6, Fig. 1)).

[0009] In a fuse block disclosed in JP-A-8-279332, when an electric wire terminal is inserted in a terminal fixing portion, a guide provided in the vicinity of a nut holding portion is designed to guide the electric wire terminal to a proper position by avoiding an interference with the nut holding portion.

[0010] Incidentally, in JP-A-10-080039, JP-A-10-247450 and JP-A-8-279332, since the fusible link is installed at the determined location on the junction box, it is difficult to cope with a circuit change, and since the directions in which the wire harnesses are led in and out are determined, it is not possible to cope with changes in attaching position and cabling configuration on the junction box.

[0011] In addition, in JP-A-8-279332, since the fusible link is attached to the fuse block at the side of a battery, the lead-in and lead-out directions of the wire harnesses are determined by the attachment position of the fusible link, and it is not possible to change the attachment object and attachment location.

[0012] In addition, in JP-A-10-080039, JP-A-10-247450, JP-A-8-279332 and JP-A-8-279332, since the fusible link is connected to the wire harnesses with the bolts via the terminals, the workability is deteriorated.

SUMMARY OF THE INVENTION

[0013] The invention was made in view of the situations, and an object thereof is to provide a fuse block which can cope with a circuit change, change the lead-in and lead-out directions of wire harnesses and improve the workability.

1) According to a first aspect of the invention, there is provided 1. A fuse block which is attached to a junction box for connecting a fusible link to a wire harness, characterized in that
a terminal connected to a wire harness is electrically connected to the fusible link at one part of the fuse block,
at least one connector connected to a wire harness is fitted into another part of the fuse block so as to be electrically connected to the fusible link, and
the fuse block is detachably attached to the junction box.
According to the fuse block described under 1) above, a wire harness to which the fusible link is

connected in series is formed by electrically connecting the terminal to the fusible link at part of the fuse block. To be different from this, the connector is fitted in the fuse block so that a wire harness to which the connector is connected is electrically connected to the fusible link at the other part of the fuse block, whereby a circuit of the wire harnesses to which the fusible link is connected in series is formed. Consequently, since the wire harnesses, whether the terminal is connected thereto or the connector is connected thereto, can be led in and out of the fuse block for electrical connection to the fusible link without any limitation on direction so as to form a circuit, the fuse block described under 1) above can deal with a circuit change and change the lead-in and lead-out directions of the wire harnesses to thereby improve the workability.

2) According to a second aspect of the invention, there is provided a fuse block as set forth under 1) above, wherein at least two of the connectors are fitted to the fuse block on an upper side of the junction box, so that the connectors are electrically connected to a pair of lead portions of the fusible link, and

the fuse block has a connection member which is electrically connected to the lead portions of the fusible link, and to which at least two of the terminals are connected on a lower side of the junction box.

According to the fuse block described under 2) above, at least two of the connectors are fitted in the fuse block on an upper side thereof so as to be electrically connected to the pair of lead portions of the fusible link, respectively, whereby there are formed circuits of the wire harnesses in each of which the fusible link is connected in series via the connector. To be different from this, at least two of the terminals are connected to the connection members, respectively, on a lower side of the fuse block, whereby there are formed circuits of the wire harnesses in each of which the fusible link is connected in series via the terminal. As this occurs, even when the connector is connected to one of the wire harnesses and the terminal is connected to the other wire harness, in the event that the connector is electrically connected to one of the lead portions of the fusible link and the terminal is electrically connected to the other lead portion of the fusible link via the connection member, the fusible link can be connected in series to the wire harness to which the connector is connected and the wire harness to which the terminal is connected, whereby in the wire harnesses having at least two of the connectors and the wire harnesses having at least two of the terminals, the wire harnesses can be led in and led out of the fuse block without any limitation imposed on direction for electrical connection to the fusible link so as to form circuits, thereby making it possible to form a plurality of circuits in a distributed fashion. In addition, even if there occurs a circuit change or the like, a wire harness of the same specification can be used to thereby improve the productivity without changing the entirety of the wire harnesses.

3) According to a third aspect of the invention, there is provided a fuse block as set under 1), wherein the connector is fitted to the fuse block on an upper side of the junction box, so that the connector is electrically connected to a lead portion of the fusible link, and

the fuse block has one connection member that is electrically connected to the lead portion of the fusible link and another connection member that is electrically connected to another lead portion of the fusible link on a lower side of the junction box.

According to the fuse block described under 3) above, the terminals of the wire harnesses to which the terminals are connected on the lower side of the fuse block are electrically connected to the one and the other connection member, respectively, whereby a circuit of the wire harnesses is formed in which the fusible link is connected in series via the terminals. To be different from this, the wire harness to which the connector is connected is electrically connected to one of the lead portions of the fusible link by fitting the connector in the fuse block on the upper side of the fuse block, and the terminal of the wire harness to which the terminal is connected on the lower side of the fuse block is electrically connected to the other connection member, whereby the wire harness to which the connector is connected and the wire harness to which the terminal is connected can be connected in series to each other. According to this configuration, in the wire harnesses which have the pair of terminals and the single connector, respectively, the wire harnesses are led in and out of the fuse block for electrical connection to the fusible link without any limitation imposed on direction so as to form a circuit, thereby making it possible to form a plurality of circuits in a distributed fashion.

4) According to a fourth aspect of the invention, there is provided a fuse block as set forth under 1), wherein a connector that is to be electrically connected to one of lead portions of the fusible link is disposed on an upper side of the junction box so as to be fitted in the fuse block, and wherein the fuse block has, on a lower side of the junction box, connection members, one of which is electrically connected to the one of the lead portions for electrical connection of one of terminals and the other of which is connected to the other lead portion of the fusible link to thereby establish an electrical connection with the other terminal.

According to the fuse block described under 4) above, the connector is fitted in the fuse block on the upper side thereof, so that the wire harness to which the connector is connected is electrically connected to one of the lead portions of the fusible link, whereby the fusible link can be connected in series to the wire

harness to which the connector is connected and the wire harness to which the terminal is connected on the lower side of fuse block. To be different from this, the terminal of the other wire harness to which the terminal is connected on the lower side of the fuse block is electrically connected to one of the connection members, whereby the fusible link can be connected in series to both the wire harnesses to which the terminals are connected. From this configuration, in the wire harnesses which have the single terminal and the single connector, respectively, the wire harness to which the terminal is connected being disposed on the lower side of the fuse block, the wire harnesses are led in and out of the fuse block for electrical connection to the fusible link without any limitation imposed on direction so as to form a circuit, thereby making it possible to form a plurality of circuits in a distributed fashion.

5) According to a fifth aspect of the invention, there is provided a fuse block as set forth under 1), wherein one of the connectors is fitted to the fuse block on an upper side of the junction box, so that the connector is electrically connected to a lead portion of the fusible link,

the fuse block has one connection member that is electrically connected to the lead portion of the fusible link on a lower side of the junction box on a lower side of the junction box,

another of the connector is fitted to the fuse block on the lower side of the junction box, so that the connector is electrically connected to another lead portion of the fusible link, and

the fuse block has another connection member that is electrically connected to said another lead portion of the fusible link on the lower side of the junction box.

According to the fuse block described under 5) above, one of the wire harnesses to which the connectors are connected is electrically connected to one of the lead portions of the fusible link by fitting one of the connectors in the fuse block on the upper side thereof, and the other wire harness to which the connector is electrically connected to the other lead portion of the fusible link by fitting the other connector in the fuse block on the lower side thereof, whereby the fusible link can be connected in series to the one and the other wire harnesses to which the connectors are connected. To be different from this, the one and the other terminals of the one and the other wire harnesses to which the terminals are connected at the lower side of the fuse block are electrically connected to the one and the other connection members, whereby the fusible link can be connected in series to both the wire harnesses to which the terminals are connected. From this configuration, in the wire harnesses having the pair of connectors and the pair of terminals, the wire harnesses are led in and out of the fuse block for electrical connection to the fusible link without any limitation imposed on direction so as to form a circuit, thereby making it possible to form a plurality of circuits in a distributed fashion.

6) According to a sixth aspect of the invention, there is provided a fuse block as set forth under any of 1) to 5), wherein the terminals and the connectors are connected to power supply side or load side wire harnesses.

According to the fuse block described under 6) above, in the event that the wire harness of one of the terminals is connected to the power supply side and the wire harness of the other terminal is connected to the load side, an electrically conductive circuit through both the terminals can be formed. To be different from this, in the event that the wire harness of one of the connectors is connected to the power supply side and the wire harness of the other connector is to the load side, an electrically conductive circuit through both the connectors can be formed. From this configuration, since the wire harnesses, whether they are those to which the connectors are connected or those to which the terminals are connected, can form a power supply circuit in a similar fashion, the cabling work can be simplified so as to improve the working efficiency.

7) According to a seventh aspect of the invention, there is provided a fuse block as set forth under any of 1) to 6), wherein at least the fusible link and the connection members are covered by a protection cover.

According to the fuse block described under 7) above, since a high heat that is generated when the fusible link is fused is dissipated to the outside in no case, heat is imparted to the junction box in no case, whereby there is caused no risk that the junction box is damaged. In addition, in the event that in addition to the fusible link, the connection members are covered by the protection cover, there is caused no risk that corrosion is generated on an electrically connecting surface between the lead portions of the fusible link and the connection members, thereby making it possible to allow a rated current to flow for a long period of time without increasing electrical resistance.

8) According to an eighth aspect of the invention, there is provided a fuse block according to any of 1) to 7), wherein the fuse block is detachably attached to an interior or exterior of the junction box.

According to the fuse block described under 8) above, in a case or the like in which a wire harness is used whose terminal is connected to a battery, since the wire harness can be made shorter in case the wire harness is attached at a selected interior or exterior location on the junction box which is close to the battery, leakage current can be decreased, and the generation of disturbance can be prevented.

9) According to a ninth aspect of the invention, there is provided a fuse block as set forth under any of 1)

to 8), wherein a reinforcement member is provided on an outer side of at least one of the terminals for reinforcement of the terminal.

According to the fuse block described under 9) above, since the fall of the terminal is prevented by the reinforcement member, the terminal is prevented from being brought into contact with the other electrical terminal and other equipment, whereby a state in which the terminal is attached can be ensured.

[0014] According to the fuse block of the invention, there can be provided advantages that a circuit change can be dealt with, the lead-in and lead-out directions of the wire harnesses can be changed, and the workability can be improved.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015]

Fig. 1 is a plan view showing a first embodiment of a fuse block according to the invention in such a state the fuse block is attached to a junction box;

Fig. 2 is an exploded perspective view of the fuse block shown in Fig. 1;

Fig. 3 is a perspective view showing a state in which the fuse block shown in Fig. 2 is assembled;

Fig. 4 is a plan view showing a second embodiment of a fuse block according to the invention in such a state the fuse block is attached to a junction box;

Fig. 5 is an exploded perspective view of the fuse block shown in Fig. 4;

Fig. 6 is a perspective view showing a state in which the fuse block shown in Fig. 5 is assembled;

Fig. 7 is a plan view showing a third embodiment of a fuse block according to the invention in such a state the fuse block is attached to a junction box;

Fig. 8 is an exploded perspective view of the fuse block shown in Fig. 7;

Fig. 9 is a perspective view showing a state in which the fuse block shown in Fig. 8 is assembled;

Fig. 10 is a plan view showing a fourth embodiment of a fuse block according to the invention in such a state the fuse block is attached to a junction box;

Fig. 11 is an exploded perspective view of the fuse block shown in Fig. 10;

Fig. 12 is a perspective view showing a state in which the fuse block shown in Fig. 11 is assembled;

Fig. 13 is a plan view showing a fifth embodiment of a fuse block according to the invention in such a state the fuse block is attached to a junction box;

Fig. 14 is an exploded perspective view of the fuse block shown in Fig. 13; and

Fig. 15 is a perspective view showing a state in which the fuse block shown in Fig. 14 is assembled.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0016] Hereinafter, a plurality of embodiments according to the invention will be described in detail by reference to the drawings.

(First Embodiment)

[0017] Figs. 1 to 3 show a first embodiment of a fuse block according to the invention.

[0018] Fig. 1 is a plan view showing the first embodiment of the fuse block according to the invention in such a state the fuse block is mounted in a junction box, Fig. 2 is an exploded perspective view of the fuse block shown in Fig. 1, and Fig. 3 is a perspective view showing a state in which the fuse block shown in Fig. 2 is assembled.

[0019] As shown in Fig. 1, a fuse block which is the first embodiment of the invention is mounted in an interior portion of a junction box 100, and the junction box 100 is fixed to, for example, the interior of an engine compartment of a vehicle body and has a load circuit fuse attachment portion 101, a load circuit relay attachment portion, two fuse block attachment portions 103, 103 in hole portions formed in an inside of the junction box 100 and a fuse block attachment portion 103 on an outside thereof. A junction box fixing portion 11 that is formed on an outside of the fuse block 10 is detachably fitted in each of the fuse block attachment portions 103. By allowing the fuse block 10 to be attached to the inside thereof, the junction box 100 can lead in a wire harness connected to this fuse block 10 so as to be in close contact with the fuse attachment portion 103 and the relay attachment portion 102, whereas by allowing the fuse block 10 to be attached to the outside thereof, the junction box 100 can lead in the wire harness so as to be in close contact with a battery which constitutes a power supply.

[0020] As shown in Fig. 2, the fuse block 10 is made up of a block main body 12, a pair of nut members 13, 14, a pair of connecting bolts 15, 16, a pair of connection plates 17, 18, a cassette type fusible link 19 having a pair of lead portions 20, 21, and a pair of connectors 22, 23.

[0021] The block main body 12 is molded from a non-conductive resin material and has a pair of connector fitting holes 24, 25 formed at an upper portion thereof and a fusible link fixing portion formed at a lower portion thereof. Then, a pair of through holes (not shown) are formed in the fusible link fixing portion, and these through holes are made to communicate with interiors of the connector fitting holes 24, 25. In addition, dislodgement preventive grooves 29, 30 are formed on the fusible link fixing portion 26 which support base portions 27, 28 provided on nut members 13, 14 while preventing the dislodgement of the base portions 27, 28 from the fusible fixing portion 26.

[0022] The nut members 13, 14 are molded of a conductive metal, and tubular portions 31, 32 in which female or internal thread portions are formed in inner circumfer-

ential portions are integrally molded on the quadrangular plate-like base portions 27, 28. The nut members 13, 14 are inserted into the dislodgement preventive grooves 29, 30 of the block main body 12 from below so as to be supported while being prevented from being dislodged in axial directions of connection bolts 15, 16, whereby when the connection bolts 15, 16 are screwed into the nut members 13, 14, respectively, lead portions 20, 21 of the fusible link 19 and lead portion connecting portions 33, 34 which are formed on connection plates 17, 18, respectively, are held between the connection bolts 15, 16 and the nut members 13, 14 for electrical connection. The base portions 27, 28 may be formed into circular plate-like shapes instead of the quadrangular plate-like shapes.

[0023] Similar to the nut members 13, 14, the connection bolts 15, 16 are molded of a conductive metal, and male or external threads are screwed into the tubular portions 31, 32 of the nut members 13, 14. When wire harnesses 12, 13 which have LA terminals 110, 111 are electrically connected to the fuse block 10, the connection bolts 15, 16 are passed through these LA terminals 110, 111, respectively, and are then screwed into the tubular portions 31, 32 of the nut members 13, 14, whereby the lead portions 20, 21 of the fusible link 19 and the lead portion connecting portions 33, 34 of the connection plates 17, 18 are held between the connection bolts 15, 16 and the nut members 13, 14 for electrical connection.

[0024] The connection plates 17, 18 are formed of a conductive metal into thin plate-like shapes. Connector connecting portions 35, 36 which are disposed at distal end portions of the connection plates 17, 18 and the lead portion connecting portions 33, 34 which are disposed at proximal end portions of the connection plates 17, 18 are formed integrally on the connection plates 17, 18. The connector connecting portions 35, 36 are inserted into the pair of through holes from a fusible link fixing portion 26 side of the block main body 12 to thereby be disposed so as to protrude into the interiors of the connector fitting holes 24, 25. The connection plates 17, 18 electrically connect the connector connecting portions 35, 36 to the wire harnesses 114, 115 that are connected to the connectors 22, 23 through the lead portions 20, 21 of the fusible link 19.

[0025] The fusible link 19 is of a cassette type and is disposed transversely for use, and a fusible portion (not shown) is electrically connected between one and the other of the pair of lead portions 20, 21. The fusible link 19 is designed such that the fusible portion is fused to break the circuit when a conducting current of a predetermined magnitude, for example, 30A flows between both the lead portions 20, 21 within a predetermined length of time, for example, 5 seconds. Since this fusible link 19 is of the cassette type, the replacement of fusible links can be implemented in a simplified fashion compared with fusible links with a normal fuse shape. In addition, the fusible link 19 can easily be attached to the junction box 100 and a vehicle body panel due to the lead portions 20, 21 having holes.

[0026] The connectors 22, 23 have external shapes that are detachably fitted in the connector fitting holes 24, 25 in the block main body 12. The connectors 22, 23 are prepared in two types; a type with a terminal in which a terminal is accommodated in the connector and a type without a terminal in which no terminal is accommodated in the connector. In the case of connectors of the type with a terminal, terminals are electrically connected to the wire harnesses 114, 115. In contrast to this, in the case of connectors of the type without a terminal, no wire harness is connected to the connectors, and the connectors are used as dummies.

[0027] As shown in Fig. 3, when connecting the wire harnesses 114 115 which have the connectors 22, 23 to the fuse block 10, the connectors 22, 23 are fitted in the connector fitting holes 24, 25 at the upper portion of the block main body 12, whereby the connector connecting portions 35, 36 of the connection plates 17, 18 are electrically connected to terminals in the connectors 22, 23, so that the fusible link 19 can be connected in series to the wire harnesses 114, 115 which have the connectors 22, 23. In addition, a protection cover 37 is placed on the fusible link fixing portion 26 which accommodates therein the fusible link 19 and the connection bolts 15, 16 for attachment thereto. The protection cover 37 does not permit a high heat that is generated when the fusible link 19 is fused to be dissipated to the outside and protects an electrical connecting surface between the lead portions 20, 21 of the fusible link 19 and the connection bolts 15, 16 from corrosion that would otherwise be generated on the electrical connecting surface.

[0028] In addition, the lead portions 20, 21 of the fusible link 19, the lead portion connecting portions 33, 34 of the connection plates 17, 18 and the nut members 13, 14 are electrically connected to each other by causing the connection bolts 15, 16 to be screwed into the nut members 13, 14 at the fusible link fixing portion 26. Then, in a case where the wire harnesses 112, 113 which have the LA terminals 110, 111 are used, the fusible link 19 can be connected in series to the wire harnesses 112, 113 which have the LA terminals 110, 111 by causing the connection bolts 15, 16 to be screwed through the LA terminals 110, 111.

[0029] The fuse block 10 that is configured as has been described heretofore is installed on the vehicle body when the junction box fixing portion 11 is fixed to the fuse block attachment portion 103 on the junction box 100. Then, in a case where wire harnesses that have already been installed on the vehicle body are cabled to an upper side of the junction box 100, the wire harnesses so cabled are the wire harnesses 114, 115 which have the connectors 22, 23, and one of the connectors 22 is connected to a power supply side, whereas the other connector 23 is connected to a load side, the connectors 22, 23 are fitted in the connector fitting holes 24, 25 of the block main body 12, respectively, whereby the wire harness 114 can be led in from the upper side of the junction box

100, the fusible link 19 can be connected in series to the power supply side connector 22 and the load side connector 23, and the wire harness 115 can be led out from the upper side of the junction box 100.

[0030] As this occurs, in the event that another LA terminal that is connected to another wire harness is electrically connected to the connection bolt 16, since the wire harness of the LA terminal is electrically connected to the lead portion 21 of the fusible link 19, power having the same potential as that of the wire harness 14 having the connector 22 can be led out via the LA terminal.

[0031] In addition, in a case where the wire harness 115 having the connector 23 is connected to the power supply side, whereas the wire harness 114 having the connector 22 is connected to the load side, in the event that on the contrary to the aforesaid case, another LA terminal connected to another wire harness is electrically connected to the connection bolt 15, power having the same potential as that of the wire harness 115 having the connector 23 can be led out via the LA terminal.

[0032] Being different from what has been described above, in a case where wire harnesses that have already been installed on the vehicle body are cabled to a lower side of the junction box 100, the wire harnesses so cabled are the wire harnesses 112, 113 which have the LA terminals 110, 111, and one of the LA terminals 110 is connected to the power supply side, whereas the other LA terminal 111 is connected to the load side, the connection bolts 15, 16 are passed through the LA terminals 110, 111 so as to be fixed to the fusible link fixing portion 26 at a lower side of the block main body 12, whereby the wire harness 112 can be led in from the lower side of the junction box 100, the fusible link 19 can be connected in series to the power supply side LA terminal 110 and the load side LA terminal 111, and the wire harness 113 can be led out from the lower side of the junction box 100.

[0033] As this occurs, dummy connectors 22, 23 may be fitted in the connector fitting holes 24, 25. Alternatively, in the event that another connector connected to another wire harness is fitted in the connector fitting hole 25 where the connector 23 is not fitted, since the wire harness of the connector so inserted is electrically connected to the lead portion 21 of the fusible link 19, power having the same potential as that of the LA terminal 110 can be led out via the connector.

[0034] In addition, in a case where the wire harness 113 having the LA terminal 111 is connected to the power supply side, whereas the wire harness 112 having the LA terminal 110 is connected to the load side, in the event that, on the contrary to what has just been described above, a further connector connected to a further wire harness is fitted in the connector fitting hole 24, power having the same potential as that of the LA terminal 111 can be led out via the connector so inserted.

[0035] To be different from what has been described above, in a case where wire harnesses that have already been disposed on the vehicle body are cabled to the upper side and the lower side of the electric junction box 100, respectively, the wire harnesses so cabled are the wire harness 114 having the connector 22 and cabled to the upper side of the junction box 100 and the wire harness 113 having the LA terminal 111 and cabled to the lower side of the junction box 100, and the wire harness 114 having the connector 22 is connected to the power supply side, whereas the LA terminal is connected to the load side, the connector 22 is fitted in the connector fitting hole 24 in the block main body 12 on the upper side of the block main body 12, whereas the connection bolt 16 is passed through the LA terminal 111 so as to be fixed to the fusible link fixing portion 26 on the lower side of the block main body 12, whereby the wire harness 114 can be led in from the upper side of the junction box 100, the fusible link 19 can be connected in series to the connector 22 on the power supply side and the LA terminal on the load side, and the wire harness 113 can be led out from the lower side of the junction box 100.

[0036] As this occurs, the dummy connector 23 may be fitted in the connector fitting hole 25 in the block main body 12. Alternatively, in the event that another connector connected to another wire harness is fitted in the connector fitting hole 25, since the wire harness of the connector is electrically connected to the lead portion 21 of the fusible link 19, power having the same potential as that of the wire harness 114 having the connector 22 can be led out via the connector so inserted.

[0037] To be different from what has been described above, in a case where wire harnesses that have already been cabled on the vehicle body are the wire harness 115 having the connector 23 and cabled to the upper side of the junction box 100 and the wire harness 112 having the LA terminal 110 and cabled to the lower side of the junction box, and the wire harness 115 having the connector 23 is connected to the power supply side, whereas the LA terminal 110 is connected to the load side, in the event that on the contrary to what has been described above, another connector connected to another wire harness is fitted in the connector fitting hole 24 where the connector 22 is not fitted, since the wire harness of the connector is electrically connected to the lead portion 20 of the fusible link 19, power having the same potential as that of the wire harness 115 having the connector 23 can be led out via the connector so inserted.

[0038] According to the fuse block 10 that has been described heretofore, by electrically connecting the LA terminals 110, 111 to the fusible link 19 at the lower portion of the block main body 12, a circuit of the wire harnesses 112, 113 to which the fusible link 19 is connected in series is formed. To be different from this, by fitting the connectors 22, 23 in the corresponding connector fitting holes 24, 25 and electrically connecting the wire harnesses to which the connectors 22, 23 are connected, respectively to the fusible link 19, a circuit of the wire harnesses 114, 115 to which the fusible link 19 is connected in series is formed. From this configuration, since the wire harnesses, whether they are the wire harnesses 112, 113 to which the LA terminals 110, 111 are connected, re-

spectively, or the wire harnesses 114, 115 to which the connectors 22, 23 are connected, respectively, can be led in and out of the junction box 100 without any limitation imposed on direction for electrical connection to the fusible link 19 so as to form a circuit, a circuit change can be dealt with, the lead-in and lead-out direction of the wire harnesses can be changed, and the workability can be improved.

[0039] In addition, according to the fuse block 10, by fitting at least two of the connectors 22, 23 in the fuse block on the upper side thereof so as to be connected to the pair of lead portions 20, 21 of the fusible link 19, respectively, circuits of the wire harnesses 114, 115 are formed in which the fusible link 19 is connected in series via the connectors 22, 23, respectively. To be different from this, by connecting at least two of the LA terminals 110, 111 via the connection bolts 15, 16, respectively, on the lower side of the fuse block, circuits of the wire harnesses 112, 113 are formed in which the fusible link 19 is connected in series via the LA terminals 110, 111, respectively. As this occurs, even in the event that the connector 22 is connected to one of the wire harnesses 114 and the LA terminal 111 is connected to the other wire harness 113, in case the connector 22 is electrically connected to one of the lead portions 20 of the fusible link 19 and the LA terminal 111 is electrically connected to the other lead portion 21 of the fusible link 19 via the connection bolt 16, the fusible link 19 can be connected in series to the wire harness 114 to which the connector 22 is connected and the wire harness 113 to which the LA terminal 111 is connected, whereby in the wire harnesses 114, 115 which have the two connectors 22, 23 and the wire harnesses 112, 113 which have the two LA terminals 110, 111, the wire harnesses can be led in and out without any limitation on direction for electrical connection to the fusible link 19 so as to form a circuit to thereby form a plurality of circuits in a distributed fashion. In addition, even in the event that there occurs a circuit change, the wire harnesses do not have to be changed entirely, and hence an improvement in productivity can be realized using a wire harness of the same specification.

[0040] In addition, according to the fuse block 10, since the LA terminals 110, 111 and the connectors 22, 23 are connected to the wire harnesses 112, 113, 114, 115 on the power supply side or the load side, in the event that the wire harness 112 of one of the LA terminals 110 is connected to the power supply side, whereas the wire harness 113 of the other LA terminal 111 is connected to the load side, a conductive circuit through both the LA terminals 110, 111 can be formed. To be different from this, in the event that the wire harness 114 of one of the connectors 22 is connected to the power supply side, whereas the wire harness 115 of the other connector 23 is connected to the load side, a conductive circuit through both the connectors 22, 23 can be formed. From this configuration, since a power supply circuit can similarly be formed from the wire harnesses 112, 113 to which the LA terminals 110, 111 are connected or the wire harnesses 114, 115 to which the connectors 22, 23 are connected, the cabling work can be simplified so as to improve the working efficiency.

[0041] Additionally, according to the fuse block 10, since the fusible link 19 and the connection bolts 15, 16 are covered by the protection cover 37, a high heat that is generated when the fusible portion of the fusible link 19 is fused is dissipated to the outside in no case, and hence no heat is given to the junction box 100, whereby the risk that the junction box 100 is damaged can be eliminated. In addition, since corrosion is generated in no case on the electrical connection surfaces between the lead portions 20, 21 of the fusible link 19 and the connection bolts 15, 16, a rated current is allowed to flow for a long period of time without increasing electrical resistance.

[0042] In addition, according to the fuse block 10, since the fuse block is detachably attached to the interior or exterior of the junction box 100, in a case where the wire harnesses 112, 113 are used whose terminals 110, 111 are connected to a battery, in the event that the fuse block is mounted to a selected interior or exterior location on the junction box 100 which is close to the battery, the wire harnesses 112, 113 can be made shorter, and hence leakage current can be reduced and the generation of disturbance can be prevented.

(Second Embodiment)

[0043] Next, referring to Figs. 4 to 6, a second embodiment of a fuse block according to the invention will be described.

[0044] Fig. 4 is a plan view showing the second embodiment of the fuse block according to the invention in such a state the fuse block is attached to a junction box, Fig. 5 is an exploded perspective view of the fuse block shown in Fig. 4, and Fig. 6 is a perspective view showing a state in which the fuse block shown in Fig. 5 is assembled. Note that in the second embodiment and respective embodiments that will be described thereafter, like or corresponding reference numerals are imparted to members having like configurations and functions to those of the members that have already been described in the relevant drawings, whereby the description thereof will be simplified or omitted.

[0045] As shown in Figs. 4, 5, a fuse block 50 according to the second embodiment has a single connector fitting hole 52 at an upper portion of a block main body 51, and a fusible link 19 is used vertically. Then, a connector 22 is disposed on an upper side of a junction box 100 so as to be fitted in the fuse block 50 so as to electrically be connected to one of lead portions 20 of the fusible link 19, and a connection bolt 15 is disposed on a lower side of the junction box 100 so as to electrically be connected to one of the lead portions 20 of the fusible link 19 for electrical connection of an LA terminal 110 that is possessed by a wire harness 112 has. Furthermore, the other

connection bolt 16 is also disposed on the lower side of the junction box 100 so as to electrically be connected to the other lead portions 21 of the fusible link 19 for electrical connection of an LA terminal 111 that is possessed by a wire harness 113. The connection bolt 15 is electrically connected to a wire harness 114 that has the connector 22 through a connection plate 17.

[0046] As shown in Fig. 6, when connecting the wire harness 114 having the connector 22 and the wire harness 113 having the LA terminal 111 together in the fuse block 50, the connector 22 is fitted in the connector fitting hole 52 at an upper portion of the block main body 51, whereby a connector connecting portion 35 of the connection plate 17 is electrically connected to a terminal inside the connector 22, and the bolt 16 that is passed through the LA terminal 111 is connected to the lead portion 21 of the fusible link 19 at a lower portion of the block main body 51, whereby the fusible link 19 can be connected in series to the wire harness 114 having the connector 22 and the wire harness 113 having the LA terminal 111. In addition, when connecting the wire harnesses 112, 113 which have the LA terminals 110, 111 to the fuse block 50, the connection bolts 15, 16 are screwed through the LA terminals 110, 111, respectively, at the lower portion of the block main body 51, whereby the fusible link 19 can be connected in series to the wire harnesses 112, 113 which have the LA terminals 110, 111.

[0047] In the fuse block 50 that is configured as has been described heretofore, in a case where wire harnesses that have already been installed on the vehicle body are cabled to the upper side and the lower side of the junction box 100, respectively, the wire harnesses so cabled are the wire harness 114 having the connector 22 and cabled to the upper side and the wire harness 113 having the LA terminal 111 and cabled to the lower side, and the connector 22 is connected to a power supply side, whereas the LA 111 terminal is connected to a load side, the connector 22 is fitted in the connector fitting hole 52 on an upper side of the block main body 51, and the connection bolt 16 is passed through the LA terminal 111 so as to be fixed to a fusible link fixing portion 26 at a lower side of the block main body 51, whereby the wire harness 114 can be led in from the upper side of the junction box 100, so that the fusible link 19 can be connected in series to the connector 22 on the power supply side and the LA terminal 111 on the load side, and the wire harness 113 can be led out from the lower side of the junction box 100.

[0048] To be different from the above, in a case where the wire harnesses that have already been installed on the vehicle body are cabled to the lower side of the junction box 100, the wire harnesses so cabled are the wire harness 112, 113 which have the LA terminals 110, 111, and one of the LA terminal 110 is connected to the power supply side, whereas the LA terminal 111 is connected to the load side, the connection bolts 15, 16 are passed through the LA terminals 110, 111, respectively, so as to be fixed to the fusible link fixing portion 26 at the lower side of the block main body 51, whereby the wire harness 112 can be led in from the lower side of the junction box 100, the fusible link 19 can be connected in series to the LA terminal 110 on the power supply side and the LA terminal 111 on the load side, and the wire harness 113 can be led out from the lower side of the junction box 110.

[0049] As this occurs, a dummy connector 22 may be fitted in the connector fitting hole 52 in the block main body 51. Alternatively, in a case where the wire harness 113 having the LA terminal 111 is connected to the power supply side and the wire harness 112 having the LA terminal 110 is connected to the load side, in the event that another connector connected to another wire harness is fitted in the connector fitting hole 52 to which the connector 22 is not connected, since the wire harness of the connector so inserted is electrically connected to the lead portion 20 of the fusible link 19, power having the same potential as that of the LA terminal 111 can be led out via the connector so inserted.

[0050] According to the fuse block 50 of the second embodiment, the LA terminals 110, 111 of the wire harnesses 112, 113 to which the LA terminals 110, 111 are connected on a lower side of the fuse block 50 are electrically connected to the one and the other connection bolts 15, 16, whereby the circuits of the wire harnesses 112, 113 are formed in which the fusible link 19 is connected in series via the LA terminals 110, 111, respectively. To be different from this, the connector 22 is inserted for connection on the upper side, so that the wire harness 114 to which the connector 22 is connected is electrically connected to one of the lead portions 20 of the fusible link 19, and the LA terminal 111 of the wire harness 113 to which the LA terminal is connected is electrically connected to the connection bolt 16 on the lower side, whereby the fusible link 19 can be connected in series to the wire harness 114 to which the connector 22 is connected and the wire harness 113 to which the LA terminal 111 is connected. From this configuration, in the wire harnesses 112, 113, 114 which has the pair of LA terminals 110, 111 and the single connector 22, the wire harnesses can be led in and out for electrical connection to the fusible link 19 without any limitation on direction so as to form a circuit, thereby making it possible to form a plurality of circuits in a distributed fashion.

(Third Embodiment)

[0051] Next, referring to Figs. 7 to 9, a third embodiment of a fuse block according to the invention will be described.

[0052] Fig. 7 is a plan view showing the third embodiment of the fuse block according to the invention in such a state the fuse block is attached to a junction box, Fig. 8 is an exploded perspective view of the fuse block shown in Fig. 7, and Fig. 9 is a perspective view showing a state in which the fuse block shown in Fig. 8 is assembled.

[0053] As shown in Figs. 7, 8, a fuse block 60 according

to the third embodiment has a single connector fitting hole 62 at an upper portion of a block main body 61, and a fusible link 19 is used vertically. Then, the fuse block 60 has a connector 22 that is disposed on an upper side of a junction box 100 so as to be detachably fitted in the fuse block 60 so as to electrically be connected to one of lead portions 20 of the fusible link 19, and has on a lower side of the junction box 100 a connection bolt 15 that is electrically connected to one of the lead portions 20 of the fusible link 19 for electrical connection of an LA terminal 110 and a connection bolt 16 that is electrically connected to the other lead portions 21 of the fusible link 19 for electrical connection of an LA terminal 111. The connection bolt 15 is electrically connected to a wire harness 114 that has the connector 22 through a connection plate 17.

[0054] As shown in Fig. 9, when connecting the wire harness 114 having the connector 22 in the fuse block 60, the connector 22 is inserted in the connector fitting hole 62 on an upper side of the block main body 61, whereby a connector connecting portion 35 of the connection plate 17 is electrically connected to a terminal inside the connector 22, thereby the fusible link 19 being connected in series to the wire harness 113 which is electrically connected to the LA terminal 111 and the wire harness 114 which has the connector 22. In addition, when connecting the wire harness 112 having the LA terminal 110, the connection bolt 15 is screwed through the LA terminal 110 on a lower side of the block main body 61, whereby the fusible link 19 can be connected in series to the wire harnesses 112, 113 which have the LA terminals 110, 111, respectively.

[0055] In the fuse block 60 that is configured as has been described heretofore, in a case where wire harnesses that have already been installed on the vehicle body are the wire harness 114 that is cabled to the upper side of the junction box 100 and which has the connector 22 and the wire harness 113 that is cabled to the lower side of the junction box 100 and which has the LA terminal 111, and the wire harness 114 having the connector 22 is connected to the power supply side, whereas the LA terminal 111 is connected to the load side, the connector 22 is fitted in the connector fitting hole 62 in the block main body 61 on an upper side of the block main body 61, whereby the wire harness 114 can be led in from the upper side of the junction box 100, the fusible link 19 can be connected in series to the wire harness 114 having the connector 22 on the power supply side and the LA terminal 111 on the load side, and the wire harness 113 can be led out from the lower side of the junction box 100.

[0056] To be different from what has been described above, in a case where the wire harnesses that have already been installed on the vehicle body are cabled to the lower side of the junction box 100, the wire harnesses so cabled are the wire harnesses 112, 113 which have the LA terminals 110, 111, and one of the LA terminals 110 is connected to the load side, whereas the other terminal 111 is connected to the power supply side, the connection bolt 15 is passed through the LA terminal 110 so as to be fixed to a fusible link fixing portion 26 on the lower side of the block main body 61, whereby the wire harness 112 can be led in from the lower side of the junction box 100, the fusible link 19 can be connected in series to the load side LA terminal 110 and the power supply side LA terminal 111, and the wire harness 113 can be led out from the lower side of the junction box 100.

[0057] As this occurs, a dummy connector 22 may be fitted in the connector fitting hole 62 in the block main body 61. Alternatively, another connector connected to another wire harness is fitted in the connector fitting hole 62 where the connector 22 is not connected, since the wire harness of the connector is electrically connected to the lead portion 20 of the fusible link 19, power having the same potential as that of the LA terminal 111 can be led out via the connector so inserted.

[0058] According to the fuse block 60 of the third embodiment, the connector 22 is fitted in the fuse block 60 on the upper side thereof, so that the wire harness 114 to which the connector 22 is connected is electrically connected to the one of the lead portions 20 of the fusible link 19, whereby the fusible link 19 can be connected in series to the wire harness 14 to which the connector 22 is connected and the wire harness 113 to which the LA terminal 111 is connected on the lower side of the fuse block 60. To be different from this, the LA terminal 110 of the wire harness 112 in which the LA terminal 110 is connected to one of the connection bolts 15 on the lower side of the fuse block 60 is electrically connected, whereby the fusible link 19 can electrically be connected to both the wire harnesses 112, 113 to which the LA terminals 110, 111 are connected, respectively. From this configuration, in the wire harnesses 113, 114 which have the single LA terminal 111 and the single connector 22, respectively, the wire harness 113 to which the LA terminal 111 is connected being disposed on the lower side of the fuse block 60, the wire harnesses can be led in and out without any limitation on direction for electrical connection to the fusible link 19 so as to form a circuit, thereby making it possible to form a plurality of circuits in a distributed fashion.

(Fourth Embodiment)

[0059] Next, referring to Figs. 10 to 12, a fourth embodiment of a fuse block according to the invention will be described.

[0060] Fig. 10 is a plan view showing the fourth embodiment of the fuse block according to the invention in such a state the fuse block is attached to a junction box, Fig. 11 is an exploded perspective view of the fuse block shown in Fig. 10, and Fig. 12 is a perspective view showing a state in which the fuse block shown in Fig. 11 is assembled.

[0061] As shown in Figs. 10, 11, a fuse block 70 according to the fourth embodiment has a pair of connector fitting holes 72, 73 at upper and lower portions of a block

main body 71, respectively, so as to face each other, and a fusible link 19 is disposed vertically for use. Then, the fuse block 70 has on an upper side of a junction box 100 one of connectors 22 that is disposed so as to be fitted in the fuse block 70 for electrical connection to one of the lead portions 20 of the fusible link 19 and has on a lower side of the junction box 100 one of connection bolts 15 that is electrically connected to one of lead portions 20 of the fusible link 19 for electrical connection of an LA terminal 110, the other connector 23 that is disposed so as to be fitted in the fuse block 70 for electrical connection to the other lead portion 21 of the fusible link 19, and furthermore, the other connection bolt 16 that is electrically connected to the other lead portion 21 of the fusible link portion 19 for electrical connection of an LA terminal 111. One of the connection bolts 15 is electrically connected to the wire harness 114 having the connector 22 through a connection plate 17, and the other bolt 16 is electrically connected to a wire harness 115 having the connector 23 through a connection plate 18.

[0062] As shown in Fig. 12, when connecting the wire harness 114 having the connector 22 and the wire harness 115 having the connector 23 to each other in the fuse block 70, the connector 22 is fitted in the connector fitting hole 72 at an upper portion of the block main body 71, and the connector 23 is fitted in the connector fitting hole 73 at a lower portion of the block main body 71, whereby connector connecting portions 35, 36 of the connection plates 17, 18 are electrically connected to terminals inside the connectors 22, 23, respectively, thereby the fusible link 19 being able to be connected in series to the wire harness 114 having the connector 22 and the wire harness 115 having the connector 23. In addition, when connecting the wire harnesses 112, 113 which have the LA terminals 110, 111 to each other in the fuse block 70, the connection bolts 15, 16 are screwed through the LA terminals 110, 111, respectively, at the lower portion of the block main body 71, whereby the fusible link 19 can be connected in series to the wire harnesses 112, 113 which have the LA terminals 110, 111.

[0063] In the fuse block 70 that is configured as has been described heretofore, in a case where wire harnesses that have already been installed on the vehicle body are the wire harness 114 that is cabled to the upper side of the junction box 100 and which has the connector 22 and the wire harness 115 that is cabled to the lower side of the junction box 100 and which has the connector 23, and the wire harness 114 having the connector 22 is connected to the power supply side, whereas the wire harness 115 having the connector 23 is connected to the load side, the connector 22 is fitted in the connector fitting hole 72 on an upper side of the block main body 71, whereas the connector 23 is fitted in the connector fitting hole 73 on a lower side of the block main body 71, whereby the wire harness 114 can be led in from the upper side of the junction box 100, the fusible link 19 can be connected in series to the wire harness 114 having the power supply side connector 22 and the wire harness 115 having the load side connector 23, and the wire harness 115 can be led out from the lower side of the junction box 100.

[0064] To be different from what has been described above, in a case where the wire harnesses that have already been installed on the vehicle body are the wire harnesses 112, 113 that are cabled to the lower side of the junction box 100 and which have the LA terminals 110, 111, and one of the LA terminals 110 is connected to the power supply side, whereas the other LA terminal 111 is connected to the load side, the connection bolt 15 is passed through the LA terminal 110 and the connection bolt 16 is passed through the LA terminal 111, so that the connection bolts 15, 16 are fixed to a fusible link fixing portion 26 on the lower side of the bock main body 71, whereby the wire harness 112 can be led in from the lower side of the junction box 100, the fusible link 19 can be connected in series to the power supply side LA terminal 110 and the load side LA terminal 111, and the wire harness 113 can be lead out from the lower side of the junction box 100.

[0065] As this occurs, dummy connectors 22, 23 may be fitted in the connector fitting holes 72, 73 in the block main body 71. Alternatively, in the event that another connector connected to another wire harness is fitted in the connector fitting hole 73 where the connector 23 is not fitted, since the wire harness of the connector so inserted is electrically connected to the lead portion 21 of the fusible link 19, power having the same potential as that of the LA terminal 110 can be led out via the connector so inserted. On the contrary to this, in a case where the wire harness 113 having the LA terminal 111 is connected to the power supply side, whereas the wire harness 112 having the LA terminal 110 is connected to the load side, in the event that a further connector connected to a further wire harness is inserted for connection in the connector fitting hole 72 where the connector 22 is not fitted, since the wire harness of the connector so inserted is electrically connected to the lead portion 20 of the fusible link 19, power having the same potential as that of the LA terminal 111 can be led out via the connector so inserted.

[0066] According to the fuse block 70 of the fourth embodiment, one of the connectors 22 is fitted in the fuse block 70 on the upper side thereof, one of the wire harnesses 114 to which the connector 22 is connected is electrically connected to one of the lead portions 20 of the fusible link 19, and the other wire harness 115 to which the connector 23 is connected is electrically connected to the other lead portion 21 of the fusible link 19, whereby the fusible link 19 can be connected in series to the one and the other wire harnesses 114, 115 to which the connectors 22, 23 are connected, respectively. To be different from this, the LA terminals 110, 111 of the one and the other wire harnesses 112, 113 in which the LA terminals 110, 111 are connected to the one and the other connection bolts 15, 16, respectively, on the lower side of the fuse block 70 are electrically connected, whereby the fusible link 19 can be connected in series

to the wire harnesses 112, 113 to which the LA terminals 110, 111 are connected, respectively. From this configuration, in the wire harnesses 112, 113, 114, 115 which have the pair of connectors 22, 23 and the pair of LA terminals 110, 111, the wire harnesses can be led in and out without any limitation imposed on direction for electrical connection to the fusible link 19 so as to form a circuit, thereby making it possible to form a plurality of circuits in a distributed fashion.

(Fifth Embodiment)

[0067] Next, referring to Figs. 13 to 15, a fifth embodiment of a fuse block according to the invention will be described.

[0068] Fig. 13 is a plan view showing the fifth embodiment of the fuse block according to the invention in such a state the fuse block is attached to a junction box, Fig. 14 is an exploded perspective view of the fuse block shown in Fig. 13, and Fig. 15 is a perspective view showing a state in which the fuse block shown in Fig. 14 is assembled.

[0069] As shown in Figs. 13, 14, the fuse block 80 according to the fifth embodiment of the invention has a single connector fitting hole 82 at an upper portion of a block main body 81, and a fusible link 19 is disposed laterally on a lower surface of the block main body 81 for use. Then, the fuse block 80 has on an upper side of a junction box 100 a connector 22 that is disposed so as to be fitted in the fuse block 80 for electrical connection to one of lead portions 20 of the fusible link 19 and has on a lower side of the junction box 100 one of connection bolts 15 that is electrically connected to one of the lead portions 20 of the fusible link 19 and the other connection bolt 16 that is electrically connected to the other lead portion 21 of the fusible link 19 so that an LA terminal 111 can be connected electrically. The connection bolt 15 is electrically connected to a wire harness 114 having the connector 22 through a connection plate 17. Then, the fuse block 80 has a reinforcement member 83 on the lower surface of the block main body 81 which is formed into a shape which surrounds the LA terminal 111 from three directions for reinforcement of the LA terminal 111. In this case, the other nut member 14 that is connected to the other lead portion 21 of the fusible link 19 is integrally press fitted in the lower surface of the block main body 81.

[0070] As shown in Fig. 15, when connecting the wire harness 114 having the connector to the fuse block 80, the connector 22 is fitted in the connector fitting hole 82 at the upper portion of the block main body 81, whereby a connector connecting portion 35 of the connection plate 17 is electrically connected to a terminal inside the connector 22. From this configuration, the fusible link 19 can be connected in series to a wire harness 113 which is electrically connected to the LA terminal 111 at a lower portion of the block main body 81 and the wire harness 114 having the connector 22. In addition, when a wire harness 112 having an LA terminal 110 is connected, the connection bolt 15 is screwed through the LA terminal 110 at the lower portion of the block main body 81, whereby the fusible link 19 can be connected in series to the wire harnesses 112, 113 which have the LA terminals 110, 111.

[0071] In the fuse block 80 that is configured as has been described above, in a case where wire harnesses that have already been installed on the vehicle body are the wire harness 114 that is cabled to the upper side of the junction box 100 and which has the connector 22 and the wire harness 113 that is cabled to the lower side of the junction box 100 and which has the LA terminal 111, and the wire harness 114 having the connector 22 is connected to the power supply side, whereas the LA terminal is connected to the load side, the connector 22 is fitted in the connector fitting hole 82 on an upper side of the block main body 81, whereby the wire harness 114 can be led in from the upper side of the junction box 100, the fusible link 19 can be connected in series to the wire harness 114 having the power supply side connector 22 and the load-side LA terminal, and the wire harness 13 can be led out from the lower side of the junction box 100.

[0072] To be different from what has been described above, in a case where the wire harnesses installed on the vehicle body are cabled to the lower side of the electric junction box 100, the wire harnesses so cabled are the wire harnesses 112, 113 having the LA terminals 110, 111, and one of the LA terminals 110 is connected to the load side, whereas the other LA terminal 111 is connected to the power supply side, the connection bolt 15 is passed through the LA terminal 110 at the lower side of the block main body 81 so as to be fixed to a fusible link fixing portion 26, whereby the wire harness 112 can be led in from the lower side of the junction box 100, the fusible link 19 can be connected in series to the load side LA terminal 110 and the power supply side LA terminal 111, and the wire harness 113 can be led out from the lower side of the electric junction box 100.

[0073] As this occurs, a dummy connector 22 may be fitted in the connector fitting hole 82 in the block main body 81. Alternatively, in the event that another connector connected to another wire harness is fitted in the connector fitting hole 82 where the connector 22 is not fitted, since the wire harness of the connector so inserted is electrically connected to the lead portion 20 of the fusible link 19, power having the same potential as that of the terminal LA 111 can be led out via the connector so inserted.

[0074] According to the fuse block 80 of the fifth embodiment of the invention, the connector 22 is fitted in the fuse block 80 on the upper side thereof, so that the wire harness 114 to which the connector 22 is connected is electrically connected to one of the lead portions 20 of the fusible link 19, whereby the fusible link 19 can be connected in series to the wire harness 114 to which the connector 22 is connected and the wire harness 113 to which the LA terminal is connected on the lower side of

the block main body 81. To be different from this, the LA terminal 110 of the wire harness 112 is electrically connected in which the LA terminal 110 is connected to one of the connection bolts 15 on the lower side of the block main body 81, whereby the fusible link 19 can be connected in series to both the wire harnesses 112, 113 to which the LA terminals 110, 111 are connected, respectively. From this configuration, in the wire harnesses 113, 114 which have the single LA terminal 111 and the single connector 22, the wire harness 113 to which the LA terminal 111 is connected being disposed on the lower side of the block main body 81, the wire harnesses can be led in and out without any limitation imposed on direction for electrical connection to the fusible link 19 so as to form a circuit, thereby making it possible to form a plurality of circuits in a distributed fashion.

[0075] Then, the fuse block 80 has on the lower surface of the block main body 81 the reinforcement member 83 which is formed into the shape which surrounds the LA terminal 111 from three directions for reinforcement thereof.

[0076] In addition according to the fuse block 80 of the fifth embodiment, since the fall of the LA terminal 111 is prevented, the LA terminal 111 can be prevented from being brought into contact with another electric terminal and another electric equipment, and hence the state in which the LA terminal 111 is attached can be ensured.

[0077] Note that the invention is not limited to the embodiments that have been described heretofore but may be modified and improved as appropriately. For example, the shape of the block main body is not limited to those illustrated heretofore, but any shape that can facilitate the assemblage is preferably selected to be set as appropriately.

[0078] For example, while at least one of the reinforcement member may be disposed on the outside of the LA terminal in each embodiment, one of the reinforcement member may be disposed on the outside of each of the LA terminals.

Claims

1. A fuse block which is attached to a junction box for connecting a fusible link to a wire harness,
   characterized in that
   a terminal connected to a wire harness is electrically connected to the fusible link at one part of the fuse block,
   at least one connector connected to a wire harness is fitted into another part of the fuse block so as to be electrically connected to the fusible link, and
   the fuse block is detachably attached to the junction box.

2. A fuse block according to Claim 1, wherein at least two of the connectors are fitted to the fuse block on an upper side of the junction box, so that the connectors are electrically connected to a pair of lead portions of the fusible link, and
   the fuse block has a connection member which is electrically connected to the lead portions of the fusible link, and to which at least two of the terminals are connected on a lower side of the junction box.

3. A fuse block according to Claim 1, wherein the connector is fitted to the fuse block on an upper side of the junction box, so that the connector is electrically connected to a lead portion of the fusible link, and
   the fuse block has one connection member that is electrically connected to the lead portion of the fusible link and another connection member that is electrically connected to another lead portion of the fusible link on a lower side of the junction box.

4. A fuse block according to Claim 1, wherein one of the connectors is fitted to the fuse block on an upper side of the junction box, so that the connector is electrically connected to a lead portion of the fusible link,
   the fuse block has one connection member that is electrically connected to the lead portion of the fusible link on a lower side of the junction box on a lower side of the junction box,
   another of the connector is fitted to the fuse block on the lower side of the junction box, so that the connector is electrically connected to another lead portion of the fusible link, and
   the fuse block has another connection member that is electrically connected to said another lead portion of the fusible link on the lower side of the junction box.

5. A fuse block according to any of Claims 1 to 4, wherein the terminal and the connector are connected to power supply side or load side wire harnesses.

6. A fuse block according to any of Claims 1 to 5, wherein at least the fusible link and the connection member are covered by a protection cover.

7. A fuse block according to any of Claims 1 to 6, wherein the fuse block is detachably attached to an interior or exterior of the junction box.

8. A fuse block according to any of Claims 1 to 7, wherein a reinforcement member is provided on an outer side of at least one of the terminals for reinforcement of the terminal.

FIG. 1

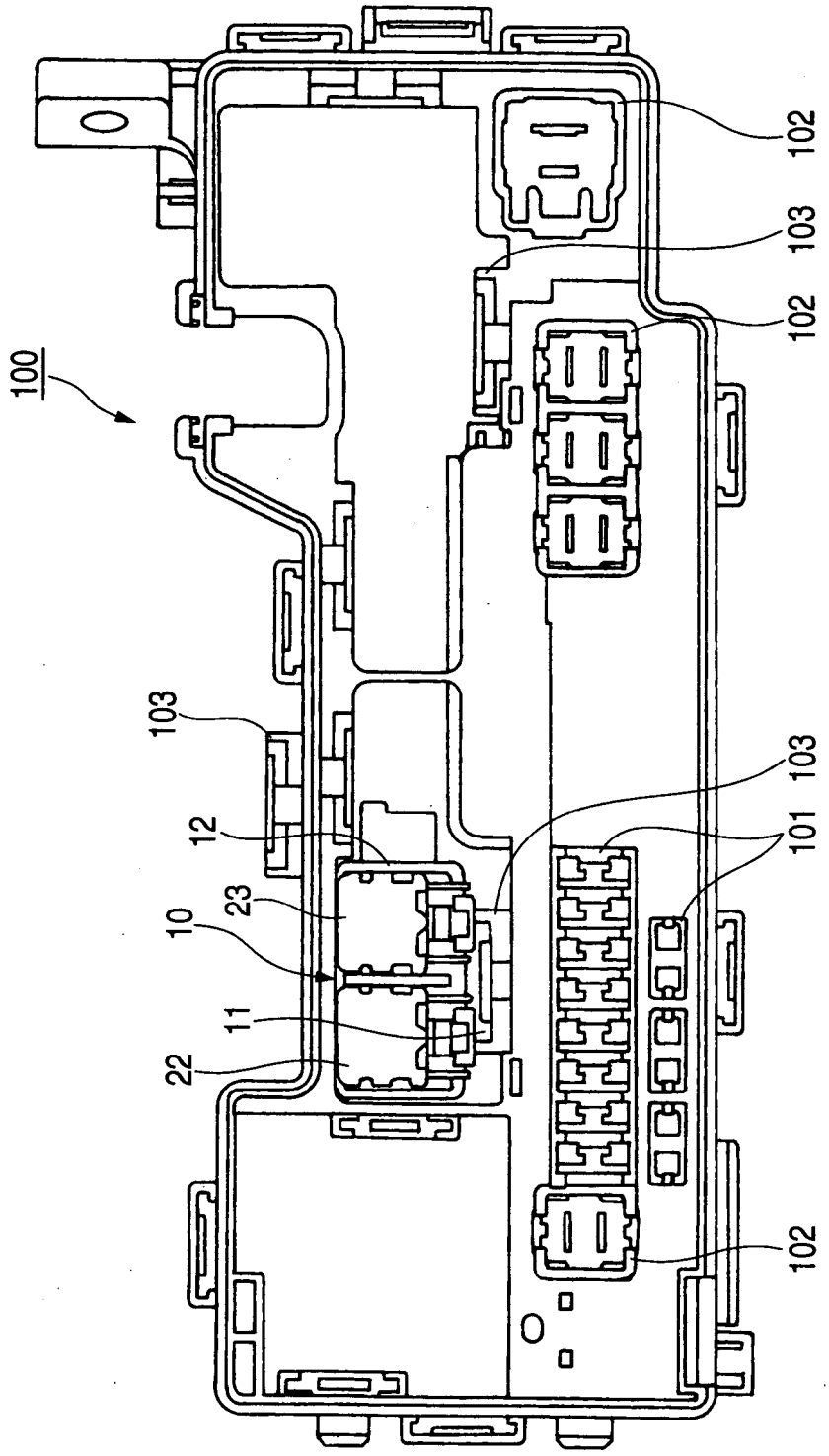

FIG. 2

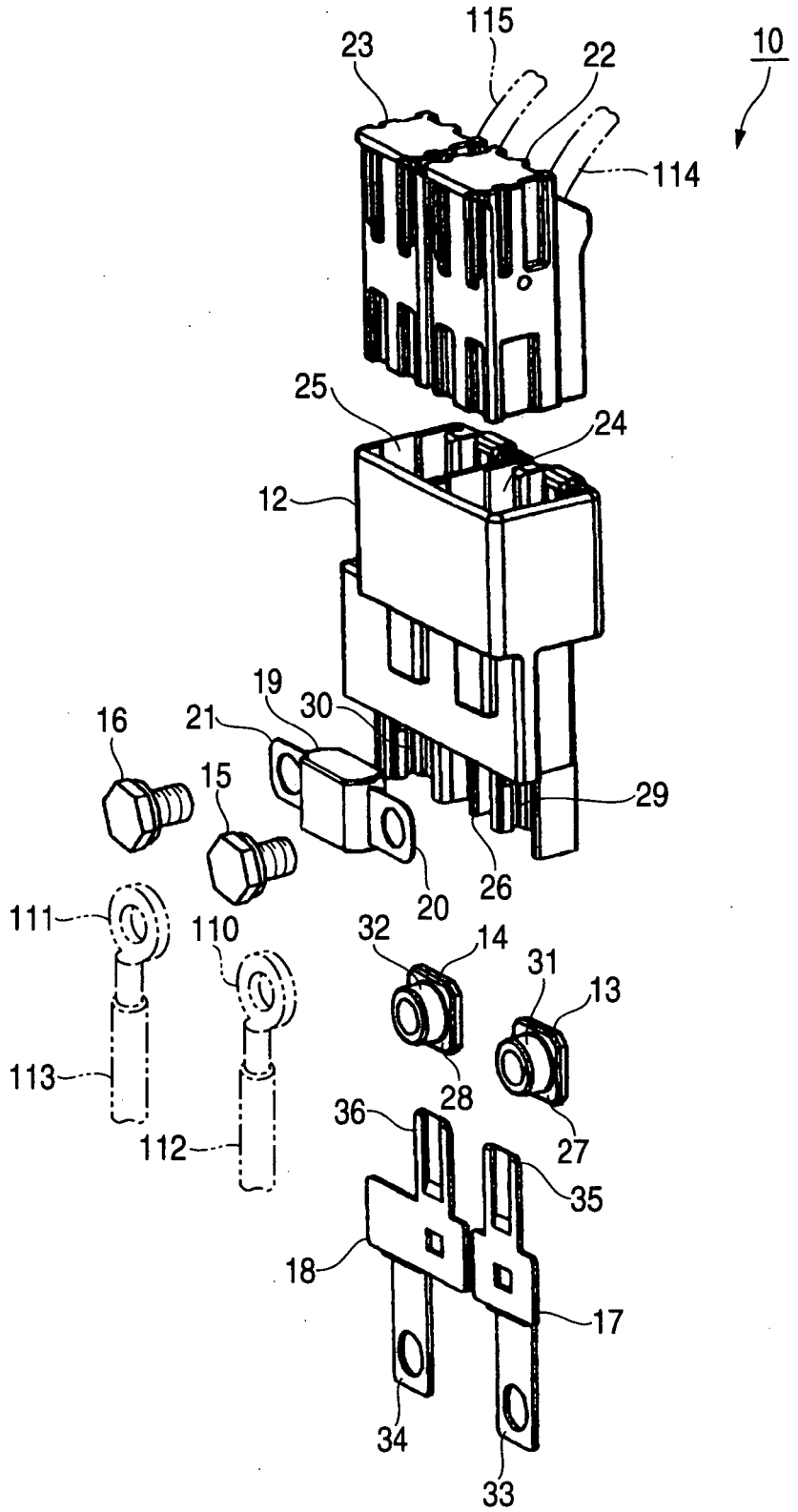
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FIG. 3

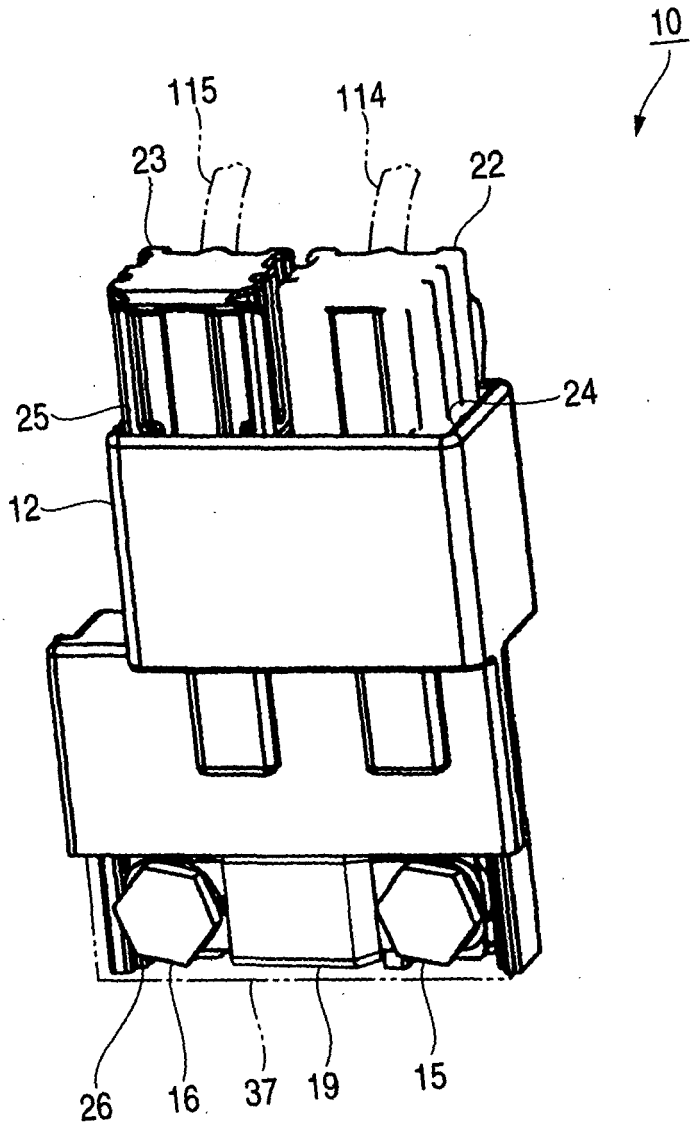

FIG. 4

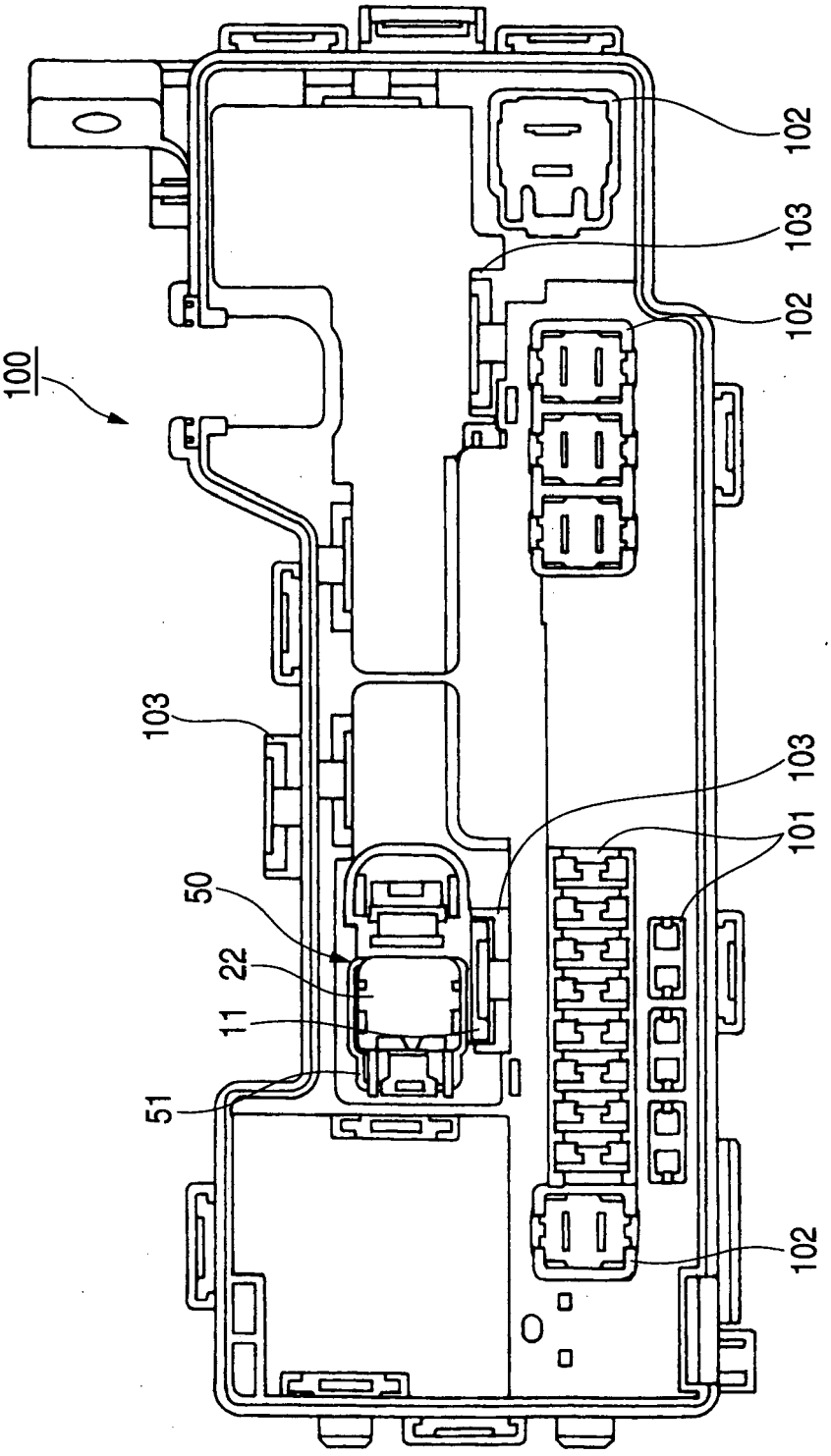

FIG. 5

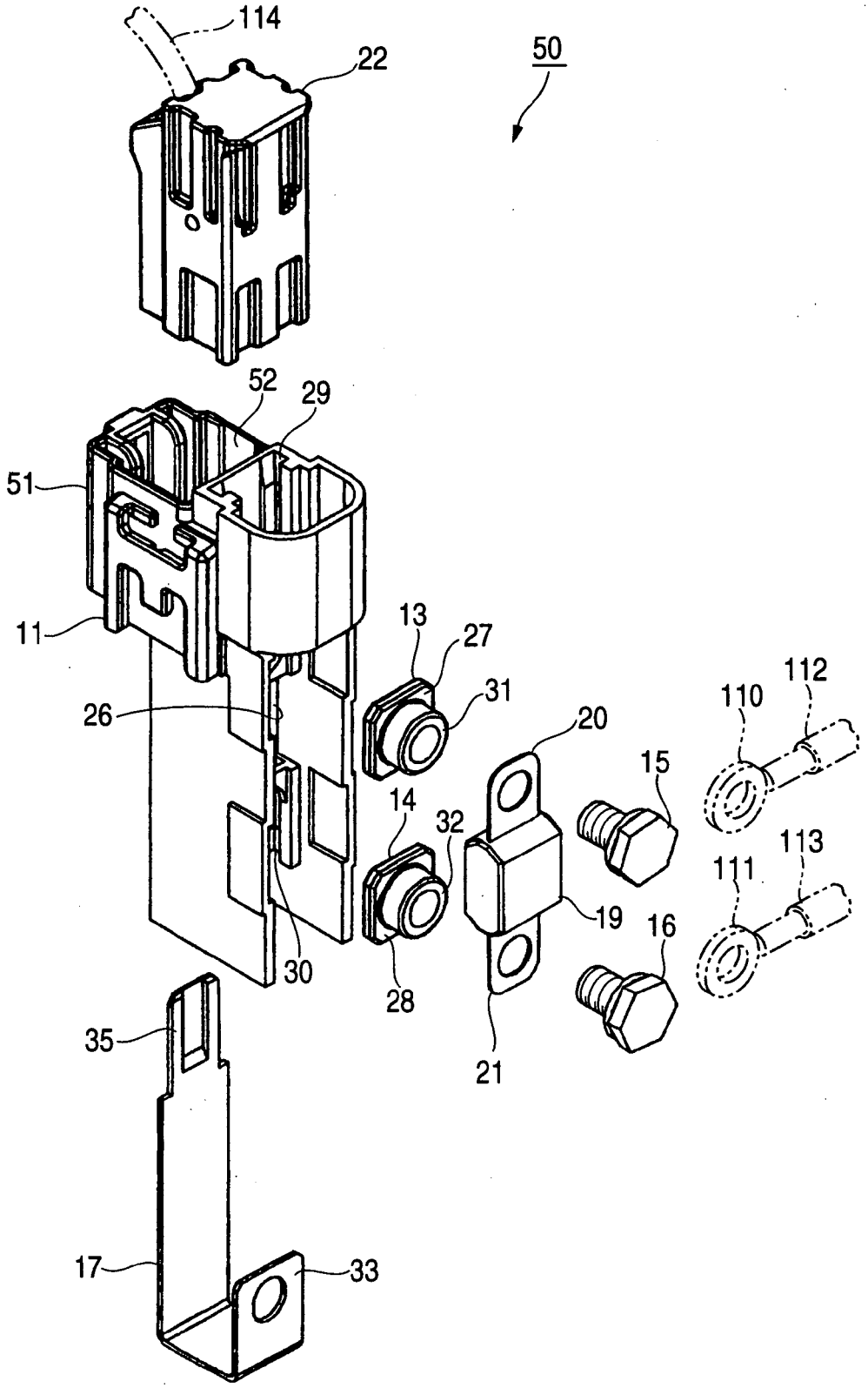
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FIG. 6

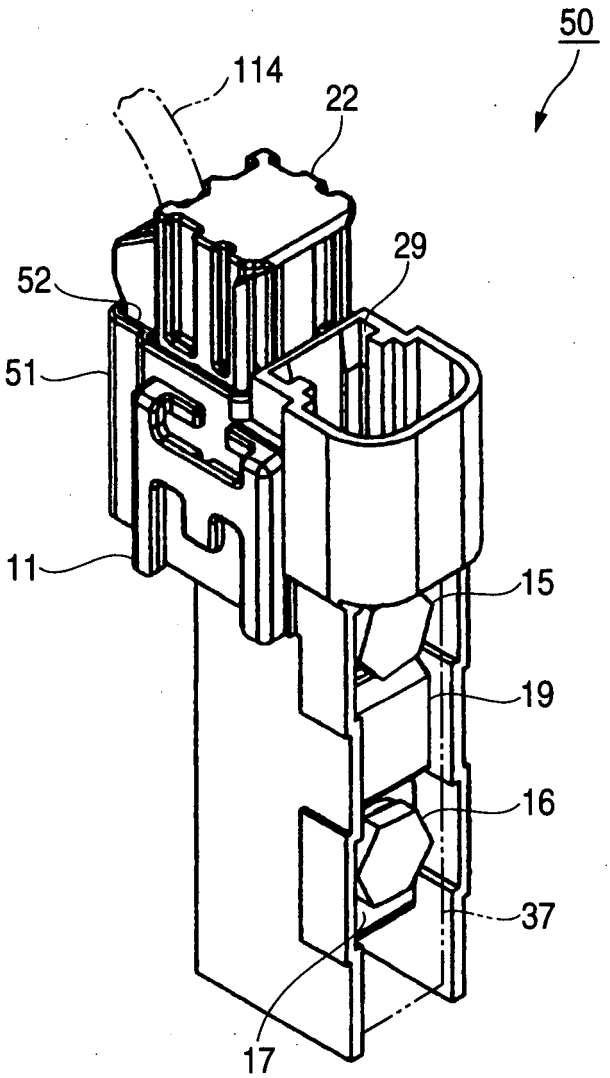

FIG. 7

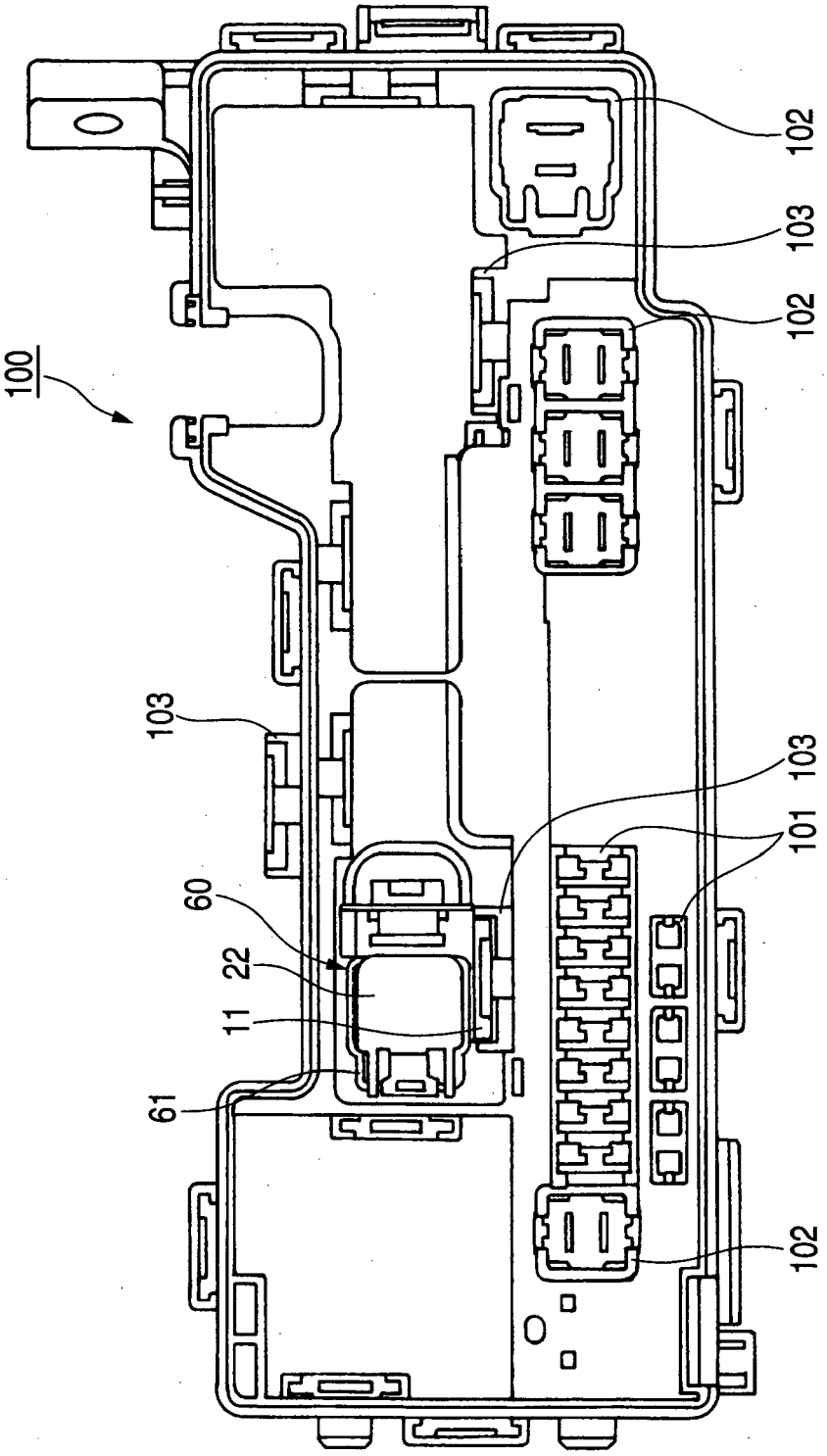

FIG. 8

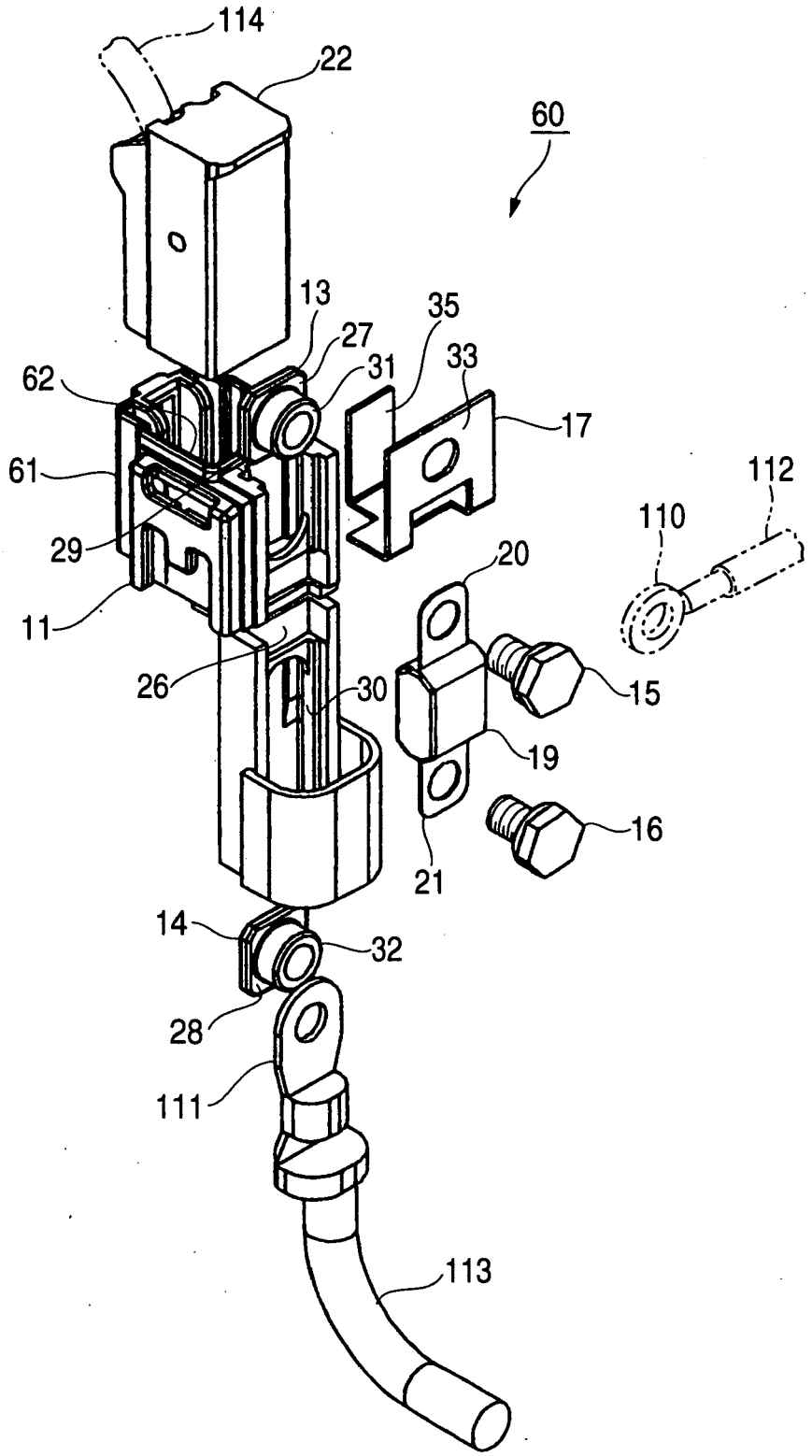
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FIG. 9

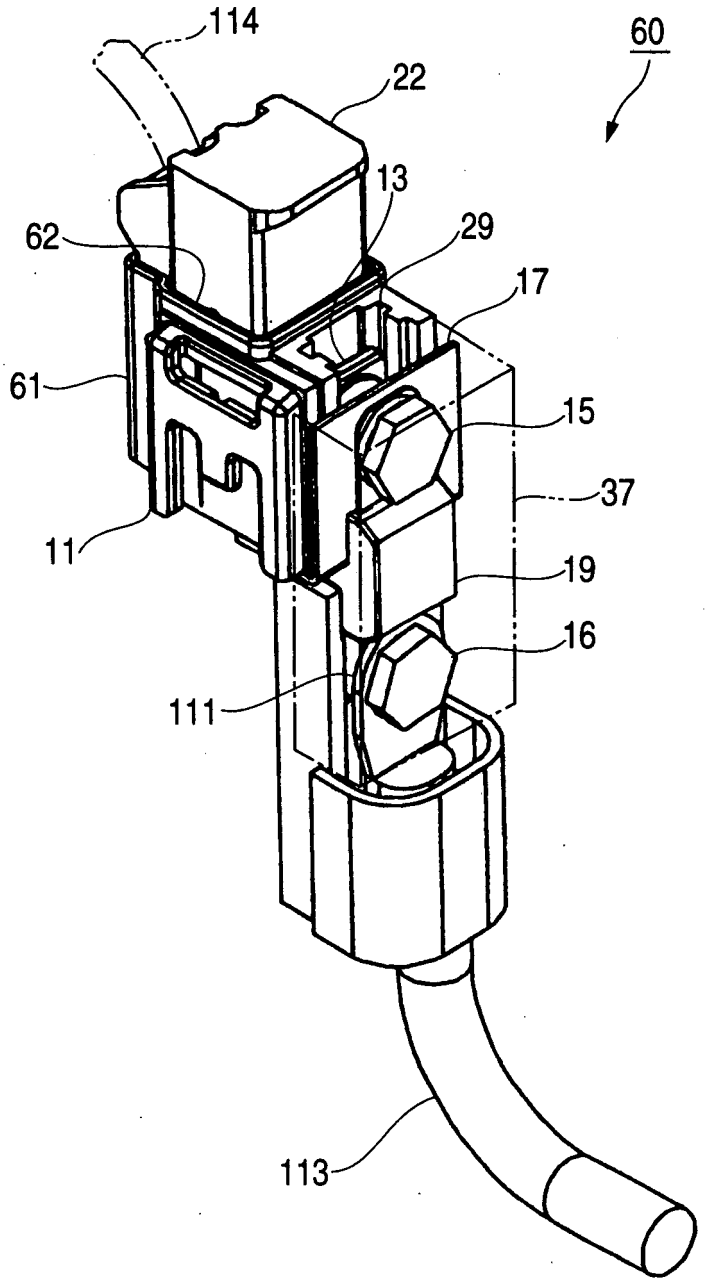

FIG. 10

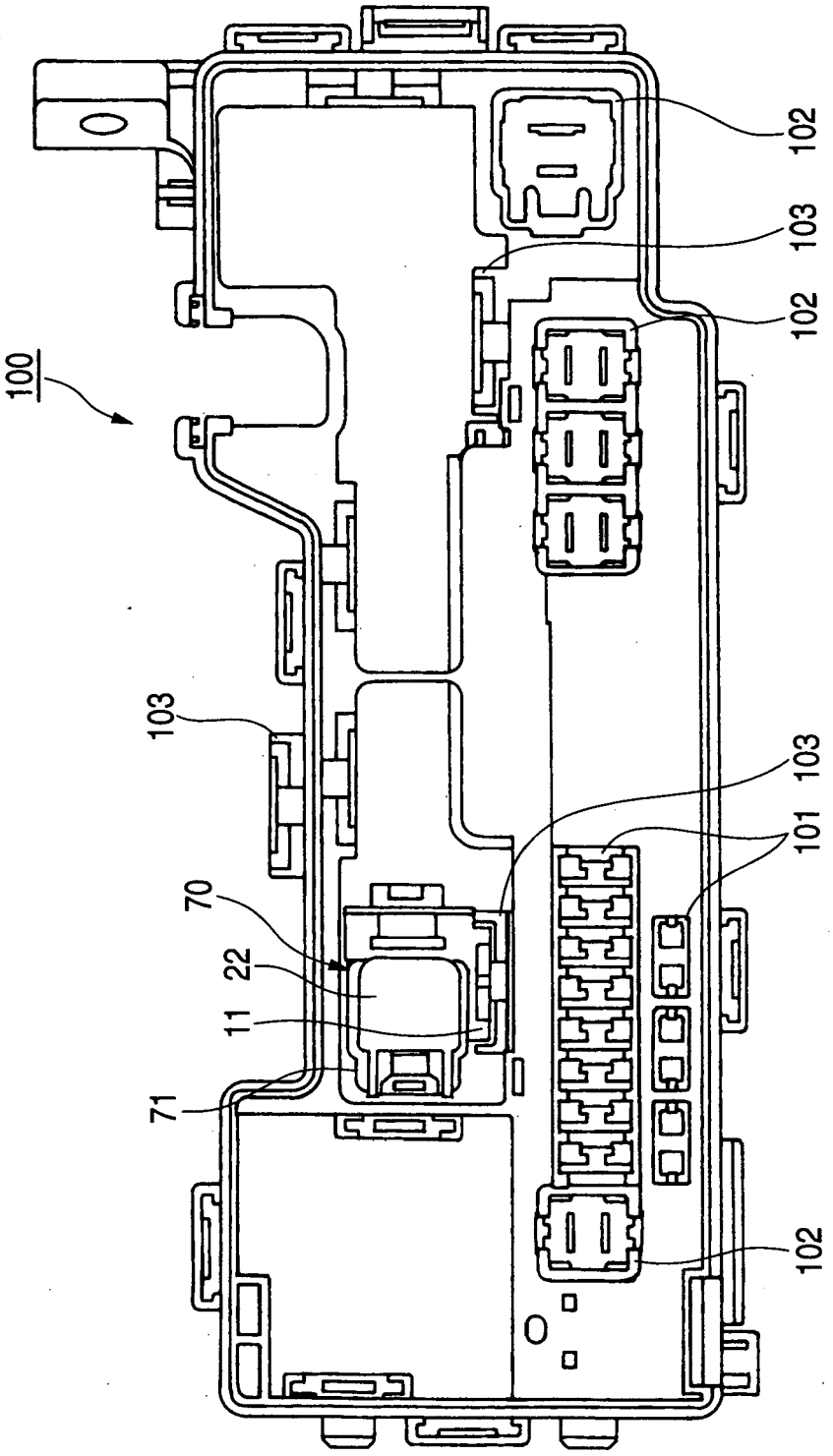

FIG. 11

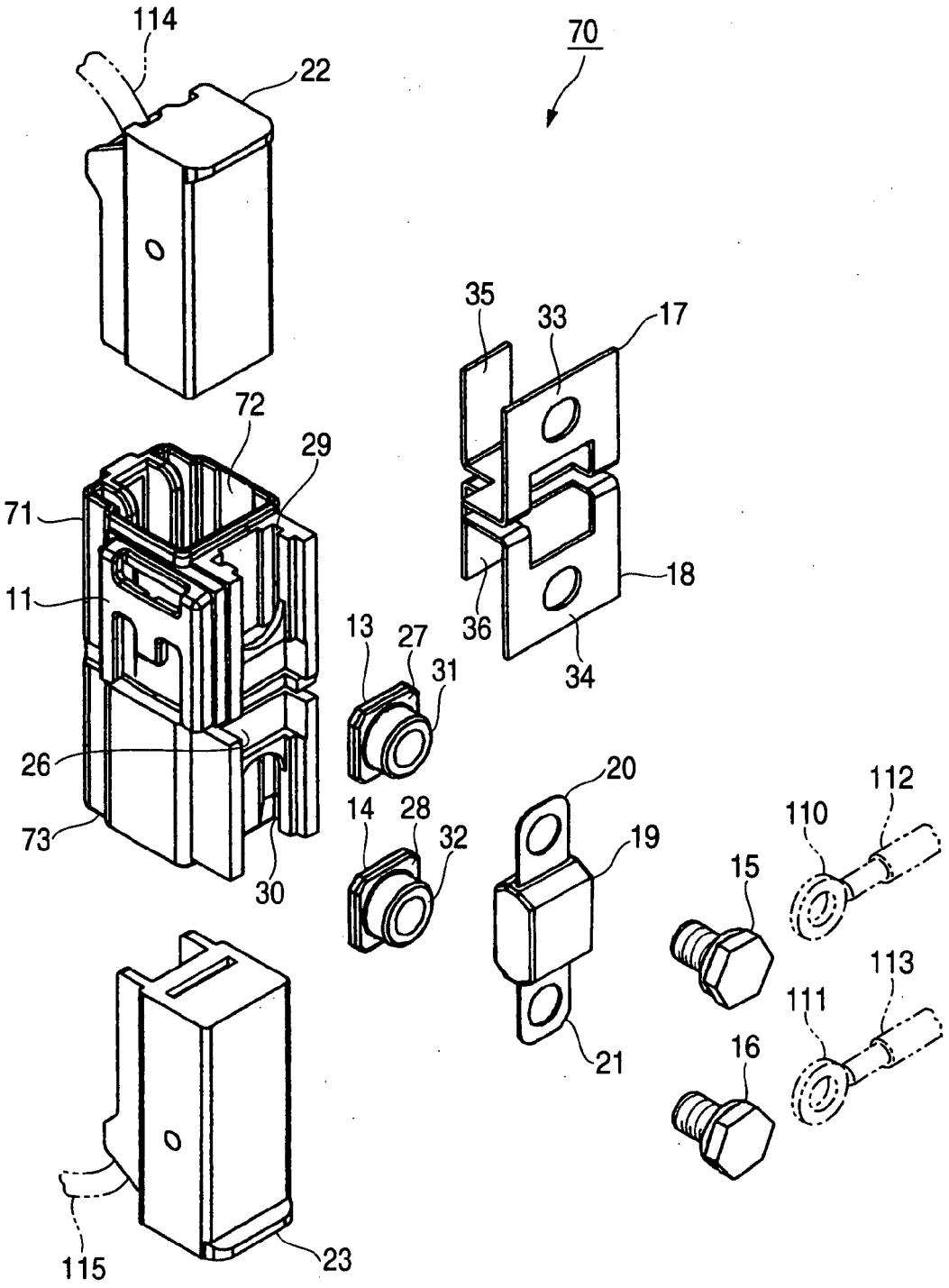
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FIG. 12

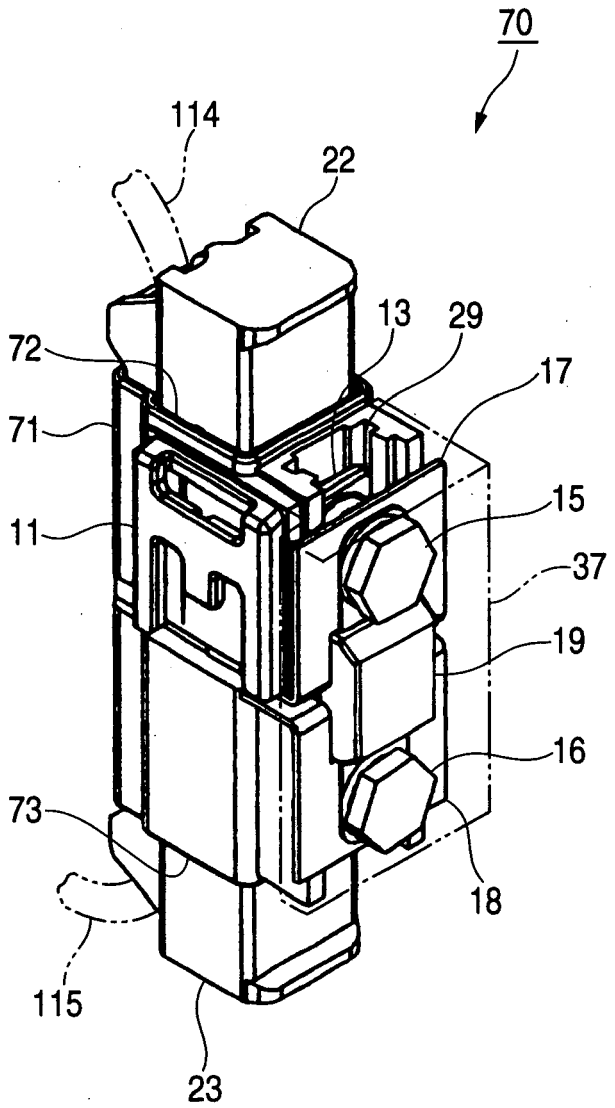

FIG. 13

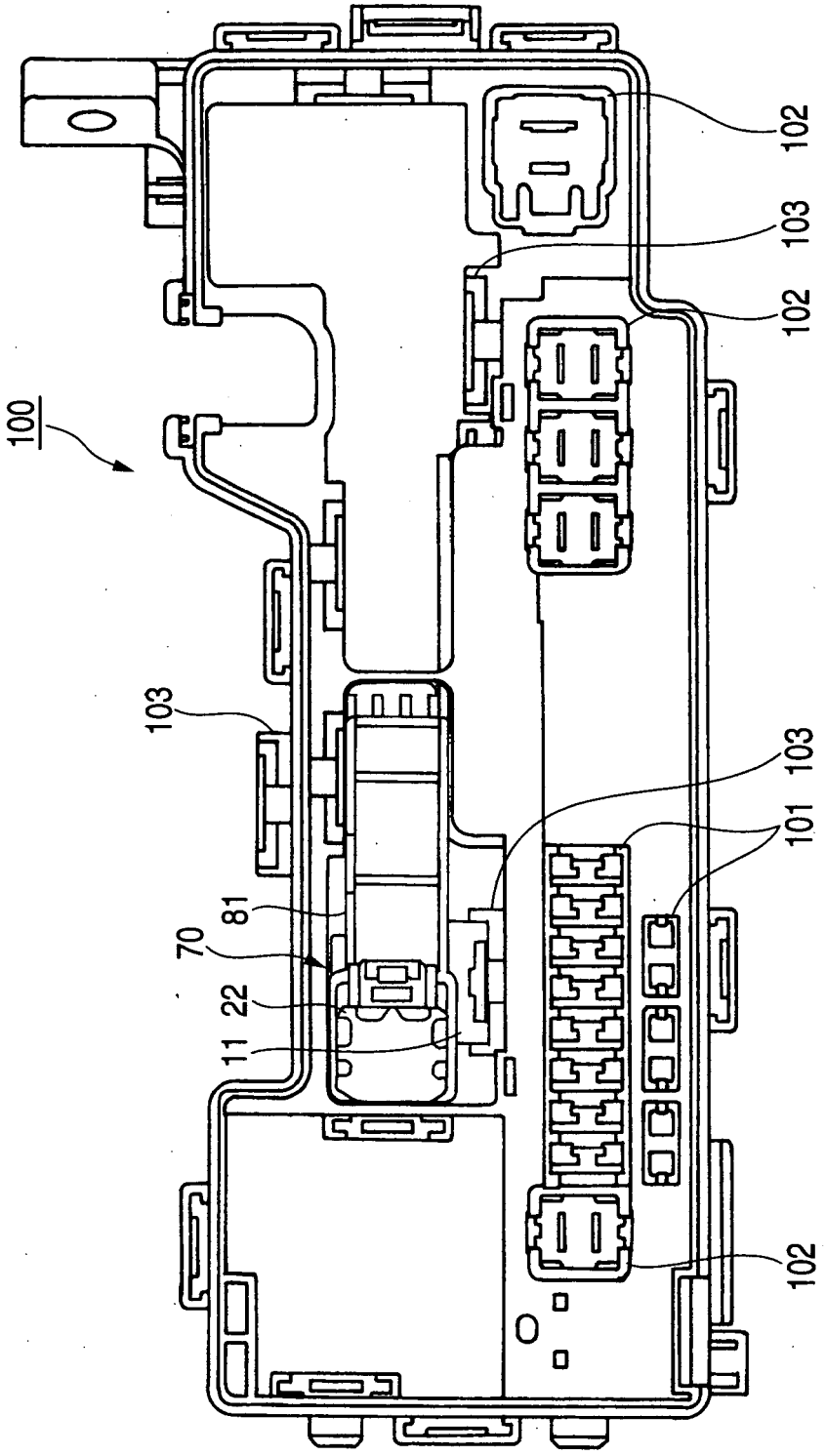

FIG. 14

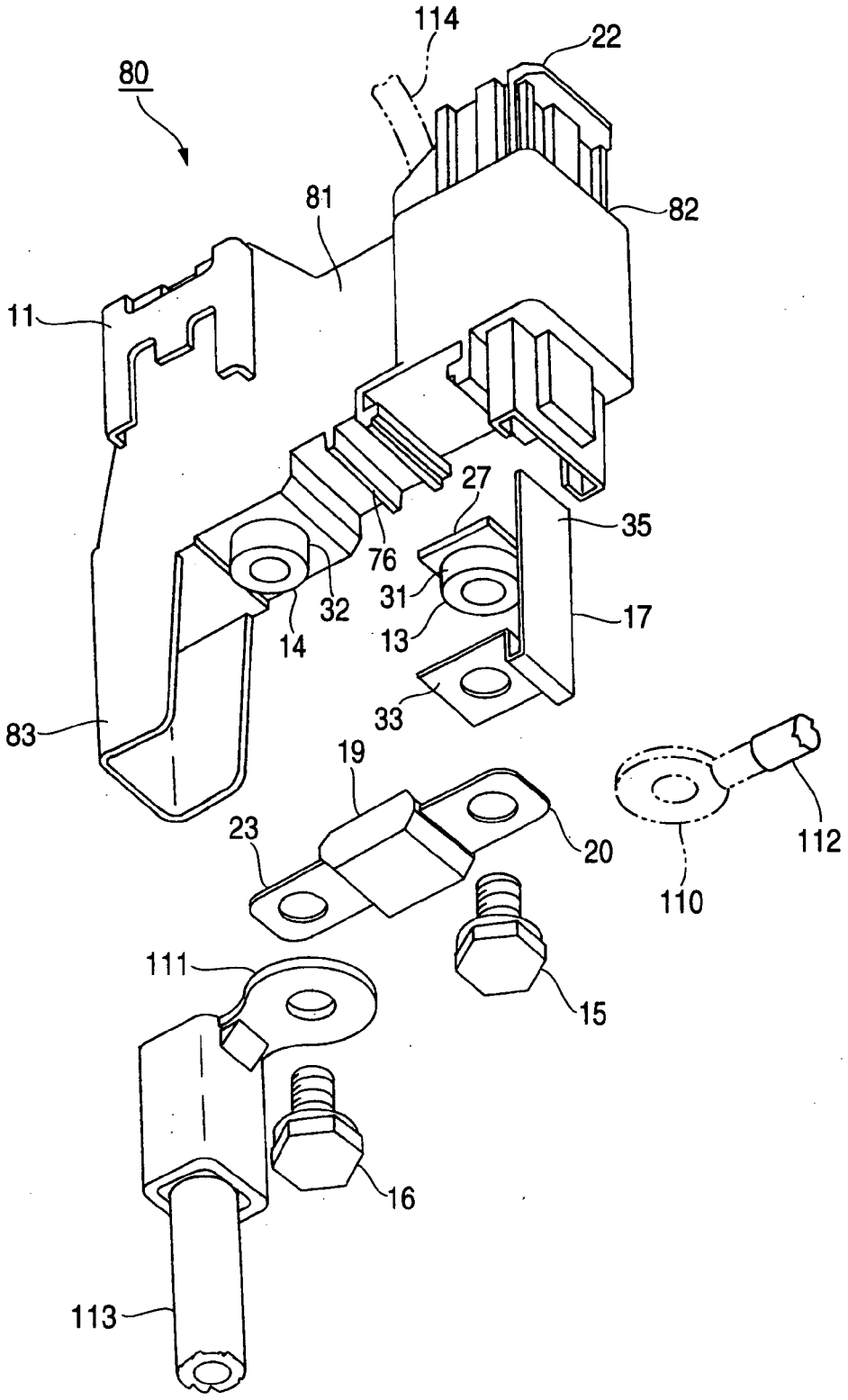
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FIG. 15