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(54) **ADJUSTABLE PLASTER RING WITH ATTACHED CLIP**

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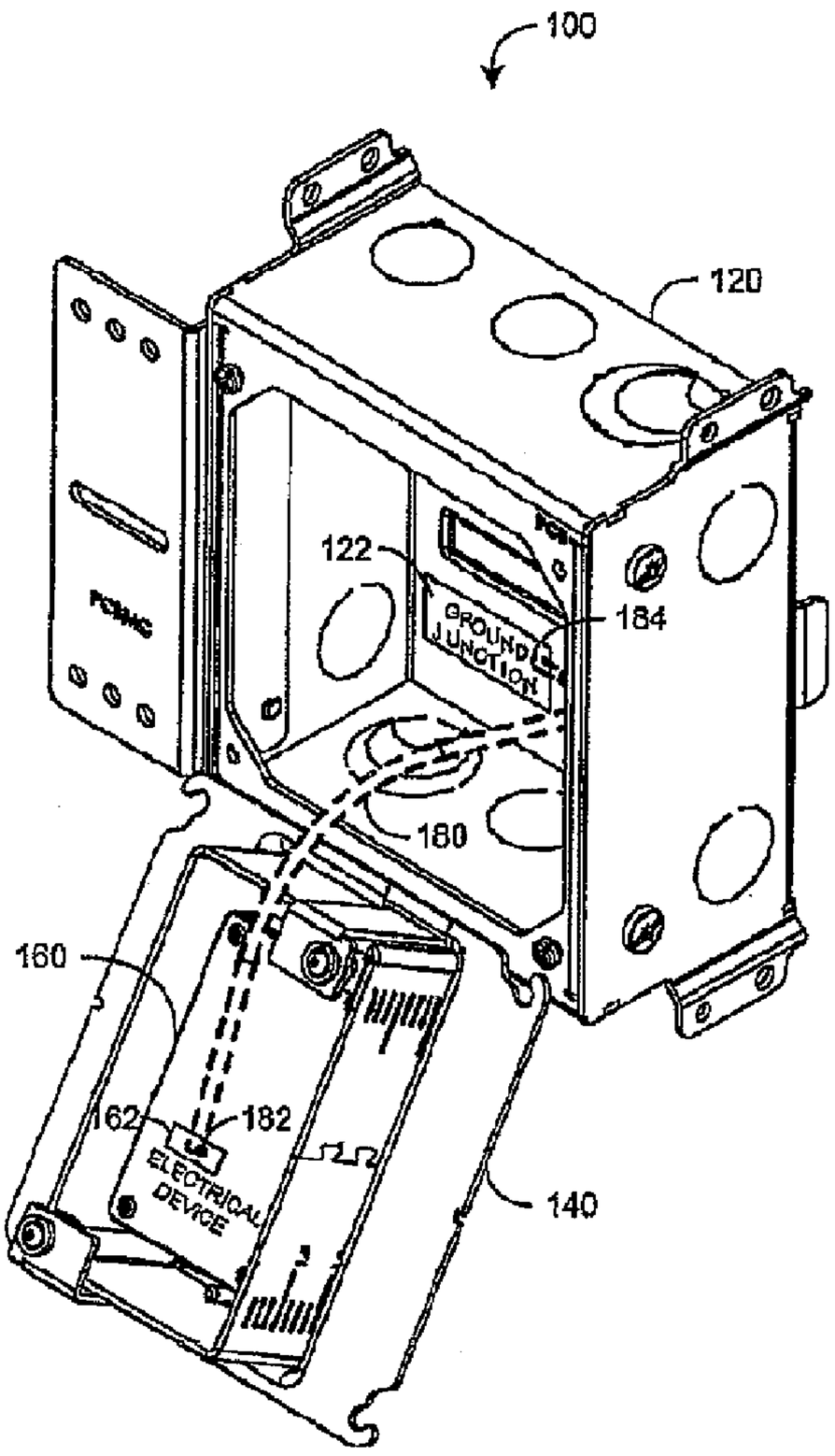
(57) **ABSTRACT**

A power distribution system has an electrical box configured to attach a power cable, a plaster ring releasably mounted to the box and one or more electrical devices installed into the ring. A pre-wired ground extends from a first end physically and electrically connected to a ground terminal on the electrical device. The plaster ring is movable between a closed position proximate the box and an open position distal the box. The pre-wired ground is configured as a lanyard so as to support the plaster ring as a wiring platform in the open position for connecting wires between the power cable and the electrical device or devices.



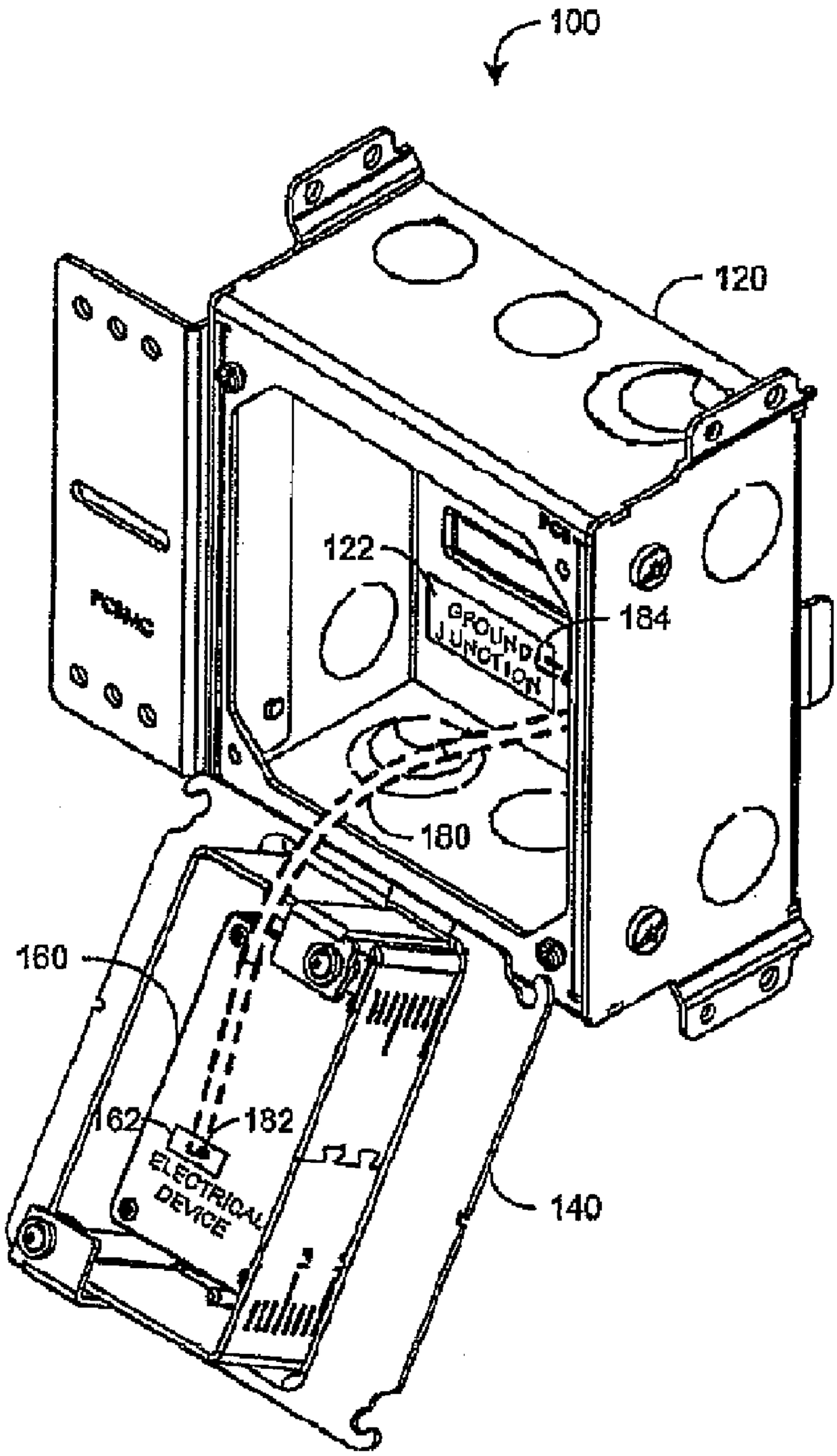

100
120
122
184
GROUND JUNCTION
180
160
162
182
ELECTRICAL DEVICE
140

FIG. 1A

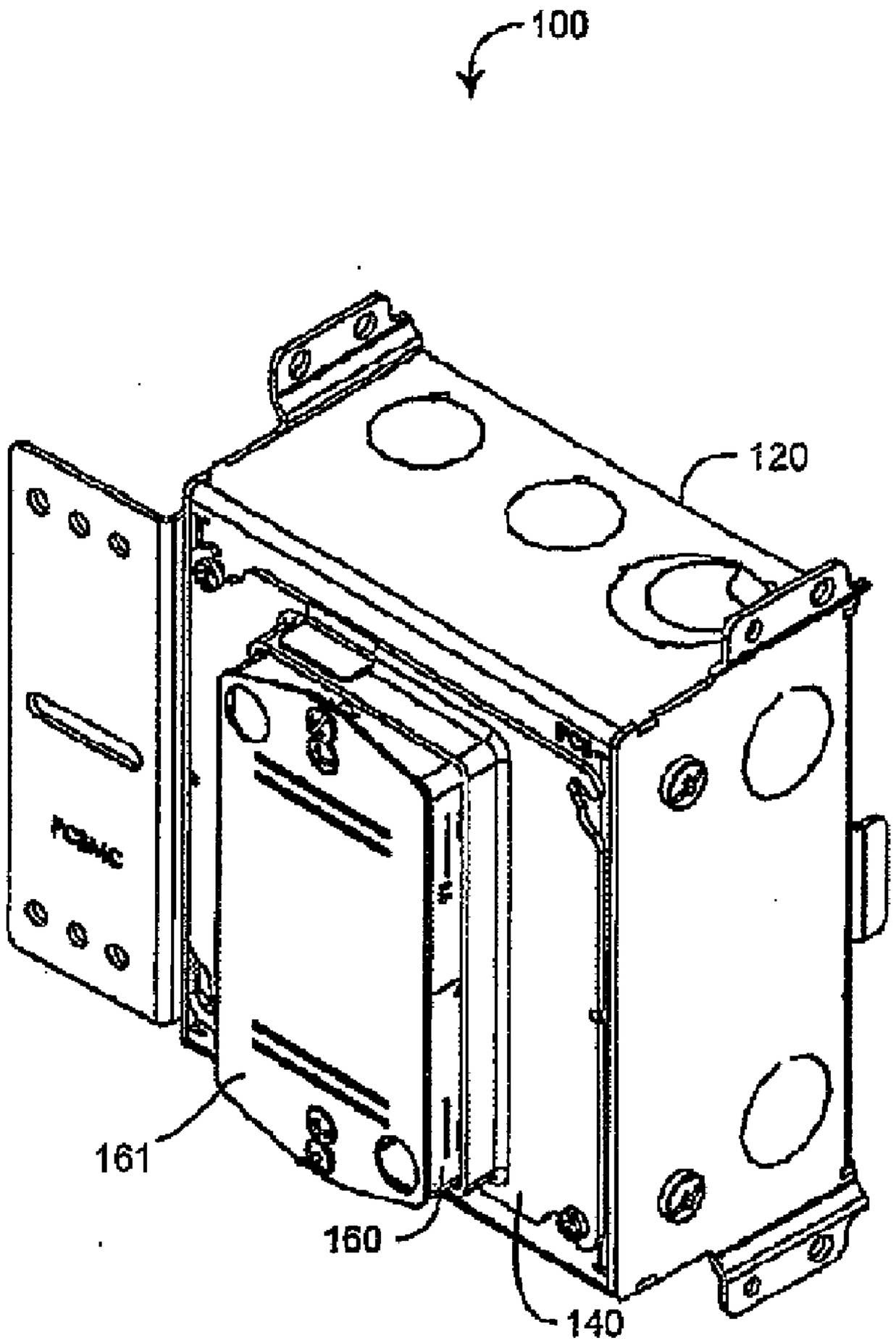


FIG. 1B

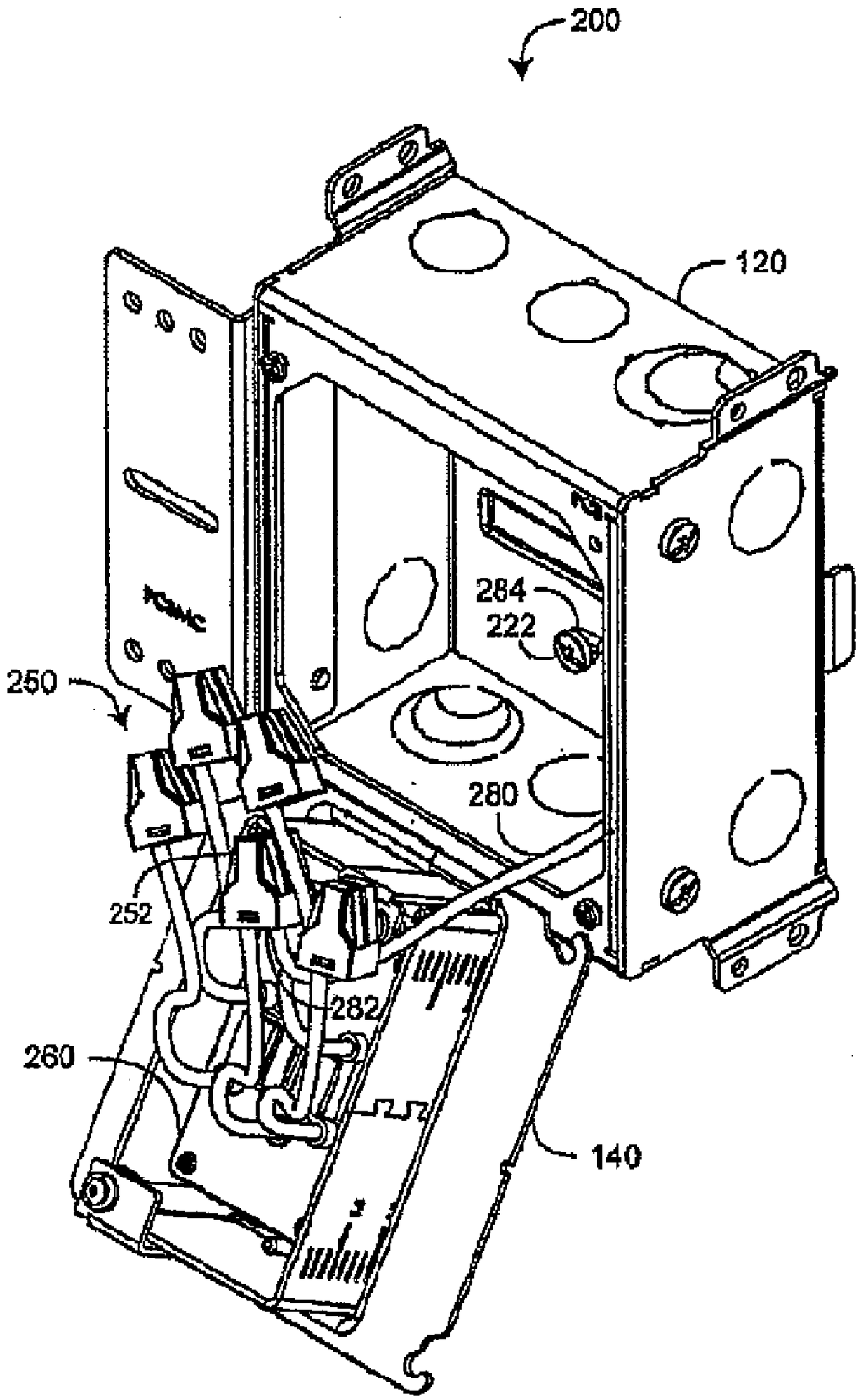


FIG. 2

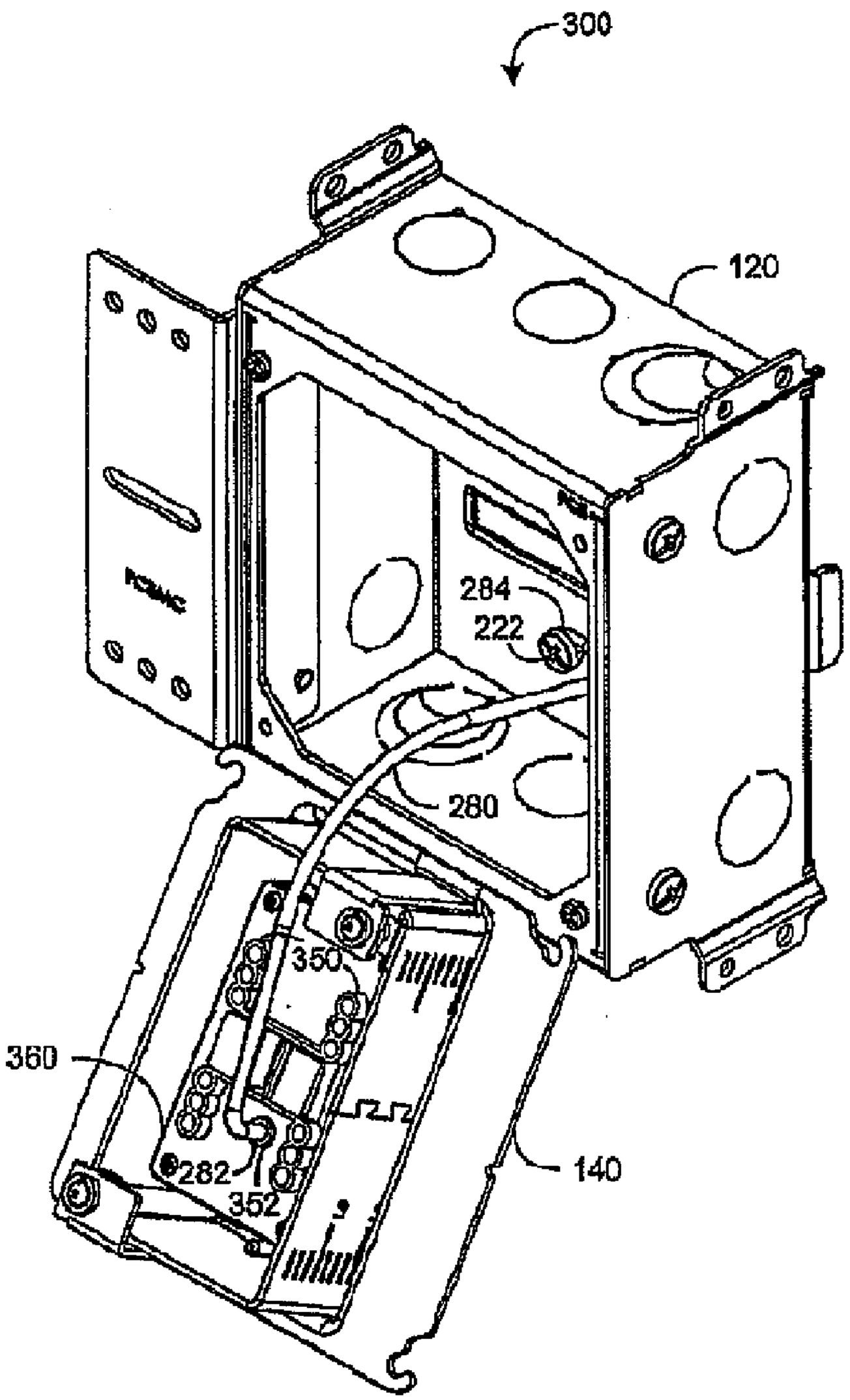


FIG. 3

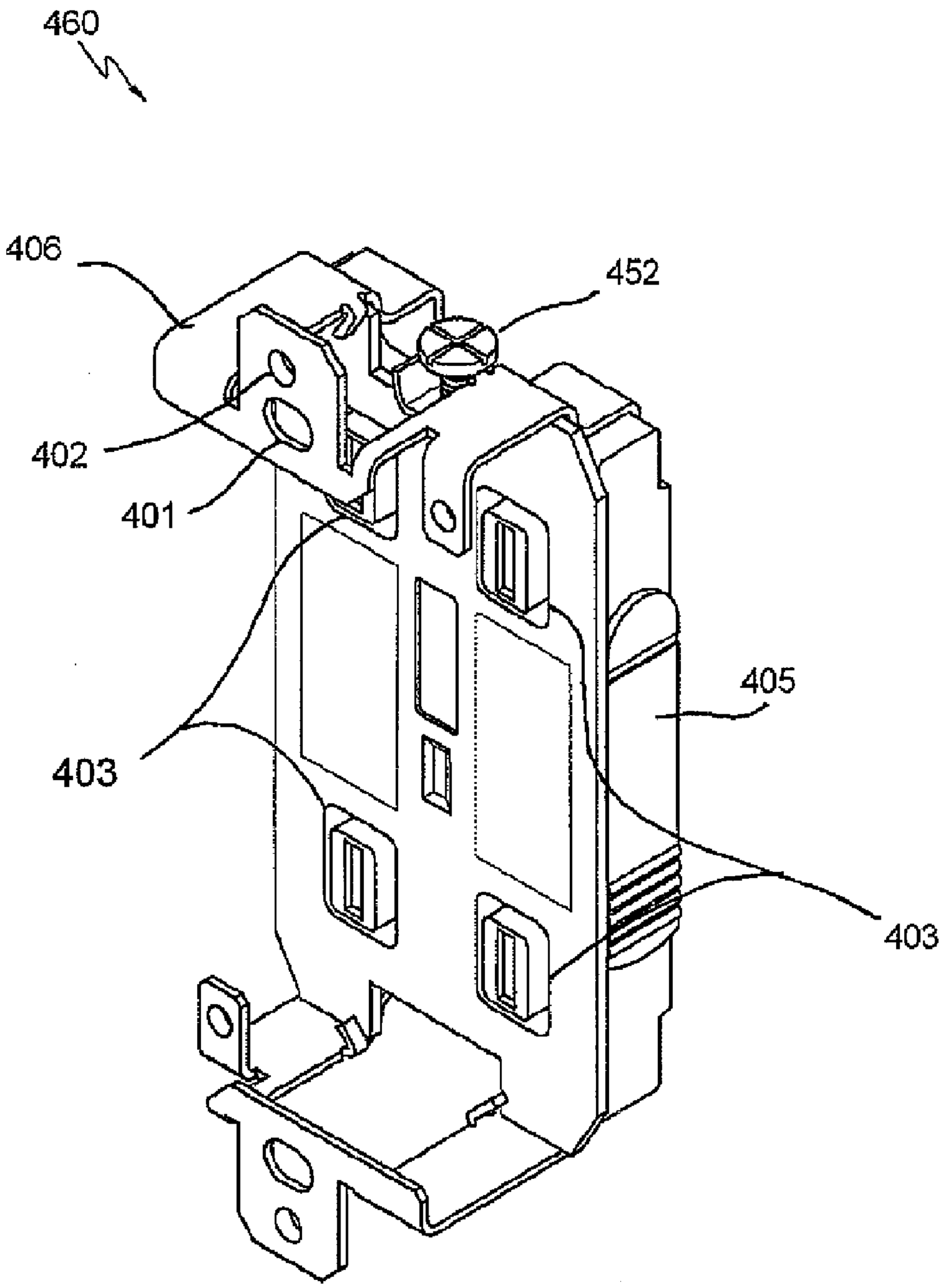


FIG. 4A

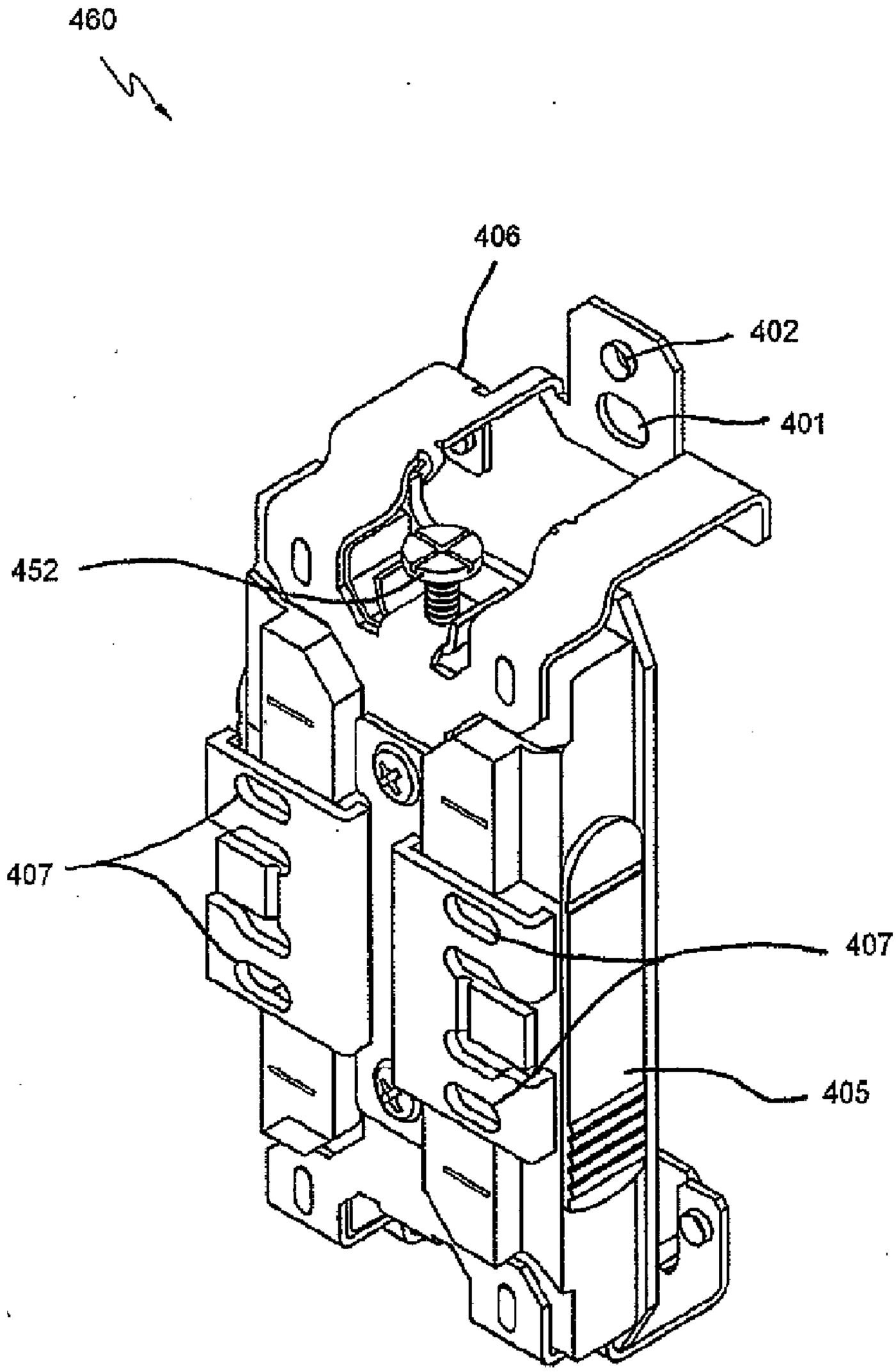


FIG. 4B

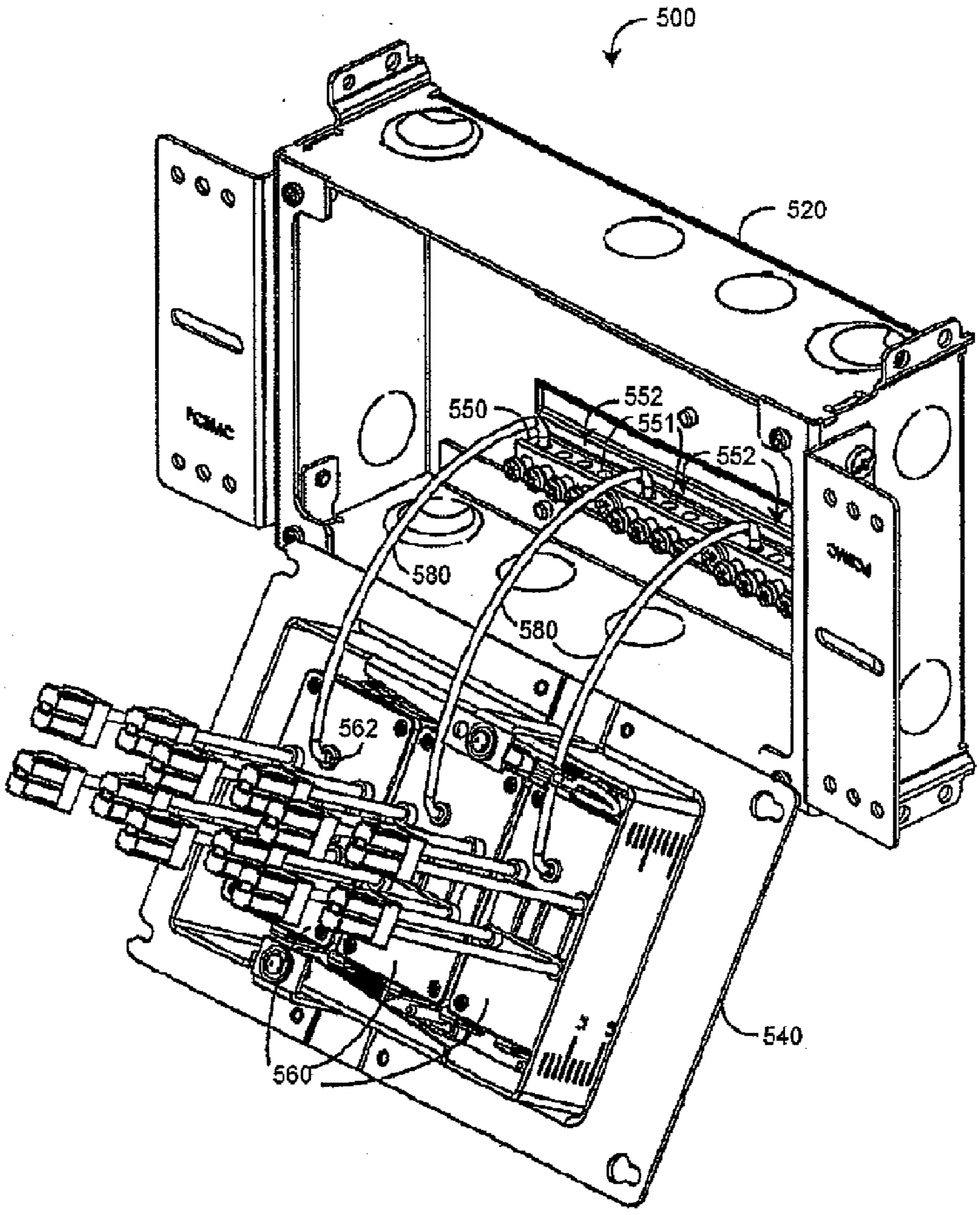


FIG. 5

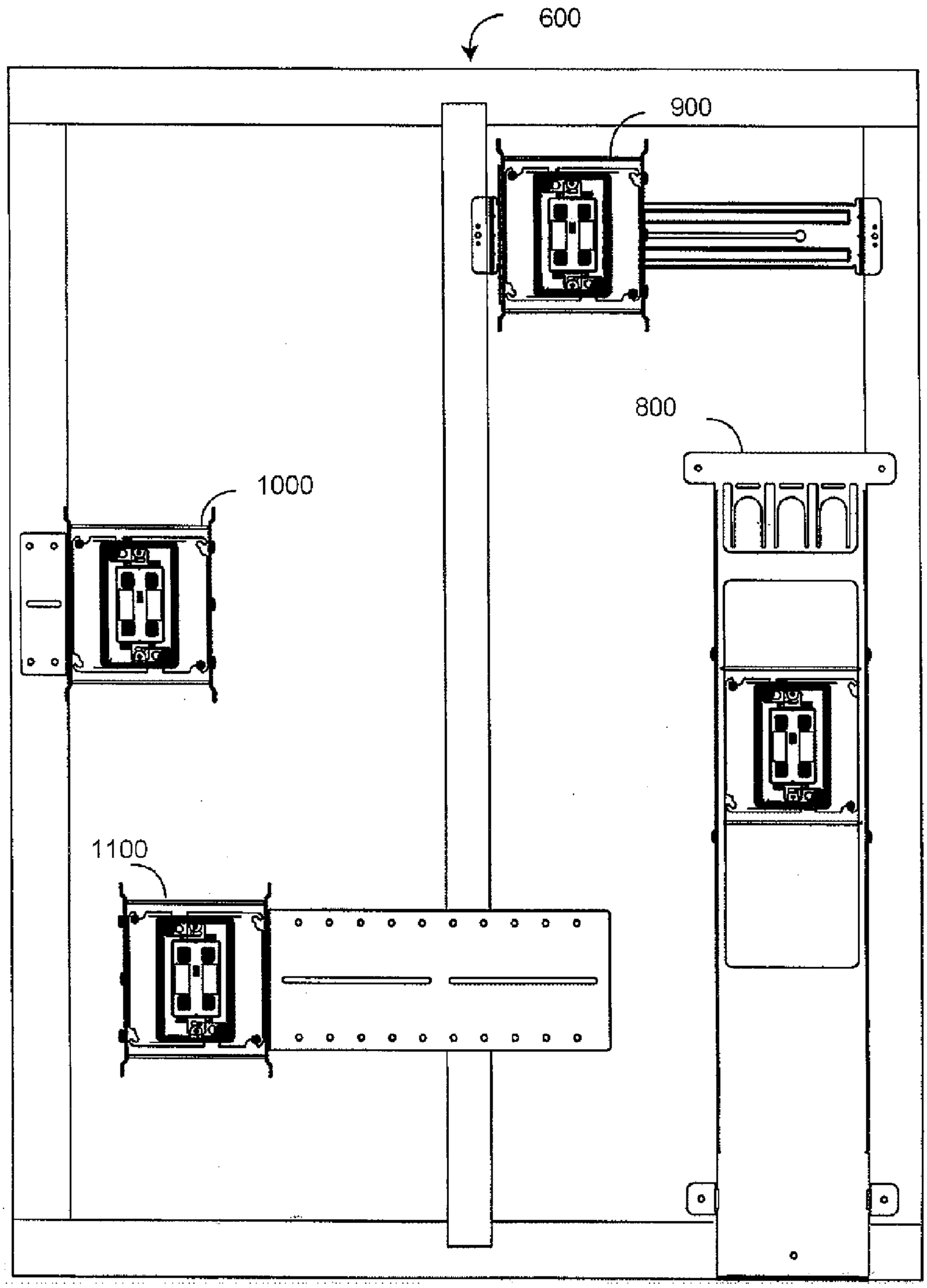


FIG. 6

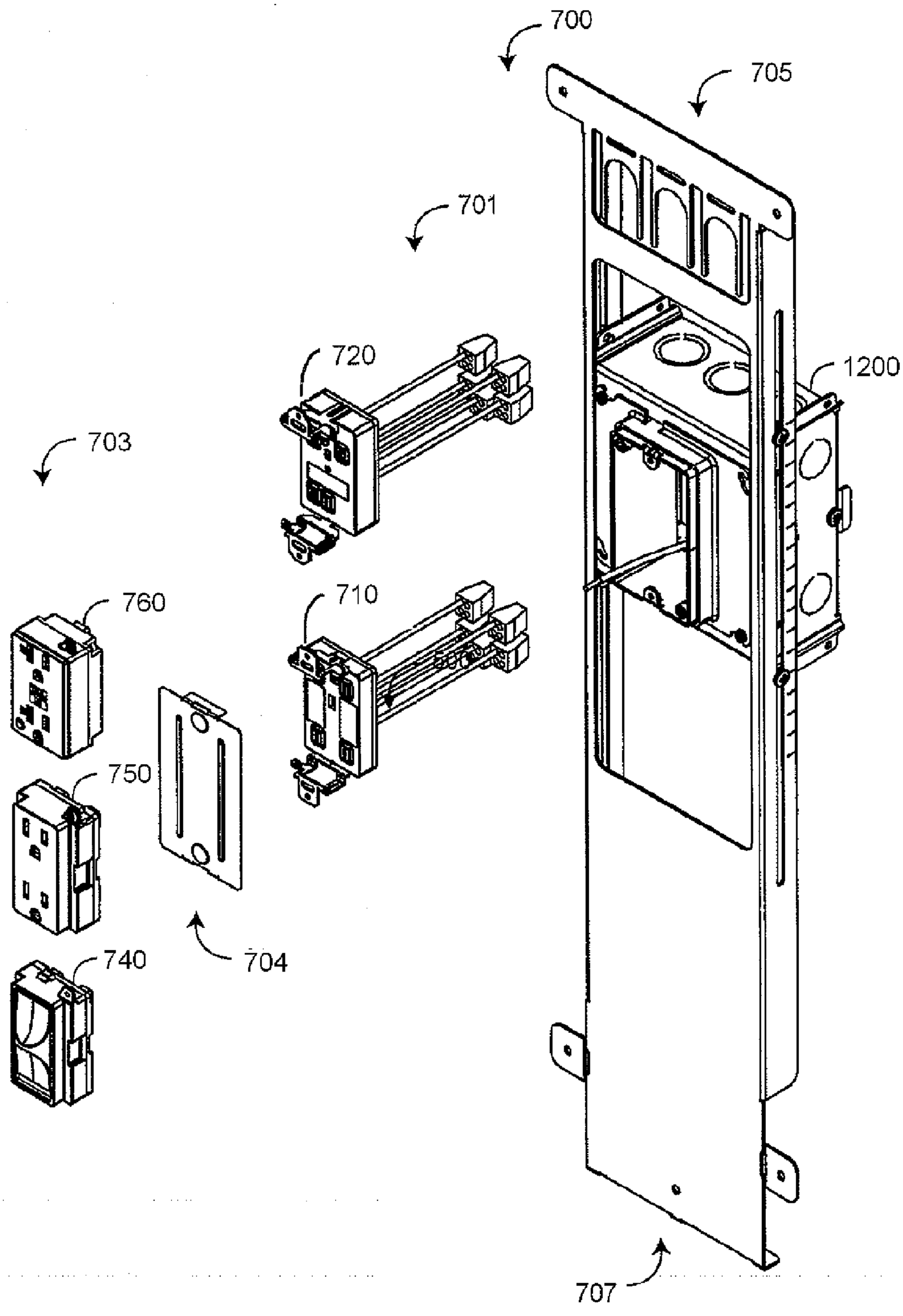


FIG. 7

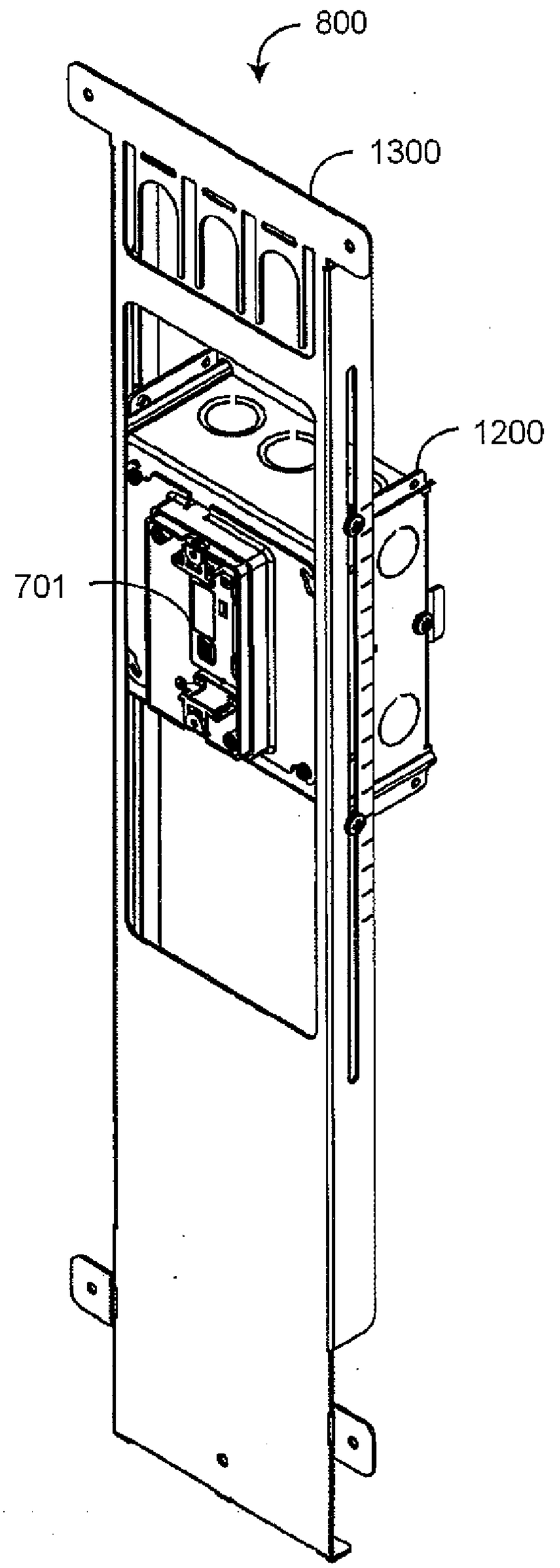


FIG. 8

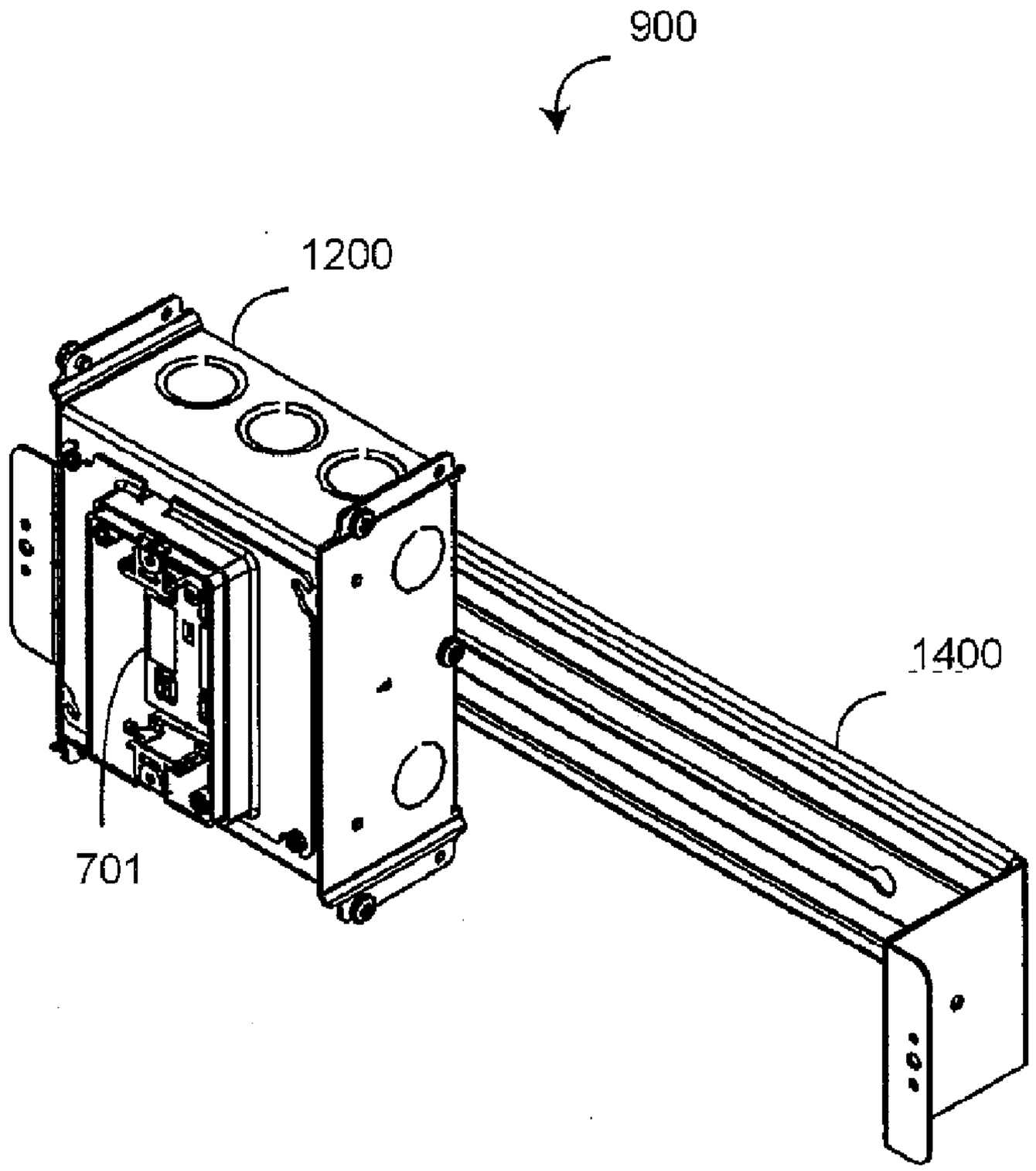


FIG. 9

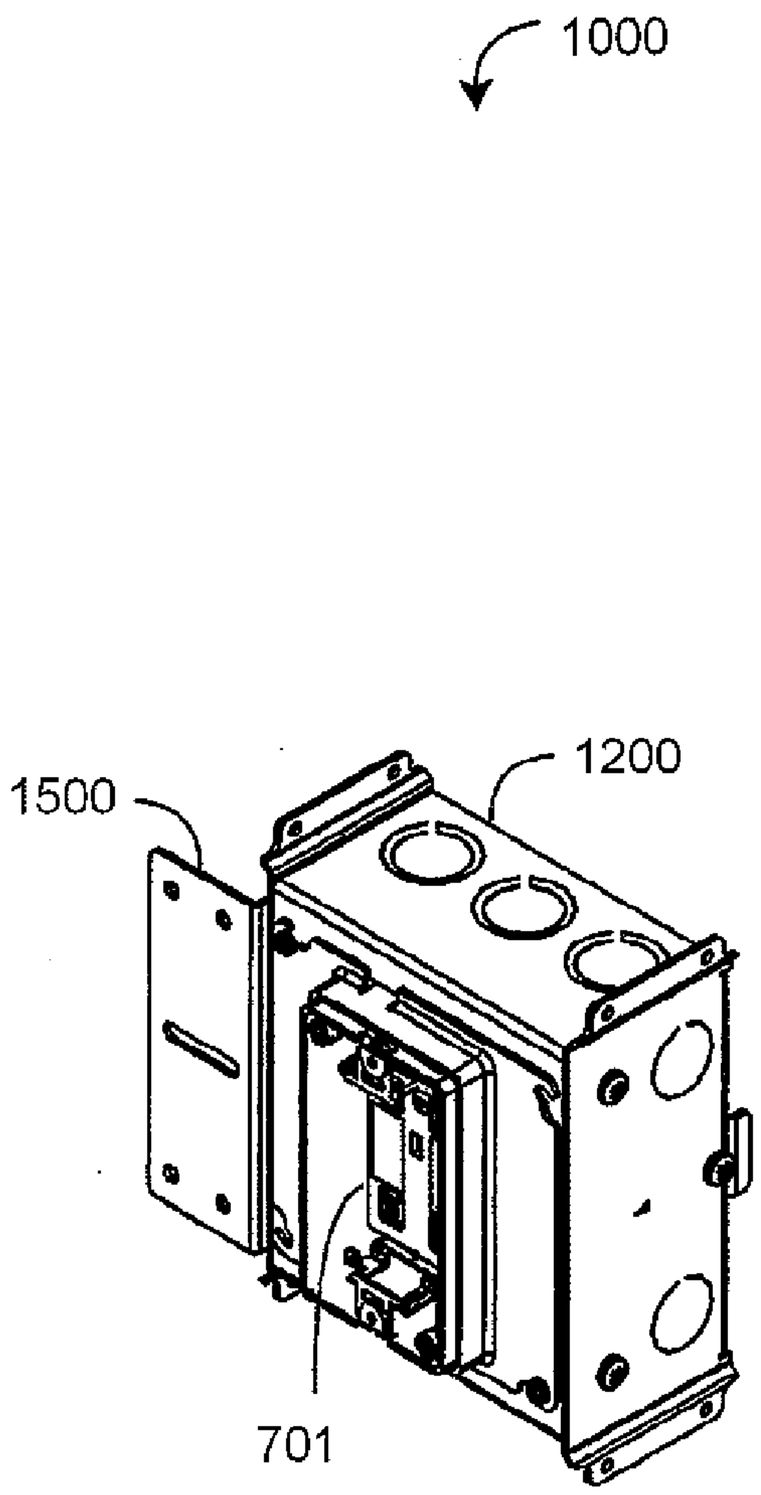


FIG. 10

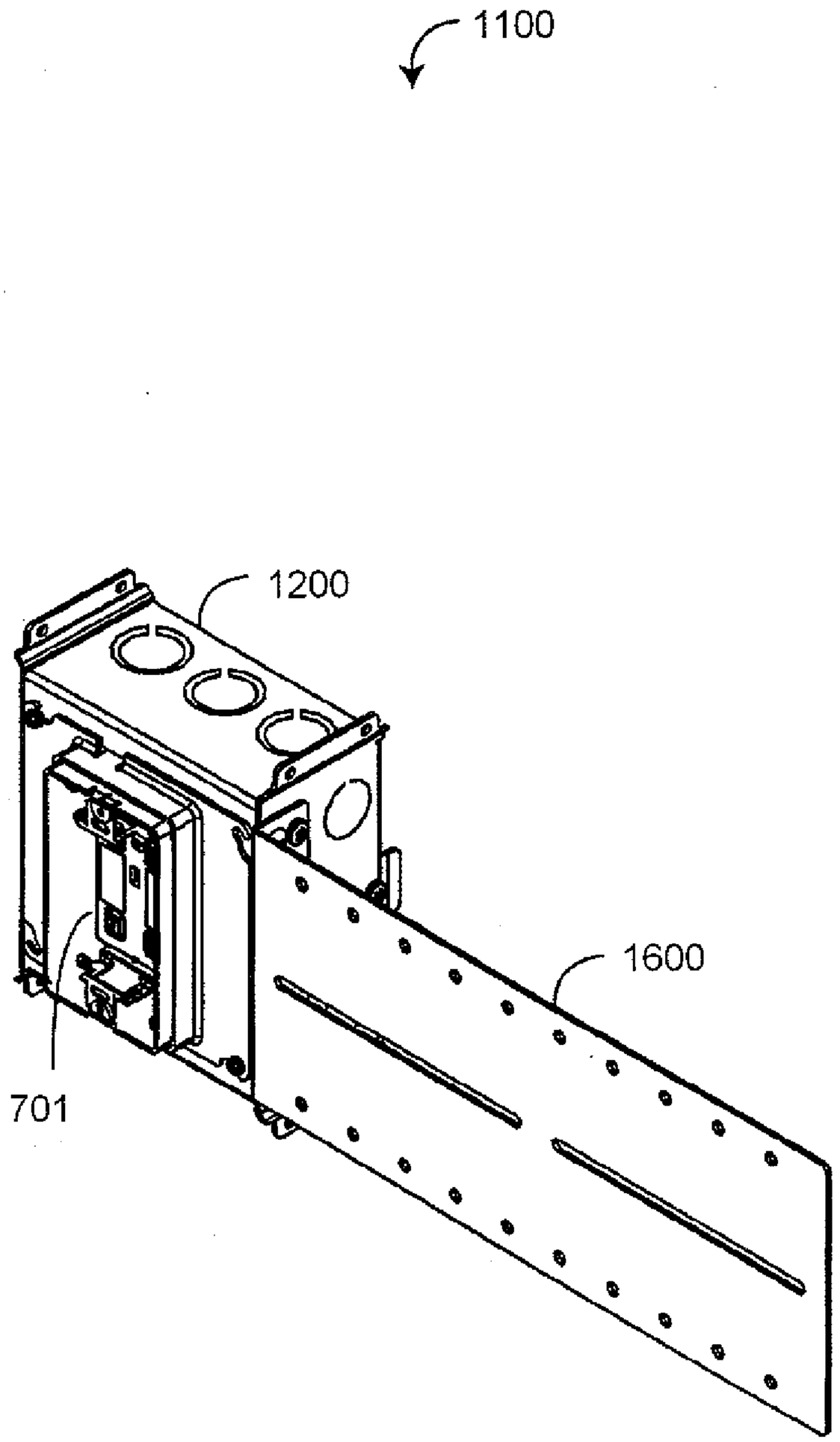


FIG. 11

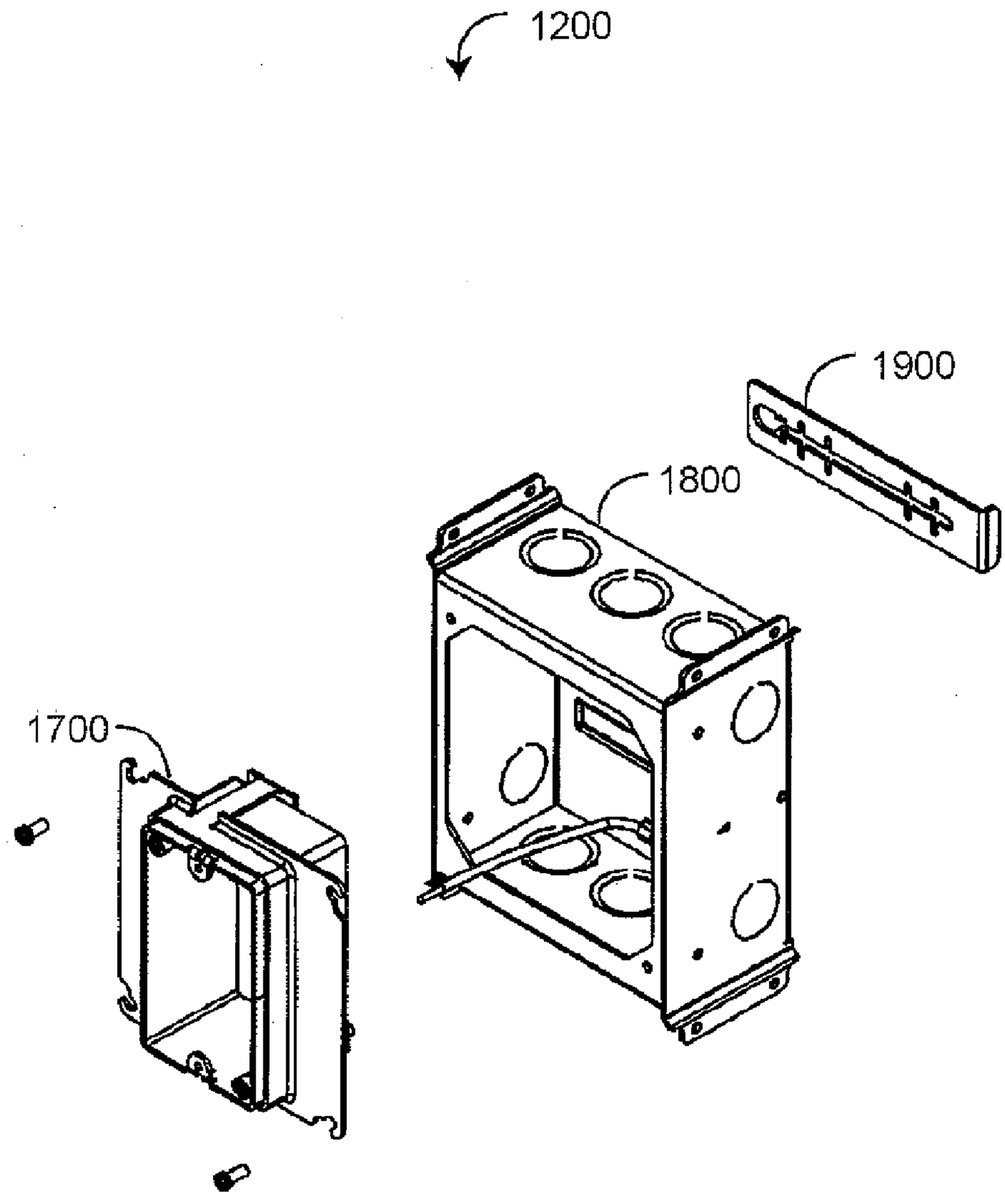


FIG. 12

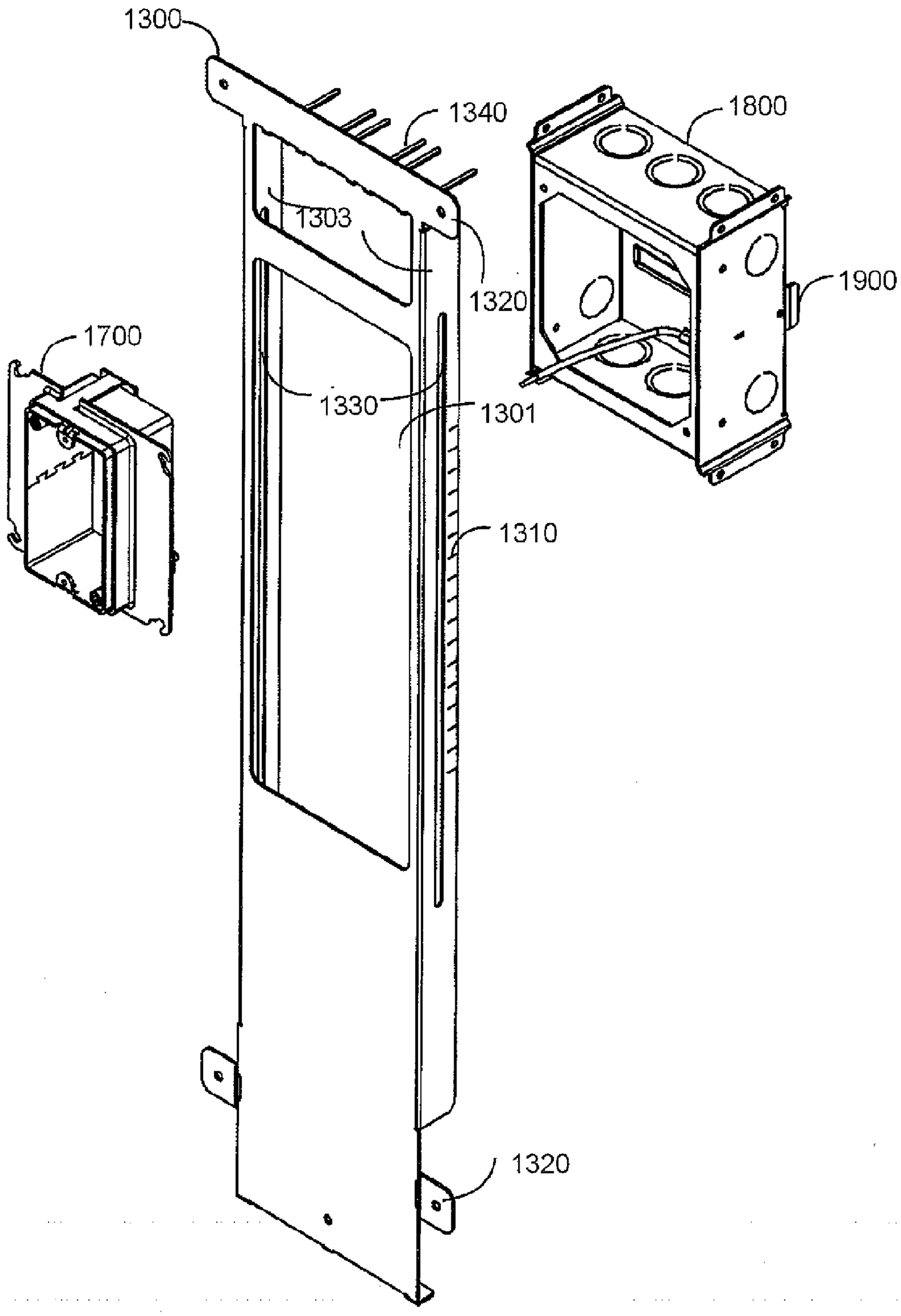


FIG.13

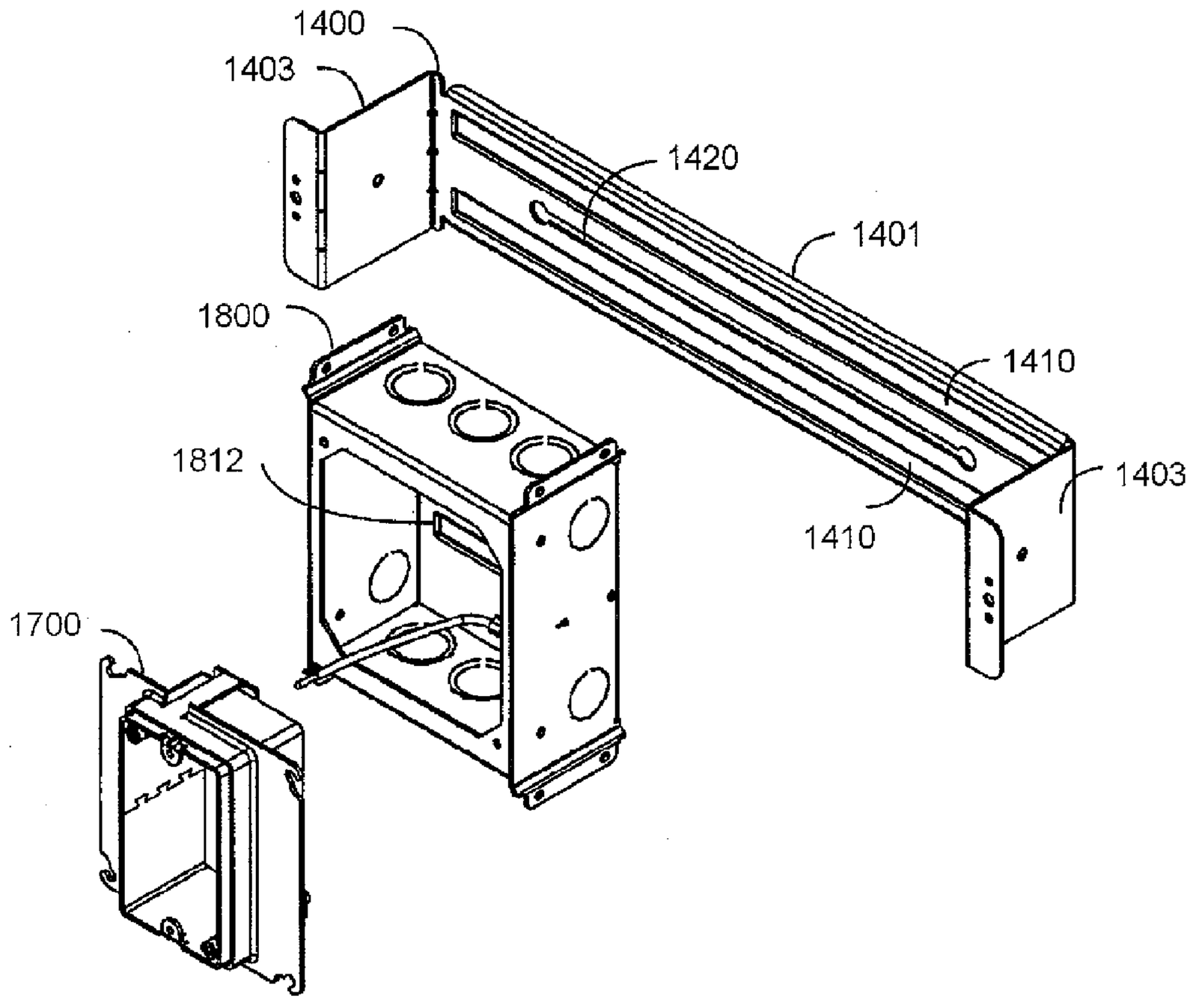


FIG. 14

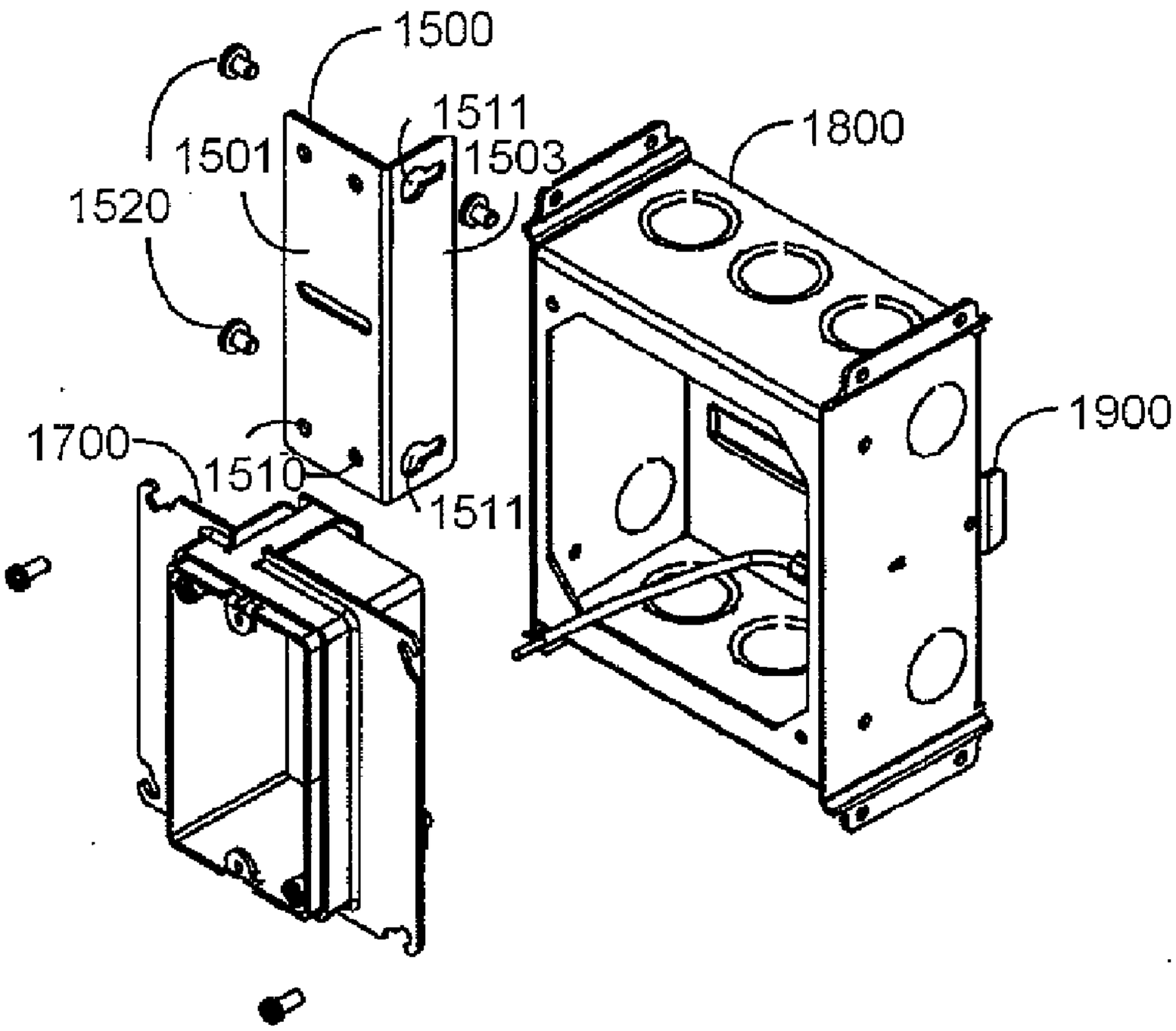


FIG. 15

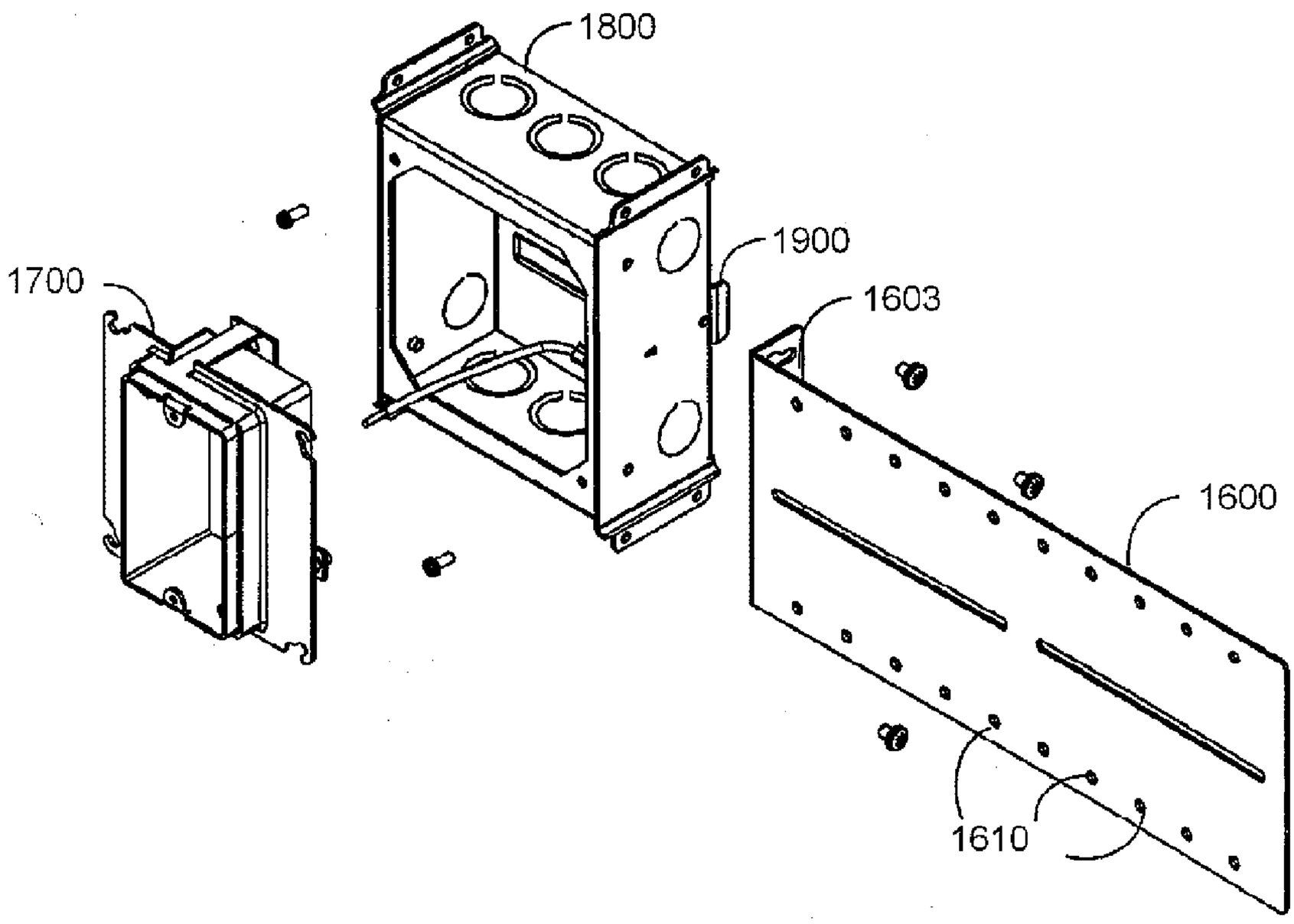


FIG. 16

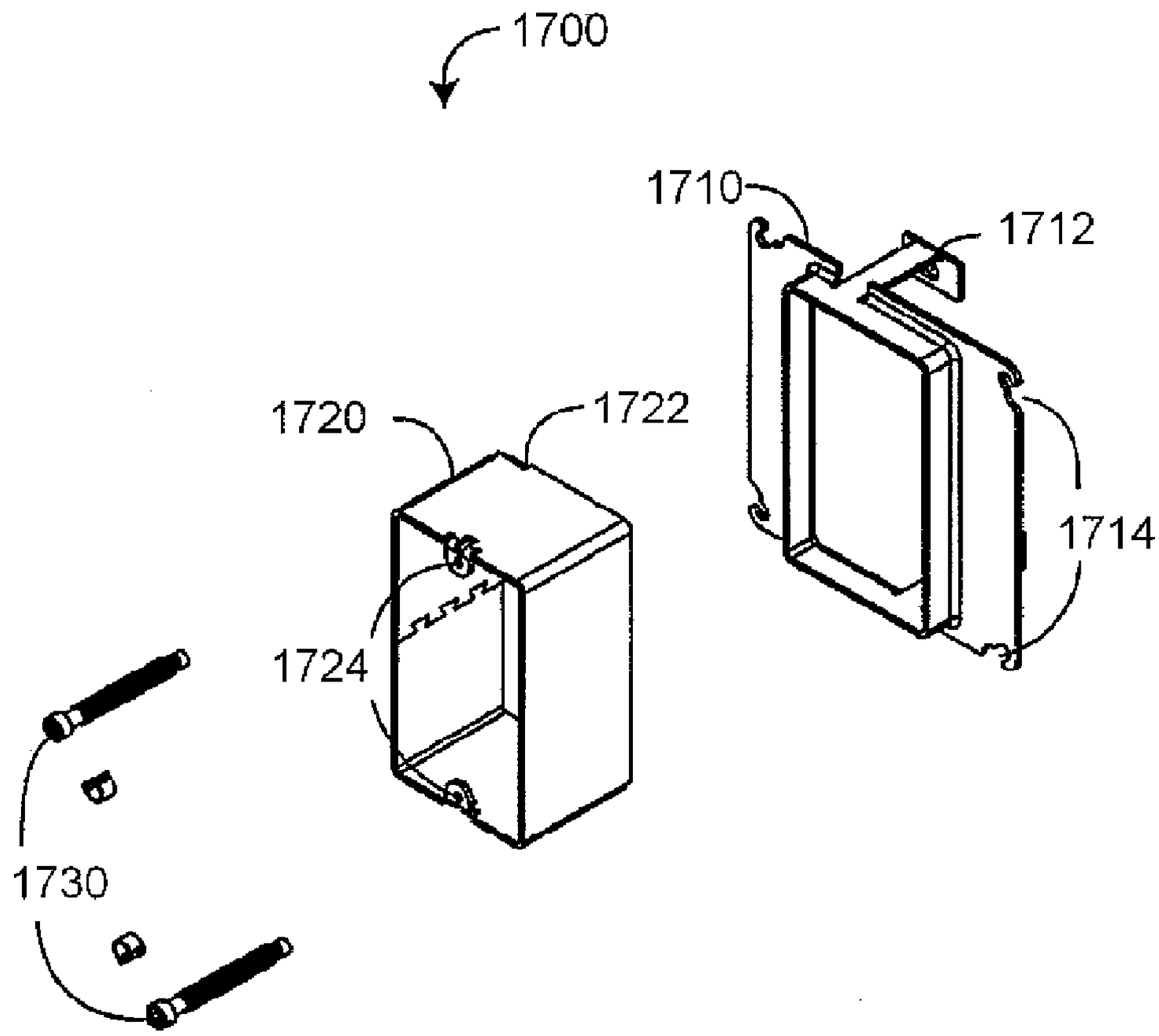


FIG. 17

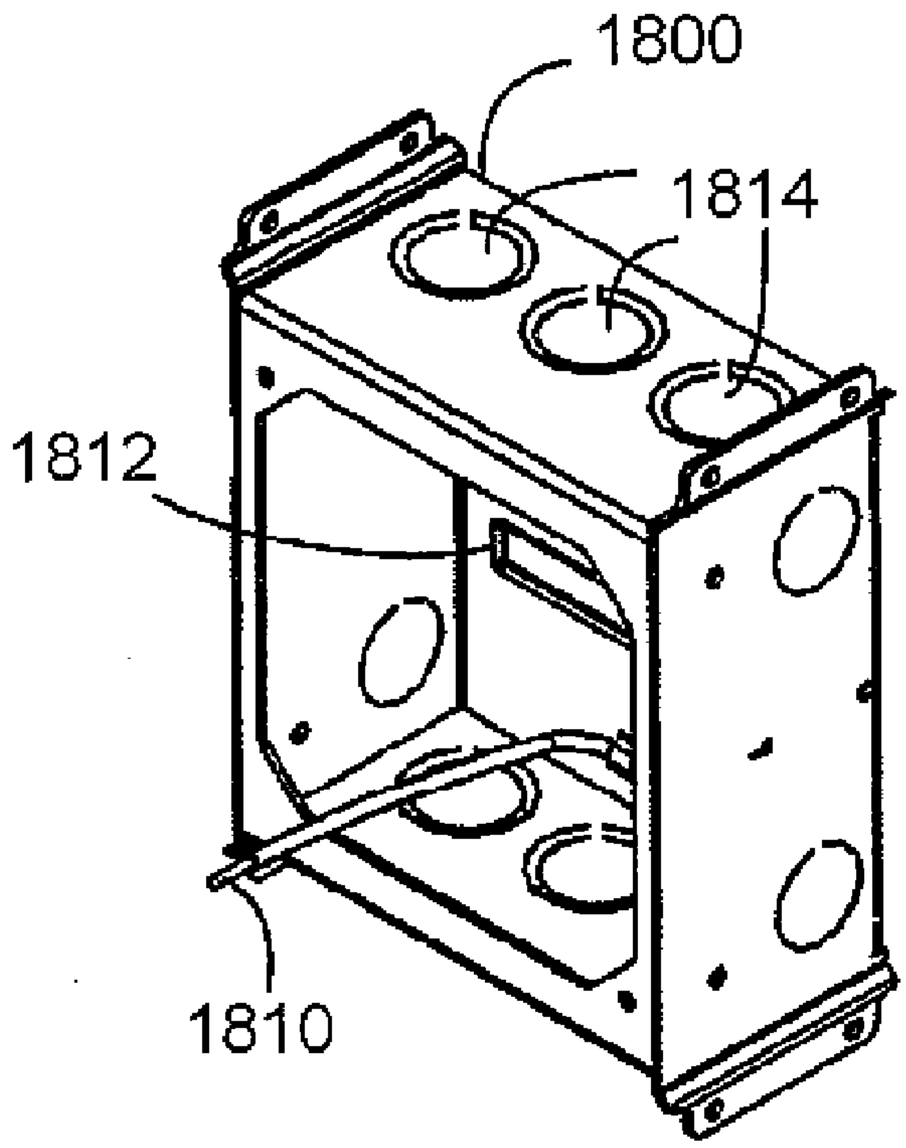


FIG. 18

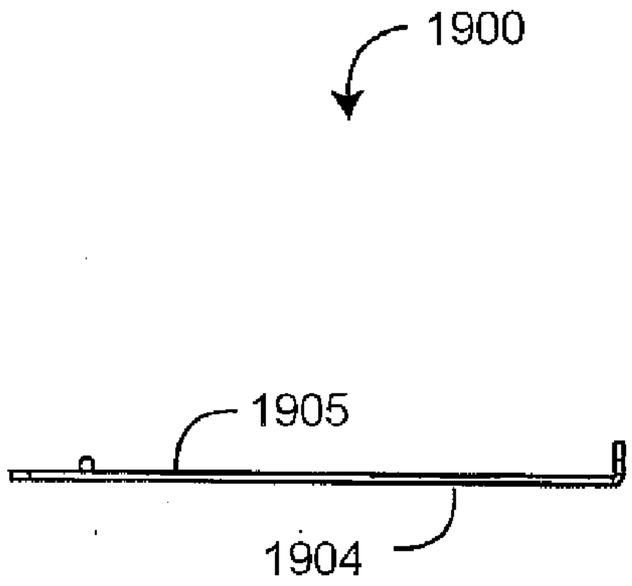


FIG. 19A

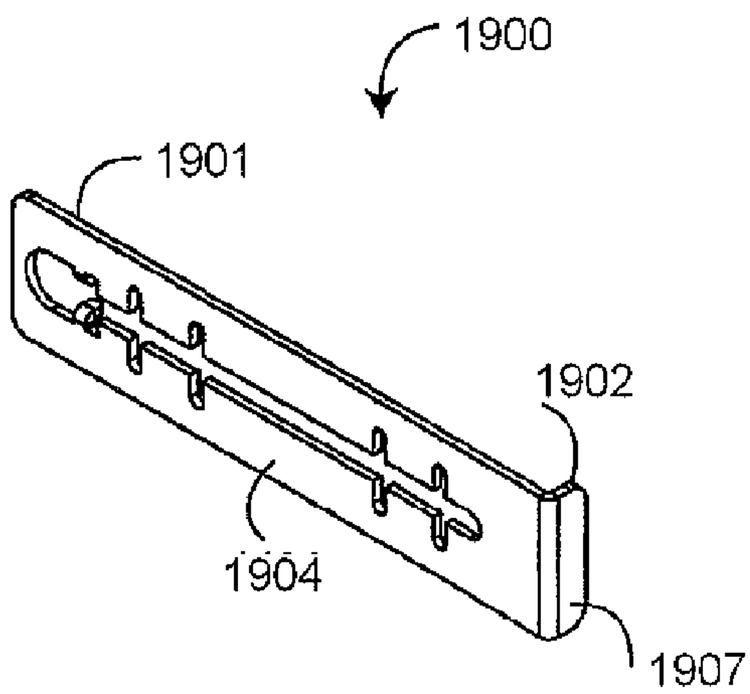


FIG. 19B

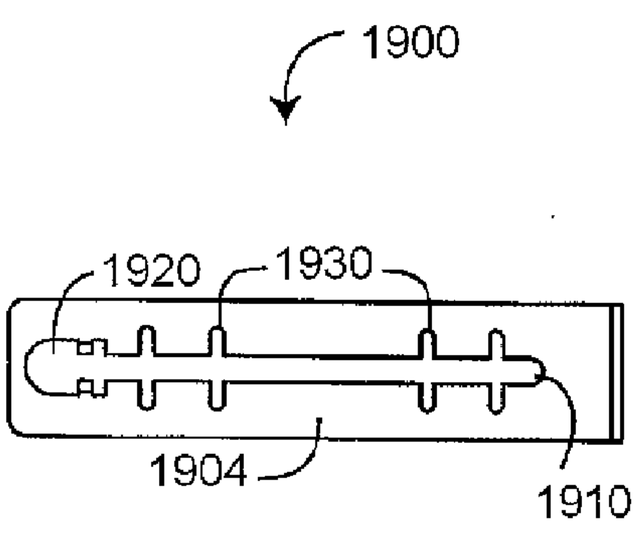


FIG. 19C

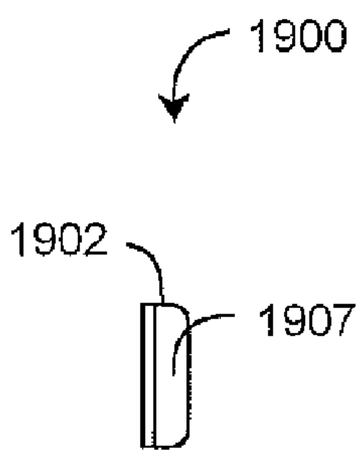


FIG. 19D

ADJUSTABLE PLASTER RING WITH ATTACHED CLIP

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. patent application Ser. No. 11/829,796 filed on Jul. 27, 2007, and entitled "PRE-WIRED POWER DISTRIBUTION SYSTEM," which claims priority from U.S. Provisional Application No. 60/833,966 filed Jul. 29, 2006 and entitled "Pre-wired Power Distribution System," each of which is incorporated by reference herein in its entirety.

INCORPORATION BY REFERENCE

[0002] Wiring modules and corresponding functional modules are described in U.S. Pat. No. 6,884,111 entitled Safety Module Electrical Distribution System, issued Apr. 26, 2005; U.S. Pat. No. 6,341,981 entitled Safety Electrical Outlet And Switch System, issued Jan. 29, 2002; and U.S. Pat. No. 6,894,221 entitled Safety Outlet Module, issued May 17, 2005. Modular electrical devices, electrical boxes and adjustable mounts are described in U.S. patent application Ser. No. 10/924,555 entitled Universal Electrical Wiring Component, filed Aug. 24, 2004. A wiring support platform is described in U.S. patent application Ser. No. 11/108,005 entitled Hinged Wiring Assembly, filed Apr. 16, 2005. All of the above-referenced patents and patent applications are hereby incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0003] A power distribution system may comprise an electrical box, a plaster ring and an electrical device, such as an outlet or switch. During a roughing phase of construction, electrical boxes with attached plaster rings are mounted to wall studs at predetermined locations. A journeyman electrician routes power cables through building framing to the appropriate box. Then power cables are fed through openings in the rear or sides of the boxes and folded back inside. During a trim phase, electrical devices are mounted to the plaster rings.

SUMMARY OF THE INVENTION

[0004] Conventional electrical distribution systems consist of either prefabricated components customized for particular electrical distribution points within a building or individual components that must be planned for, ordered, allocated to building locations and then attached together and wired during installation at each electrical distribution point. Further, it is impractical to test each wired installation for conformance to construction standards.

[0005] A pre-wired power distribution system, in contrast, advantageously combines installation flexibility, convenience and verifiability. A combination electrical box, plaster ring, one or more electrical devices installed in the plaster ring and one or more pre-wired grounds between the electrical box and the electrical device or devices provides for a pre-tested ground path. In an embodiment, the electrical device is a wiring module configured to accept any of various functional modules. The pre-wired ground also functions as a lanyard between the electrical device and the electrical box, allowing the plaster ring to be pivoted to, and supported in, an open position to provide hands-free connection of power wires to the electrical device. This feature is particularly useful for wiring gang electrical boxes housing multiple electrical devices. In an embodiment, a ground bus bar mounted to the electrical box provides further flexibility by accommodating multiple grounds for power cables routed to the electrical box. In this manner, an electrical box, a plaster ring and wiring module or other electrical device or devices may be manufactured, assembled, distributed and/or installed as a pre-wired power distribution component, by itself or in combination with an adjustable mount.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIGS. **1**A-B are perspective views of a pre-wired power distribution system in an open position and a closed position, respectively;

[0007] FIG. **2** is a perspective view of a pre-wired power distribution system embodiment having a writing module with external push wire connectors;

[0008] FIG. **3** is a perspective view of a pre-wired power distribution system embodiment having a wiring module with internal push wire connectors;

[0009] FIG. **4**A is a front perspective view of an embodiment of a wiring module with internal push wire connectors;

[0010] FIG. **4**B is a rear perspective view of the wiring module of FIG. **4**A; and

[0011] FIG. **5** is a perspective view of a pre-wired power distribution system embodiment having a box-mounted ground bus bar;

[0012] FIG. **6** is a front view of a modular integrated wiring system utilizing various embodiments of a universal electrical wiring component;

[0013] FIG. **7** is a front perspective exploded view of a universal electrical wiring component having modular electrical devices combined with an adjustable, modular mount;

[0014] FIG. **8** is a front perspective view of a floor bracket electrical wiring component;

[0015] FIG. **9** is a front perspective view of a stud bracket electrical wiring component;

[0016] FIG. **10** is a front perspective view of a box bracket electrical wiring component;

[0017] FIG. **11** is a front perspective view of an extended box bracket electrical wiring component;

[0018] FIG. **12** is an exploded perspective view of a junction box assembly;

[0019] FIG. **13** is an exploded perspective view of a floor bracket assembly;

[0020] FIG. **14** is an exploded perspective view of a stud bracket assembly;

[0021] FIG. **15** is an exploded perspective view of a box bracket assembly;

[0022] FIG. **16** is an exploded perspective view of an extended BOX bracket assembly;

[0023] FIG. **17** is an exploded perspective view of an adjustable plaster ring;

[0024] FIG. **18** is a perspective view of a junction box; and

[0025] FIGS. **19**A-D are top, perspective, front and side views, respectively, of a support arm.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0026] FIGS. **1**A-B illustrate a pre-wired power distribution system **100** having an electrical box **120** configured to attach at least one power cable, an adjustable plaster ring **140**, an electrical device **160** mounted to the plaster ring **140** and a

ground lanyard **180** pre-wired between the electrical device **160** and the electrical box **120**. The electrical box **160** can be any type known in the art.

[0027] In some embodiments, the electrical device **160** is a wiring module that is configured to connect to a source of electrical power via a plurality of cables (e.g., hot, neutral, and ground cables). The plurality of cables (not shown) are fed through the electrical box **120** and connected to a wiring portion of the wiring module, as disclosed herein. In some embodiments, once the wiring module is connected to power cables and fully installed within the electrical box **120**, the wiring portion of the wiring module is substantially enclosed by the electrical box **120** and the adjustable plaster ring **140**, and is inaccessible to users. The wiring module also includes a user-accessible portion that removably accepts a functional module (not shown) that provides a selected electrical power distribution function. For example, the functional module may be an outlet receptacle or a switch. The user-accessible portion of the wiring module includes shielded connectors, or sockets, that mate with the functional module. The shielded connectors help reduce the risk of electrical shock to users when a functional module is not installed in the wiring module. In FIG. **1**B, the shielded connectors are concealed by a protective cover **161** that protects the connectors from foreign objects, for example, during a rough-in phase of construction. The functional module can be installed without accessing the wiring portion of the wiring module or the power cables.

[0028] In some embodiments, the electrical device **160** (e.g., a wiring module) is mounted to the adjustable plaster ring **140**. The adjustable plaster ring provides for an adjustable distance between the electrical device **160** and the electrical box **120**. For example, the adjustable plaster ring may include adjusting screws that can be turned to increase or decrease the distance between the electrical device **160** and the electrical box **120**. In this way, the depth of the electrical device **160** within a wall can be adjusted to result in the desired fit with the wallboard.

[0029] One lanyard end **182** is connected to a box ground junction **122** and another lanyard end **184** is connected to an electrical device terminal **162**. The plaster ring **140** can be releasably attached to the electrical box **120**. The plaster ring **140** is movable between an open position FIG. **1**A distal the electrical box **120** and a closed position FIG. **1**B proximate the electrical box **120**. The plaster ring **140** can be releasably attached to the electrical box **120** in the closed position. The ground lanyard **180** provides a ground path from the electrical device **160** to the electrical box and mechanically supports the plaster ring in the open position. In some embodiments, however, the ground lanyard **180** does not necessarily support the plaster ring in the open position.

[0030] In an embodiment, the ground lanyard **180** is a ground wire connected between a single point ground **222** (FIG. **2**) on the electrical box **120** and a ground terminal **252** (FIG. **2**) on the electrical device **160**, as described in further detail with respect to FIGS. **2-3**, below. In another embodiment, the ground lanyard **180** includes multiple ground wires connected between a ground bus bar **450** (FIG. **4**) mounted on a multi-gang electrical box **420** (FIG. **4**) and the ground terminals **462** (FIG. **4**) of multiple electrical devices **460** (FIG. **4**) mounted in a multi-gang plaster ring **440** (FIG. **4**), as described in further detail with respect to FIG. **4**, below. As described herein, the electrical devices **160** may be wiring modules that are configured to accept various functional modules. The electrical box **120** is adapted to utilize various adjustable or fixed stud brackets, and the plaster ring **140** may be adjustable. These aspects facilitate the positioning of the mounted electrical devices during wall installation of the ground wire supporting wiring assembly **100**. With this combination of features, a pre-wired power distribution system provides a broadly adaptable electrical system component.

[0031] The connections between the ground lanyard **180** and the electrical box **120** can be formed using any type of connection known in the art. For example, a connection between the ground lanyard **180** and the electrical box **120** or the electrical device **160** may comprise an electrical screw terminal or a push-in connector. In some embodiments, the electrical screw terminal is treated with a threadlocker material once the connection is made to improve the mechanical reliability of the connection. The ground lanyard **180** can also be soldered or clamped to the electrical box **120** or the electrical device **160**. Advantageously, in cases where the electrical device **160** is a wiring module, the connection between the ground lanyard **180** and the electrical box **120** or the electrical device **160** can be made substantially permanent because the wiring module need not be removed to replace an outlet receptacle, switch, or other similar functional module. In contrast, it would generally be undesirable to form a permanent ground connection between a conventional outlet receptacle or switch and an electrical box **120** because doing so may prevent the replacement of the conventional outlet receptacle or switch. The fact that the connections between the ground lanyard **180** and the electrical device **160** or the electrical box **120** can be made substantially permanent can also allow the connections to be made stronger (allowing the ground lanyard to support the weight of the electrical device **160** and adjustable plaster ring **140**, as described herein) and more reliable, both from a mechanical and an electrical standpoint.

[0032] The pre-wired ground lanyard **180** can be advantageously tested at the manufacturer. In an embodiment, the ground lanyard **180** is subjected to a mechanical pull test and an electrical continuity test. In a particular embodiment, the pull-test has at least a 20 lb. force. The mechanical pull test and the electrical continuity test would otherwise be too cumbersome to perform on ground connections installed by an electrician at a worksite. However, since the ground connection between the electrical device **160** and the electrical box **120** is installed at the manufacturer, these tests can be performed more efficiently than can be done at a worksite. Moreover, these tests can be performed using equipment that is too expensive or bulky to use at a worksite where the ground connection might otherwise be installed. In some embodiments, however, the ground lanyard **180** is not pre-wired but is instead configured to be connected upon installation of the electrical device **160** within the electrical box **120**.

[0033] Since the ground connection between the electrical device **160** and the electrical box **120** acts as a pull-tested lanyard **180**, the plaster ring **140** can be supported in an open position (FIG. **1**A) by the ground lanyard **180**, advantageously allowing an electrician hands-free access to one or more electrical devices **160** so as to wire these devices to power cables routed to the electrical box **120**. Upon wiring completion, the plaster ring **140** is moved to a closed position (FIG. **1**B) and secured to the electrical box **120**. Multiple electrical devices **160** can be pre-attached to the plaster ring **140** because doing so does not block access to the electrical box **120** or impede the wiring process. Further, the use of a ground bus bar as the electrical box ground junction **184**

advantageously allows the ground wiring of one or more power cables to the bus bar without resorting to ad hoc pigtail junctions or the use of the electrical device connectors.

[0034] FIG. **2** illustrates a pre-wired power distribution system embodiment **200** having a wiring module **260** pre-wired with push-wire connectors **250**. A ground wire **280** extends between the wiring module **260** and an electrical box **120**. In some embodiments, the ground wire **280** includes a push-wire connector at some point along its length to be connected to a ground cable fed into the electrical box **120** along with other power distribution cables. The ground wire **280** has a first end **282** attached to a ground push-wire connector **252** and a second end **284** secured to a ground attachment point **222** in the interior of the electrical box **120**. In some embodiments, the ground attachment point **222** is a screw terminal. The push-wire connectors **250** are connected to internal crimp wires of the wiring module **260** and adapted to accept power and ground wires from cables (not shown) routed to the electrical box **120**. An electrician can easily and quickly attach the power wires to the appropriate push wire connectors **250** while the plaster ring **140** is supported by the ground wire **280**.

[0035] FIG. **3** illustrates another pre-wired power distribution system embodiment **300** having a wiring module **360** with internal push-wire connectors **350**. A ground wire **280** extends between the wiring module **360** and an electrical box **120**. The ground wire **280** has a first end **282** attached to a ground push-wire connector **352** and a second end **284** secured to a ground attachment point **222** in the interior of the electrical box **120**. The push-wire connectors **350** are adapted to accept power and ground wires from cables (not shown) routed to the electrical box **120**.

[0036] FIG. **4**A is a front perspective view of an embodiment of a wiring module **460** having internal push-wire connectors **407**. The wiring module **460** has a mounting bracket **406** with an aperture **401** to mount the wiring module **460** to an adjustable plaster ring (e.g., **140**) and an aperture **402** to attach a protective cover (e.g., **161**) to the wiring module **460**. The wiring module **460** also includes shielded connectors **403** for receiving a functional module (e.g., an outlet receptacle functional module or a switch functional module).

[0037] FIG. **4**B is a rear perspective view of the wiring module **460**. The wiring module **460** includes a screw terminal ground lanyard connection point **452**. In other embodiments, the ground lanyard connection point is, for example, an internal push-wire connector, a soldered joint, or a clamped joint. The wiring module **460** also includes internal push-wire connectors **407** for receiving power cables (e.g., hot, neutral, and ground power cables) routed to an electrical box (e.g., **120**). The internal push-wire connectors **407** can also be used for creating a ground connection between the wiring module **460** and an electrical box (e.g., **120**). For example, the wiring module **460** could be mechanically and electrically coupled to an electrical box via a pre-wired ground lanyard (e.g., **180**). The internal push-wire connectors **407** can be, for example, any type of push-in connector housed wholly or partially within the wiring module **460** for receiving power cables. In some embodiments, the internal push-wire connectors **407** are stab-in connectors. The wiring module **460** also includes a tab **405** that covers screw terminals that are in electrical contact with individual ones of the internal push-wire connectors **407**. The screw terminals can be used as an alternative to the internal push-wire connectors **407** if desired.

[0038] The internal push-wire connectors **407** are particularly advantageous in situations where space within the electrical box **160** is limited or in any other setting where it is desirable to conserve space within the electrical box **160**. This may be true, for example, in relatively shallow walls (e.g., walls measuring less than about 3" from the outside edge of a wall stud to the back wall). The internal push-wire connectors **407** conserve space within the electrical box **160** (or allow for the usage of a shallower depth electrical box **160**) because they do not include a length of wire between the wiring module and a connector as is the case for the embodiment illustrated in FIG. **2** having external push-wire connectors **250**. While such external push-wire connectors **250** are desirable under some circumstances, the internal push-wire connectors of FIGS. **3-4** can result in space and cost savings due to the elimination of wire joining the connectors (e.g., **250**) to the wiring module (e.g., **260**). It should be understood that the wiring module **460** with internal push-wire connectors can be used with or without a pre-wired ground lanyard (e.g., **180**).

[0039] FIG. **5** illustrates a pre-wired power distribution system embodiment **500** having a 3-gang electrical box **520**, a 3-gang adjustable plaster ring **540**, a ground bus bar **550** mounted directly to the electrical box **520**, three wiring modules **560** attached to the plaster ring **540** and a multiple wire ground lanyard **580**. The ground lanyard **580** extends between the bus bar **550** and ground terminals **562** on each of the wiring modules **560**. The bus bar **550** is configured to accept additional ground wires from power cables routed to and from the electrical box **520**. As such, the ground lanyard **580** supports the plaster ring **540** in the open position shown, providing a wiring platform for the electrician to wire all three wiring modules **560** as a unit without having to handle and hold each of the wiring modules individually during the wiring process.

[0040] Advantageously, the bus bar **550** is configured to allow the attachment of multiple ground wires **580** so as to provide ground connections for not only wiring modules, but also power cables routed in and out of the electrical box **520**. The bus bar **550** has a plurality of sections **552** and individual terminals **551** within each section. In an embodiment, there is one section **552** corresponding to each of the wiring modules **560** and multiple terminals **551** in each section. Each of the sections can be in electrical contact or electrically isolated. In this manner, ground wiring capacity increases with the size and electrical device mounting capacity of the electrical box **520**. Each terminal **551** is configured to accept a ground wire **580** from either a wiring module **560** or an attached power cable. In a 3-gang embodiment, the bus bar **550** has three sections corresponding to three wiring modules, and each section has four terminals configured to accept up to four ground wires, though other numbers of sections and terminals are also possible. The bus bar **550** advantageously eliminates the need for pigtail ground connections or the equivalent use of electrical device terminals. The bus bar **550** can be configured for use with external push wire connector wiring modules **260** (FIG. **2**), internal push wire connector wiring modules **360** (FIG. **3**) or any electrical devices having push-wire, screw terminal or similar wire connectors.

[0041] Although described and illustrated herein with respect to 1- and 3-gang embodiments, a pre-wired power distribution system can be configured for any number of electrical devices, including 2-gang, 4-gang, and other many-gang embodiments. A pre-wired power distribution system has been disclosed in detail in connection with various

embodiments. These embodiments are disclosed by way of examples only and are not to limit the scope of the claims that follow. One of ordinary skill in art will appreciate many variations and modifications.

[0042] FIG. **6** illustrates a modular integrated wiring system **600** utilizing universal electrical wiring component embodiments **800-1100**. A floor bracket component **800**, a stud bracket component **900**, a box bracket component **1000** and an extended box bracket **1100** are included, providing adaptability for different electrical power distribution designs. Each wiring component **800-1100** provides mounting flexibility by adjusting to various wall dimensions, stud configurations, and electrical distribution point locations. Specifically, each component **800-1100** has an adjustable depth into the wall, guaranteeing a flush finish with the wall surface at every electrical distribution point. In addition, the floor bracket component **800** provides an adjustable height. The stud bracket component **900** can be positioned at any height and provides an adjustable distance between studs. The box bracket component **1000** can be positioned at any height, and the extended box bracket component **1100** can be positioned at any height and at various locations between studs. Further, each wiring component **800-1100** accommodates a variety of functional modules, including various outlets, switches, GFCI devices, and motion detectors to name few. Advantageously, the color of the functional modules and even some functionality can be readily changed at anytime without rewiring, as described below. The resulting modular integrated wiring system **600** has the labor saving advantages of prefabrication with the design and installation flexibility of individually configured and wired components.

[0043] A universal electrical wiring component combining modular electrical devices and an adjustable, modular mount is described with respect to FIG. **7**, below. A floor bracket component **800** is described in further detail with respect to FIG. **8**, below. A stud bracket component **900** is described in further detail with respect to FIG. **9**, below. A box bracket component **900** is described in further detail with respect to FIG. **9**, below, and an extended box bracket component **1100** is described in further detail with respect to FIG. **11**, below. Adjustable mounts are described in detail with respect to FIGS. **12-16**, below.

[0044] FIG. **7** further illustrates a universal electrical wiring component **700** having an adjustable mount **705** combined with a wiring module **701**. The adjustable mount **705** includes a bracket **707** and a box assembly **1200**. The bracket **707** can be, for example, a vertically adjustable floor bracket **1300** (FIG. **13**), a horizontally adjustable stud bracket **1400** (FIG. **14**), a box bracket **1500** (FIG. **15**), or an extended box bracket **1600** (FIG. **16**). The box assembly **1200** is mounted to the bracket **707** and the wiring module **701** is mounted in the box assembly **1200**. The wiring module **701** may be a regular wiring module **710** or a GFCI wiring module **720**. The adjustable mount **705** is configured to position the wiring module **701** at any of various locations within a building wall. The wiring module **701** is configured to connect to a source of electrical power and to removably accept a functional module **703**. Advantageously, the combination of adjustable mount and wiring module form a universal electrical wiring component that can implement a variety of electrical distribution points of an electrical system. For example, a universal electrical wiring component can accept various outlet modules **750-760** and can be adjusted to implement a wall outlet. As another example, a universal electrical wiring component can accept various switch modules **740** and can be adjusted to implement a switch outlet. A universal electrical wiring component **200** may be, for example, a floor bracket component **800** (FIG. **8**), a stud bracket component **900** (FIG. **9**), a box bracket component **1000** (FIG. **10**) or an extended box bracket component **1100** (FIG. **11**). A cover **704** may be used to protect a wiring module **701** from damage prior to functional module installation.

[0045] FIG. **8** illustrates a floor bracket component **800** having a wiring module **701** and an adjustable mount comprising a box assembly **1200** and a floor bracket **1300**. In this embodiment, the floor bracket **1300** provides the wiring module **701** an adjustable height from the floor and the box assembly **1200** provides the wiring module **701** an adjustable distance from the box assembly **1200** for a flush position with a wall surface.

[0046] FIG. **9** illustrates a stud bracket component **900** having a wiring module **701** and an adjustable mount comprising a box assembly **1200** and a stud bracket **1400**. In this embodiment, the stud bracket **1400** provides the wiring module **701** an adjustable distance between studs and the box assembly **1200** provides the wiring module **701** an adjustable distance from the box assembly **1200** for a flush position with a wall surface.

[0047] FIG. **10** illustrates a box bracket component **1000** having a wiring module **701** and an adjustable mount comprising a box assembly **1200** and a box bracket **1500**. In this embodiment, the box bracket **1500** allows positioning of the wiring module **701** along a vertical stud. Also, the box assembly **1200** provides the wiring module **701** an adjustable distance from the box assembly **1200** for a flush position with a wall surface.

[0048] FIG. **11** illustrates an extended box bracket component **1100** having a wiring module **701** and an adjustable mount comprising a box assembly **1200** and an extended box bracket **1600**. In this embodiment, the extended box bracket **1600** allows vertical positioning of the wiring module **701** along a stud and horizontal positioning between studs. Also, the box assembly **1200** provides the wiring module **701** an adjustable distance from the box assembly **1200** for a flush position with a wall surface.

[0049] FIG. **12** illustrates a box assembly **1200** having a Junction box **1800**, an adjustable plaster ring **1700** and a support arm **1900**. The plaster ring **1700** removably attaches to the junction box **1800** and a wiring module **701** (FIG. **7**) attaches to the plaster ring **1700**. The plaster ring provides the wiring module **701** (FIG. **7**) with an adjustable distance from the junction box **1800**, as described in detail with respect to FIG. **17**. The junction box **1800** advantageously has an attached ground wire that can be quickly connected to a wiring module **701** (FIG. **7**). The plaster ring **1700** has slotted fastener apertures so that the plaster ring **1700** along with an attached wiring module can be removed from, and reattached to, the junction box **1800** by merely loosening and tightening, respectively, the fasteners. The support arm **1900** attaches to the back of the junction box to provide support against an inside wall surface, as described in further detail with respect to FIGS. **19**A-D, below.

[0050] FIG. **13** illustrates a floor bracket **1300** having an open front **1301** and ruled sides **1310**. The floor bracket **1300** has tabs **1320** for attaching the bracket **1300** to one or both of a floor joist or a wall stud. Side grooves **1330** allow fasteners to attach the junction box **1800** at an adjustable height from the floor. Conduit supports **1340** are adapted for attachment to

conduits running to the junction box **1800**. The plaster ring **1700** is attached to the box **1800** through the open front **1301** so that the plaster ring **1700** can be removed from the box **1800** without removing the box **1800** from the bracket **1300**.

[0051] FIG. **14** illustrates a stud bracket **1400** having a horizontal bar **1401** and ends **1403**. The ends **1403** are folded perpendicularly to the bar **1401** and adapted to secure the bracket **1400** horizontally between wall studs. The bar **1401** has grooves **1410** and a slot **1420** that extend horizontally to proximate both ends **1403** of the bracket **1400**. The grooves **1410** are adapted to slideably retain corresponding box tongues **1812** (FIG. **18**). The slot **1420** is centered between the grooves **1410** and accommodates a fastener that secures the junction box **1800** to the bracket **1400** while allowing the box to slideably adjust in position along the bar **1401**. The plaster ring **1700** is attached to the box **1800** and can be removed from the box **1800** without removing the box **1800** from the bracket **1400**.

[0052] FIG. **15** illustrates a box bracket **1500** having a stud mounting face **1501** and a box mounting face **1503**. The stud mounting face **1501** is disposed perpendicular to the box mounting face **1503** and is adapted to fasten to a wall stud. Either side of the junction box **1800** attaches to the box mounting face **1503**. The box mounting face **1503** has a keyhole slots **1511** allowing the junction box **1800** to fasten and unfasten to the bracket **1500** without removing the fasteners **1520**. The stud mounting face **1501** has a plurality of mounting holes **1610** to accommodate fasteners that allow the junction box **1800** to be positioned along a stud.

[0053] FIG. **16** illustrates an extended box bracket **1600** having an extended stud mounting face **1601** and a box mounting face **1603**. The box mounting face **1603** is disposed perpendicular to the extended stud mounting face **1601** and is adapted to fasten to the junction box **1800**. The extended stud mounting face **1601** is adapted to fasten to a wall stud. The extended stud mounting face **1601** has a plurality of mounting holes **1610** spaced along the length of the bracket **1600** to accommodate fasteners that allows the junction box **1800** to be position vertically along a stud and horizontally between studs.

[0054] FIG. **17** further illustrates an adjustable plaster ring **1700** having a base ring **1710**, an insert ring **1720** and adjusting screws **1730**. The insert ring **1720** is slideably retained by the base ring **1710** and secured to the base ring **1710** by the adjusting screws **1730**. The insert ring **1720** is adapted to mount a wiring module and to adjust the wiring module position relative to the base ring **1710** in response to turning of the screws **1730**. The base ring **1710** has keyhole slots **1714** adapted to accommodate fasteners that attach the plaster ring **1700** to a junction box. The keyhole slot **1714** allows the plaster ring **1700** to fasten and unfasten to the junction box without removing the fasteners.

[0055] FIG. **18** further illustrates a junction box **1800** having a ground wire **1810**, a tongue **1812** and knockouts **1814**. The ground wire **1810**, being pre-wired to the box, advantageously saves a fabrication step on the job site. Further, the ground wire **1810** is configured to insert into a push-wire connector on a pre-wired wiring module, providing a plug-in function module with a path to ground. The tongue **1812** stabilizes the box within a groove on a stud bracket, if used. The knockouts **1814** provide attachment points for power cable conduits.

[0056] FIGS. **19**A-D further illustrate a support arm **1900** adapted to attach to a back face of the junction box **1800** (FIG. **18**) and provide support against an inside wall surface. In particular, the support arm **1900** has an attachment section **1901** and a support section **1902** extending generally perpendicularly from one end of the attachment section **1901**. The attachment section is generally planar having an inside face **1904** that is disposed against the junction box **1800** and an opposite outside face **1905** that is disposed distal the junction box **1800**. The support section **1902** has a support face **1907** that is disposed against an inside wall surface. The attachment section **1901** has an adjustment slot **1910**, a fastener hole **1920**, and a plurality of bending slots **1930** distributed along and extending perpendicularly across the adjustment slot **1910**. The attachment section **1901** is configured to bend along one of the bending slots **1930** so as to provide a variable length support extending generally normal to the junction box back face. The support arm **1900** is held to the box **1800** with a fastener that is slideable along the adjustment slot **1910**, providing an adjustable support arm position.

[0057] A universal electrical wiring component has been disclosed in detail in connection with various embodiments. These embodiments are disclosed by way of examples only and are not to limit the scope of the claims that follow. One of ordinary skill in the art will appreciate many variations and modifications.

What is claimed is:

1. An adjustable plaster ring for use in an electrical distribution system, comprising:

a base ring configured to be mounted to a front face of an electrical box, the base ring comprising:

a central opening configured to slidably receive an insert such that the position of the insert can be varied with respect to the base ring;

a plurality of peripheral portions, the peripheral portions being configured to substantially cover corresponding peripheral portions of an opening in the front face of the electrical box; and

a bracket for adjustably connecting the insert to the base ring, the bracket and the base ring being formed from a monolithic piece, and the bracket leaving a gap in one of the peripheral portions; and

a separate piece coupled to the base ring at the gap in the peripheral portion left by the bracket, the separate piece substantially closing the gap.

2. The adjustable plaster ring of claim **1**, wherein the base ring comprises a plurality of keyhole slots for mounting the base ring to the electrical box.

3. The adjustable plaster ring of claim **1**, wherein the base ring comprises a raised flange that extends from a generally planar surface of the base ring and that defines the central opening.

4. The adjustable plaster ring of claim **3**, wherein the separate piece is angled to fit in a corner defined by the intersection of the raised flange and the generally planar surface.

5. The adjustable plaster ring of claim **3**, wherein the bracket extends rearward of the base ring from the raised flange.

6. The adjustable plaster ring of claim **1**, wherein the separate piece cooperates with the plurality of peripheral portions of the base ring to entirely cover the corresponding peripheral portions of the opening in the front face of the electrical box.

7. The adjustable plaster ring of claim **1**, wherein the insert comprises a mounting portion with a first hole, wherein the bracket comprises a second hole, and wherein a screw is

inserted through the first and second holes to adjustably connect the insert to the base ring.

8. The adjustable plaster ring of claim **7**, wherein the insert comprises an insert ring, wherein the mounting portion of the insert ring is located at the interior of the insert ring, and wherein the bracket extends to a position such that the second hole axially coincides with the first hole.

9. The adjustable plaster ring of claim **1**, wherein the insert is adjustably connected to the base ring by a threaded fastener.

10. The adjustable plaster ring of claim **1**, wherein the central opening is generally rectangular.

11. The adjustable plaster ring of claim **1**, wherein the electrical device is a wiring module comprising:

a non-electrically conductive housing sized to fit within the electrical box;

one or more cable connectors having one or more electrical contacts configured to electrically couple with one or more power cables routed to the electrical box;

one or more module connectors having one or more electrical contacts, the one or more module connectors being configured to electrically couple to an electrical outlet module that is installable at least partially within the electrical box; and

one or more internal conductors electrically coupling the one or more electrical contacts of the one or more cable connectors with the corresponding one or more electrical contacts of the one or more module connectors so as to electrically couple the electrical outlet module to the one or more power cables when the electrical wiring module and the electrical outlet module are installed within the box.

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