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PLUG-IN TYPE ELECTRICAL SOCKET

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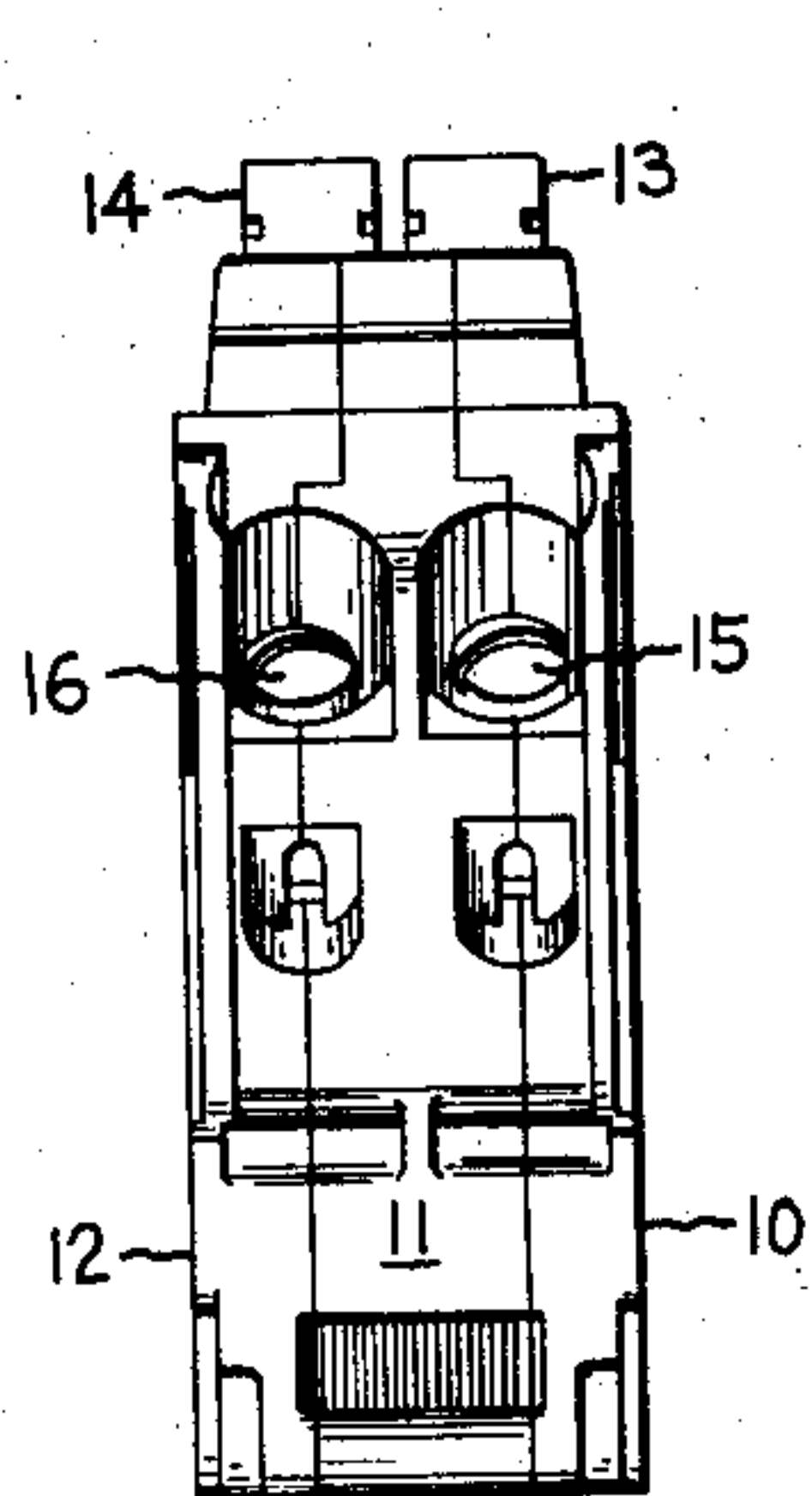


Fig. 2

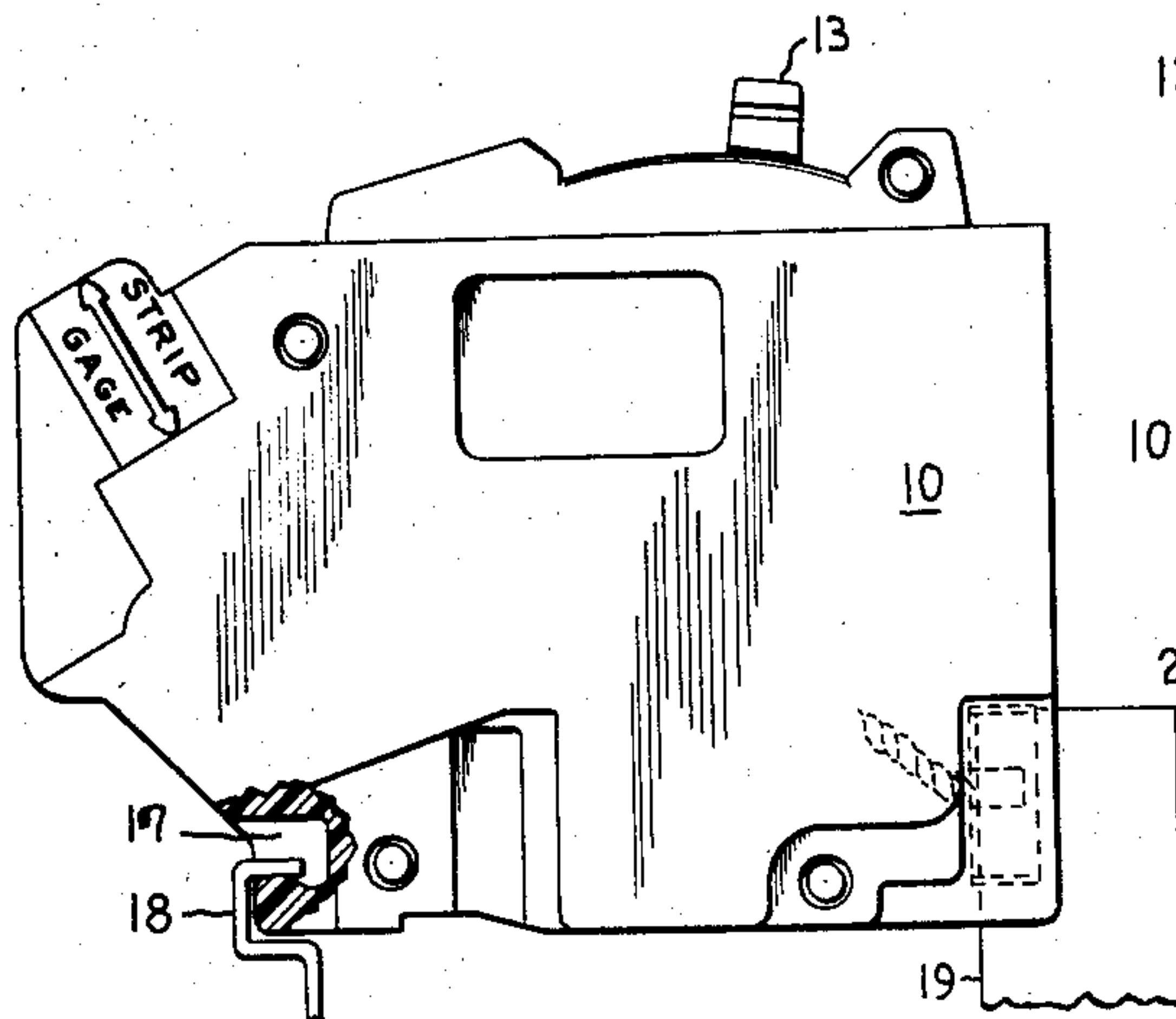


Fig. 1

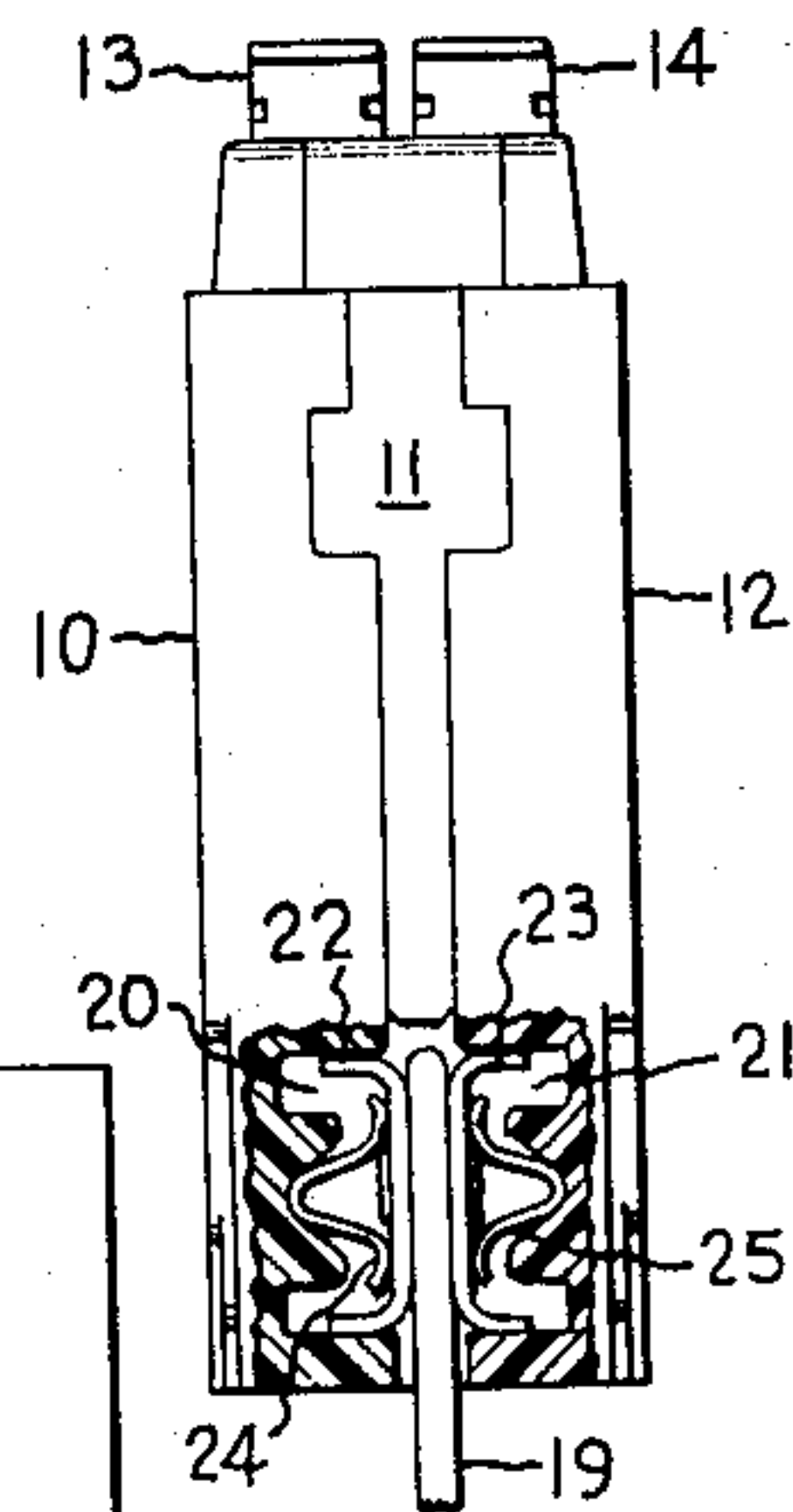


Fig. 3

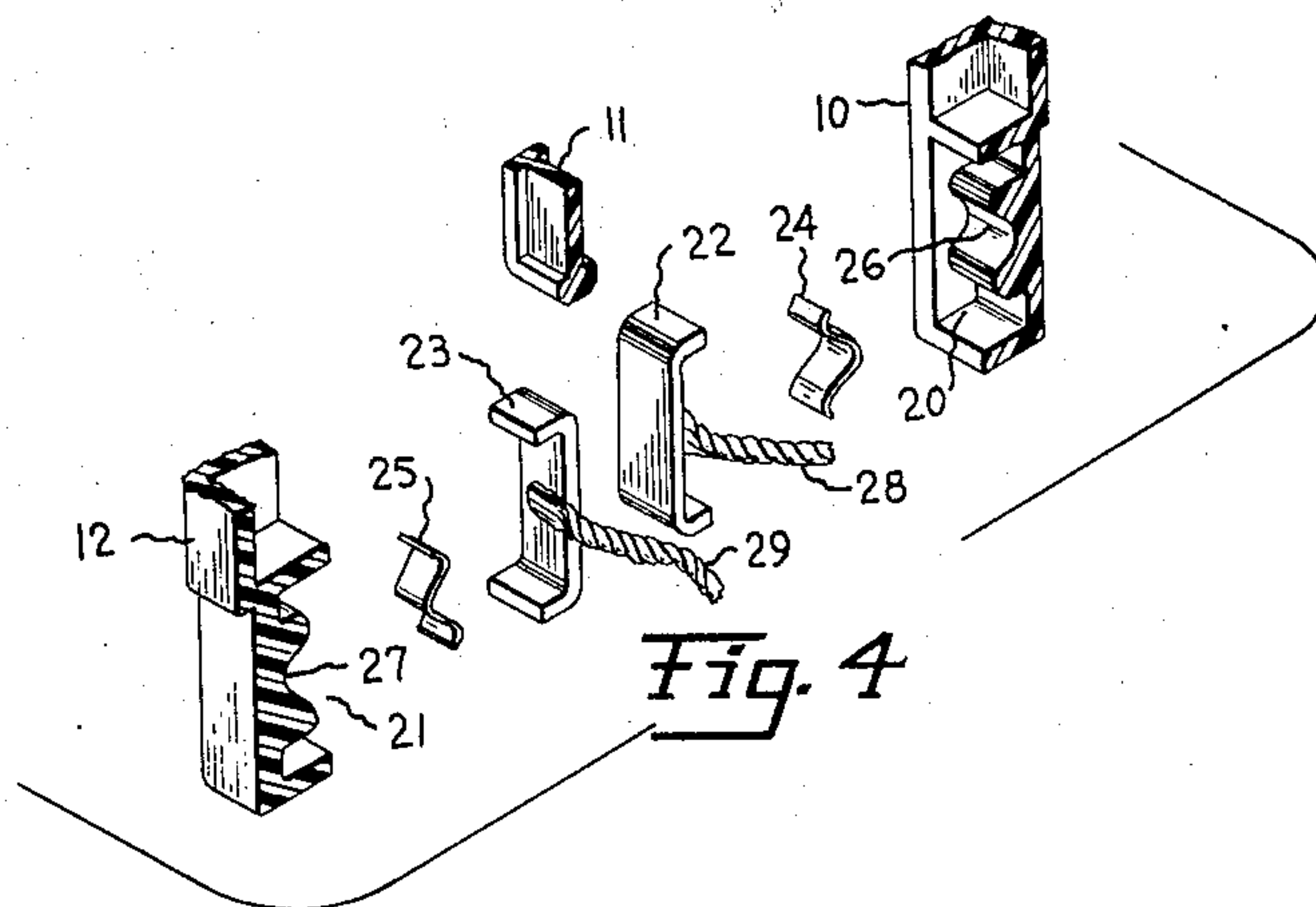


Fig. 4

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PLUG-IN TYPE ELECTRICAL SOCKET

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4 Claims. (Cl. 200—5)

My invention relates to electric sockets and particularly to an electric socket adapted for use with small air circuit breakers.

Patent No. 2,738,446—W. J. Fleming, assigned to the same assignee as the present invention, discloses a panelboard and circuit breaker construction presently in general use, in which circuit breakers are readily mounted and connected to a line connector or bus bar contact blade by being hooked at one end to a retaining lug and pivoted thereabout into a plugged-in engagement with a blade type contact at the center of the panelboard. The circuit breaker, for this purpose, is provided with a slot at one corner thereof and a socket is contained within the circuit breaker casing adapted to receive the contact blade.

Connecting sockets included in such circuit breakers according to the aforesaid patent have comprised an inverted U-shaped member having the side portions thereof adjacent the bight portion spaced relatively widely apart and having the remaining portion of the side portions close together, after the fashion of a standard fuse clip for blade type fuses. The resilience of the U-shaped piece is depended upon to ensure good contact with the contact blade, or may be supplemented by a small U-shaped reinforcing spring clipped on from the side edges. This type of construction provides a good contact engagement if the contact blades are all parallel to each other and perpendicular to the general plane of the panelboard. It often happens however that certain contact blades are not perfectly parallel to each other, nor perpendicular to the general plane of the panelboard, and this causes the contacting parts of such connectors of the circuit breaker to contact the blade at two line contact areas. While such a line contact is ordinarily satisfactory for electrical conductivity purposes, it does not provide a good thermal transfer contact between the circuit breaker and the contact blade, and thereby causes the circuit breaker to run at a higher temperature than it otherwise would.

Application Serial Number 689,422, filed concurrently herewith by H. J. Hammerly and H. A. Nadeau discloses a circuit breaker which is an improvement on the circuit breaker of the Fleming patent comprising a "dual" or "2-in-1" circuit breaker, in which two separate circuit breakers are arranged in side-by-side relation within a single casing, the casing being the same width as the prior art single pole circuit breaker. The two circuit breakers in a single casing are adapted to plug onto a single blade contact. For purposes of ease of manufacture, it is desirable that each circuit breaker mechanism be identical and be capable of being manufactured as a physically separate item.

Socket connectors of the prior art type, if used in an improved circuit breaker of the dual or 2-in-1 type would result in the mechanisms of both breakers being connected together at the socket connection end.

It is therefore an object of my present invention to provide a socket adapted to make contact with a blade type contact and which will insure good contact with both

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sides of said blade even though the blade contact and the socket are not in exact alignment with each other.

Another important object of my invention is to provide a socket means for making contact between two separate circuit breaker mechanisms and a single contact blade such that the contact members can cooperate in making contact with a single blade, but still are physically separate so that each of such circuit breaker mechanism and contact comprises a separate, identical, assembly.

Other objects and aspects of my present invention will become apparent from the following detailed description taken in conjunction with the accompanying drawing and its scope will be pointed out in the appended claims.

Figure 1 is a side elevational view of an electric circuit breaker incorporating my invention;

Figure 2 is an end elevation view of the load terminal end of the circuit breaker of Figure 1;

Figure 3 is an end elevation view of the line terminal end of the circuit breaker of Figure 1, partly in section, showing my improved socket construction;

Figure 4 is an exploded perspective view of the socket construction of Figures 1 and 3.

In accordance with my invention, I provide a dual electric circuit breaker including an insulating casing comprising three generally parallel portions 10, 11 and 12. The outside portions 10 and 12 and the central portion 11 each are provided with peripheral walls extending generally perpendicular to the major flat plane of each piece and cooperating to form two circuit breaker chambers each containing a circuit breaker mechanism, not shown, adapted to be operated by operating handles 13 and 14 respectively, and each being provided with a separate load terminal 15 and 16 respectively (see Figure 2). The general construction and arrangement of the dual circuit breaker may for instance be as shown in application Serial Number 689,422, H. J. Hammerly and H. A. Nadeau, mentioned above.

The circuit breaker includes a recess 17 at one end adapted to interengage with a retaining lug 18 carried by a panelboard or other mounting means, and is adapted to be pivoted about the lug 18 until the opposite end engages a contact blade 19.

The central casing portion 11 is provided with a cutaway portion adjacent one corner thereof, and the outside casing portions 10 and 12 are provided with irregularly shaped recesses 20 and 21 respectively. Each of the recesses 20 and 21 is adapted to receive a generally C-shaped conductive contact member 22 and 23 respectively. Each of the contact members 22 and 23 has a resilient generally V-shaped spring member 24 and 25 positioned between it and the corresponding casing wall. Each of the spring members 24 and 25 includes an intermediate rounded portion adapted to engage a bearing surface 26 and 27 respectively in the recesses 20 and 21. Each of the contact members 22 and 23 is therefore mounted in a "floating" manner in the recesses 20 and 21. When the circuit breaker is pivoted into engagement with the contact blade 19, the two contact members 22 and 23 are forced apart against the bias of the resilient spring members 24 and 25 which provide good contact with the contact blade.

If the contact blade 19 is not absolutely perpendicular to its general mounting surface and therefore not in alignment with the circuit breaker, the contact members 22 and 23 automatically adjust themselves to the flat surfaces of the contact blade 19. During this action the resilient members 24 and 25 pivot in the bearing portions 26 and 27 and still apply resilient pressure to the contact members to maintain good engagement thereof with the contact blade.

Each of the contact members 22 and 23 has a separate flexible conductor 28 and 29 attached thereto by suitable

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means such as by welding. It will be observed that while the contact members 22 and 23 cooperate with each other and with the casing part to ensure contact with the contact blade 19, they are physically separate. They have, moreover, no positive connection with the casing and need only be placed individually in the respective recesses where they are trapped by the cooperating casing parts 10 and 12.

While I have shown only one embodiment of my invention, it will be apparent that many modifications thereof may readily be made by those skilled in the art, and I therefore intend by the appended claims to cover all such modifications as fall within the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. An electric circuit breaker comprising an insulating casing, a pair of separate circuit breaker mechanisms disposed in generally side-by-side relation within said casing, a recess in said insulating casing adjacent one end thereof, a pair of separate contact members normally in mutual abutting relation within said recess, a resilient member between each of said contact members and a corresponding adjacent wall of said recess, and a flexible electrical conductor connected to each of said contact members and a corresponding one of said circuit breaker mechanisms.

2. An electric circuit breaker comprising an insulating casing, at least two electric circuit breaker mechanisms disposed in generally side-by-side relation within said casing, a recess in said insulating casing adjacent one end thereof, a pair of generally U-shaped contact members disposed in back-to-back abutting relation within said recess, a generally U-shaped resilient member positioned entirely between each of said contact members and a corresponding wall of said recess, each of said walls of said recess having a bearing surface, the bight portion of each of said resilient members being pivotally supported in said bearing surface for rotation of said resilient member in a plane perpendicular to said wall, each of said contact members being supported in said recess without restraining positive connection to said body whereby said contact members are resiliently movable toward and away from each other and are also pivotally movable with said resilient members about said bearing portions as pivots in a direction perpendicular to said wall, and a flexible electrical conductor connected to each of said contact members and a corresponding one of said mechanisms.

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3. An electric circuit breaker comprising a generally rectangular insulating casing having opposed side and end walls and a bottom wall, a pair of separate circuit breaker mechanisms disposed in generally side-by-side relation within said casing and each including a movable contact, a separate load terminal for each of said circuit breaker mechanisms mounted on one of said end walls, a slot in one corner of said insulating casing extending into said bottom wall and the end wall opposite said one end wall, a pair of separate plug-in contact members resiliently mounted within said casing adjacent said corner slot and adapted to be contacted respectively by opposite sides of a conductive contact blade inserted in said corner slot, and separate electrical connecting means for connecting each of said contact members to one of said movable contacts of said circuit breaker mechanisms respectively.

4. An electric circuit breaker comprising a generally rectangular insulating casing having opposed side and end walls and a bottom wall, a pair of separate circuit breaker mechanisms disposed in generally side-by-side relation within said casing and each including a movable contact, a separate load terminal for each of said circuit breaker mechanisms mounted on one of said end walls, a slot in one corner of said casing extending into said bottom wall and the end wall opposite said one end wall, a pair of separate flat strip contact members supported in mutually confronting relation in said insulating casing adjacent said corner slot, said contact members having their major planar surfaces parallel to said side walls so as to be contacted respectively by opposite side portions of a conductive blade-like contact member inserted in said corner slot, and separate means for electrically connecting said contact members to said movable contacts of said circuit breaker mechanisms respectively.

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