July 12, 1927. F. DIEHL 1,635,312

ELECTRICAL CONNECTER AND TERMINAL BLOCK

Filed May 19, 1921

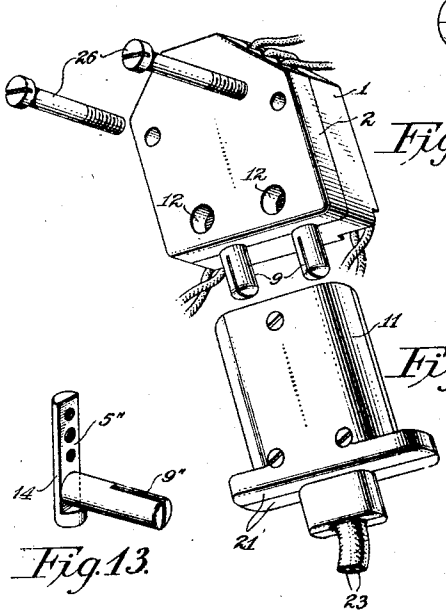


Fig. 1.

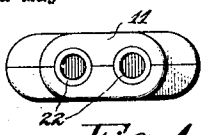


Fig. 4.

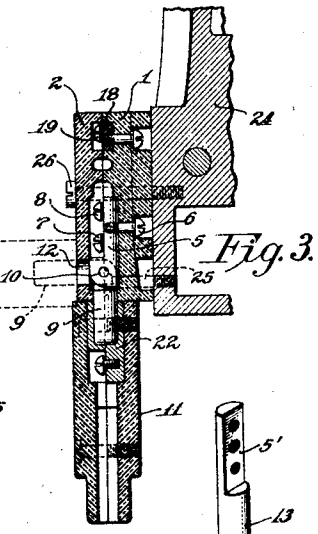


Fig. 3.

Fig. 13.

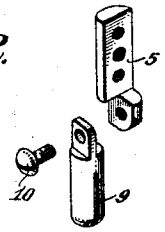


Fig. 12.

Fig. 14.

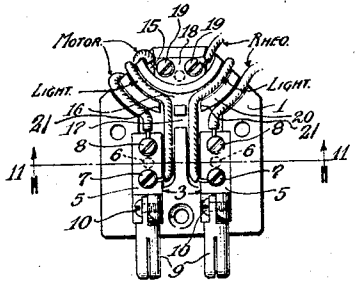


Fig. 5.

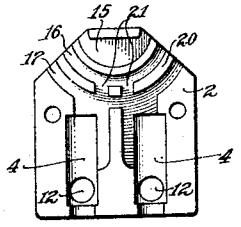


Fig. 6.

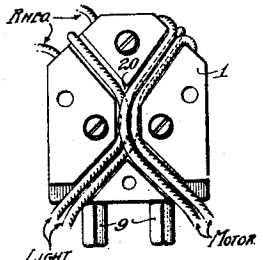


Fig. 7.

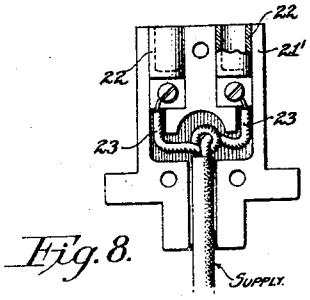


Fig. 8.

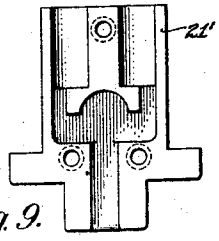


Fig. 9.

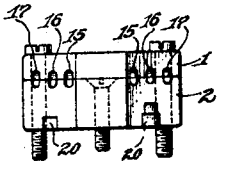


Fig. 10.

WITNESSES:

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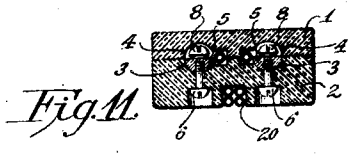


Fig. 11.

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UNITED STATES PATENT OFFICE.

FREDERICK DIEHL, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, OF ELIZABETH, NEW JERSEY, A CORPORATION OF NEW JERSEY.

ELECTRICAL CONNECTER AND TERMINAL BLOCK.

Application filed May 19, 1921. Serial No. 470,751.

This invention relates to electrical connecters, more particularly of the plug and detachable socket type, and has for an object to provide a connecter in the form of a terminal or distributing block adapted to be rigidly secured to a suitable support and embodying provision whereby the socket member may be applied to the plug member in two or more different directions to meet the requirements of the particular installation in which the block is used.

Another object of the invention is to provide for the convenient interconnection of a plurality of separate circuits within the block.

Still further, the invention has for an object to provide a terminal block and plug connecter particularly adapted for use with power and lighting circuits in installations on small electrically operated machines, such as sewing machines. In some installations it is desirable to apply the socket member horizontally and in others vertically and it is an object of the invention to provide a terminal block and plug connecter which is readily convertible to accommodate a socket member when applied in either direction.

To the attainments of the ends in view the terminal block, which is preferably of the bipolar type, comprises an insulating housing constructed preferably with base and cover members having screw holes whereby the base member may be attached to the machine or other support and the cover member firmly secured in place over the base member.

The housing is preferably formed internally with seats for the respective plug members which project externally of the housing through apertures in communication, respectively, with said seats. A feature of the present improvement is the provision of additional apertures in the housing extending at an angle to the first mentioned apertures and in communication, respectively, with said seats, whereby terminal plugs adapted to project exteriorly of said housing through either of said sets of apertures may be secured to said seats. The plug connecter may thus be readily converted from one form to another so as to receive a socket member applied, say, either vertically or horizontally.

Another feature of the invention is the provision for interconnection of the various electrical circuits and their connection with the source of electrical energy. To this end the meeting faces of the base and cover members of the insulating housing are formed with a series of mating grooves, in one of which is disposed a connecter plate for the series connection of two circuits leading, respectively, from the main plug terminals. These grooves also accommodate one or more circuits to be connected in multiple to the main plug terminals.

In the accompanying drawings, Fig. 1 is a perspective view of a plug connecter member embodying the invention. Fig. 2 is a perspective view of the complemental socket member. Fig. 3 is a longitudinal sectional view through the plug and socket members as applied to the frame of an electrically equipped sewing machine such, for instance, as that disclosed in application of Martin Hemleb, Serial No. 467,835 filed May 9, 1921. Fig. 4 is an end view of the socket member. Fig. 5 is an inner face view of the base member of the plug connecter. Fig. 6 is an inner face view of the complemental cover member. Fig. 7 is a back face view of the base member. Figs. 8 and 9 are, respectively, views of the meeting faces of the halves of the socket member. Fig. 10 is an upper end view of the plug member. Fig. 11 is a transverse sectional view of the plug member. Fig. 12 is a disassembled perspective of one of the main terminals of the plug member in its preferred form and Figs. 13 and 14 are perspective views of modified forms of plug members adapted to be used interchangeably with one another in lieu of the form shown in Figs. 3, 5 and 12.

In the preferred embodiment of the invention, as illustrated in Figs. 1 to 12, inclusive, the plug connecter consists of an insulating housing preferably comprising a base member 1 and cover member 2 the meeting faces of which are provided with the relatively large parallel longitudinally extending complemental grooves 3, 4, respectively. When the base and cover members are assembled, these grooves 3 and 4 practically form parallel cylindrical holes in the lower end of the insulating housing, the axis of such holes being preferably substantially

coincident with the plane defined by the meeting faces of the base and cover members.

Seated in the grooves 3 are the shank portions 5 of the main plug terminals which are held in place by the screws 6 and which are provided with the wire holding or terminal screws 7, 8. Each of the main plug terminals preferably comprises, in addition to the shank portion 5, a projecting plug portion 9 which is secured to the shank portion by means of the screw 10. The parts 5 and 9 of the plug members may be arranged in alinement, as shown in full lines, Figs. 3 and 5, in which event the plug members 9 will project downwardly from the insulating housing through the lower ends of the holes formed by the mating grooves 3, 4 in the base and cover sections and will be accessible to the usual socket member 11 applied vertically.

In some uses of the plug connecter it may be undersirable or inconvenient to apply the socket member 11 vertically, and to accommodate the application of the socket member from a different direction, the cover section 2 of the insulating housing is formed with lateral apertures 12 in axial intersecting relation with the holes formed by the mating grooves 3, 4. When desired, the main plug terminals may be converted from the straight to the angular type by turning the projecting plug portions 9 about the screws 10 so that they may project say, horizontally through the apertures 12, as shown in dotted line, Fig. 3; it being necessary in the embodiment illustrated to remove the cover section 2 prior to adjustment of the plug portions 9 from one position to the other.

In lieu of the convertible main plug terminals 5, 9, the interchangeable plug terminals shown in Figs. 13 and 14, may be employed; the straight type 13, comprising the alined shank and plug portions 5′, 9′, being used when the socket member 11 is to be applied vertically, and the angular type 14, when the member 11 is to be applied horizontally. In the angular type 14, the shank and plug portions 5″ and 9″ may be firmly secured together by any suitable means or otherwise rigidly associated.

The meeting faces of the base and cover sections 1, 2 are each further formed with complementary semi-circular grooves 15, 16 and 17, which are adapted to receive the wires of the various circuits branching from the main terminals 5, 9. The uppermost groove 15 is enlarged to receive the connecter plate 18 fitted with the terminal screws 19. The wall 20 between the grooves 16 and 17 is cut away at two spaced points 21, 21 to facilitate the passage of one of the circuits, such as a lighting circuit, to the main terminal screws 7, 7. The opposite ends of the groove 17 may be occupied, respectively, by one wire of a motor circuit and one wire of a controller or rheostat circuit, the remaining or return wires of such circuits being passed into the groove 15 and connected to the terminal screws 19 on the connecter plate 18, thus effecting a series connection of the motor and controller circuits.

The rear face of the base section 2 may be formed with an X-shaped groove 20′, Fig. 7, to receive the motor and lighting circuits and permit the pairing off of the companion wires of the respective circuits and the running of such circuits to different corners of the block for convenient distribution.

The socket member 11 is of the usual form comprising the half-sections 21′ of insulating material similarly grooved in their meeting faces to receive the socket terminals 22 to which the current supply wires 23 are attached.

The plug connecter described may be firmly secured to any suitable support, such as the frame 24 of a sewing machine or other electrically equipped device, by means of the screws 25, 26. The screw 25 passes through the base member 1, only, as shown in Fig. 3, and holds the latter in position on the frame 24 when the screws 26 and cover section 2, are removed.

Having thus set forth the nature of the invention, what I claim herein is—

1. An electrical connecter comprising an insulating housing having a passageway adapted to receive a conductor, characterized by this that the housing is formed with distinct angularly related apertures communicating with said passageway, a suitable plug member being fitted to a selected one of said apertures and fixed within said housing, the other aperture being unoccupied.

2. A plug connecter comprising an insulating housing formed with an internal seat for a terminal plug, and an aperture in communication with said seat, said housing being formed with an additional aperture separate from and extending at an angle to said first mentioned aperture and in communication with said seat, whereby a terminal plug adapted to project exteriorly of said housing through either of said apertures, may be secured to said seat.

3. A plug connecter comprising an insulating housing having separate angularly related apertures and a plug terminal comprising two relatively shiftable sections one of which is mounted within said housing and the other of which is adapted to project exteriorly thereof through one or the other of said apertures.

4. A plug connecter comprising an insulating housing having separate angularly related apertures and a plug terminal comprising hinged sections one of which is mounted within said housing and the other

of which is adapted to project exteriorly of said housing through one or the other of said apertures.

5. A plug connecter comprising base and cover members, a terminal mounted between said members, and a plug member pivotally secured to said terminal, and shiftable from an operative position parallel to the plane of the meeting faces of said members to another operative position transverse to said plane.

6. A plug connecter comprising base and cover members, a terminal mounted on said base member, and a plug member pivotally secured to said terminal, and shiftable from an operative position parallel to the plane of the meeting faces of said members to another operative position transverse to said plane, said cover member being formed with apertures through which said plug members may project when occupying said transverse position.

7. A plug-connecter comprising an insulating housing including a base, a conductor-wire terminal secured in said housing, and a plug electrically connected to said conductor-wire terminal within said housing and adjustable so as to project exteriorly of said housing in different directions while maintaining said electrical connection.

8. A combined plug connecter and distributing block comprising an insulating housing formed with base and cover sections and having a pair of main plug terminals secured therewithin and projecting exteriorly thereof, and a connecter plate secured within said housing in insulated relation to said plug terminals, the meeting faces of said base and cover sections being formed with wire-receiving grooves extending across the space between said connecter plate and plug terminals.

In testimony whereof, I have signed my name to this specification.

FREDERICK DIEHL.