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C. V. OBST
TERMINAL STRIP

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2 Sheets-Sheet 2

FIG. 3

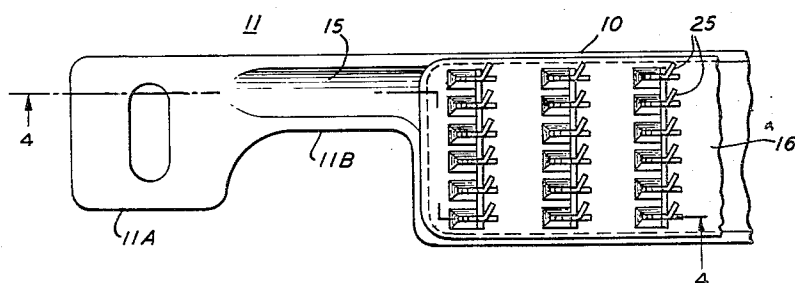


FIG. 4

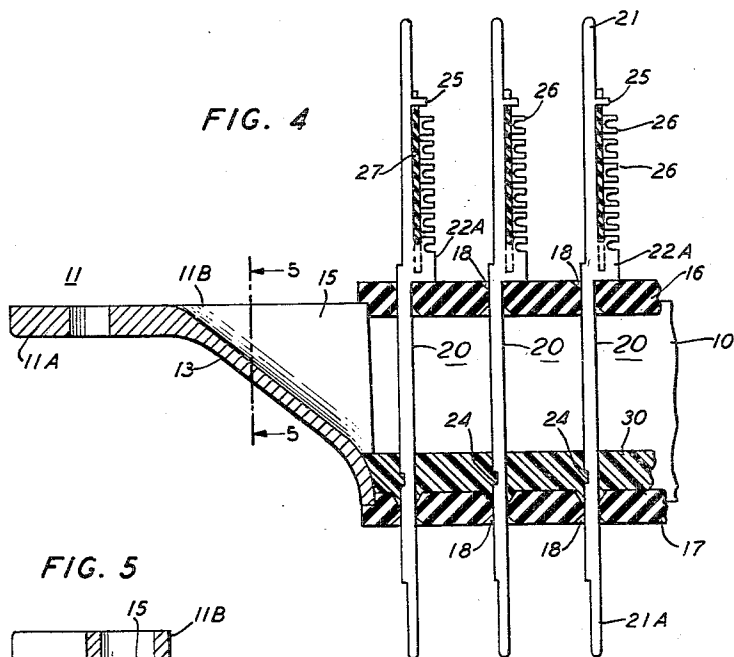
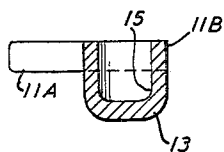


FIG. 5



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TERMINAL STRIP

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10 Claims. (Cl. 339—198)

This invention relates to means for interconnecting the wires of electric circuits and more particularly to terminal strips. Although not necessarily limited thereto, the terminal strip chosen as illustrative of the invention is adapted for use with wrapped wire connections.

Terminal strips, as their name implies, comprise a plurality of suitably mounted terminals for terminating or interconnecting the wires of an electric circuit. Such terminal strips are conveniently mounted on instruments, panels, frames, relay racks, et cetera.

An object of this invention is to facilitate the termination or interconnection of a plurality of circuit wires or conductors.

One feature of this invention resides in a terminal strip comprising a box-like frame having orificed covers of insulating material, a plurality of terminals in corresponding orifices of both covers, molded plastic material within the frame for imbedding the terminals and for securing at least one of the covers to the frame and means on the terminals for securing the other cover to the frame.

Another feature of the invention lies in a plurality of insulating subpanels associated with groups of terminals and means for mounting said panels on said terminals.

Other and further objects and features of this invention will appear more fully and clearly from the following detailed description of an illustrative embodiment thereof taken in connection with the appended drawing in which:

Fig. 1 is a view in side elevation of the embodiment of the invention used as an illustration thereof;

Fig. 2 is an end elevation of the device illustrated in Fig. 1;

Fig. 3 is a top view of a portion of the device of Fig. 1 taken from the viewpoint of the line 3—3 of Fig. 1;

Fig. 4 is a sectional view on the line 4—4 of Fig. 3;

Fig. 5 is a sectional view on the line 5—5 of Fig. 4;

Fig. 6 is a view of one of the terminals; and

Fig. 6A is a view of a portion of another similar terminal.

The box-like frame 10 of this terminal strip has projecting lugs or ears generally designated as 11 and 12 for mounting the strip on a panel or the like. The ears 11 and 12 include respectively an orificed mounting portion 11A and 12A and a narrowed connecting portion 11B and 12B. The ears 11 and 12 are reinforced respectively by webs or gussets 13 and 14. As may be seen in Figs. 3, 4, and 5, the web 13 is of channel shape including a passage 15 for a purpose to be described. The frame 10 is advantageously made of metal, such as a diecast zinc alloy.

Mounted in and closing the open ends of the frame 10 are orificed covers or face plates 16 and 17 of insulating material, such as molded polystyrene plastic.

The orifices 18 of each cover are arranged in a series of parallel rows. Each orifice is of a section to fit a terminal with slight clearance and is flared toward each face of the cover to facilitate the insertion of terminals

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during assembly. The covers 16 and 17 may be and are advantageously duplicates, but for convenience of description have been designated respectively as the top (16) and the bottom (17) cover. The number of terminal rows and terminals per row may, of course, be varied from the illustrated ten rows of six terminals each.

Each terminal row consists of a plurality of generally like but specifically different terminals. In the six-terminal-per-row arrangement illustrated, five terminals are the same except for the spacing of certain parts and the sixth is slightly different. The terminal shown in Fig. 6 is illustrative of the five terminals, and the portion of a terminal shown in Fig. 6A is illustrative of the sixth.

Looking first at Fig. 6, the terminal generally designated as 20 has end portions 21 and 21A for receiving connecting wires. In the particular example shown, the portions 21 and 21A are rectangular in section for the purpose of receiving wrapped wire connections. Other configurations for different types of connections may be used where desirable.

Each of the five terminals has a projection 22, the shoulder 23 of which rests, in the assembled condition, on the outer face of the top cover 16. Spaced from the shoulder 23 in the direction of the end portion 21A is a notch 24, which, as may be seen in Fig. 4, is adjacent to the inner face of the bottom cover 17 in the assembled condition. A tongue 25 projects from the terminal 20 adjacent the base of the end portion 21. Intermediate the tongue 25 and the projection 22 is a connector tab 26. For a purpose to be described, the spacing between the projection 22 and the tab 26 is different for each of the five like terminals.

The terminal generally designated 20A and shown in Fig. 6A is similar to the others except that the tab and the projection are so close together that they have been made integral, the portion 26A representing the tab and the portion 22A the projection, corresponding respectively to like elements 22 and 26 of the terminal shown in Fig. 6.

The terminals may be assembled by inserting them in the orifices 18 of the top cover 16 and then in the corresponding orifices 18 of the bottom cover 17 while the covers are in place on the frame 10. While the covers are held in place and the terminals are maintained with their shoulders 23 and 23A against the top surface of the cover 16, a quantity of hardenable plastic material is poured into the channel 15 in sufficient amount to at least cover the notches 24 of all of the terminals as shown at 30 in Fig. 4. When the plastic material has hardened, the whole structure is secured together, the bottom cover and the terminals by the plastic and the top cover by the shoulders 23 and 23A of the terminals. If desired, the plastic material may completely fill the space in the frame between the covers 16 and 17. The plastic material may be a catalyst hardened epoxide resin.

Associated with each row of terminals is an insulator plate or subpanel 27. The plate 27 has a plurality of notches along one edge (the top edge in Fig. 2) and a diagonal row of slots across its surface. The lower left hand corner of the plate 27, as viewed in Fig. 2, is notched, having a setback shoulder 29. The previously noted five like terminals 20 each has a notch 28 in the projection 22, and the remaining terminal 20A has a similar notch 28A in the tab 26A. The bottom of the plate 27 fits into the notches 28 of the terminals 20 and the shoulder 29 into the notch 28A of the terminal 20A. The tab 26A is thereby located adjacent the shoulder 29. The tabs 26 are so located on their respective terminals that they project through the slots in the noted diagonal line of slots in the plate 27. The tongues 25 fit in the adjacent notches along the top edge of the plate 27 and are bent over to secure the plate to the terminal row. The connec-

tor tabs 26 and 26A serve as terminals for making connections, as by strapping, to adjacent apparatus elements, in addition to any wrapped or other connections that may be made to the terminal end portions 21 and 21A.

Terminal strips in accordance with this invention are advantageously mounted on racks or frames closely adjacent to various apparatus elements. The narrowed portions 11B and 12B of the mounting ears 11 and 12 thus afford clearance space through which connecting wires or cables may be passed from the front to the rear of the frame or vice versa.

Since a partial filling of the frame with the hardenable insulating material is adequate from the standpoint of structural strength, these devices would in the interest of economy of material, usually be made in this way. Terminal strips, so constructed, are advantageously mounted vertically with the channel 15 of the mounting ear 11 downward. This allows any moisture that may condense within the frame to run off. The tendency of moisture to condense in this zone is inhibited by air circulation through the frame via this channel and leakage space due to the slight clearance around the terminals that are not sealed in the top cover.

What is claimed is:

1. A terminal strip comprising an elongated box-like metal frame open at the top and bottom and having mounting ears on opposite ends thereof, covers of insulating material for the top and the bottom of said frame, each cover having a plurality of rows of terminal receiving orifices therein, elongated terminals mounted in corresponding aligned orifices of and projecting beyond each cover, each terminal having a cover securing shoulder resting on the outer face of the top cover, an insulator plate for each row of terminals, each plate having a plurality of notches in one edge and a corresponding plurality of slots arranged in a diagonal row thereacross, each terminal having a tongue fitting into one of said notches and a tab fitting into one of said slots, and a molded body of insulation within said frame imbedding a portion of each of said terminals and securing the bottom cover to the frame.

2. A terminal strip comprising an elongated frame open at the top and bottom and having mounting means on opposite ends thereof, covers of insulating material for the top and the bottom of said frame, each cover having a plurality of rows of terminal receiving orifices therein, a plurality of terminals mounted respectively in corresponding aligned orifices of and projecting beyond each cover, each terminal having a cover securing shoulder resting on the outer face of the top cover, an insulator plate for each row of terminals, each plate having a plurality of notches in one edge and a corresponding plurality of slots arranged in a diagonal row thereacross, each terminal having a tongue fitting into one of said notches and bent over toward the plate and a tab fitting into one of said slots, and a molded body of insulation within said frame imbedding said terminals and securing the bottom cover to the frame.

3. A terminal strip comprising an elongated box-like frame open at the top and bottom and having mounting ears on opposite ends thereof, covers of insulating material for the top and the bottom of said frame, each cover having a plurality of rows of terminal receiving orifices therein, a plurality of terminals each mounted respectively in corresponding aligned orifices of and projecting beyond each cover, each terminal having a cover-securing shoulder resting on the outer face of the top cover and a notched portion positioned adjacent to the bottom cover; and a body of insulation molded within said frame, imbedding the notched portion of each of said terminals and securing the bottom cover to the frame.

4. A terminal strip comprising an elongated box-like metal frame open at the top and bottom and having mounting ears on opposite ends thereof, reinforcing webs between each ear and the frame, one of said webs defining

a channel leading into said frame, covers of insulating material for the top and the bottom of said frame, each cover having a plurality of rows of terminal receiving orifices therein, elongated terminals each mounted in corresponding aligned orifices of and projecting beyond each cover, each terminal having a cover securing shoulder resting on the outer face of the top cover, and a molded body of insulation within said frame and channel imbedding said terminals and securing the bottom cover to the frame.

5. A terminal strip comprising a frame having opposite open sides and oppositely directed mounting portions, orificed insulating covers for said open sides, a plurality of terminals arranged in rows in the orifices and projecting therefrom, a notched insulating plate for each row of terminals, said terminals having tongue-like projections in the notched parts of the plates for securing the plates to the terminals, and a molded mass of insulating material imbedding an intermediate portion of each terminal and securing at least one cover to the terminals and to the frame, said terminals having a shouldered portion for securing the other cover to the frame.

6. A terminal strip as in claim 5 in which at least one of said mounting portions is shaped to define a channel communicating with the interior of said frame.

7. A terminal strip comprising a metallic frame having opposite open sides and oppositely directed mounting portions, correspondingly orificed insulating covers for said open sides, a plurality of elongated terminals arranged in rows each terminal in the corresponding orifices of each cover and projecting therefrom, and a molded mass of insulating material imbedding intermediate portions of the terminals and securing at least one cover to the terminals and to the frame, said terminals having a shouldered portion for securing the other cover to the frame.

8. A terminal strip comprising a frame having opposite open sides and oppositely directed mounting means, each mounting means having a restricted portion adjacent the frame and defining therewith a wire passage, orificed insulating covers for said open sides, a plurality of terminals arranged in rows in the orifices and projecting therefrom, a notched insulating plate for each row of terminals, said terminals having tongues in the notched parts of the plates and notched projections spaced from the tongues for securing the plates to the terminals, and a molded mass of insulating material imbedding intermediate portions of the terminals and securing at least one cover to the terminals and to the frame, said terminal projections having a shouldered portion for securing the other cover to the frame.

9. A terminal strip comprising a frame having opposite open sides and oppositely directed mounting portions one of which includes a channel leading into the frame, orificed insulating covers for said open sides, a plurality of terminals arranged in rows in the orifices and projecting therefrom, and a mass of insulating material molded in the channel and frame for imbedding intermediate portions of the terminals and securing at least one cover to the terminals and to the frame, said terminals having a shouldered portion for securing the other cover to the frame.

10. A terminal strip comprising a frame having opposite open sides and oppositely directed mounting portions, orificed insulating covers for said open sides, a plurality of terminals arranged in rows in the orifices and projecting therefrom, an insulating plate for each row of terminals, said plates having notches along one edge, said terminals having bent-over tongues in the notches and having notched projections spaced from the tongues and fitting over the opposite edge of the plate for securing the plates to the terminals, and a molded mass of insulating material imbedding intermediate portions of the terminals and securing at least one cover to

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the terminals and to the frame, said terminals having a shouldered portion for securing the other cover to the frame.

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