

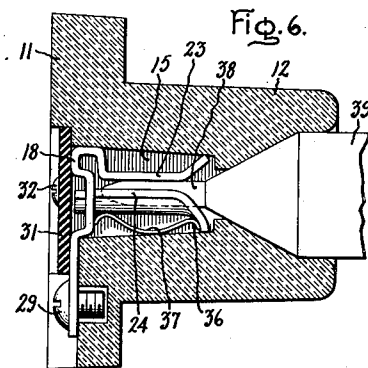
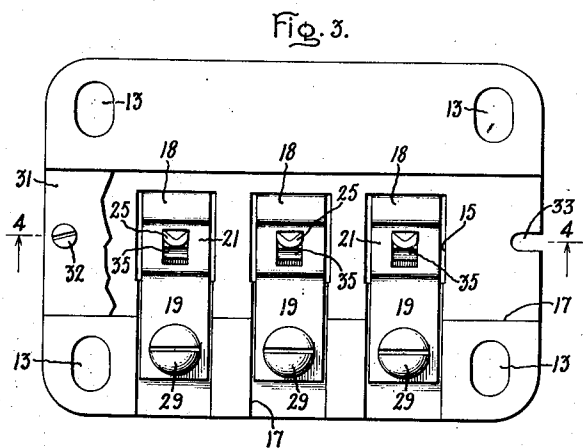
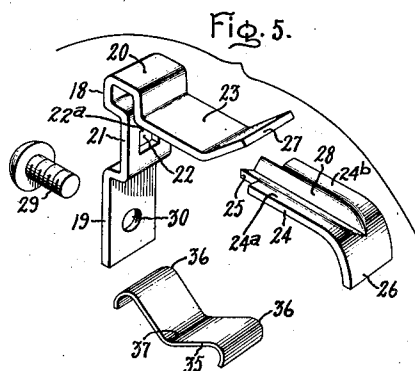
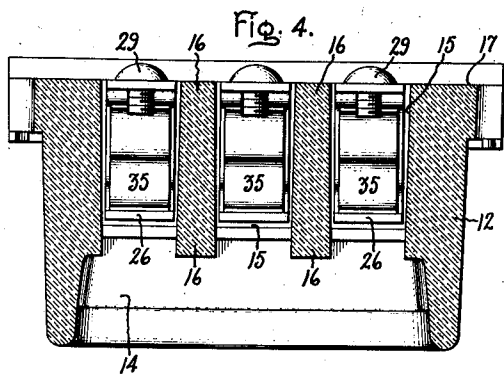
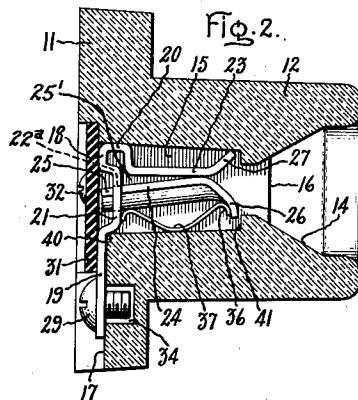
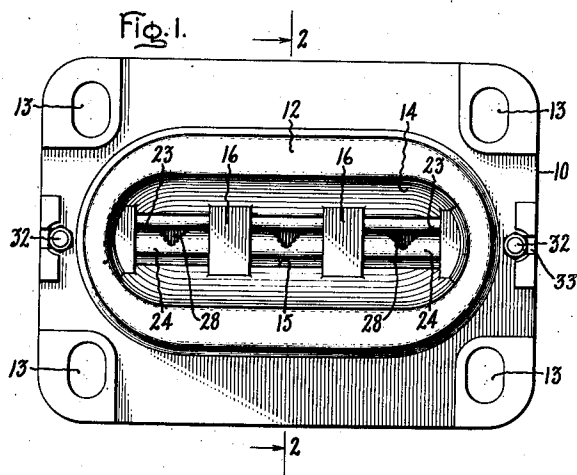
Jan. 30, 1940.

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2,188,789

TERMINAL BLOCK

Filed July 21, 1938



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UNITED STATES PATENT OFFICE

2,188,789

TERMINAL BLOCK

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Application July 21, 1938, Serial No. 220,523

4 Claims. (Cl. 173-363)

This invention relates to a terminal block, and more particularly to a terminal block for use with electric ranges.

It is an object of the invention to provide an improved construction and arrangement in terminal blocks of the type described which provide excellent electric contact means and which may be manufactured at low cost.

In the accompanying drawing, Fig. 1 is a view looking at the top of the terminal block; Fig. 2 is a sectional view on the line 2-2 of Fig. 1; Fig. 3 is a plan view looking at the base of the block with a portion of the base closure removed; Fig. 4 is a sectional view on the line 4-4 of Fig. 3; Fig. 5 is an exploded view of the terminal contact structure; and Fig. 6 is a sectional view through the terminal block similar to Fig. 2 showing a prong connector inserted in the terminal structure.

It is desirable in many electric ranges to provide oven heating elements which are removable to facilitate cleaning of the oven and in single unit ovens to provide means for changing the position of the unit to give proper heat distribution for various cooking operations such as baking, broiling, etc. To make the heater elements easily removable they are provided with connectors or terminal prongs which are plugged into a terminal block placed in the oven, usually in the rear wall thereof. This invention relates to such terminal blocks which are adapted for oven mounting. Such a block must be capable of supporting an end of the heater element and, at the same time, provision must be made for a firm electrical contact between the heater connector prongs and contact elements of the terminal block.

Referring to the drawing, a terminal block is shown provided with a housing 10 having a base portion 11 and an extended portion 12. For the purposes of illustration, the base portion is shown of a generally rectangular shape and is provided with holes 13 at each of the corners for mounting the housing upon a supporting plate such as the rear wall of an oven. In order that the terminal block may withstand the high temperatures existing in an oven the housing is made of a vitreous or ceramic material, such as porcelain.

The extended portion 12 is of generally oblong form, as shown in Figs. 1 and 4, and is provided with a tapered recess 14 which merges with a plurality of contact-receiving chambers 15. In the form of the invention illustrated, three of the chambers 15 are provided, each being separated from the other by a partition 16 integral with

the housing. The number of chambers and terminal contacts may be increased or decreased at will depending on the number of resistor connectors employed in the heating units. The base of the housing is provided with a slot 17 for receiving parts of the terminal contact structures now to be described.

The terminal contact structures in each of the chambers are identical so that only one of the structures will be described. The terminal contact structure comprises a substantially L-shaped contact member 18 having a leg 19 and an arm 20 extending at right angles to the leg 19. The leg 19 is provided with an indented portion 21 having a slot 22 therein formed with a positioning edge 22a. The arm 20 is provided with an indented portion 23 which serves as the contact surface cooperating with a connector prong. A second contact member 24 cooperates with the arm 20 to form a prong clamping means. The contact member 24 is provided with a tang 25 which extends into the slot 22 and permits the member 24 to move relative to the arm 20 while, at the same time, the cooperating tang and slot guide the movable member 24 for movement parallel with the arm 20. In normal position the tang abuts the edge 22a so that the tang end of the member 24 is spaced from the contact portion 23. This position is shown at 25' in Fig. 2. In order to guide a connector prong into engagement with the contact members the contact member 24 and the arm 20 are flared outwardly at 26 and 27, respectively. In addition, the contact member 24 is grooved at 28 to receive a round connector prong, and is provided with flat portions 24a and 24b on each side of the groove for cooperation with a flat connector prong. By this construction the terminal contact structure is adapted to receive connector prongs of either round or flat cross-section. A terminal screw 29 is threaded into an opening 30 in the leg 19 for the purpose of receiving the conducting lead wire.

The contact structures are mounted in the housing in the position shown by Fig. 2. In this position the contact members 18 and 24 are disposed in the housing with the arm 20 and the member 24 within the chamber 15 and the leg 19 resting in the slot 17. A heavy closure plate 31, which may be made of insulating material such as sheet laminated materials, or the like, retains all the contact structures within the housing by extending across the slot 17 and clamping the legs 19 against the base of the housing. The plate 31 is secured to the base by any suitable means such as the screws 32 seated in

slots 33 formed in opposite ends of the base. The plate forms a closure for each of the chambers 15 and comprises a simple and effective means of retaining the contact structure within their respective chambers. In mounted position, the terminal screws 29 extend into recesses 34 formed in the base of the housing.

In order to maintain the contact member 24 in engagement with the contact arm 20 a resilient U-shaped spring 35 is inserted within the chamber 15 between the contact member 24 and a wall of the chamber. The ends 36 of the spring engage the ends of the member 24 while the base 37 of the spring engages the side wall of the chamber 15. The spring is made of spring steel that will withstand the high oven temperatures without losing strength and resiliency.

As shown more particularly by Fig. 6, the contact member 24 floats freely within the chamber 15 and moves bodily relative to the arm 20 whenever a connector prong, such as shown at 38, is inserted into the terminal contact structure. Insertion of the terminal prong depresses the spring 35 which in turn exerts a strong clamping action on the contact member 24 holding the prong securely between the member 24 and the arm 20. In those cases where a flat connector prong is employed the flat surfaces 23 and 24a-24b grip the prong firmly, whereas in those cases where a round connector prong is used the prong rests within the groove 28 and abuts the contact surface 23. Fig. 6 shows a round connector inserted in the contact assembly. In each case the connector prong makes contact along the entire length of the indented portion 23 of the arm 20, thereby obtaining an excellent electrical connection between the prong and the contact structure. The slot 22 permits the contact arm 24 to move parallel to the arm 20 with the tang 25 moving in the space formed between the indented portion 21 and the closure plate 31.

The contact member 24 is of such length and so placed that easy insertion of the connector prong is possible. Due to the fact that the tang end of the contact member is normally spaced slightly from the contact arm 23, as shown at 25' in Fig. 2, it is possible to insert the connector prong without binding of the contact member which might make separation of the contact member and arm difficult. Were the tang end of the member 24 in flush contact with the surface 23 in normal position, insertion of a prong connector would move the flared end 26 of the member away from the contact surface and cause the member 24 to pivot about the tang thereby preventing the tang end from moving away from the contact surface 23. In other words, by providing the space 25' it is possible to insert the connector prong without causing binding or locking of the movable parts.

The L-shaped contact member 18 cannot be flexed within the chamber because the arm 20 and the flared end 27 make contact with the wall of the chamber 15 while the edge of the indentation 21 makes contact with the opposite wall, as shown at 40 in Fig. 2. By this arrangement, the L-shaped member is held rigidly within the chamber 15 making it possible for the spring 35 to be compressed to its fullest extent by insertion of a connector prong so that a strong clamping action is maintained between the prong and contact structure. The contact arm 24 is prevented from falling out of the chamber 15 by the flared portion 26 which engages a leading edge 41 in the wall of the chamber. The width of the contact

members is substantially that of the chamber 15 so that the contact members fit snugly within the chamber at all times.

By the terminal block construction described, it is possible to provide an adequate support for ends of the heater elements and an excellent electrical connection between the connector prongs and the contact terminal structure. The plug structure 39, shown by Fig. 6, is tapered so that it cooperates with the tapered recess 14 to support one end of the heater element upon the block, while the prong is in parallel line contact with the contact members 20 and 24 to provide an ample area of electrical contact. Tipping of the contact member 24 is prevented by the U-shaped spring, the ends of which engage each end of the contact member to hold it flat against the connector prong. By providing a freely floating contact member, such as the contact member 24, in cooperation with the fixed contact arm 20, it is possible to make the contact members of heavy brass construction thereby insuring a strong and highly effective electrical connection; this would not be possible, were it necessary to provide resilient contacts which would flex upon insertion of the connector prong.

The contact structures are easily assembled within the chambers 15 and the closure plate is simply bolted to the base to hold the assembled structures in position.

While the contact structure has been illustrated and described as part of an oven terminal block, it should be understood that the contact structure is applicable to other terminal blocks and other plug receptacles.

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

1. In a terminal block structure, a housing having a chamber therein, a fixed contact, said contact having a contact arm within said chamber and a leg extending at right angles to said arm, said leg being provided with an extended portion having a slot therein, a freely floating contact member within said chamber having a tang extending into said slot, and spring means between said contact member and a wall of said chamber biasing said contact member toward said contact arm.

2. In a device of the class described, a housing having a chamber therein, a stationary L-shaped contact having a contact arm within said chamber and a leg extending at right angles to said arm, said leg being provided with an indented portion having a slot therein, a contact member within said chamber having a tang extending within said slot and a U-shaped spring having ends engaging the ends of said member and biasing said member toward said contact arm, said spring maintaining said contact member parallel to said arm to provide a large gripping area for a connector prong.

3. In a terminal block structure, a housing having a chamber therein, a fixed contact, said contact having a contact arm within said chamber and a leg extending at right angles to said arm, said leg being provided with an extended portion having a slot therein, a freely floating contact member within said member having a tang extending into said slot, spring means between said contact member and the wall of said chamber biasing said contact member toward said contact arm, and a plate of insulating material closing one end of said chamber and clamping said leg against said housing to retain said assembled contacts in position.

4. In a device of the class described, a housing having a chamber therein, a fixed contact, said contact having a contact arm within said chamber and a leg extending substantially at right angles to said arm, said leg being provided with an indented portion having a slot therein, a freely floating contact member within said chamber having an end extending into said slot and engaging the edge of said slot to space said end of the contact member from said arm, means between said contact member and a wall of said chamber biasing said contact member toward said contact arm and a plate of insulating material closing one end of said chamber and clamping said leg against said housing to retain said assembled contacts in position, the end of said floating contact member resting in the space between said plate and indented portion.

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