

Nov. 19, 1929.

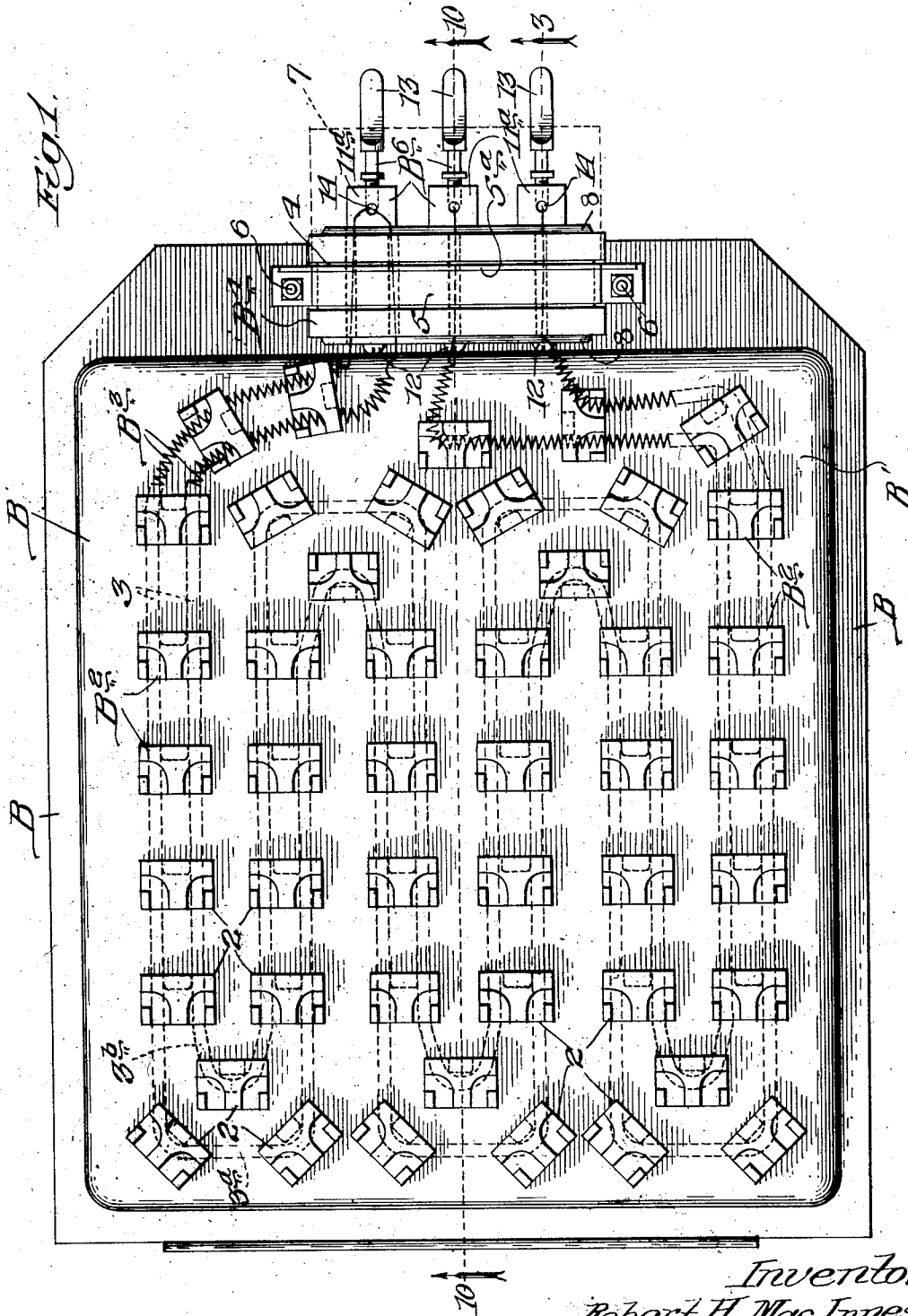
R. H. MacINNES

1,736,451

ELECTRIC OVEN

Filed Aug. 29, 1927

3 Sheets-Sheet 1



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Fig. 2.

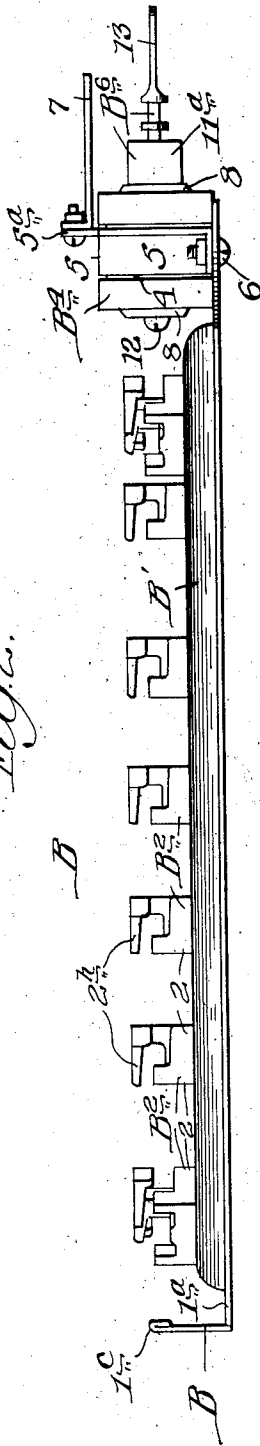


Fig. 3.

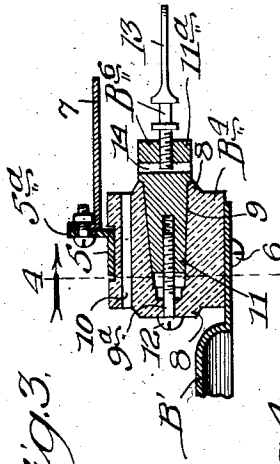


Fig. 4.

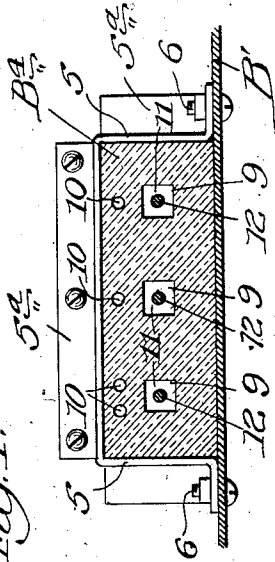


Fig. 5.

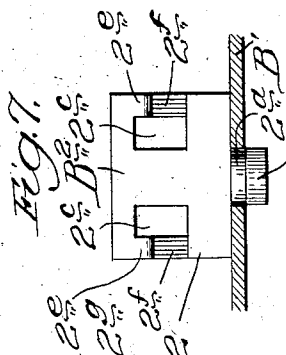


Fig. 6.

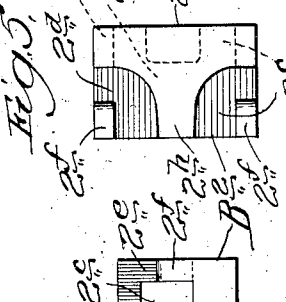


Fig. 7.

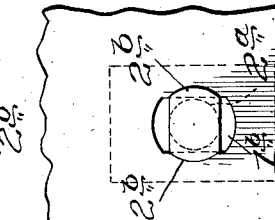


Fig. 8.

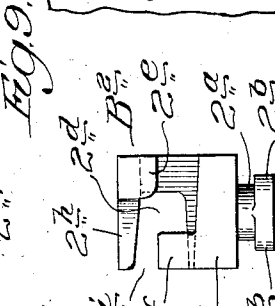
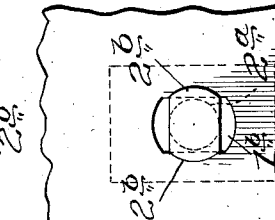


Fig. 9.



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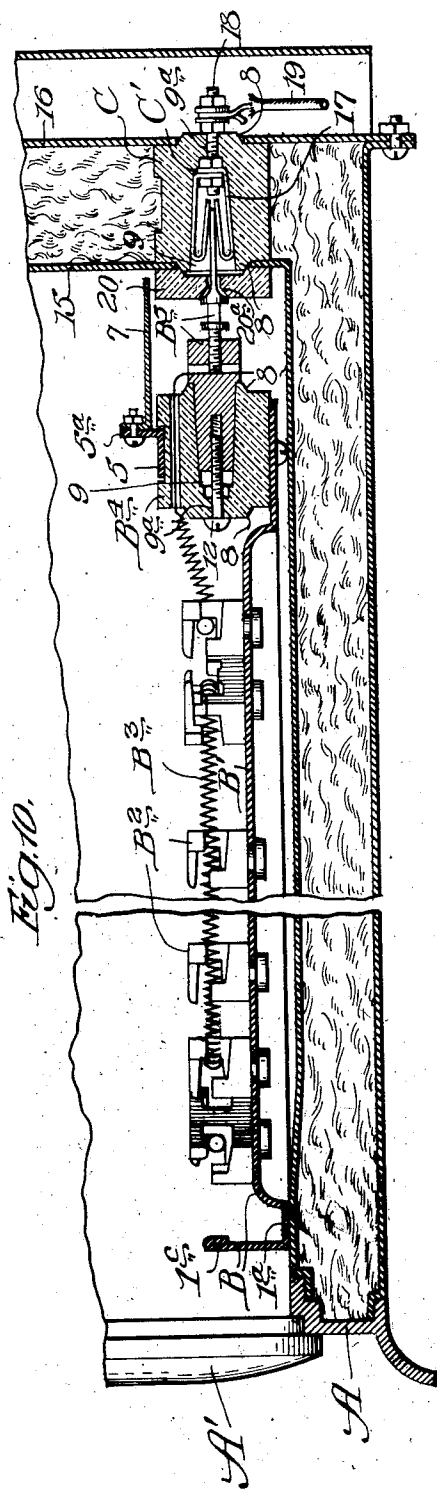
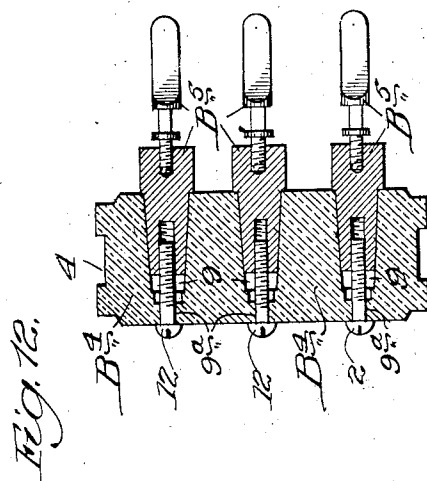
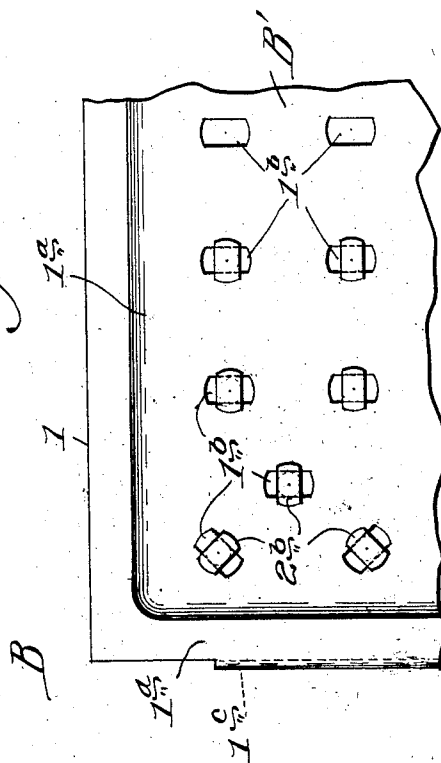
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ELECTRIC OVEN

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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ELECTRIC OVEN

Application filed August 29, 1927. Serial No. 216,140.

The present invention pertains to electric ovens and involves novel features of construction of such an oven and the heating element thereof.

The primary object is to provide an improved and simplified construction, the parts whereof can be made in the simplest manner and the assembly of which can be effected cheaply and easily.

The invention is illustrated in a preferred embodiment in the accompanying drawings, in which—

Fig. 1 is a plan view of a heating element for an oven constructed in accordance with the invention; Fig. 2, an elevational view of the same with resistance-coils omitted; Fig. 3, a broken vertical sectional view taken as indicated at line 3 of Fig. 1; Fig. 4, a broken transverse sectional view taken as indicated at line 4 of Fig. 3; Fig. 5, a plan view of a supporting-block employed for stringing the resistance-wire coil; Figs. 6 and 7, front and rear views of the same, respectively; Fig. 8, a side elevational view of the same; Fig. 9, a broken bottom plan view illustrating the manner in which the shank of the supporting-block interlocks with the socket, or slot, of the mounting-plate; Fig. 10, a broken vertical sectional view of the improved oven and heating element therein; Fig. 11, a broken bottom plan view of the heating element; and Fig. 12, a plan view of the interchangeable insulation-block used as a means for mounting the switch-jacks in the oven and used also as a means for mounting the switch-plugs on the heating element.

In the construction illustrated, A designates an oven equipped with a door A'; B designates a heating element which comprises a mounting-plate B', resistance-coil supporting-blocks B², a resistance-coil B³, an insulation-block B⁴ mounted on the rear end of the plate B' and contact-plugs, or switch-plugs, B⁵ mounted on the block B⁴; and C designates an insulation-block mounted in the rear lower portion of the oven and equipped with switch-jacks C'.

The insulation-blocks B⁴ and C are of the same size and form, and are interchangeable.

The heating element B may be removed from the oven at will. The mounting-plate B' preferably consists of a steel-plate which is so stamped as to provide a marginal portion 1 and a raised body-portion 1^a which is provided with interlock-slots, or sockets, 1^b. These sockets are arranged in longitudinal and transverse rows, except that at the end-portions of the plate certain sockets may be disposed between the longitudinal rows for the purpose of receiving the supporting-blocks for loops of the resistance-coil. The mounting-frame is shown provided at its front end with a flange 1^c which may serve as a handle when it is desired to withdraw the heating element from the oven.

The supporting-blocks B² are all alike. Each block (see Figs. 5-8) comprises a head-portion 2 and a reduced shank-portion 2^a provided with interlock-flanges 2^b, forming an elongated head for the shank. The shank may be inserted through the slots 1^b, and the block may then be partially rotated to effect the interlocking engagement.

The head 2 of each supporting-block is provided with a pair of channels 2^c extending therethrough in substantially parallel relation. These channels are laterally open at the tortuous paths indicated at 2^d. As thus described, each channel 2^c is partially bound at its outer side by diagonally opposite flanges, or retainer-lips, 2^e and 2^f, the former of which is a depending lip and the latter an upstanding lip. These retainer-lips prevent later displacement of the resistance-coil after it has been entered in the channel. The head of the block B² is also provided at its upper portion with a channel 2^g which intersects the two channels 2^c, the end-portions of the channel 2^g affording portions of the laterally open tortuous channels 2^d. The channel 2^g is covered by a central tongue 2^h which is midway between the two upturned flanges 2^f. The channel 2^g is open at the front face of the block, as indicated at 2ⁱ.

The resistance-wire is strung upon the supporting-blocks in the manner illustrated in Fig. 1. Thus, two adjacent strands 3 of the resistance-coil extend through the path

of parallel channels 2^c of a longitudinal row of supporting-blocks. The strands may be introduced into the channels by lateral movement, the coil being kinked in a vertical plane as may be necessary to pass over the upstanding
 5 retainer-lip 2^f and under the depending retainer-lip 2^g.

Where the resistance-coil turns a corner, or where a loop of the resistance-coil is to be supported, the coil is passed under the tongue 2^h
 10 so as to engage the channel 2^g. Thus, in Fig. 1, the corner portions of the loop 3^a are shown engaging the channels 2^g of two of the supporting-blocks; and the shorter loop 3^b is shown passed beneath the tongue 2^h and thus
 15 engaging the channel 2^g. In this instance, the coil also extends through portions of the channels 2^c.

The insulation-block B⁴, which is the same
 20 in form and is interchangeable with the insulation-block C, is shown as consisting of an elongated rectangular block provided at its upper side and ends with a peripheral groove 4 which is engaged by a metal strap 5 whose
 25 ends are secured to the mounting-plate by means of bolts 6. The strap, or stirrup, 5 is provided with flanges 5^a adapted to serve as guards. To the upturned flange 5^a is secured a guard-plate 7 which extends rearwardly to
 30 the inner rear wall of the oven, as shown in Fig. 10.

The insulation-block B⁴ is provided at its front and rear faces with longitudinal projections 8 which serve the function of engaging
 35 slots with which the spaced rear walls of the oven are provided, when the block is employed at the position C.

The insulation-block is provided with a series of sockets 9 which are of square or annular cross-section. These sockets preferably extend somewhat more than half way through the block and are in alignment with perforations 9^a. The block is provided also
 40 with perforations 10 through which the wires leading from the resistance-coils may pass.

When the insulation-block is used, as indicated at B⁴, the squared sockets 9 serve to receive the shank-portions of the switch-plugs B⁶. These shank-portions are designated 11
 50 and are provided with tapped bores which are engaged by screws 12 extending through the perforations 9^a. The shanks 11¹ are equipped with heads 11^a provided with tapped openings which receive the threaded
 55 shanks of the blade-portions 13 of the switch-plugs B⁶. Extending vertically through the head 11^a is a perforation 14 in which the wire from the resistance-coil is entered. The wire is clamped into the passage 14 by means of
 60 the threaded shank of the blade 13. As will be understood from Fig. 3, the wire passes from the resistance-coil through the passage 10 and then into the passage 14 where it is secured.

65 As appears from the right-hand portion of

Fig. 10, the block C which corresponds with the block B⁴ is interposed between the inner wall 15 and outer wall 16 of the oven, and the projections 8 extend through slots with which
 70 said walls are provided, the block being thus anchored in position. The block is turned end for end in this position, so that the sockets 9 are turned forwardly. The jacks 17 are mounted in the sockets and secured in
 75 position by means of screws 18 which extend through the perforations 9^a. With the screws, or bolts, 18 are connected wires 19 which lead to suitable switches (not shown).

In front of the wall 15 is disposed a block 20 which is secured in position by any suitable means (not shown). The block 20 is
 80 provided with guide-perforations 20^a through which the switch-plugs enter when the heating element is placed in position in the oven.

Ordinarily, provision is made for using
 85 any one of three heats in the oven. This is accomplished by suitable arrangement of the portions of the resistance-coil and suitable switch connections, so that all portions of the resistance-coil can be used in series, two portions
 90 may be used in parallel, or one portion may be used alone. In the illustration given, the resistance-coil is shown arranged to enable the result mentioned to be obtained.

From the description given, it will be understood that the heating element is of very
 95 simple construction, the parts may be manufactured at moderate cost, and the assembly may be readily and cheaply effected. The supporting-blocks for the resistance-wire are
 100 molded, or pressed, from a suitable compound. When desired, the adjacent strands 3 may be disconnected from an intervening supporting-block, the block may be rotated to a position at right angles to the position shown and
 105 thereupon may be removed. Thus, replacements may be readily made.

The feature of making the blocks B⁴ and C interchangeable also contributes to the cheapness of manufacture. This feature
 110 effects a saving in dies, or molds, enables a stock of parts to be kept at a moderate amount, and prevents mistakes in assembly. It is true, also, that by using a single form of supporting-block for the resistance-wire,
 115 the stock of parts may be smaller, the assembling operation is rendered more rapid, and chances for errors are eliminated.

The foregoing detailed description has been given for clearness of understanding
 120 only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

What I regard as new, and desire to secure
 125 by Letters Patent, is:

1. An electric heating element comprising a mounting-plate, and supporting-blocks provided with shanks removably and interlockingly connected with said mounting-
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plate, each of said blocks having a head-portion provided with a pair of laterally open channels extending in one direction and equipped with retainer-lips and having an intersecting channel open at one side.

2. An electric heating element comprising a mounting-plate provided with interlock-sockets; a plurality of rows of supporting-blocks having shank-portions interlocking with said sockets, and having head-portions provided with a pair of laterally open channels extending in one direction and an intersecting channel which is open at one side; a resistance-coil having strands flanking the rows of supporting-blocks, a pair of said strands engaging the pairs of channels through said blocks, said resistance-coil presenting loops and curves; and supporting-blocks of the same construction as the first-mentioned blocks but having their intersecting channels engaged by the loops and curves of said resistance-coil.

3. In an oven, the combination with a pair of spaced walls of said oven, of an interposed insulation-block having projections engaging slots in said walls, said block having sockets opening at the front side of the block and having reduced perforations extending from said sockets through the rear side of the block, switch jacks in said sockets, and bolts extending through said perforations and securing said jacks in said sockets.

4. In an oven, the combination with a pair of spaced walls of said oven, of an interposed insulation-block having projections engaging slots in said walls, said block having sockets opening at the front side of the block and having reduced perforations extending from said sockets through the rear side of the block, switch jacks in said sockets, bolts extending through said perforations and securing said jacks in said sockets, and a block disposed in front of the inner wall of said oven and provided with guide-perforations registering with the spaces of said jacks which are adapted to receive the contact-plugs of the heating element.

5. An interchangeable insulation-block for the purpose set forth, said block having its front and rear portions provided with projections and having sockets open at one face of the block and perforations extending from said sockets and opening at the other face of the block, contact-members in said sockets, and connections extending through said perforations and securing said contact-members in position.

6. In means of the character set forth, an insulation-block provided with sockets opening at one face of the block and perforations extending from said sockets and opening at the other face of the block; and switch-plugs and switch-jacks interchangeably adapted to said sockets.

7. An electric oven having a pair of spaced

walls, an insulation-block interposed between said walls and interlockingly connected therewith, said block having sockets opening into said oven and perforations extending from said sockets to the opposite face of said block, jacks mounted in said sockets, bolts extending through said perforations and securing said jacks in position; and a heating element mounted in said oven comprising a mounting-plate, supporting-blocks thereon, a resistance-coil strung on said blocks, an insulation-block similar to the insulation-block interposed between said walls but reversed in position, contact-plugs mounted in the sockets of said last-mentioned block and connected with the wires of said coils, and screws extending through the perforations of said last-mentioned block and connected with tapped bores with which the shanks of said contact-plugs are provided.

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