

E. E. GOLD.  
ELECTRIC COOKER.  
APPLICATION FILED JULY 16, 1896.

NO MODEL.

3 SHEETS—SHEET 1.

FIG. 1.

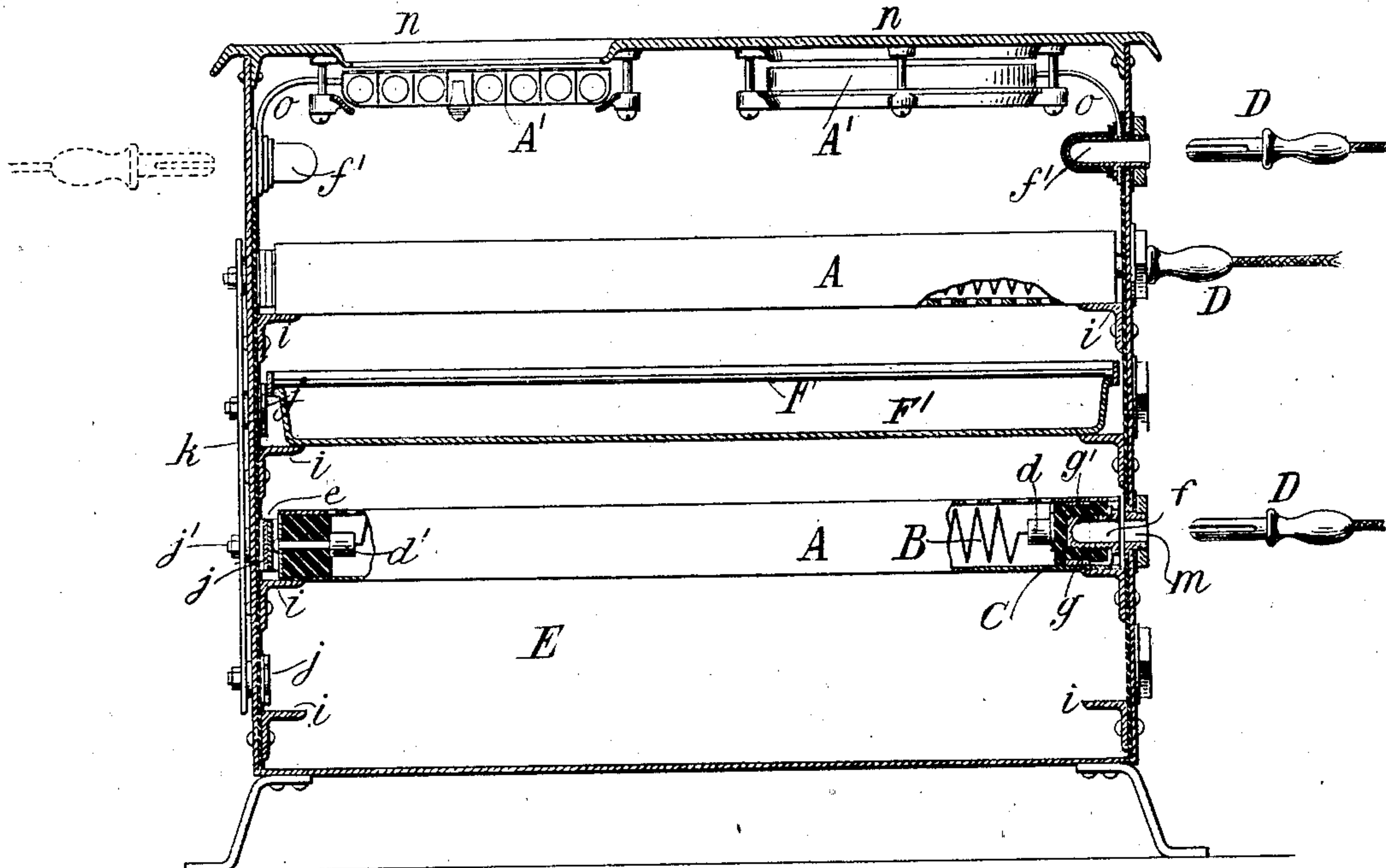


FIG. 2.

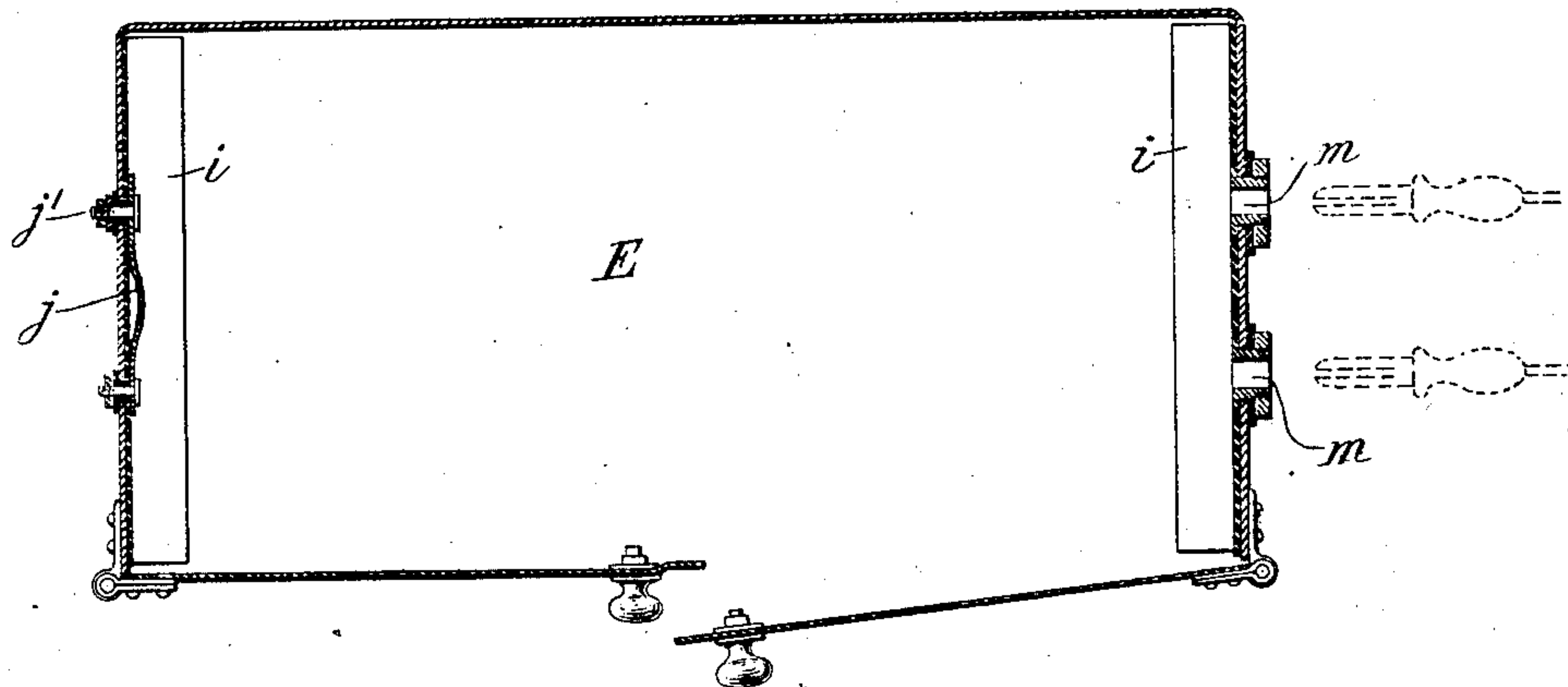


FIG. 3.

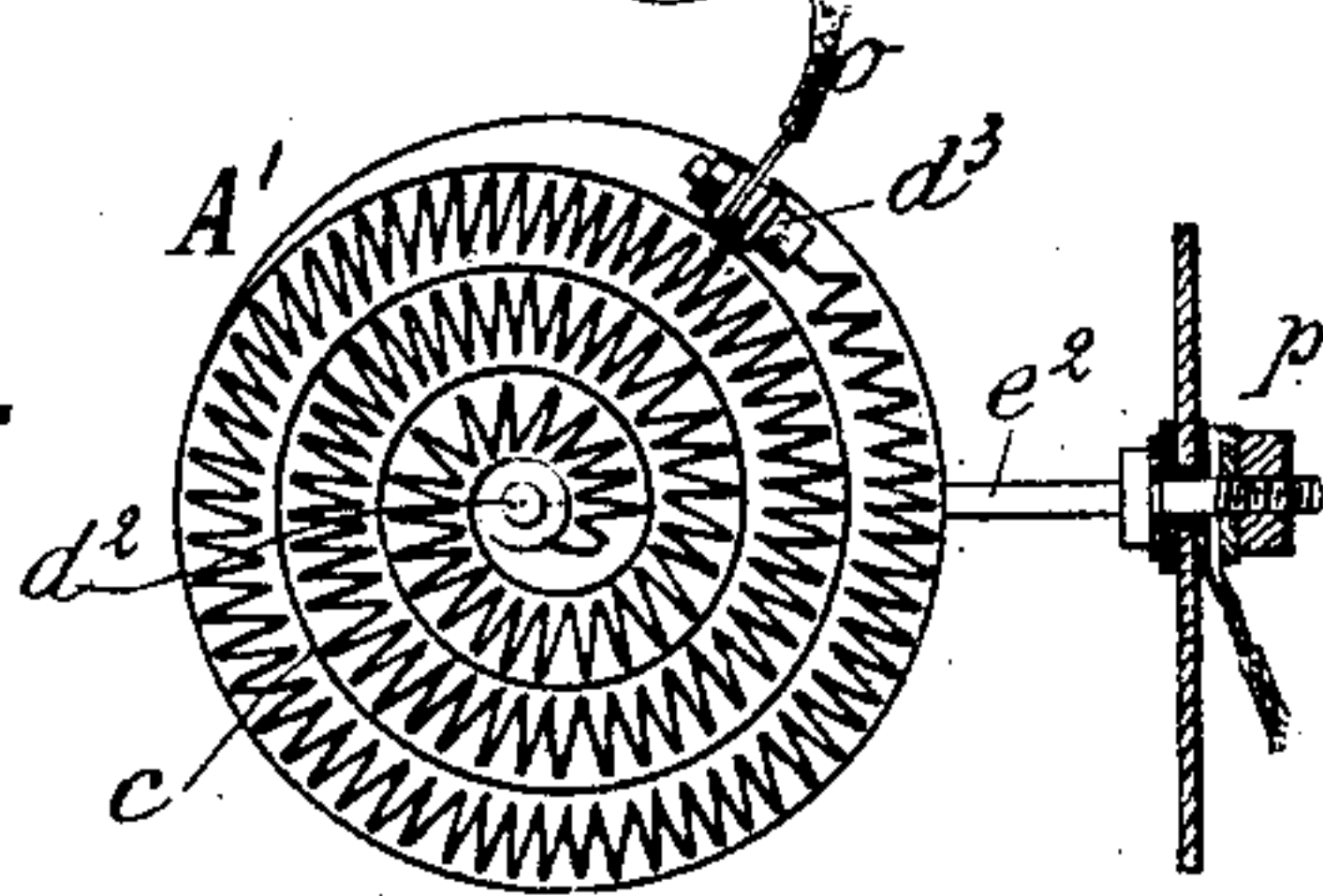
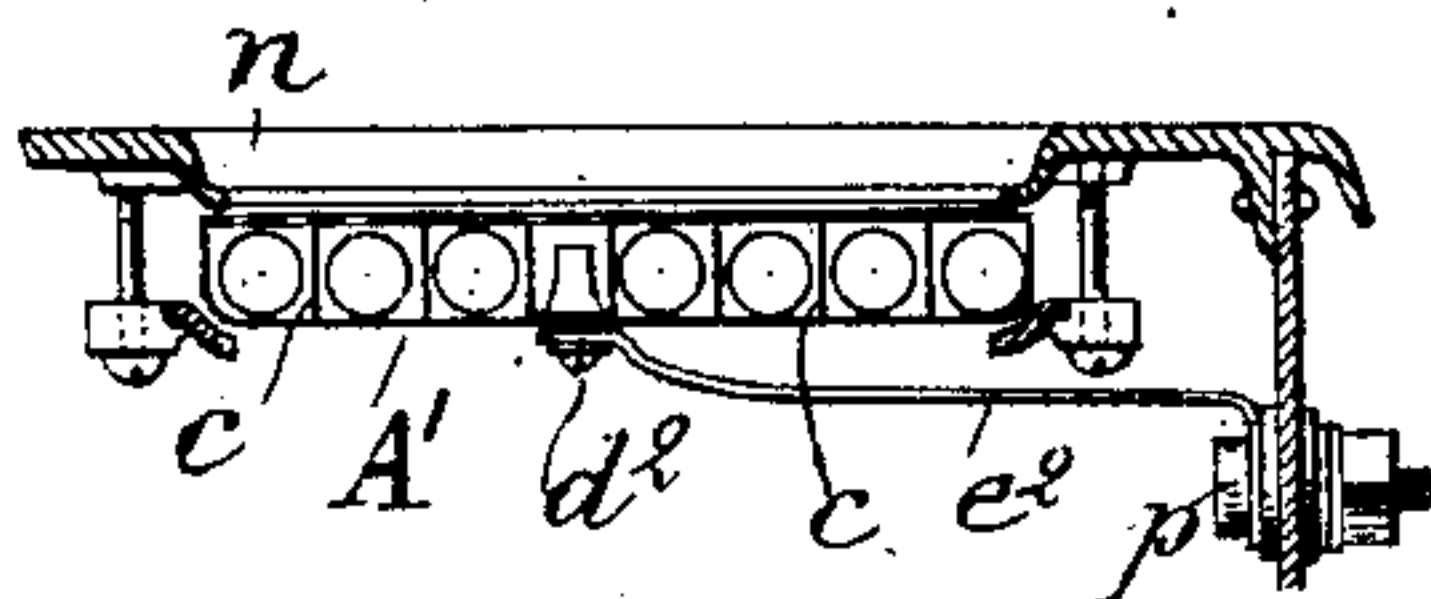


FIG. 4.



WITNESSES:

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3 SHEETS—SHEET 2.

FIG. 5.

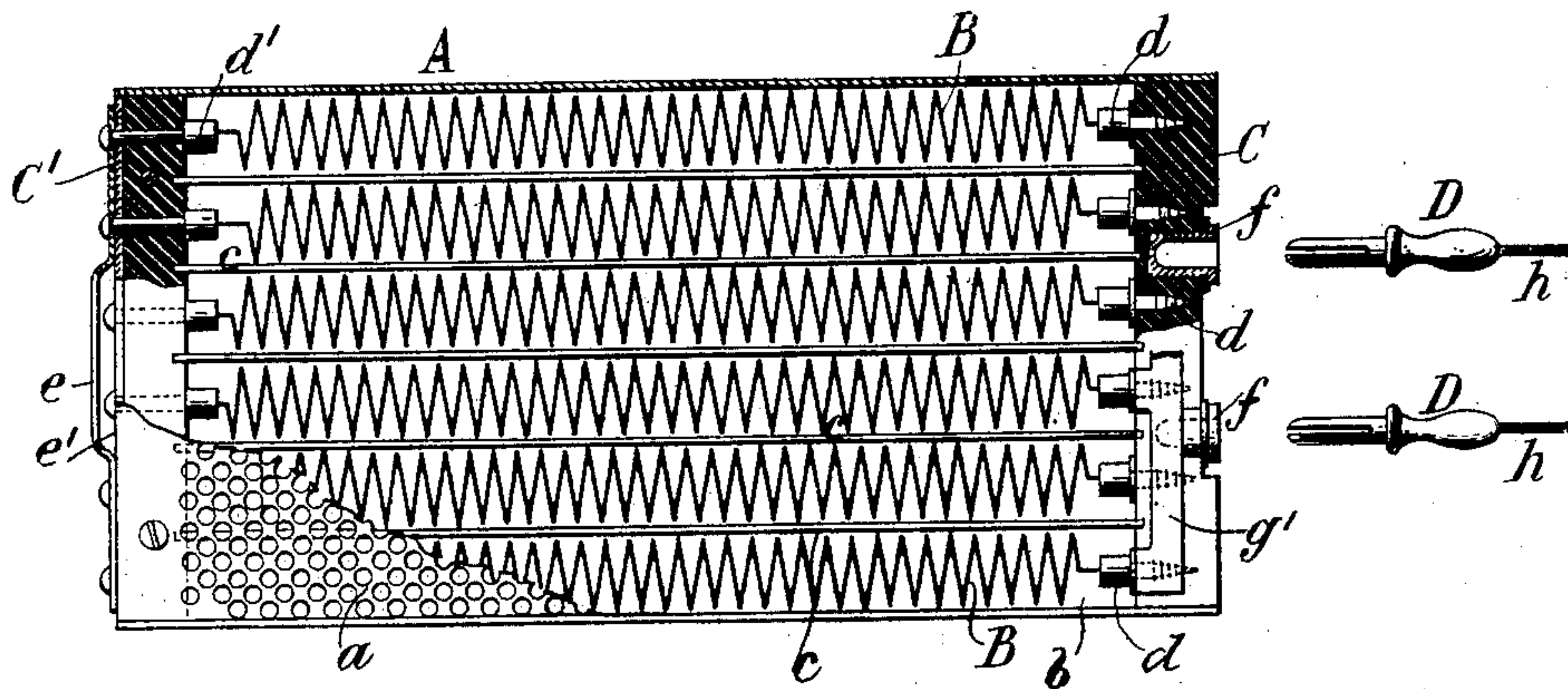


FIG. 6.

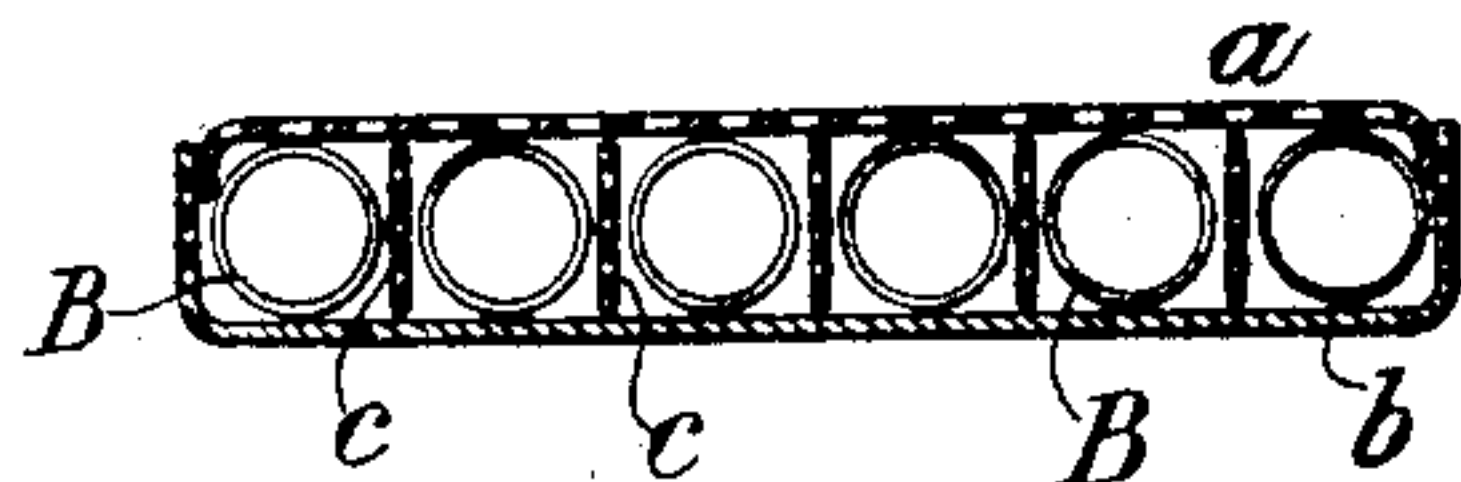


FIG. 7.

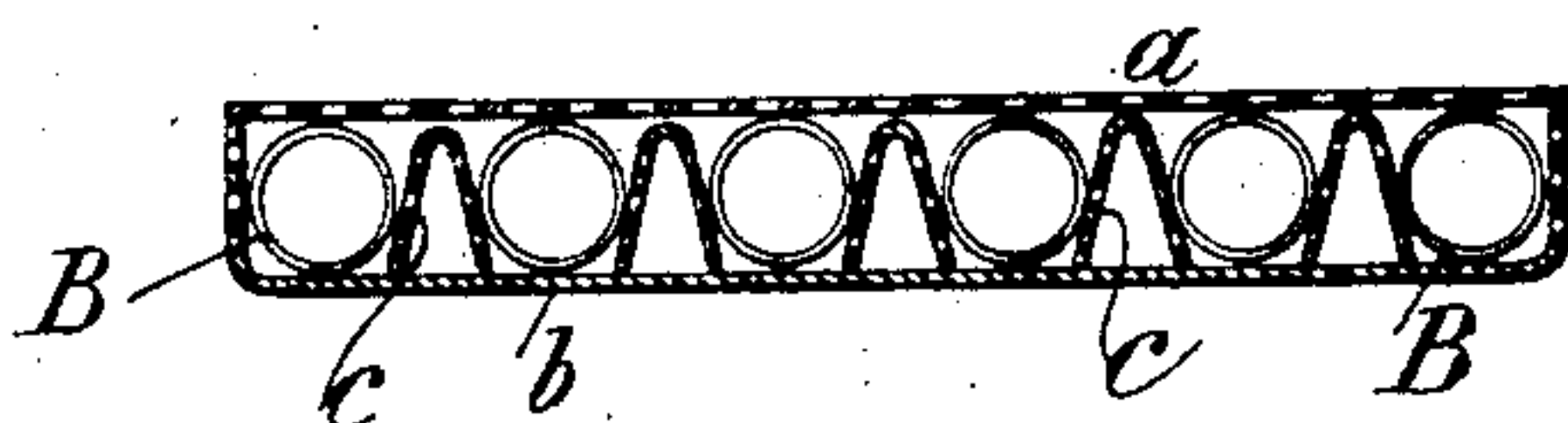


FIG. 8.

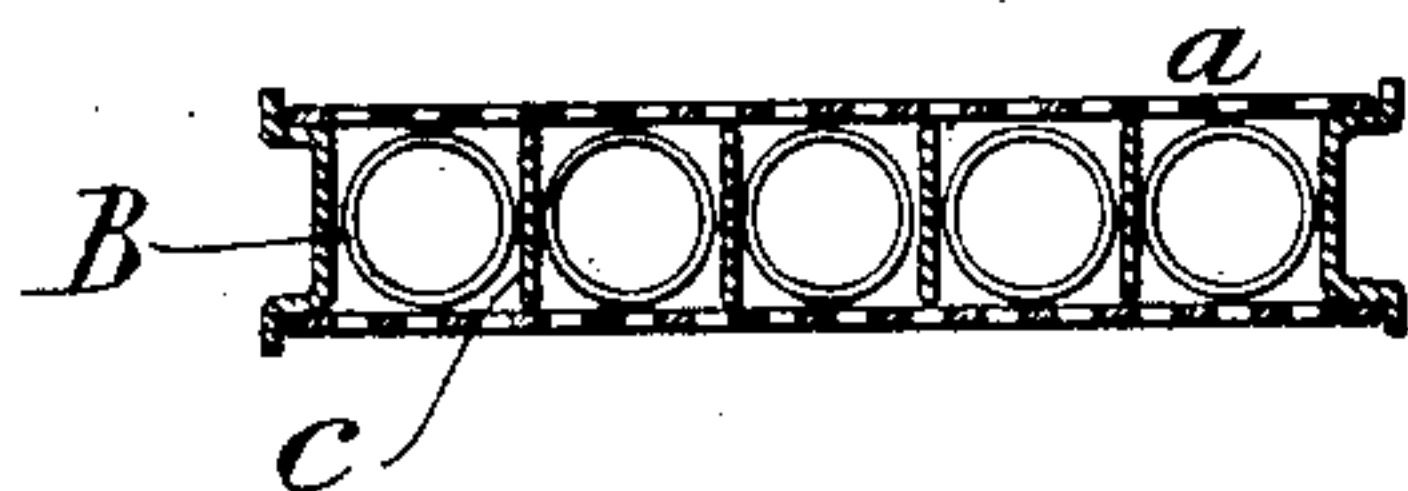


FIG. 9.

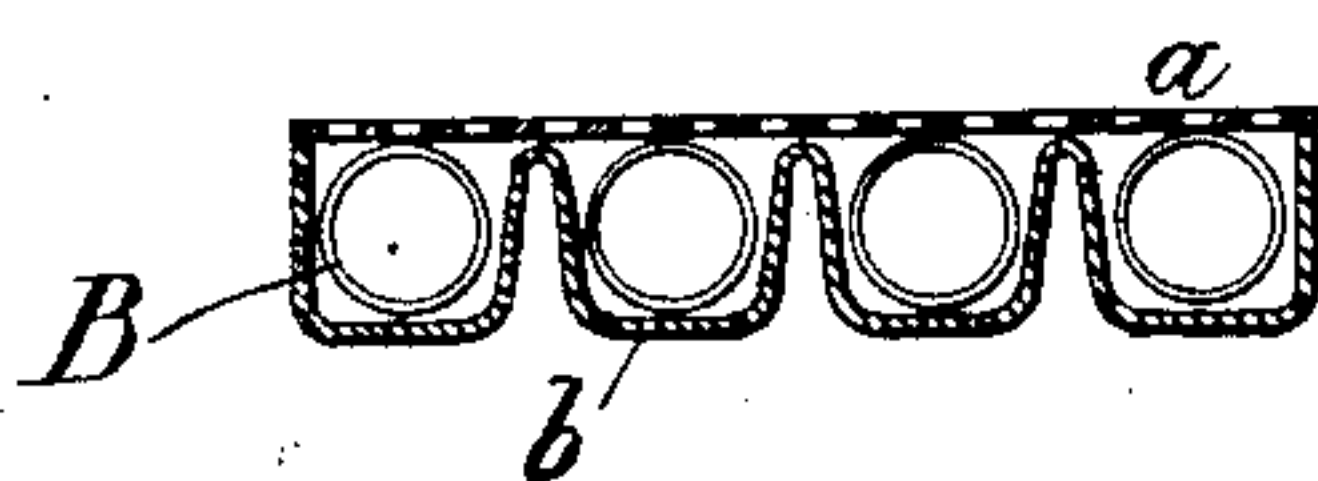
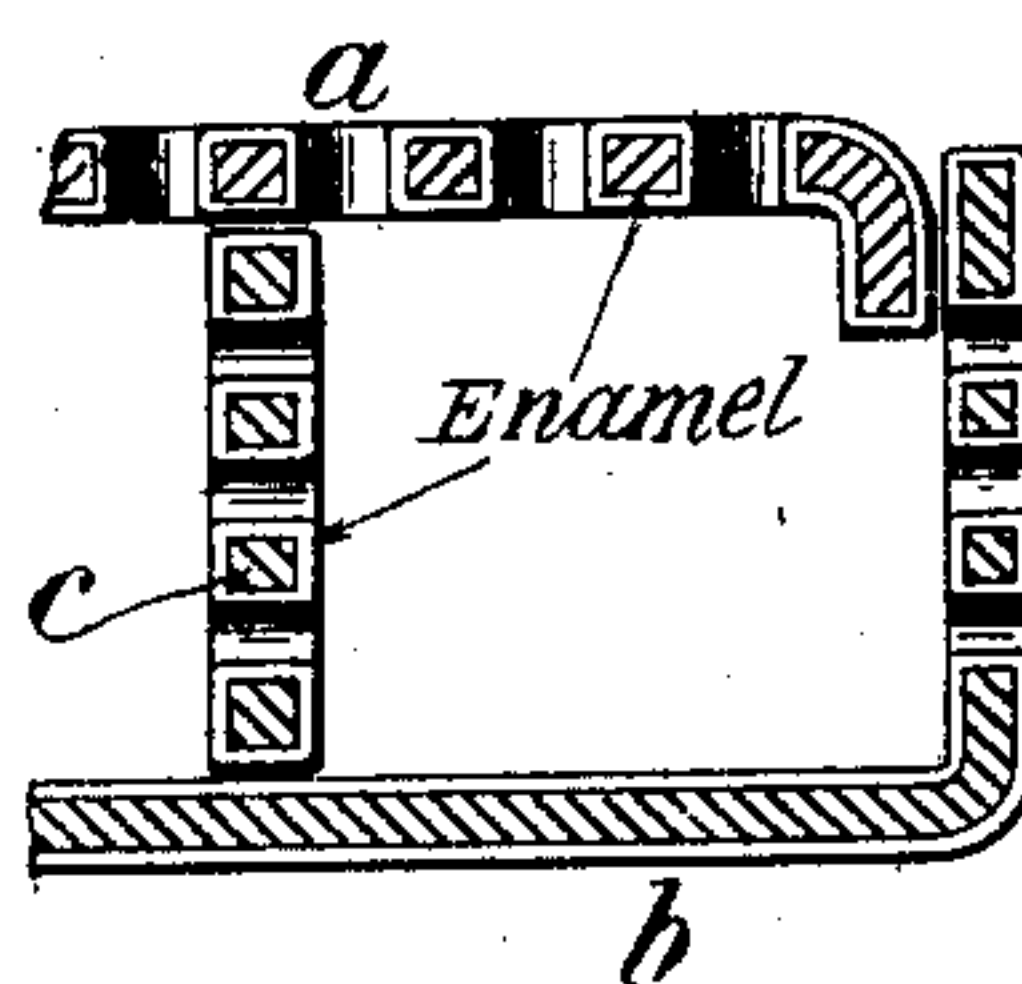


FIG. 10.



FIG. 14.



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3 SHEETS—SHEET 3.

NO MODEL.

FIG. 11.

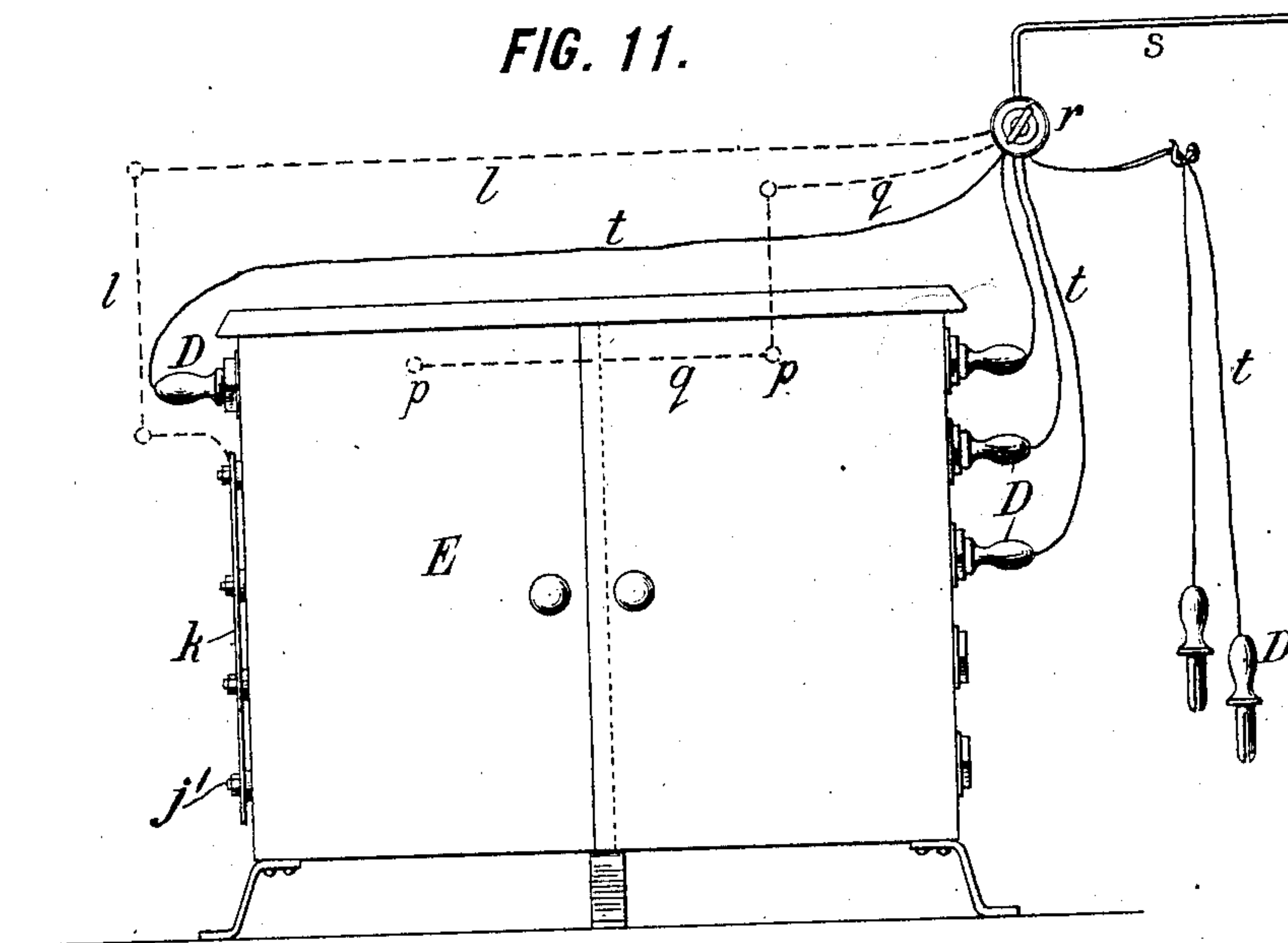


FIG. 12.

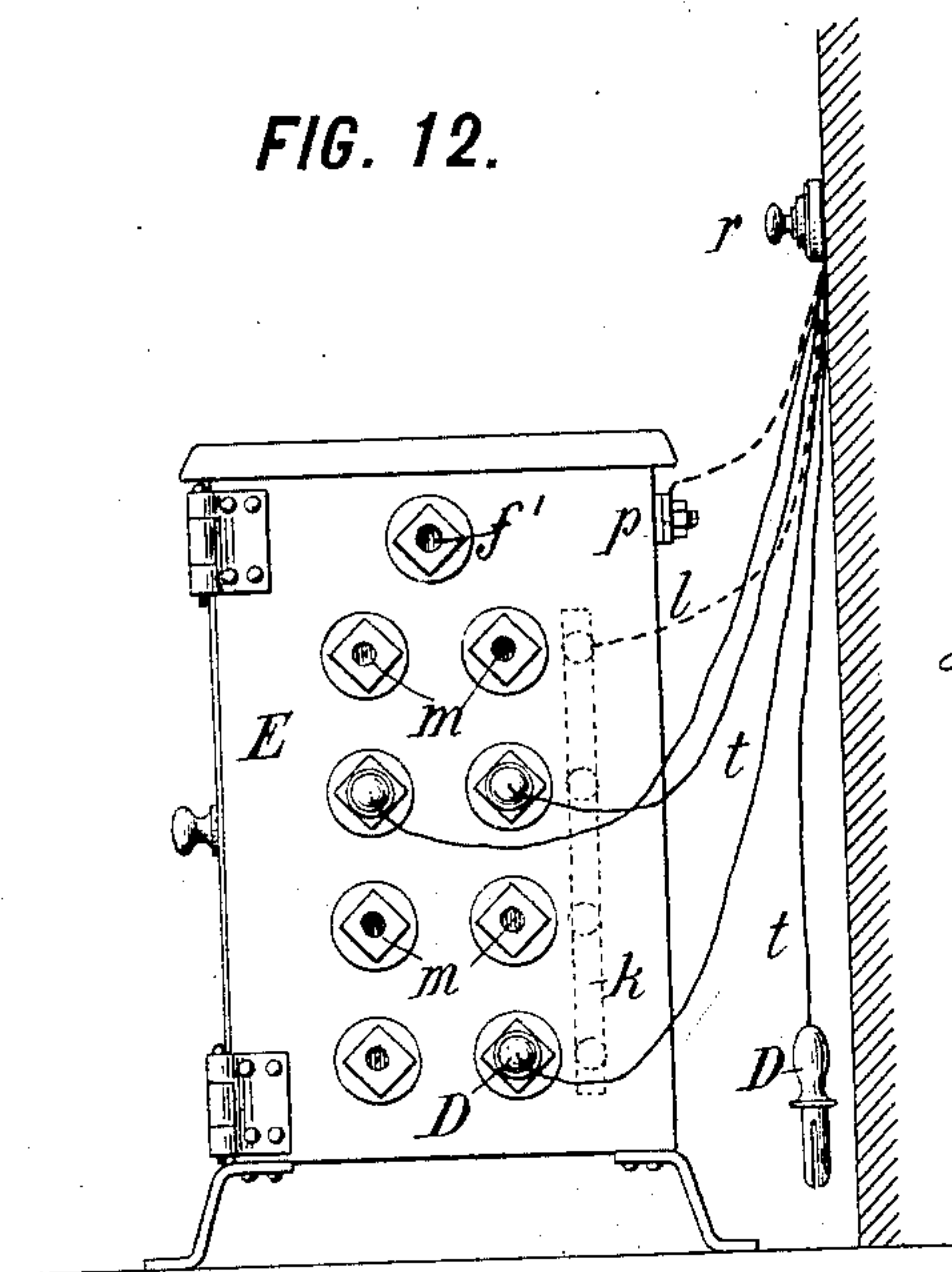
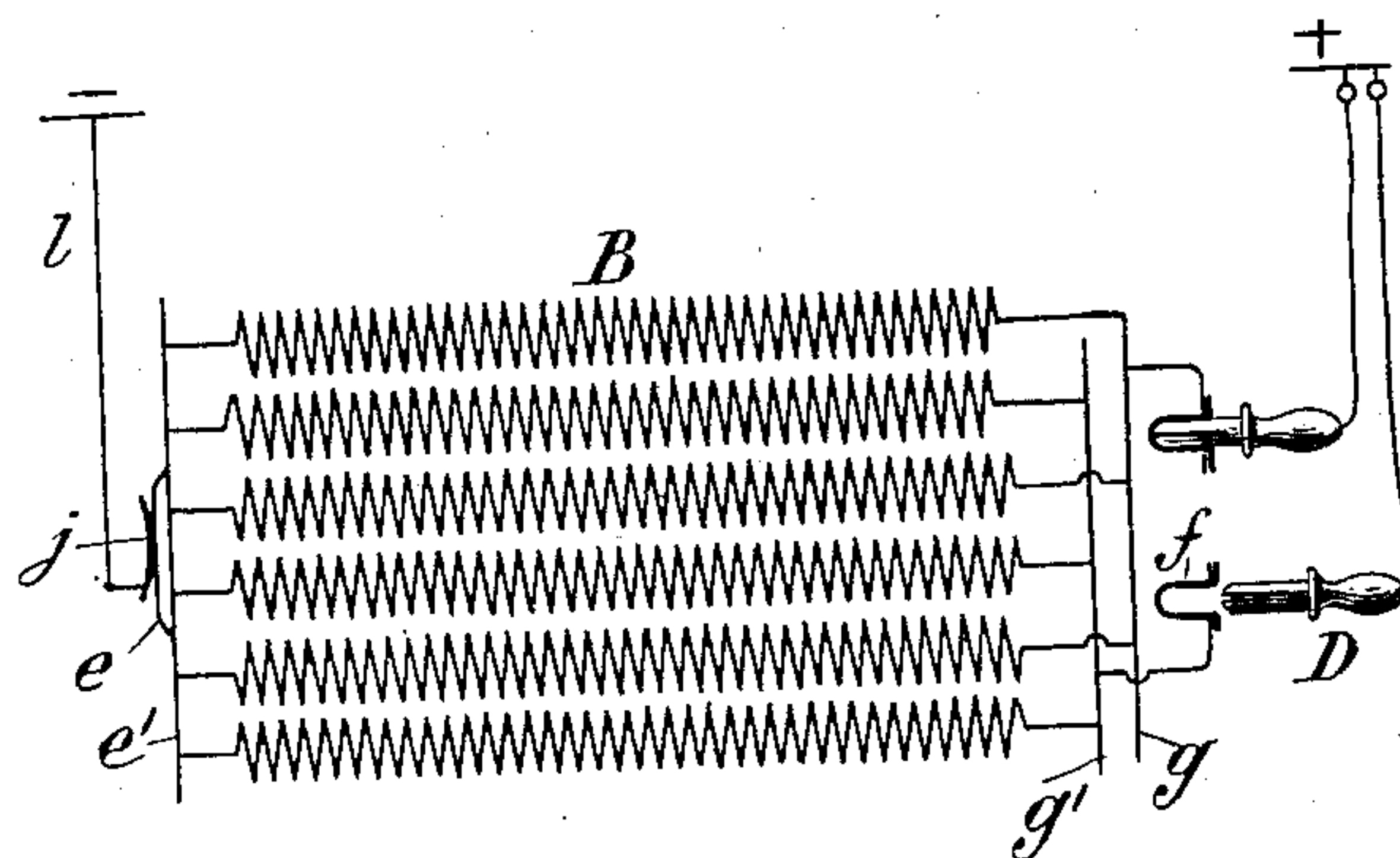


FIG. 13.



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# UNITED STATES PATENT OFFICE.

EDWARD E. GOLD, OF NEW YORK, N. Y.

## ELECTRIC COOKER.

SPECIFICATION forming part of Letters Patent No. 730,252, dated June 9, 1903.

Application filed July 16, 1896. Serial No. 599,340. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD E. GOLD, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Electric Cookers, of which the following is a specification.

This invention relates to electric heaters especially designed and adapted for cooking purposes.

My new electric cooking-heater has the general form of a horizontal flat tray, portable and preferably invertible, comprising coils—*i. e.*, helices—of resistant-wire as the heating medium and having terminals by which conducting-wires may be connected for putting the heater in circuit. The heater or tray has a flat plate on its upper side, immediately beneath which are the coils, upon which may be placed a dish containing any substance to be cooked. The top plate may be perforated or not. Preferably the heater is constructed with two plates with the coils confined between them, one plate being perforated and the other not, so that by inverting the heater either plate may be brought uppermost. The respective plates may be made of any insulating material which is preferably a good conductor of heat, but by preference I make the plates of metal coated with an insulating-enamel—such, for example, as ordinary enameled sheet-iron. For separating the coils which are confined between the plates I interpose separate strips of insulating material, which may also be made of enameled sheet metal. Several coils arranged parallel may be employed, or a single-coil helix may be coiled spirally, so that its several spiral convolutions fill the space between the flat parallel plates in the same essential manner as when several parallel coils are used. For best utilizing these electric trays or heaters I provide an oven or stove consisting of a suitable casing into which the trays may be inserted, so as to serve as shelves on which to place the articles to be cooked. The sides of the oven are provided with ledges or cleats for upholding the trays and so that any tray may be placed on any pair of cleats, and thereby set in the oven at any desired height. Removable grids or gratings may be provided to be introduced as shelves between the elec-

tric trays or upon ledges not occupied by the latter. The top of the stove may be provided with stove-holes, as usual, under each of which is provided a special electric tray or heater.

For introducing the electric heaters in circuit they are provided with circuit-terminals connected to the coils, adapted for connection with exterior conductors connecting with the respective circuit-leads. One or both of the connections may consist of a metallic socket in the heater connected with the coils and adapted to receive a metal pin or plug connected by a wire or cable with the stationary circuit-lead.

Some suitable means is provided for controlling the amount of heat to be generated in each of the electric heaters or trays. Any of the usual switches or circuit-controllers may be adopted in known ways to this end; but the means which I prefer is to construct each electric heating-tray with its coils divided into two groups, each group connected at, for example, its positive end with a terminal or socket-piece, so that each tray has two socket-pieces, in one of which may be inserted a plug for energizing, for example, the odd-numbered coils, and in the other of which may be inserted a plug for energizing, for example, the even-numbered coils. The result of this construction is a very simple regulation, since when one plug is inserted in either socket of a given electric heating-tray a minimum quantity of heat is developed, while by inserting a second plug in the other socket the heat developed may be doubled.

I will proceed to describe the preferred construction and application of my invention in connection with the accompanying drawings, wherein—

Figure 1 is a vertical section of the stove or oven. Fig. 2 is a horizontal section thereof. Fig. 3 is a plan of one of the stove-hole heaters. Fig. 4 is a vertical mid-section thereof. Fig. 5 is a plan of one of the electric cooking heaters or trays removed from the stove and partly broken away or dissected. Fig. 6 is a transverse section of Fig. 5. Figs. 7, 8, 9, and 10 are similar transverse sections showing various constructions. Fig. 11 is a reduced front elevation of the stove, showing the electric connections. Fig. 12 is an end ele-



vation of the same. Fig. 13 is a circuit diagram showing the electric connections with one circuit heater or tray. Fig. 14 is an enlargement of the right-hand portion of the plates shown in Fig. 6.

I will first describe the construction of the electric cooking heater or tray with reference particularly to Figs. 1, 5, and 6. This tray as a whole is lettered A. It is constructed with coils B B of resistant-wire confined between plates *a* and *b* and separated by strips or partitions *c c*. The plates *a*, *b*, and *c* may be of any insulating material, but are preferably of enameled metal, the enamel being any electrically-insulating enamel. The enamel used for the well-known agate-ware is suitable for the purpose. By thus constructing the plates they are good heat-conductors, while the coating of enamel affords an ample electrical insulation for the respective coils. By this construction the coils are inclosed in elongated cells or chambers lined with insulating-enamel. The construction is clearly shown in Fig. 14. One plate may be perforated, as shown at *a*; but both plates may be perforated, as shown in Fig. 8. In lieu of a perforated plate any other foraminous material suitably enameled or otherwise coated with insulating material may be employed.

The preferred means of connecting the parts is shown in Fig. 5, where at opposite ends of the electric heater or tray are strips or bars C and C' of insulating material, such as molded asbestos. The plates *a* and *b* are fastened by screws or otherwise to the opposite sides of these bars. The strips *c* are let into the insulating-bars at their ends to keep them in place. The opposite ends of the respective coils B B are connected to binding-posts or other conductors, which are mechanically supported by the bars C C'. Those at one end (lettered *d*) are shown as screws screwing into the bar, while those at the other end (lettered *d'*) are shown as pins passing through the bar and riveted down upon strips *e e'* of metal, which are thus fastened upon the outer side of the bar C', and consequently upon one end of the electric tray. At the other end of the tray the preferred construction consists of one or two socket-pieces *f*, of metal, screwed or otherwise fastened into recesses in the insulating-bar and electrically connected with the respective screw connectors *d d'*. Preferably there are two of the metal socket-pieces *f*, of which one is connected to the odd-numbered screws *d* and the other to the even-numbered screws. The effect of this mode of connection is shown in the diagram Fig. 13. For effecting this alternate connection two metal strips *g* and *g'* may be employed, extended, respectively, along the upper and lower sides of the bar C, as shown in the section Fig. 1. The lower strip *g* has branches extending upward and connecting with the screws *d* of the odd-numbered coils, (counting from the top in Fig. 5,) while the upper strip *g'* has similar branches connecting with the even-numbered

screws, one of the strips having a branch connecting with one socket-piece, while the other strip has a branch connecting with the other socket-piece. Many other expedients for making the necessary electrical connections may be employed, my invention not being limited to any particular way of effecting these connections. An electric heater or tray thus constructed is adapted for numerous uses or applications in the art of electric heating, and especially for cooking purposes. It may be mounted upon any suitable support in horizontal position, either side up, and by connecting its terminals with the electric circuit carrying either a continuous or alternating current of suitable character a proportionate generation of heat will at once occur in the coils of the electric heater. The heater will thus be used for heating, for example, a flat-iron, or by placing a basin of water upon it the water may be boiled, or any food contained in the basin may be boiled or otherwise cooked. By turning the electric tray with the imperforate plate uppermost it may be used as a griddle for frying griddle-cakes or the like.

In Fig. 5 I have shown two plugs D D, having insulating-handles and adapted to enter the respective socket-pieces *f f* for making connection with the heater, the metal plugs being connected by insulated wires or cables *h h* to the stationary leads of an electric circuit in any manner. By inserting a plug connected with the positive lead into one socket-piece and a plug connected with the negative lead into another socket-piece the current will flow, for example, through the odd-numbered coils and thence through their posts *d* into the upper strips *e e'*, thence into the posts *d'* of the even-numbered coils, and back through these coils to the other socket-piece *f* and negative plug D; or another mode of connection is to supply a connector leading from the upper strip *e* to the negative lead of the circuit and connect both plugs D D to the positive lead, whereupon either plug is inserted, the current will flow through half of the coils from the positive side and out through the strip *e* and negative conductor. This of course gives out heat from only half of the coils. If greater heat is desired, the second plug D is inserted in the second socket-piece thereof, causing the current to flow through all of the coils and practically doubling the amount of heat generated.

In order to provide for the most effective use of these electric cooking-trays A A, I have devised the construction of stove or oven shown best in Figs. 1 and 2. The oven E is constructed as a box or chamber having, preferably, front doors which may be thrown wide open and having cleats or ledges *i i* on opposite sides or ends for the support of the electric trays A A. Four pairs of such ledges are shown in Fig. 1 and two trays are shown in place upon them. An ordinary gridiron-shelf F is also shown, which may be slid in



with a pan  $F'$ , if desired, upon any pair of ledges not occupied by an electric tray. For facilitating the electric connections with the trays the oven is provided on one side, which I may call the "negative" side, with a conducting metal strip  $j$  over each ledge, adapted to make electric contact with the metal strip  $e$  on the negative end of the heating-tray, as best shown in Fig. 13. Each strip is connected by a conducting pin or bolt  $j'$  with an external metal strip  $k$ , which serves as the negative conductor for all of the strips  $j$ . This strip  $k$  is connected by a wire  $l$  with the negative lead, as shown in Fig. 11. On the other or positive side the oven is provided over each ledge  $i$  with two holes  $m m$ , provided with insulating-bushings and arranged to coincide with the socket-pieces  $f f$  when the tray is in place, so that the plugs  $D D$  may be thrust through these bushed holes into the socket-pieces to make the connection. The insulating-bushings serve to prevent leakage of current from the plugs into the casing or shell of the oven. This casing or shell may be of sheet-iron or may advantageously be enameled, if desired, in which latter case the insulating-bushing may not be necessary. It results from this construction, first, that any electric tray of the proper dimensions may be introduced into the oven on any pair of ledges; second, that it may be turned either side up without impairing its electrical connection, since the socket-pieces  $f f$  and holes  $m m$  are equidistant from the middle and since the negative connecting-strips  $e$  and  $j$  are in the middle; third, that after introducing the tray either or both the plugs  $D$  may be plugged into its socket-piece, according to the amount of heat desired; fourth, that the tray cannot be removed until both the plugs have first been drawn out. The manipulations are consequently very simple and easily learned by any person of sufficient intelligence to manage any cooking-stove.

The top of the stove is provided with one, two, or more stove-holes  $n n$ , two being shown. Under these stove-holes are placed electric heating-trays  $A'$ . These are constructed in the same manner as already described, except that being circular it is more convenient to take a single coil and coil it upon itself spirally, as shown in Fig. 3, the separating-strip  $c$  being also coiled spirally. One terminal post,  $d^2$ , is in the center, and is connected by a wire  $e^2$  to a binding-post  $p$  at the back of the stove. The other terminal,  $d^3$ , is at the exterior, as shown in Fig. 3, and to it is connected a wire  $o$ , which extends to either side, as shown in Fig. 1, and has its opposite end connected to a socket-piece  $f'$ , the construction of which is shown in section at the right hand in Fig. 1. It consists, essentially, of a metal cup or socket clamped upon the side of the wall of the oven and projecting through a hole therein and insulated therefrom and adapted to receive one of the plugs  $D$  in or-

der to connect the heater or tray  $A'$  in circuit. To prevent possibility of a shock, the outer surface of the socket-piece  $f'$  projecting into the oven should be covered with insulating material. The two binding-posts  $p p$  are connected together, as shown in Fig. 11, by a wire  $q$ , which connects with the stationary leads of the circuit. In this figure a switch-terminal is shown at  $r$ , the stationary leads being indicated at  $s$ . From this terminal switch  $r$  lead the flexible conductors  $t$ , connected with the respective plugs  $D$ . The negative connections  $l q$  are shown in dotted lines in this figure and in Fig. 12.

If it is desired to bake or roast in this stove, one of the heating-trays may be placed at or near the bottom of the oven, preferably with its perforated plate  $a$  uppermost, the dishes to be roasted being placed above the heating-tray. If it is desired to broil, a heating-tray will be placed in preferably the upper part of the oven and the steak or other thing to be broiled is supported close beneath it, the heater being preferably arranged with its perforated plate lowermost. In this last case the air heated by the coils is confined and retained in a layer of concentrated hot air extending shortly below the heater and overlying the meat. In baking, however, there is a constant and rapid circulation of air in the oven, the cooler air falling to the bottom, entering the holes in the perforated plate, being heated by the coils, and then ascending.

It must be understood that my invention is not limited to the details herein set forth, as these may be greatly modified. The shape and proportions of the electric trays may be greatly varied, it being understood that the trays are shown in Figs. 1 and 2 somewhat larger than their correct proportions relatively to the oven in order to show their details more clearly. It is to be understood that a single resistance-coil coiled upon itself in a flat spiral, as shown in Fig. 3, is the equivalent of a plurality of coils extended parallel with one another, as shown in Fig. 5.

If desired, the plates  $c$  and the inturned flanges of the plates  $b$  may be perforated, as shown in Figs. 6, 7, and 14, or the tray may be open otherwise at its edges or laterally, so that a lateral flow of heated air can pass between the plates and through the coils. When this flow is possible, the trays can be removed and turned on edge for use as a heater or radiator in case of necessity.

It is to be understood that by "resistance-coils" as used in this specification and claims I use the word "coil" in the sense of a helix or helical coil of wire as it is universally used in the electrical art and not in the sense of a spiral coil or of a coil of other resistant-conductor than wire. The word "exposed" as applied to such coils means open or exposed to the atmosphere, so as to directly radiate their heat thereto, in contradistinction to resistance-coils that are shut in or embedded in



cement, asbestos, or other material that prevents direct radiation of heat to the air.

I claim as my invention the following-defined novel features, substantially as hereinbefore specified, namely:

1. An electric cooking-heater consisting of a self-contained portable heating-tray, comprising two parallel horizontal plates connected together to form a casing, with opposite parallel sides adapted to be slid into parallel ways or ledges of a suitable oven, having resistance-coils confined between said plates, and exterior terminal connections for such coils arranged upon said parallel sides of the tray, whereby they may make contact with exterior conductors provided in said ways or ledges.

2. An electric cook-stove consisting of an oven having internal ledges at different levels, and circuit-terminal provisions at said ledges for electric connection with the leads of a circuit, combined with an electric heater constructed as a tray adapted to be seated on either of said ledges and having one terminal adapted when so seated to normally and automatically make electric connection through one of said terminal provisions with one of said circuit leads, and having another terminal-connector adapted when so seated to permit the making and breaking of the connection through the other of said terminal provisions.

3. An electric cook-stove consisting of an oven having internal ledges at different levels, and plug-holes at said ledges, combined with electric heaters constructed as trays adapted to be seated on said ledges, and having terminal-connectors formed as socket-pieces, arranged when so seated to register with said plug-holes, and circuit-conductors with ter-

minal plugs adapted to be thrust into said socket-pieces.

4. An electric cook-stove consisting of an oven having internal ledges at different levels, and circuit-terminal connectors in said oven at the respective ledges on one side, and plug-holes at the opposite side, combined with electric heaters constructed as trays adapted to be seated on either of said ledges, and having each at one end a terminal connection adapted to make contact with the connector at said ledge, and at the other end a terminal-connector consisting of a socket-piece arranged when so seated to register with one of said plug-holes, and circuit-conductors with terminal plugs adapted to be thrust into said socket-pieces to effect the electric connection.

5. An electric cook-stove consisting of an oven having internal ledges at different levels, and fixed circuit-terminal connectors in said oven at the respective ledges on one side, combined with an electric heater constructed as a tray adapted to be seated on said ledges and having a terminal connection adapted to automatically make contact with the connector at a ledge when said tray is placed on said ledge, and circuit-terminal connectors adapted to be connected to or disconnected from the other terminal of said heater while the latter is in place on a ledge.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

EDWARD E. GOLD.

Witnesses:

GEORGE H. FRASER,  
THOMAS F. WALLACE.