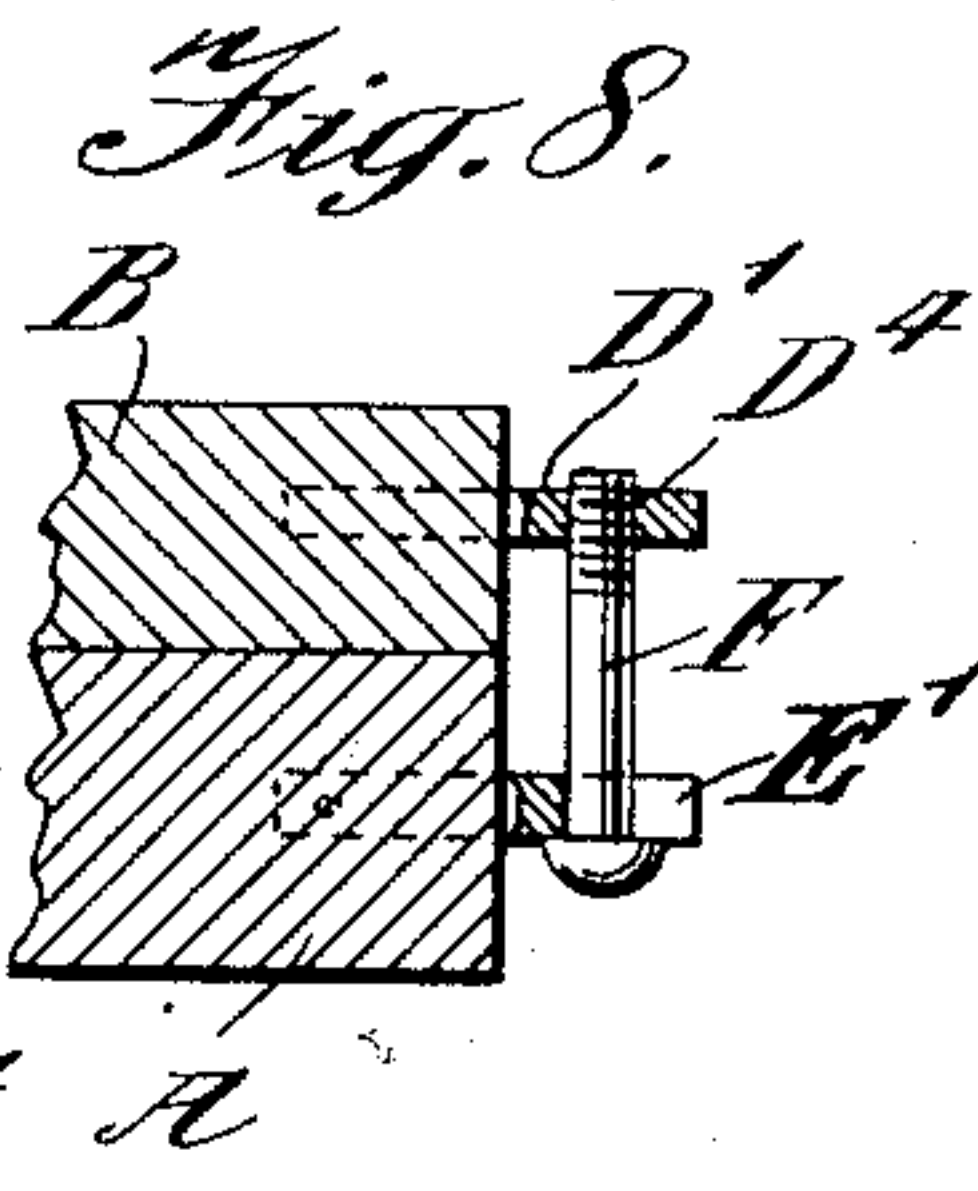
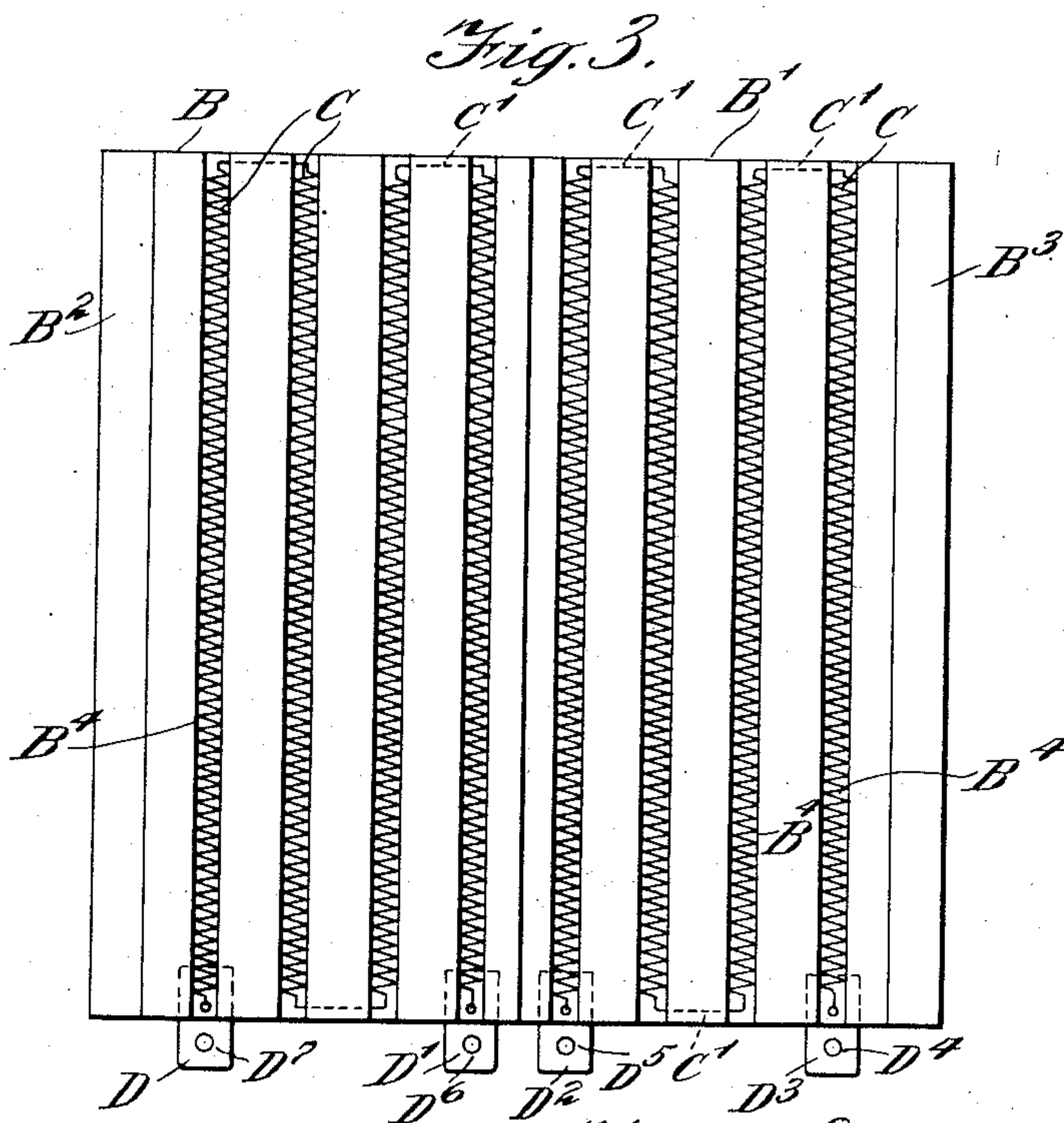
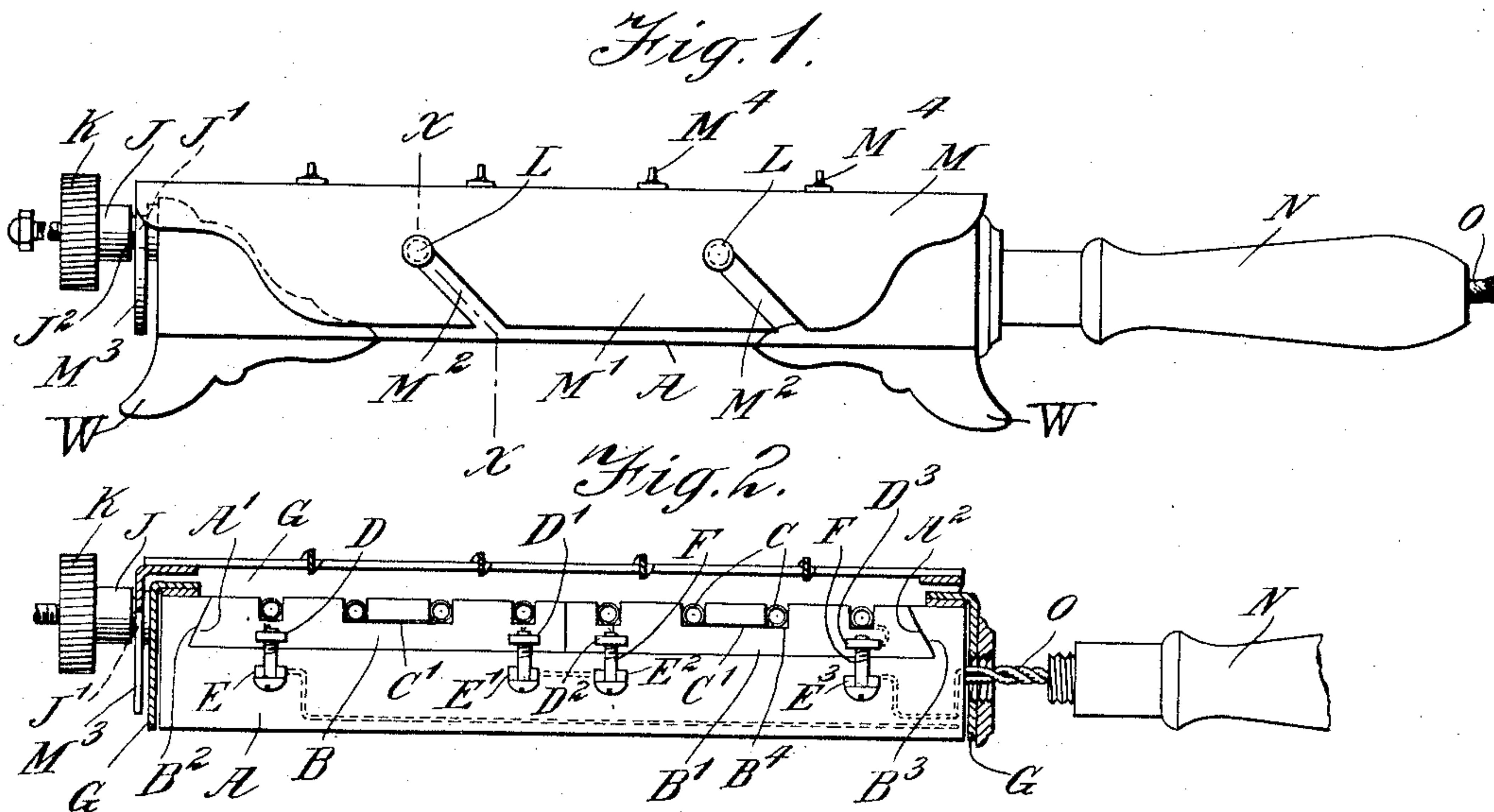


M. M. KOHN.
ELECTRIC HEATER.
APPLICATION FILED OCT. 30, 1909.

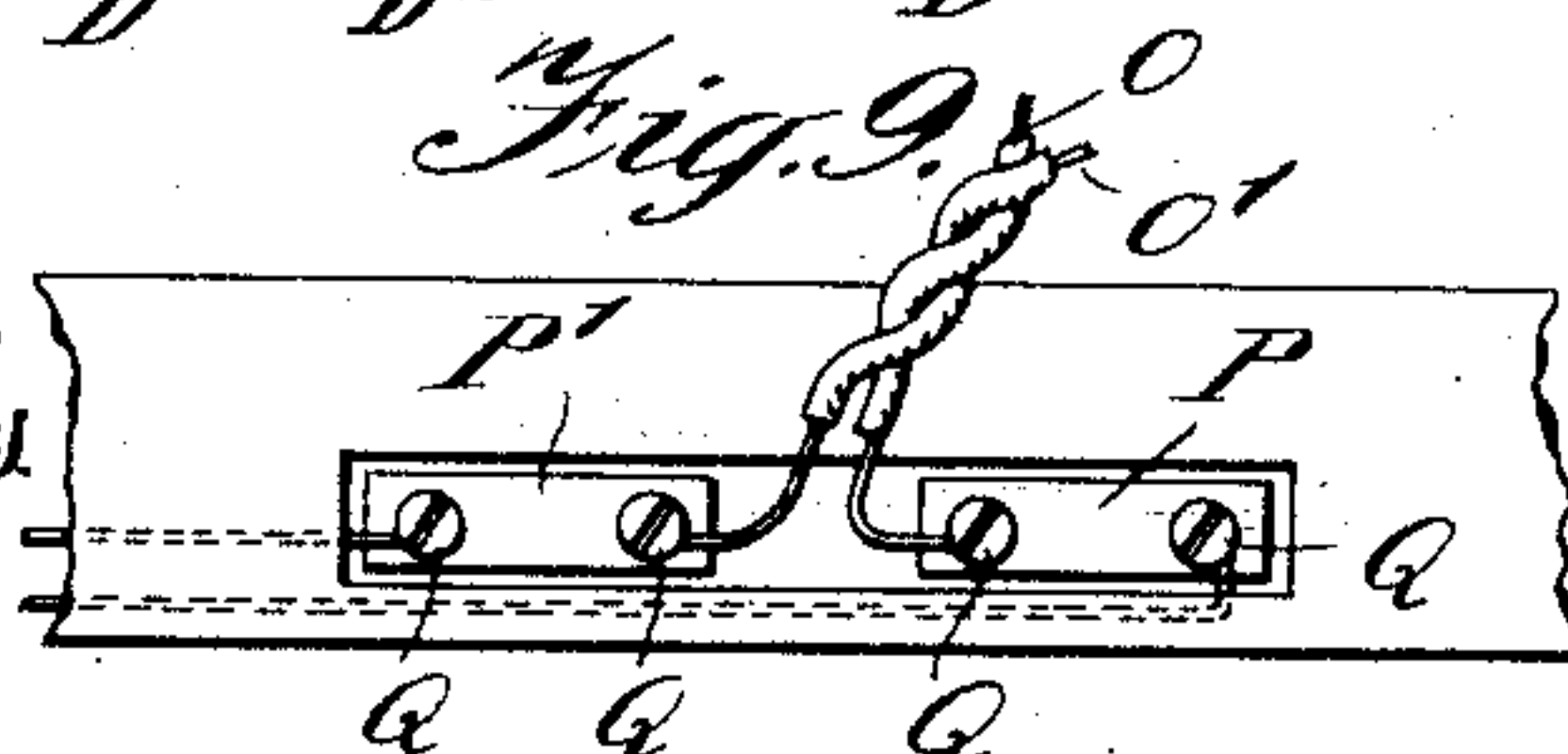
983,292.

Patented Feb. 7, 1911.

2 SHEETS—SHEET 1.



WITNESSES:
George Cheney
Minnie S. Miller

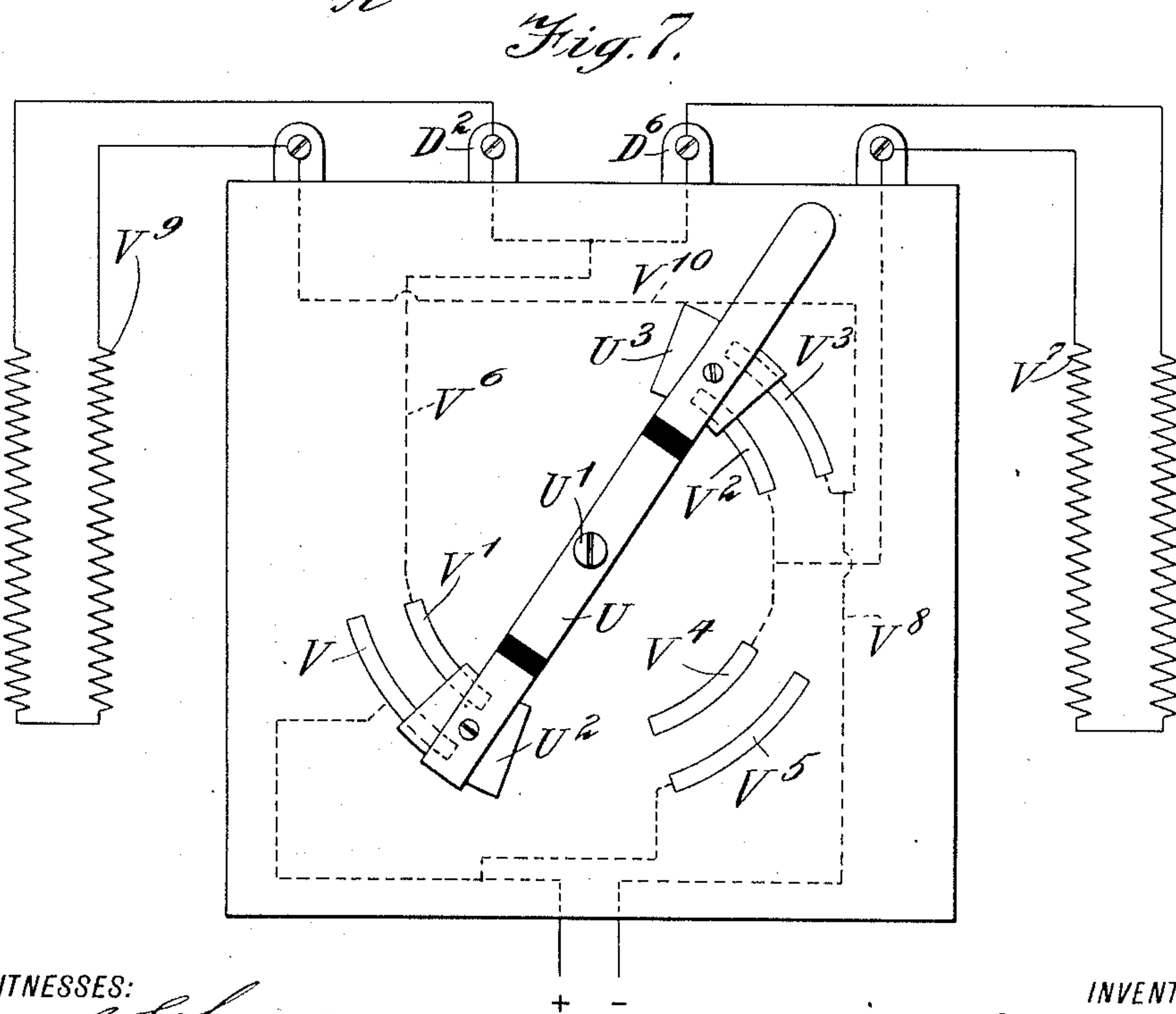
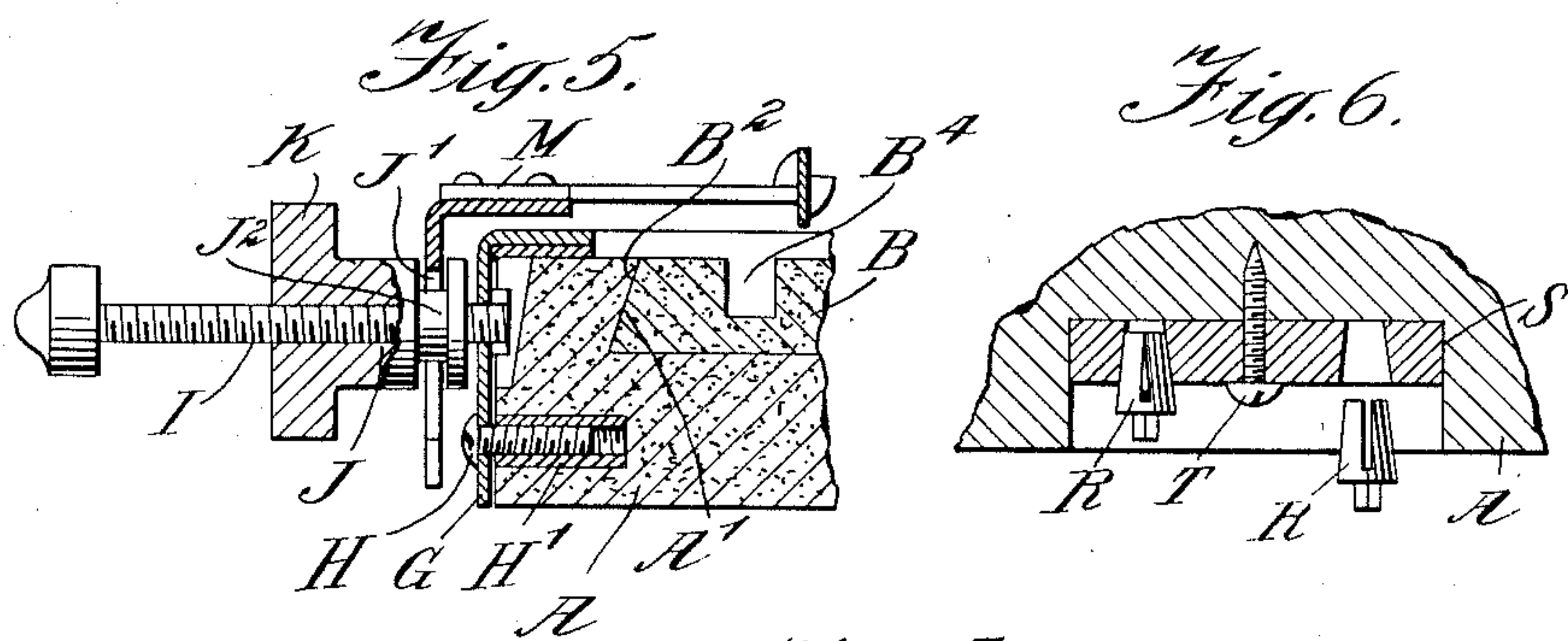


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2 SHEETS--SHEET 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

MILTON M. KOHN, OF NEW YORK, N. Y.

ELECTRIC HEATER.

983,292.

Specification of Letters Patent.

Patented Feb. 7, 1911.

Application filed October 30, 1909. Serial No. 525,425.

To all whom it may concern:

Be it known that I, MILTON M. KOHN, citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Electric Heaters, of which the following is a specification.

My invention relates to electric heaters and the object of same is to provide a heater of simple construction.

The advantages and novel features will be pointed out in the following specification and claims.

Referring to the drawings, Figure 1 is an exterior side view of my improved heater. Fig. 2 is a side view, partly in section, disclosing the ends of the heating units. Fig. 3 is a plan view of the heating units. Fig. 4 is a cross sectional view through the top plate or grid, taken on line $x-x$ of Fig. 1. Fig. 5 is a longitudinal sectional view of a portion adjacent to the means provided to effect a relative adjustment between the body portion and grid portion. Fig. 6 is a sectional view disclosing one of the means for holding the ends of conductors. Fig. 7 is a view of the switch, illustrating how the coils of the heating units may be connected either in series or multiple series. Fig. 8 is a detail view of the means used to connect the body portion both mechanically and electrically with the coil holding units. Fig. 9 is an end view of the body portion disclosing the means provided to connect the leading-wires to the body portion.

A, indicates the body portion which may be made of any suitable non-conductor of heat and electricity, such as fire clay or pressed asbestos, and is provided with beveled walls at A' and A^2 respectively, and its width is equal to the length of the coil holding units, B and B' shown in Fig. 3. The coil holders B and B' are each provided with a beveled edge B^2 and B^3 respectively, to engage the beveled walls in the body portion, and abut against each other at their sides opposite the beveled portion. Each coil-holder is provided with a plurality of grooves B^4 , preferably in pairs as shown, and located in each groove is a heating coil C, the ends of which are connected by integral straight portions $C'-C'$, etc., which rest in short slots which extend from one

groove to the next, as shown in Fig. 2; and the extreme ends of each heating coil are connected to metal plates D, D' , D^2 , and D^3 , one end of each of which is embedded in the coil carrying portions, and their opposite ends projecting a short distance therefrom as illustrated in Figs. 3 and 8. These projecting ends are drilled and tapped as illustrated at D^4 in Fig. 8.

Located in the body portion A directly below the plates D, D' , D^2 and D^3 , are similar plates E, E' , E^2 and E^3 , except that the lower plates have bifurcated ends to permit the connecting screws F to engage as illustrated in Fig. 8. By screwing the screw F upward the portions A and B are mechanically held together, and since plates D' and E' are included in the electrical circuit, screw F serves to electrically connect the heating coils. By loosening screw F, the portion B may be withdrawn from body A without disconnecting said screw from plate D' , as will be easily understood.

A metal frame G extends all around the outer sides of the body portion A, to cover said sides, and also overlaps the upper outer edges of said body portion, and said frame is secured to the body portion by a number of screws H, one of which is shown in Fig. 5, by embedding a short tube H' in the body portion and threading said tube so that screw H can be held firmly. Connected rigidly to said frame G at one end, is a threaded rod I, on which is mounted a nut J which is threaded to fit said rod, and is provided with an annular groove J' , and a knob K of hard fiber or other suitable non-conductor of heat.

Firmly connected to the frame G on each side thereof and projecting a short distance therefrom are screws L—L which are located in alinement with each other and spaced apart a pre-determined distance. The shanks of these screws serve as supports for the grid M, which is formed with depending side portions M' having inclined slots M^2 , and is also provided with a depending end portion M^3 having a slot M^4 in which the shank J^2 of nut J rests. By screwing nut J outward from the body A, the nut will pull the grid with it and by reason of the slots M^2 being inclined, the grid will be raised from the body portion, thus taking the top of the grid farther from the heating coils, as will be readily understood. The grid portion is

provided with cross strips M^4 which consist of flat strips of metal bent at their ends to a right angle to the plane surface of the strip, and the ends are riveted to the sides of the grid portion by rivets M^5 .

It is obvious that other forms of grids may be used, such as a grid having a flat upper plate, or a grid having a shallow chafing dish formed integral therewith, by forming the sides and end with slots M^2 and M^4 , which would make the grid portions interchangeable. The present grid may be used in toasting bread, broiling steak, and for other purposes where it is desired that the heat shall come in direct contact with the article being heated.

N, indicates a handle which is connected to the body portion or frame G, and has a conduit leading therethrough, through which the leading-wires O and O' pass. These wires are connected respectively to plates P and P', the ends being held in contact with said plates by screws Q which are connected to the plates, the plates being embedded in the body portion A. The ends could be held by the split portion of taper plugs R—R shown in Fig. 6, if preferred, the plugs fitting in the plate S and held by friction therein, and the plate being held to the body portion by screw T, as shown.

Electric circuits are illustrated in Fig. 7 and are shown in Figs. 2 and 3, partly by dotted lines, which show the wires leading to and from the heating coils embedded in the body portion A. The heater is provided with a leg W at each corner to elevate the body portion. By providing a switch as illustrated in Fig. 7 the coils may be connected up in series or multiple series, as shown by the drawing, the diagram showing the coils connected in parallel. When the coils are connected in multiple or multiple series each unit then being connected directly across the line, the maximum heat is obtained. By throwing the switch so that the coils are in series in the line, the resistance is thereby increased proportionately so that the current flowing is one half that under the former arrangement, therefore generating less heat. Should a coil burn out, a new one may be quickly substituted by loosening the screws F in the coil holder and withdrawing said holder, removing the coil therein and inserting a new one. A whole coil holder and coil could be quickly substituted if preferred. The grooves serve as reflectors to project the heat toward the article to be heated. The depending walls M' prevent currents of air from blowing through between the coils and top of grid, thereby confining the heat under the grid. The arrangement whereby the top portion or grid may be quickly changed for another style of grid, such as a coffee pot or chafing dish, is of special value.

Fig. 3 is shown with the heating coils connected in series, the switch being left out, but the switch illustrated in Fig. 7 may be used. This switch is made of a flat strip of insulating material U which is connected in pivotal relation to the bottom of the heater by a screw U' , and fastened to the under side of said strip U are two metal plates U^2 and U^3 . Contacts V, V', V^2 , V^3 , V^4 and V^5 are embedded in the bottom of element A and arranged in the path of the switch members U^2 and U^3 . This switch as now shown has connected the heating coils in multiple, the current passing from the positive pole to contact V—plate U^2 —contact V' and conductor V^6 to posts D^2 and D^6 where it divides, one circuit being through coils V^7 to contact V^2 —plate U^3 —contact V^3 and conductor V^8 to the negative terminal. The other circuit is through post D^2 and coil V^9 to conductors V^{10} and V^8 to the negative pole. By turning the switch on its pivot U' so that plate U^2 contacts with contacts V^4 and V^5 , the coils are connected in series, as will be readily understood. It will be also understood that with connections in multiple on any standard line voltage, a certain current is required to produce a certain amount of energy, and by the device above described which switches the coils from multiple to series, the same apparatus without any change whatever, can be used on double the voltage for which it is normally used without danger of being burned out, as will be readily understood.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is,

1. An electric heater comprising a base portion, a plurality of coil holders removably secured thereto, screws for holding same in fixed relation, a heating coil in each coil holder, and a switch for uniting said coils in series or multiple circuit arrangement.

2. An electric heater comprising a base portion, a plurality of coil holders removably secured thereto and held in fixed relation, a heating coil in each coil holder, and a grid supported in movable relation to said base portion.

3. An electric heater comprising a base portion having pins projecting from each side thereof, heating coils supported thereby and connected thereto in fixed relation, a grid supported in movable relation to said base portion, and having depending side portions provided with slots as shown, which engage with said pins.

4. An electric heater comprising a base portion, a plurality of coil holders removably secured thereto, a removable heating coil in each coil holder, a grid mounted above the body, and means for manually adjusting and holding said grid relative to said body portion.

5. An electric heater comprising a base portion of non-conducting material, a plurality of coil holders of non-conducting material, projecting plates connected with said base portions and said coil holders and arranged in pairs, one above the other, heating coils located in said coil holders, the ends of which are connected to said plates, and means for mechanically and electrically connecting the plates on said base portion to the plates on said coil holders.

6. An electric heater comprising a base portion, a plurality of coil holders, said base portion and coil holders having projecting plates, the projecting ends of said plates in said base portion being bifurcated and screws connected to the projecting ends of the plates in said coil holders, and the shanks of which rest in said bifurcated ends of the plates in the base portion.

7. An electric heater comprising a base portion, a plurality of coil holders removably secured thereto and having grooves formed therein, a coil in each of said grooves, and means connected to the bottom of said heater for connecting said coils in series or multiple circuit arrangement.

8. An electric heater comprising a base portion, projecting pins connected to said base portion and having laterally projecting pins, a plurality of coil holders removably secured, and a grid having obliquely disposed slots through which said pins in the body portion project.

9. An electric heater comprising a base portion, a plurality of coil holders removably secured thereto, a heating coil in each coil holder, and a grid mounted above said coils, and means for raising and lowering said grid relative to said coils.

10. An electric heater comprising a base portion, a plurality of coil holders removably secured thereto and provided with grooves, a coil in each of said grooves, a grid located above said coils, and means for manually raising and lowering said grid and for holding it in fixed relation relative to said base portion.

11. An electric heater comprising a base portion, a plurality of coil holders removably secured thereto and provided with grooves, a coil in each of said grooves, a grid located above said coils, and means for raising and lowering said grid relative to said coils.

12. An electric heater comprising a base portion having beveled walls, a plurality of coil holders having beveled walls adapted to cooperate with the walls in the base and removably secured to said base portion,

said coil holders having grooves formed therein, and a coil located in each of said grooves.

13. An electric heater comprising a base portion having beveled walls, a plurality of coil holders having beveled walls adapted to cooperate with the walls in the base and removably secured to said base portion, said coil holders having grooves formed therein, and a removable coil located in each of said grooves.

14. An electric heater comprising a base portion having beveled walls, and a plurality of coil holders having beveled walls adapted to cooperate with the walls in the base portion to hold the coil holders to said base portion.

15. An electric heater comprising a base portion formed of a single piece of non-conducting material and provided with beveled walls, two coil holders each of which is provided with a beveled wall adapted to engage with one of said beveled walls of the body portion and means for mechanically holding the coil holders to the body portion.

16. An electric heater comprising a base portion formed of a single piece of non-conducting material and provided with beveled walls, two coil holders each of which is provided with a beveled wall adapted to engage with one of said beveled walls of the body portion and metallic means for mechanically holding said parts together, and constructed to serve as electrical conductors.

17. An electric heater comprising a base portion, a plurality of coil holders removably secured thereto and having grooves formed therein, a coil in each of said grooves, means for connecting said coils in series or multiple circuit arrangement and a grid supported above said coil holders, and means for raising and lowering said grid and holding it in the adjusted position.

18. An electric heater comprising a base portion, a plurality of rectangular coil holders removably secured thereto, each of which is provided with a plurality of longitudinally extending grooves, a coil in each of said grooves, and metallic means for connecting said coil holders to said body portion.

Signed at New York city in the county of New York and State of New York this 29th day of October A. D. 1909.

MILTON M. KOHN.

Witnesses:

FRANK M. ASHLEY,
MINNIE S. MILLER.