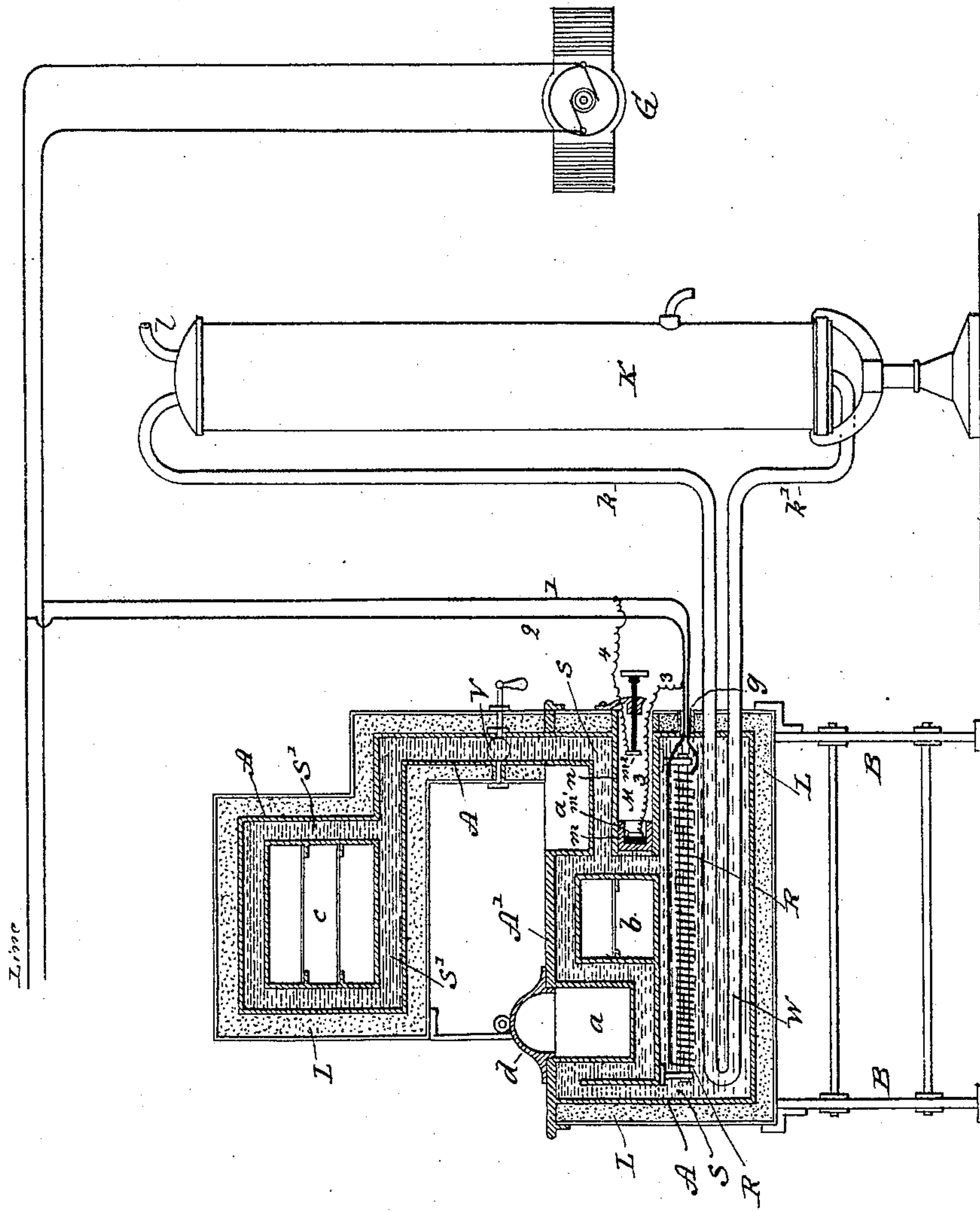


(No Model.)

E. ABSHAGEN.
ELECTRIC COOKING APPARATUS.

No. 442,932.

Patented Dec. 16, 1890.



Witnesses
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ERNEST ABSHAGEN, OF CHICAGO, ILLINOIS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF FIVE-EIGHTHS TO GEO. M. CLARK, HENRY M. HUBBARD, AND WILLIAM H. HUBBARD, ALL OF SAME PLACE.

ELECTRIC COOKING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 442,932, dated December 16, 1890.

Application filed August 4, 1890. Serial No. 360,877. (No model.)

To all whom it may concern:

Be it known that I, ERNEST ABSHAGEN, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Electric Cooking Apparatus, of which the following is a specification.

My invention relates to the construction of electric ranges and stoves in which one or a series of resistances are placed in the circuit of an electric current and operated in conjunction with a surrounding non-conducting heat-retaining material; and the objects of my invention are, first, to provide the resistance with a non-conductive material of a fluid and oily nature—such as sperm-oil, lard-oil, cotton-seed oil, linseed-oil, or any other fatty oil of a non-volatile character—which fluid material, unlike other material heretofore employed for similar purposes, will always be in close contact with the resistance-piece, either when hot or cold, and not shrink away by expansion or contraction; second, to afford facilities of taking up and retaining the heat generated by the resistance-piece in large quantities and at a high temperature; third, in order to remove the internal pressure to which the casing of my electric range is subjected by reason of the expansion of the oil when heated I provide an automatically-working expansion-regulator; fourth, to regulate the amount of heat required for each range by shunting automatically the current which supplies the electric energy to the resistance-piece by means of a shunt arrangement put in operation by the aforementioned expansion-regulator, whereby the amount of current supplied to the resistance-piece can be automatically regulated, and the heat in my electric range can then be maintained at an even temperature if needed, or the heat may be increased or decreased at the will of the operator. I attain these objects by the apparatus illustrated in the accompanying drawing, in which the illustration gives a longitudinal vertical view of my electric cooking-range with hot-water attachment.

In the drawing, A represents the casing or outer wall of a stove, which may be of the

range form shown or any other form and be supported by any suitable standards, such as B B. Said casing forms a hollow receptacle and is provided with a number of cooking-compartments *a b c*, arranged in such manner that access may be had to them from without by means of suitable covers, doors, &c., as shown, for instance, at *d*. The space S within the outer casing A and surrounding the different compartments *a b c* is completely filled with an oily fluid, such oily fluid having free access to the surface of the smaller compartments *a b c*. Within the space S, preferably below all the compartments *a b c*, I introduce a resistance-coil R. An electric wire 1, coming from an electric generator G of any known form or other source of electric energy, is introduced at *g* into the inner space S and is connected to the resistance-coil R, while the return-wire 2 will leave the oil-space S preferably at or near the same place *g* where wire 1 enters, and by returning to the generator G an electric circuit is completed.

It will be readily seen that, in case the resistance-coil R is of proper size relative to wire 1 and to the electric current supplied by the latter, a proportionate amount of heat will be generated in the resistance-coil R, which, being surrounded by oil, will be prevented from fusing, and will therefore transfer such heat to the body of the oil within the range. The heated oil surrounding all the compartments *a b c* will subject the interior of the latter and such articles of food as are placed within the same to the action of the heat. In order to prevent outward radiation, I have surrounded the entire apparatus, except its top plates, with a non-heat-conducting material L, such as asbestos, mineral wool, &c., thereby concentrating the heat toward the interior of the range.

The top plate A', which is subjected to the heat exerted by the heated oil against its under side and which is not covered by mineral wool on its outer side, may be used in the same manner as the top of the ordinary cooking-stove is used to heat vessels, flat-irons, &c. Placed within the oil-space S is a coil or series of coils W, which, being connected in the

usual manner by means of pipes k k' to a water-boiler K , will provide the necessary amount of hot water for domestic uses, the boiler K being connected by means of a pipe l to a cold-water supply.

At V , I have shown a cut-off valve, which permits the shutting off communication between the upper oil-space S' and the lower oil-space S . By this means baking-oven c need not be subjected to the influence of the heat while the lower part of the range containing the oil-space S is in operation, unless desired.

In order to give room to the expansion of the heated oil within the closed vessel A , I have shown at M an expansion-regulator, which consists of a piston m , which works horizontally within its piston-cylinder n . The expanded oil will gradually push outwardly the piston m , while the outer atmospheric pressure will force the piston inwardly again as soon as the contraction of the oil takes place. The piston m is provided with a contact-point m' , which is the terminal of a shunt-wire 3. An adjustable contact-point m^2 , which forms the terminal of another shunt-wire 4, can be adjusted in such a manner that as soon as the oil has been expanded to a certain degree the contact is made between the points m' m^2 , thereby cutting out the resistance-coil R .

Any suitable electrical device for short-circuiting the current may be used in connection with my expansion-regulator.

One or a number of such ranges may be placed in connection with a main line, receiving electrical energy from the same source or generator, and these electric ranges and stoves may be placed either in series or in multiple arc, or they may be placed in the same circuit with an arc or an incandescent light or with the electrical heater, (shown in my application now pending,) all the features receiving the same energy from the same generator.

I sometimes find it advisable to pack the oil-spaces S and S' with mineral wool before filling the casing A with oil, as by this means a saving in the amount of oil used in my electrical apparatus is obtained without interfering with the heat-radiating properties of the same.

I claim—

1. The electrical cooking apparatus consisting of a closed vessel or receptacle filled with an oily fluid and provided with suitable cooking-compartments heated by said fluid, and a resistance-piece immersed in said fluid and in circuit with a generator of electricity, substantially as set forth.

2. In an electrical cooking apparatus, a resistance-piece surrounded by oil, in combination with a yielding expansion-regulator, the latter arranged to operate in such manner as to remove automatically all internal pressure from the cooking apparatus caused by the expansion of the heated oil within said apparatus, as herein set forth and described.

3. In an electrical cooking apparatus, a casing containing an oily fluid surrounding an electrical resistance-piece, which latter is in circuit with an electrical generator, an automatic expansion-regulator operated by the expansion and contraction of the hot and cold oil within said apparatus, and an electrical shunt operated by the expansion-regulator and so arranged as to withdraw at any certain point the electrical current from the resistance-piece within the apparatus by short-circuiting the current automatically at certain stages of the temperature of the oil within the apparatus, as herein set forth and described.

4. In an electrical cooking apparatus, an outer casing inclosing one or more independent compartments, the interior of which may be reached from without the outer casing, and an oily fluid occupying the entire space between the outer casing of the apparatus and casings of the separate smaller compartments within said outer casing, and a resistance-piece placed within this oily fluid, in combination with an electrical generator, by means of which a current of electricity may be sent through this resistance-piece for the purpose of heating the surrounding oil, which latter exerts its heat-radiating influence upon such articles of food as may be placed within the apparatus, or for such other purposes for which the same is suitable, substantially as herein set forth and described.

5. In an electrical cooking apparatus, an outer casing containing a number of sub-compartments, the latter being surrounded by an oily fluid which is brought to a high state of temperature by means of a current of electricity passing through a resistance-piece placed within said oily fluid, said oily fluid, said resistance-piece, and a cut-off valve placed within the apparatus and arranged in such a manner that communication may be established or cut off between different parts of the interior of said apparatus by opening or closing said valve for the purpose of subjecting either the entire apparatus or part thereof to the heat-radiating influence of the oil within said apparatus, as herein shown and described.

6. In an electrical cooking apparatus, a casing containing an oily fluid, which latter is heated by an electric current passing through a resistance-piece placed within said oily fluid, said fluid, said resistance-piece, and a non-heat-conducting outer cover surrounding the entire apparatus for the purpose of concentrating the heat toward the interior of the apparatus and preventing an outward heat radiation, as shown and described.

7. A stove A , having cooking-compartments, as a b , and filled with an oil or oily fluid which surrounds the cooking-compartments, in combination with a resistance-piece, and electrical connections for heating said fluid, substantially as specified.

8. The stove A , having cooking-compart-

ments and filled with an oil or oily fluid which surrounds said compartments, a resistance-coil, and electrical connections for heating said fluid, and a valve interposed in the fluid-
5 passages between said coil and some one or more of said compartments and enabling the heat to be shut off from the latter, substantially as specified.

10 9. The combination of the stove A, filled with a body of oily fluid, a resistance-coil for heating said fluid, and electrical connections whereby said coil is placed in circuit with an electric generator, with a boiler K and a coil

of pipe W, connected to said boiler and heated by its immersion in the oily fluid, substantially as specified. 15

10. The stove A or other heater containing a body of oil or oily fluid, and a packing of mineral wool, asbestos, or similar material, in combination with a resistance-coil and its 20 electrical connections for heating said fluid, substantially as specified.

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Witnesses:

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