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ELECTRIC OVEN LIGHTER

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Fig. 1

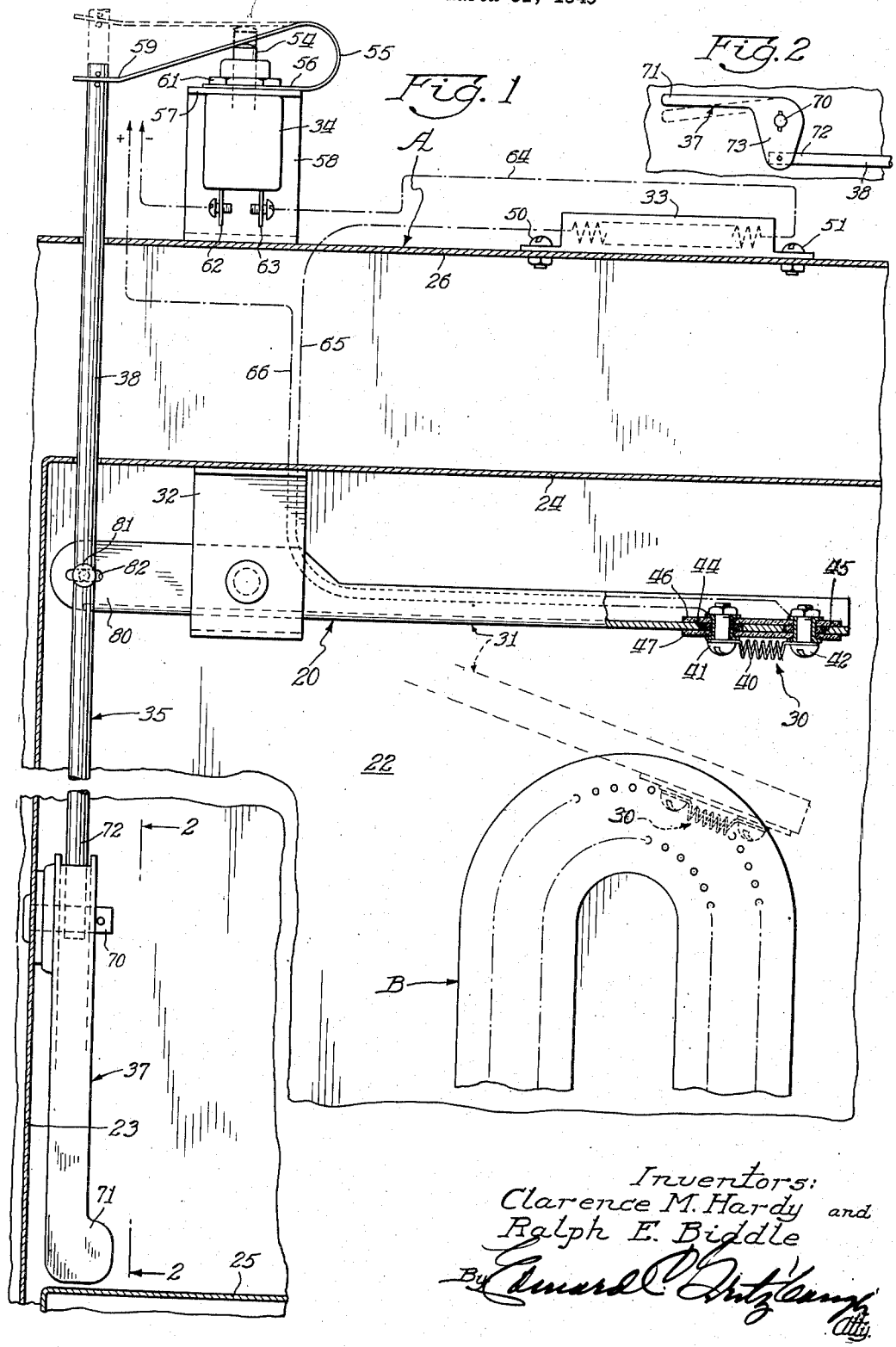

Fig. 2

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ELECTRIC OVEN LIGHTER

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5 Claims. (Cl. 126—39)

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This invention relates in general to ignition devices for range ovens and other heating devices employing gas burners so that such gas burners may be conveniently and advantageously ignited with a minimum of effort, said ignition device being particularly characterized by the employment of electric means selectively operable by the operator.

Heretofore, in ignition devices of this general class, flash tubes, trailer arms, and other methods of ignition flame travel have been employed to accomplish the purposes intended by the present invention. Such prior art devices comprised of elaborate and expensive means to effect the operation of igniting a gas burner. Moreover, many apparent difficulties have been encountered in that such devices were not fool proof and, in some instances, were dangerous in their operation.

It is recognized that in the prior art numerous attempts have been made to provide an ignition device for gas and oil burners of this general class and efforts have been made to overcome the various deficiencies found in such prior art structures, but to the best of the applicants' knowledge the prior art structures have had only limited success, and have been accorded only limited commercial recognition. It is believed that this fact results from apparent deficiencies of the prior art structures, their nonadaptability for universal application and their expensive construction which so greatly increased the cost as to seriously handicap sales acceptance.

The present improvement in ignition devices and controls therefor is directed to simplify their construction and their mode of operation, and also to provide an ignition device and controls therefor which may readily and conveniently be employed universally to various appliances employing gas or oil burning elements presently being commercially exploited. Moreover, the present device seeks to employ conventional parts wherever necessary and possible, thereby to effect a substantial reduction in cost over the prevailing types of ignition devices presently being employed.

Accordingly, an object and accomplishment of the invention is to provide an ignition device for gas or oil burning elements, said ignition device being particularly and advantageously applicable for employment in gas stoves and to effect ignition of the gas burning elements of the oven chamber, said ignition device being particularly characterized in its simple but sturdy construction and in its convenient, fool proof and safe operation.

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Another object and accomplishment of the invention is to provide an improved ignition device for employment adjunctively with conventional gas or oil burning elements to effect ignition thereof without the employment of a match or the employment of a constant burning gas source.

A further object and accomplishment of the invention is to provide an ignition device and controls therefor for the purposes intended and contemplated herein which are particularly characterized in the arrangement wherein the ignition device provides and maintains a longer operative period, the ignition coil being fastened to a movable mounting to permit the coil to be out of the direct flame when the burner is in operation.

It is a more particular object and accomplishment of the invention to provide an ignition device as contemplated herein wherein there is employed a switch located in the electric system and associated with the device so that the electrical circuit is closed only when the system is to be employed.

Another particular object and accomplishment of the invention is to provide an ignition device and controls therefor for the purposes contemplated herein, said device having a safety feature in that the ignition system is not operable unless a compartment door associated with an appliance wherein the device is being employed is fully opened. In this way the compartments containing the burner elements will not fill up with unburned gases to form an explosive mixture inside these compartments without the operator's knowledge.

Another detailed object and accomplishment of the ignition device contemplated herein provides for the temperature inside a compartment wherein the burner elements are employed to be the same as room temperature when the ignition system or burner is not in operation.

The invention seeks, as a final object and accomplishment, to provide an ignition system and controls therefor as contemplated herein and characterized by an arrangement of parts to more advantageously and satisfactorily perform the function required of it and adapted to provide a compact unit which will successfully combine the factors of structural simplicity and durability, and yet be economical to manufacture.

Additional objects, features and advantages of the invention disclosed herein will be apparent to persons skilled in the art after the construction and operation are understood from the within description.

It is preferred to accomplish the various objects of the invention and to practice the same in substantially the manner as hereinafter more fully described, and, as more particularly pointed out in the appended claims.

With the above and other incidental objects in view, the invention has other marked improvements and superiorities which radically distinguishes it from presently known structures, these improvements in the invention residing in the novel construction and cooperative function of the parts thereof, the combination of the parts and the arrangement thereof as illustrated in the drawing and which will be more fully described hereinafter and particularly pointed out in the claims.

In the accompanying drawing on which there is shown a preferred embodiment of the invention,

Fig. 1 is a top plan elevational view of an ignition system for employment adjunctively to gas or oil burning elements and embodying the features of the present invention, this view showing some of the component parts thereof in section to more clearly illustrate the construction thereof; and

Fig. 2 is an elevational view of a handle element forming a component part of the ignition system depicted in Fig. 1, said view being taken substantially on the plane of the line 2—2 in Fig. 1.

The drawing is to be understood as being more or less of a schematic character for the purpose of illustrating and disclosing a typical or preferred form of the improvements contemplated herein and in the drawing like reference characters identify the same parts in the several views.

As one possible example of advantageous employment of the contemplated ignition service and controls therefor, reference is made to the drawing, particularly Fig. 1, wherein there is illustrated the ignition system and controls therefor with which the invention is particularly concerned and designated in its entirety by the numeral 20 as being operatively associated, for example, with a conventional oven compartment of a gas burning range designated in its entirety by the letter A, said ignition system and controls therefor being adjunctively employed for example, with conventional gas burning elements operatively disposed in the range A and designated in their entirety by the letter B. The illustrated range A may comprise an oven chamber 22 having a side wall 23, a back wall 24 and an open end provided with a hinged door as at 25, said range having a range back wall 26 acting as a casing enclosing the oven compartment 22 and various other elements of the range (not shown).

Suffice it to say, since the invention is not particularly concerned with the precise construction of the illustrated range and/or its associated parts, they will not be further described in detail, and it is deemed sufficient for all intentions and purposes herein contained to show only portions adjacent to and cooperating with the ignition system and controls therefor contemplated herein. It is to be understood that details of construction of such ranges or other appliances with which the ignition system contemplated herein may advantageously be employed and/or their associated parts may be modified to suit particular conditions or to satisfy the engineering genius of various competitive manufacturers

and in some instances the contemplated ignition system and controls therefor may be advantageously employed in other types of appliances employing gas or oil burning elements, and I do not wish to be limited to the construction of these elements as set forth except where such construction particularly concerns the invention contemplated herein.

Having thus described, by way of example, a possible adaptation of the ignition system and controls therefor generally indicated at 20 and as contemplated herein, and having described the general environment surrounding the adaptation, the specific construction and cooperative functions of the parts of said ignition system and controls therefor with which the present invention is particularly concerned will now be described in detail.

In the exemplary embodiment of the invention depicted in Fig. 1, the ignition system 20 with which the present invention is particularly concerned comprises, in general, an ignition coil assembly designated in its entirety by the numeral 30 and being operatively disposed on end portions of a lighter arm 31 carried for pivotal movement by a bracket 32 which is secured to the rear wall 24 of the oven compartment, a resistance element or transformer 33, a switch 34 in circuit with said resistor or transformer 33, and controls 35 operatively associated with the lighter arm 31 and the switch 34 whereby the lighter arm 31 may be brought into its gas igniting position and whereby the switch is permitted to operate to close the circuit, each of such actions being responsive to manual actuation of a control lever designated in its entirety by the numeral 37.

Referring more particularly to Fig. 1, the ignition coil 30 comprises a wire element 40 twisted to define the shape as shown and formed, for example, of Nichrome wire, said wire element 40 having end portions respectively secured to the lighter arm 31 by bolts 41 and 42. It is notable that suitable insulation is disposed between the wire element 40 of the electrical ignition coil 30 and the lighter arm 31. This insulation may comprise washers 44 and 45 respectively associated with the bolts 41 and 42. Suitable insulation plates 46 and 47, which may be formed of shellac bonded mica are provided to effect proper insulation of the ignition coil from the lighter arm 31.

The lighter arm 31 may be formed of a channel shaped structure as shown and is mounted on the bracket 32 for pivotal movement in a horizontal plane between the position shown in full lines and the position shown in dotted lines in Fig. 1. When the lighter arm is moved into the dotted line position it can be seen that the ignition coil is in close proximity to the conventional gas burner element B.

Carried by the back wall 26 and mounted thereon by any convenient means, such as, for example, bolts 50 and 51, is the resistor element 33. In some adaptations it may be well to employ a transformer instead of the resistor element 33 as shown. The resistor element 33 functions to regulate and provide a proper flow of current to the ignition coil 40.

Particular attention is invited to the switch 34 which may be of any conventional design and is provided with normally open contacts and a spring pressed plunger 54 having end portions arranged to be in intimate contact with a spring 55 having one end 56 thereof fixedly secured to and carried by a flange 57 of a bracket 58 which is

secured to the outer face of the range back wall 26. The other end portions 59 of the spring 55 are provided with a suitable aperture arranged to receive end portions of a tie rod 38 forming part of the control mechanism 35. It is notable that the switch is mounted on the bracket 58 and is held in a fixed position by means of the lock screw 61.

It can be seen that the switch 34 is provided with two electrical connections 62, 63, the connection 62 being arranged to receive end portions of suitable electric wire forming the negative side of the circuit. The connection 63 is arranged to receive end portions of a suitable wire 64 connected with the resistor element 33, and, the electric wire 65 is arranged as shown to connect the resistor element 33 with the bolt 42, and, the bolt 41 having connected thereto end portions of a suitable wire 66 forming the positive side of the electrical circuit, thereby to complete the electric circuit.

Referring more particularly to Fig. 2, the handle 37 may be mounted as shown on the side wall 23 of the oven compartment 22 for pivotal movement in a vertical plane by means of the pivot pin 70 and the handle 37 may be provided with a finger receiving portion 71 defining a substantially horizontally projecting flange to effect a degree of leverage in its operation.

End portions 72 of the tie rod 38 forming a part of the control 35 are secured by any convenient means to a leg 73 of the handle 37.

Attention is invited to Fig. 1 wherein end portions 80 of the lighter arm 31 are secured to the tie rod intermediate the ends thereof by means of a suitable pin 81 having portions arranged to be received into a slotted aperture 82 disposed in the end portions 80 of the lighter arm.

In referring to Fig. 1, it can be seen that movement of the finger receiving portion 71 in a vertical plane will cause the tie rod 38 to move rearwardly in the oven chamber. By virtue of the connection between the lighter arm and the tie rod 38 intermediate the ends thereof, the movement of the tie rod 38 will cause the lighter arm to assume its dotted line position as shown, and, simultaneously with this operation, the spring 55 will be caused to assume its dotted line position which will permit the plunger 54 to move outwardly of the switch to close the contacts which will complete the circuit and cause electrical current to flow into the ignition coil 40, the combined operations as aforesaid being effective to ignite the gas emanating from the burner element B.

After the ignition coil 40 has performed its service and pressure on the finger receiving portion 71 is released, the spring 55 will cause the tie rod 38 and handle 37 to assume their normal positions and, in the same operation, effect movement of the lighter arm to its inoperative position and open the contacts of the switch 34, thereby to break the circuit.

In order to provide absolute safety in the operation of the device contemplated by this invention, the handle 37 is operatively disposed within the oven compartment which requires the full opening of the compartment door 25 before the ignition device may be operated. In this manner the oven and burner compartments will not fill up with unburned gas to form an explosive mixture inside these compartments without the operator's knowledge.

Moreover, the movement of the lighter arm between operative and inoperative positions provides longer life to the device since none of the parts thereof are in direct contact with the flame when the burner element B is in operation. A further advantage in the contemplated device is the function of the switch 34 in regulating the current supply to the ignition coil 40 so that only momentary operation of the ignition coil is necessary to effect ignition of the gas from the burning element B and when the lighter arm is in its inoperative position the current is shut off until it is needed to ignite gases of the burner element B.

The operation of the device is as follows: Particular attention is invited to the disposition of the handle 37 within the confines of the oven chamber 22 so that it is absolutely necessary to open the oven compartment door 25 in order to operate the device. This provides safety in the operation of the device because the opening of the oven compartment door 25 will prevent unburned gases to form an explosive mixture inside the compartment without the operator's knowledge.

After the oven door is opened the handle 37 is pressed downward slightly which action will cause the tie rod 38 fastened to the lighter arm 31 which supports the ignition coil 30 to move the ignition coil in close proximity to the burner element B as illustrated in dotted lines in Fig. 1. At the same time, the tie rod 38 which moves the lighter arm, displaces the spring 55 and switch plunger 54 to close the electrical circuit and energize the ignition coil.

When pressure is removed from the handle 37, the spring 55 will force the rod to move in the opposite direction, which action will cause the lighter arm and ignition coil to move away from the burner and assume its inoperative position as illustrated in full lines in Fig. 1. At the same time, the spring will move the switch plunger 54 to open the electrical circuit and deenergize the ignition coil.

It can be seen that the provision of the movement of the lighter arm between operative and inoperative positions provides definite advantages in maintaining a longer operative period without necessitating repair or replacement because the ignition coil is out of the direct flame when the burner is in operation and the ignition device is in its inoperative position.

Moreover, the ignition device contemplated herein may be advantageously employed adjunctively with conventional fuel burner elements to effect ignition thereof without the employment of a match or the employment of a constant burning source.

From the foregoing disclosure, it may be observed that we have provided an improved ignition device for gas burner elements which efficiently fulfills the objects thereof as hereinbefore set forth and which provides numerous advantages which may be summarized as follows:

1. Structurally simple, efficient and durable;

2. Economical to manufacture and readily adaptable to mass production manufacturing principles; and

3. The provision of an ignition device for gas burning elements, said ignition device being particularly and advantageously applicable for employment in gas ranges to effect ignition of the gas burning elements of the oven chamber, said ignition device being particularly characterized in its simple but sturdy construction and in its convenient, fool proof and safe operation.

While we have illustrated preferred embodi-

ments of our invention, many modifications may be made without departing from the spirit of our invention, and we do not wish to be limited to the precise details of construction set forth, but wish to avail ourselves of all changes within the scope of the appended claims.

We claim:

1. An ignition device comprising a lighter arm fulcrumed for movement of one of its end regions toward and from a fuel burner; an ignition coil carried by said arm end region; means defining an electrical circuit in which said coil is interposed; a switching device including a switch having a plunger in said circuit maintained in normally open position; a spring exerting pressure on said switch plunger for holding said switch in said open position; a longitudinally reciprocal shift rod having an operative connection with the other end region of said lighter arm and said spring and yieldably held in an inactive position by said spring; and a lever connected to said reciprocal shift rod for moving said shift rod out of a normally inactive position in opposition to said spring thus causing said lighter arm to position said ignition coil adjacent the fuel burner, such movement of said shift rod being effective to release pressure of said spring on said plunger for closing the circuit through said switch to said ignition coil.

2. A gas range having an oven therein defined by a plurality of oven walls spaced from the range walls, and a gas burner in said oven; and means for igniting said burner comprising a lighter arm pivoted on an oven wall remote from said burner and being movable at one end into close proximity to said burner; an electrical ignition coil on said movable end of said arm; means defining an electric circuit in which said coil is interposed; a switching device including a normally open switch in said circuit and mounted on the exterior of a range wall; an elongate control member extending through a range wall and an oven wall and including means having operative connection with said switch, an intermediate portion of said member having connection with said lighter arm at one side of the pivot of said arm; and a manually operated lever within the oven and fulcrumed on a wall thereof and having operative connection with said control member.

3. In a gas range having an oven herein defined by a plurality of oven walls spaced from the range walls, and a gas burner in said oven; ignition means for said burner comprising a lighter arm pivoted on an oven wall remote from said burner and being movable at one end into close proximity to said burner; an electrical ignition coil on said movable end of said arm; means defining an electric circuit in which said coil is interposed; a switching device including a normally open switch in said circuit and mounted on the exterior of a range wall; an elongate longitudinally reciprocable control member extending through a range wall and an oven wall and including resilient means having operative connection with said switch, an intermediate portion of said member having connection with said lighter arm at one side of the pivot of said arm; and a manually operated lever within the oven and fulcrumed on a wall thereof and having operative connection with said control member said control member being effective to cause said resilient means to close said normally open switch and activate said ignition means and being effective to cause said lighter arm to move said ignition means into close proximity to said gas burner.

4. The combination with a gas range having an oven therein defined by a plurality of oven walls spaced from the range walls, and a gas burner in said oven, of an ignition device comprising a lighter arm disposed within said oven and fulcrumed for movement of one end thereof between operative and inoperative positions with respect to the gas burner, an ignition coil carried by said end, means defining an electrical circuit in which said coil is interposed, a switching device including a normally open switch in said circuit and disposed on the exterior of a range wall, control means for said arm and said switch comprising an operable reciprocable elongate member having operative connection with the other end of said lighter arm and with end portions thereof extending through a wall of the oven and a wall of the range for operative connection with said switch, spring means connecting said elongate member with said switch, the movement of said elongate member in one direction being effective to close said switch in opposition to said spring and also to position said ignition coil adjacent the gas burner, said spring means being effective to move said elongate member in a reverse direction to displace said ignition coil and being effective to allow said switch to move to its normally open position.

5. In a gas range having an oven therein defined by a plurality of walls spaced from the range walls, and a gas burner in said oven, an ignition device comprising in combination, a lighter arm fulcrumed for movement of one end thereof between operative and inoperative positions with respect to said gas burner, an ignition coil carried by said end, means defining an electrical circuit in which said coil is interposed, a switching device including a normally open switch and a spring operated plunger in said circuit and maintained in open position and mounted on the exterior of a range wall, and control means for said lighter arm and switch comprising a longitudinally reciprocable rod, a pivotal connection between said rod and said lighter arm, manually operable means connected to said longitudinally reciprocable rod and disposed within the oven and adapted to move said rod in one direction to operate said spring plunger to close said circuit and also to position said ignition coil adjacent the fuel burner, and spring means for moving said rod in a reverse direction to displace said ignition coil, said spring means being effective to move said switch plunger to normally open said electrical circuit.

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