

March 1, 1938.

A. D. OLDS

2,109,848

ELECTRIC SADIRON

Filed March 11, 1935

3 Sheets-Sheet 1

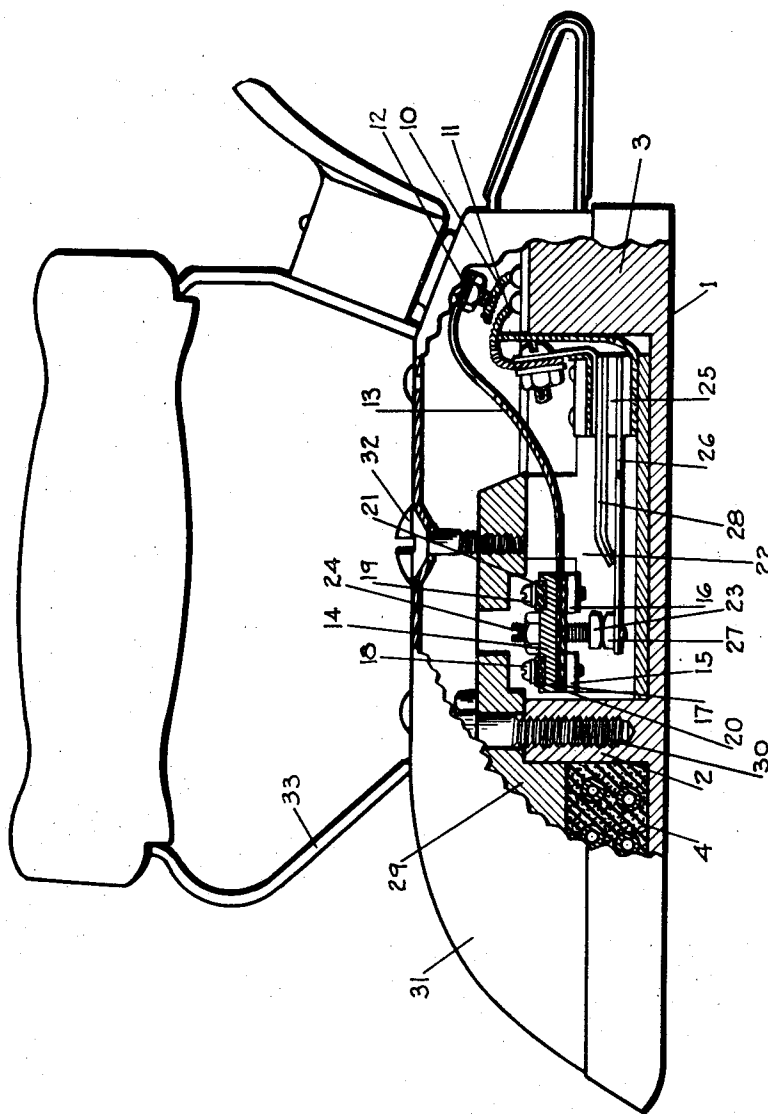


FIG. 1

INVENTOR.

AMBROSE D. OLDS

BY

B. J. Fink

ATTORNEY.

March 1, 1938.

A. D. OLDS

2,109,848

ELECTRIC SADIRON

Filed March 11, 1935

3 Sheets-Sheet 2

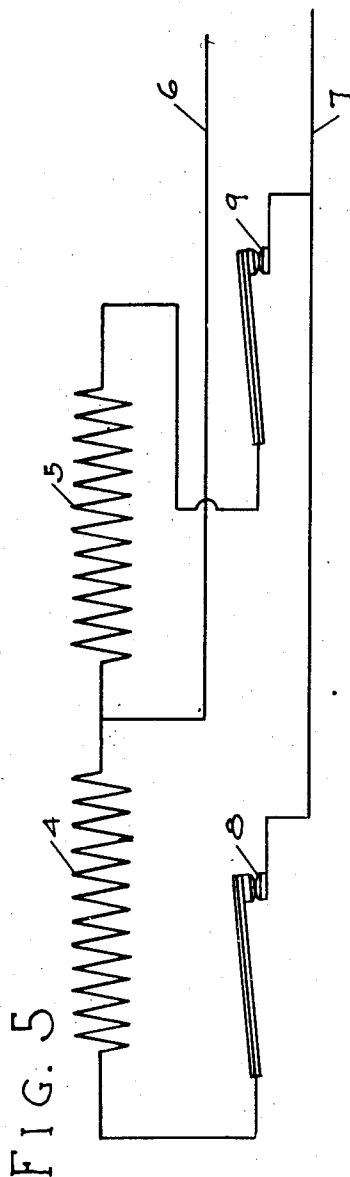
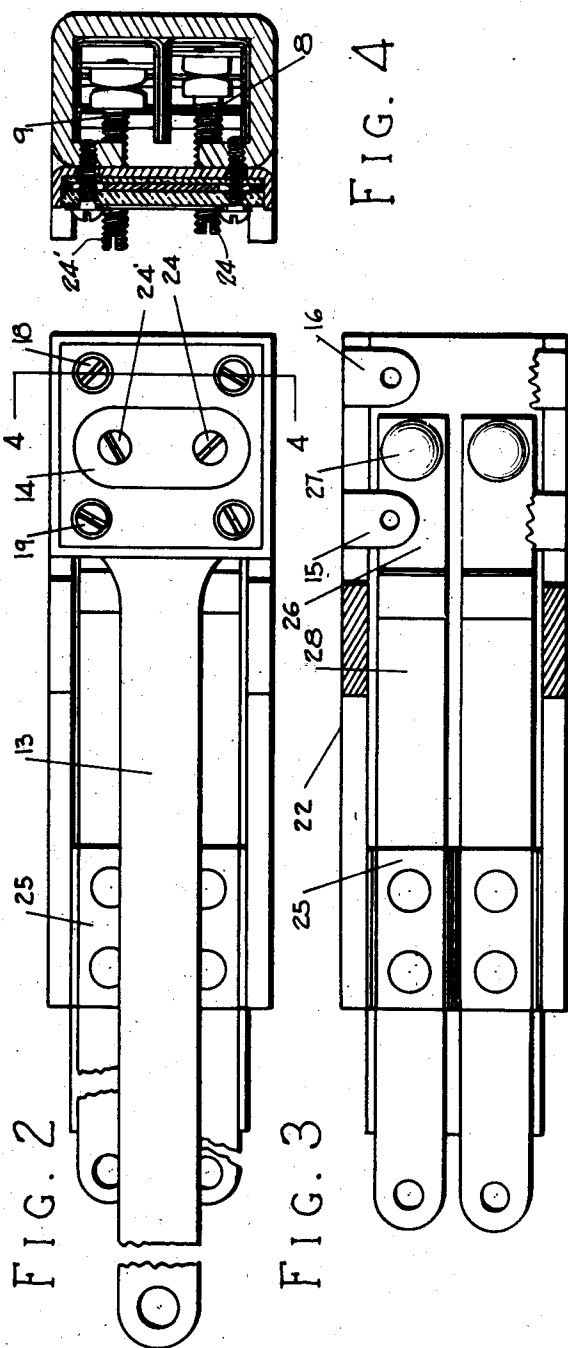


FIG. 5

INVENTOR.
AMBROSE D. OLDS
BY *B. F. Frank*
ATTORNEY.

March 1, 1938.

A. D. OLDS

2,109,848

ELECTRIC SADIRON

Filed March 11, 1935

3 Sheets-Sheet 3

FIG. 7

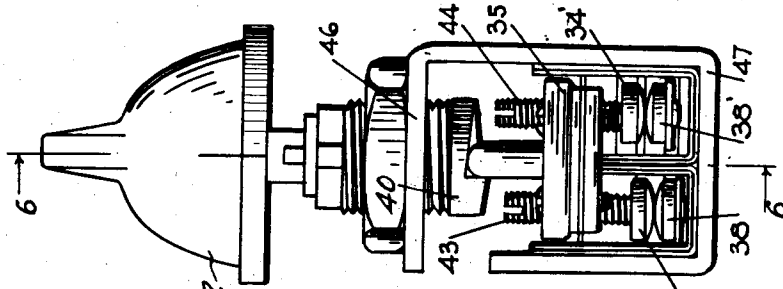
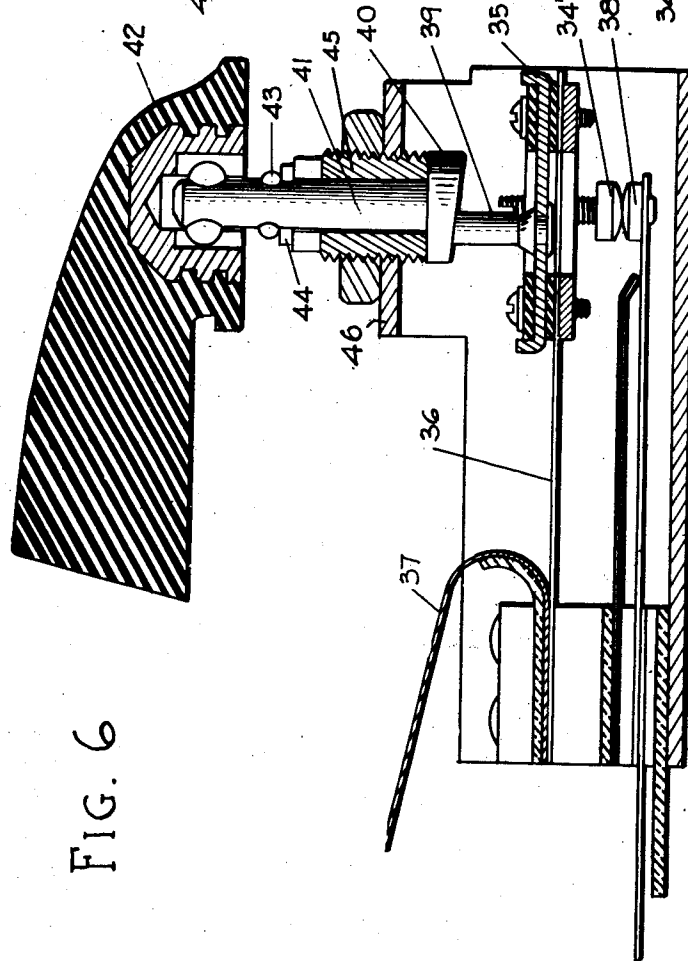


FIG. 6



INVENTOR.

AMBROSE D. OLDS

BY

B. I. Drink

ATTORNEY.

UNITED STATES PATENT OFFICE

2,109,848

ELECTRIC SADIRON

Ambrose D. Olds, Wichita, Kans.

Application March 11, 1935, Serial No. 10,377

5 Claims. (Cl. 219—25)

This invention relates to electrically heated sad irons or laundry irons and the primary object of the invention is to provide means for introducing excess wattage in the heating element of the iron so that when there is an excess service demand the wattage input can be in excess of the normal demand. Under present day practice irons are required to iron goods in which the moisture content is variable over a very wide range and ordinarily irons which are adapted to iron goods with a relatively small moisture content are not adapted for ironing heavy blankets and other goods having an excess of moisture and vice versa.

It has long been recognized that the ideal iron is one in which there is as little heat loss through the casing as possible. Of course, the ideal iron would be one in which the heating element was the sole plate so that the heat could be transmitted to the goods to be ironed without conduction losses and to this end sole plates have been made with the heating element embodied in them. It is also well known that the art of ironing consists in efficiently vaporizing or dissipating the moisture in the goods. So I have provided a heating element, or in fact, two heating elements, each of which is under the control of a thermostat in close proximity to the sole plate, the thermostats having different settings so that one of the thermostats can be opened when the other is closed and so that one will respond to other temperatures than the other.

The history of the household iron has been one of constantly increasing wattage. The non-automatic iron was commonly a 660 watt, 110 volt device. This performed with reasonable satisfaction. However, when the thermostat was added which prevented the iron overrunning and reaching a dangerous temperature, it was soon obvious that there was not sufficient wattage input to hold the temperature up to a satisfactory ironing temperature, even under average conditions. In other words, the sole plate temperature was not high enough, except when ironing very light material.

Nevertheless, automatic irons were put out for a number of years having a wattage input of around 600 watts. Finally, thru the development of better thermostats it was possible to raise this wattage to 1000 watts. This, it was found, did a much better job since, in the majority of instances, when the thermostat was set at 450 degrees, 450 degrees was maintained while ironing. However, considerable thermostat difficulty occurred, because of the heavier current resulting in quicker erosion of the contacts. It was found

necessary to separate the contacts more rapidly and with more positive action.

This led to the well known quick make and break thermostat which had the serious disadvantage that, because of the built up energy required to snap the contacts open or shut had a very wide range. In other words, instead of maintaining let us say 450 degrees, its cycle of operation took it as low as 400 degrees and as high as 500. The wide cycle necessitated in this type of thermostat often made questionable the advantage of using an adjustable thermostat. It has been well known for some time that even the 1000 watt iron does not cover all possible ranges of material. In other words, it is possible to dissipate from the sole plate of the average iron more than 1000 watts under ironing conditions. I have found by experiment that under normal ironing as much as 1200 to 1400 watts can be dissipated. It is thus obvious that if a completely satisfactory job of ironing is to be accomplished it is necessary to have a wattage input of as much as 1400 or 1500 watts. The advantage of such an input, of course, is well known but the difficulties of accomplishing thermostatic control with such a heavy current has prevented its introduction up to the present.

It is estimated that about 75% of the ironing could be accomplished with a wattage input of approximately 700 to 800 watts without any material decrease in sole plate temperature. I, therefore, have provided a thermostat set for example, at 450 degrees, which controls a 750 watt element and holds the temperature at approximately 450 degrees until more wattage is required than can be supplied by this element. Under this last named condition if the sole plate temperature drops, for example 50 degrees, I have provided a second thermostat set at this point which then cuts in a second element of equivalent wattage, allowing input of 1500 watts. This, as indicated previously, is sufficient to take care of any demand encountered during ironing. 1500 watts will remain on as long as required by the ironing conditions, but as soon as the sole plate temperature raises above the setting of the minimum thermostat this heating element is cut out and the original higher setting is again regained. It will thus be seen, that I have provided a practical means of building a high wattage iron without the necessity of encountering the usual troubles encountered in trying to make a thermostat operate on this excessive wattage. Numerous attempts have been made to build a thermostat sufficiently small to go into the base

of an iron, yet which will handle the heavy current encountered in the 1500 watt element. However, as far as I know none of these have proved successful over an extended period, the difficulty, of course, lying in the 15 ampere current which causes the contacts to fail very rapidly.

Another advantage of my invention is the quicker heating up time possible since both elements and both thermostats are in the circuit till the iron reaches the predetermined minimum thermostat setting. In one adaption of my invention, I have provided means for adjusting the two thermostats simultaneously, independent of their separate adjustments. In other words, by this means it is possible to adjust both thermostats throughout any desired range, still keeping their respective differentials as determined by the independent setting of the adjustment screws provided for them.

In order that the heating elements in the thermostats can independently operate I have shown them in parallel in the circuit. The construction of the preferred embodiment of my invention will be understood by reference to the following description in connection with the accompanying drawings in which:

Figure 1 is a side, elevational view of iron, parts being broken away to show certain other parts.

Figure 2 is a plan view of the adjustable contact carrier and conductor.

Figure 3 is a plan view of the lower contact members.

Figure 4 is a cross-sectional view on line 4-4 of Figure 2.

Figure 5 is a diagrammatical view of ironing circuit.

Figure 6 is a sectional view through a slightly modified form of thermostat control.

Figure 7 is front view of the same.

Referring now to the drawings by numerals of reference, 1 designates the sole plate of an iron having an upstanding portion 2 between its ends to receive the thermostatic control unit and a thickened portion 3 at the heel in front of the upstanding portion 2 is an imbedded electric heater consisting of the parts 4 and 5 in circuit, including the two conductors 6 and 7. The parts 4 and 5 are in parallel in the circuit and interposed between the separate heating elements 4 and 5 and the conductor 7 are thermostats 8 and 9. These thermostats can be of substantially the same construction but they will have settings so that one will operate at a temperature different from the other. I prefer to have the sole plate with a low thermal capacity, so that there will be little heat loss through conduction from the heating elements to the goods to be ironed. The iron is provided with the usual plug socket connected to the conductors 10 and 11. The conductor 10 is fastened to a connection 12 which supports a lead 13, in turn connected to a contact 14 insulated from the supporting bars 15 and 16 by the insulation 17. The bolts 18 and 19 being also insulated by the pads 20 and 21. The bars are fast on the unit carrying member 22 but contact 23 can be adjusted vertically through the screw 24. The thermostat is shown as consisting of a block 25 with a flexible contact carrying member 26, having a contact 27 to contact the contact 23. The bimetallic bar 28 is also carried by the block 25 and it is electrically connected to the conductor 11. The bimetallic bar will flex in response to a rise in temperature to move the bar 26 to break contacts 23 and 27 as

is well understood. The unit carrier with the contacts and thermostat is held in place by a cap piece 29 and it in turn is fastened to the member 2 by the bolt 30. This cap piece serves a dual purpose in that it holds the unit carrier in place and also holds the heating element in place. The upper case 31 is held in place by the screw 32 and of course the case carries a handle 33. There are two thermostats in the unit carrier and they are set through the screws 24 and 24', see Figure 4, so that one will open at higher temperature than the other. These thermostats are generically indicated 8 and 9 in Figures 4 and 5. Therefore, it will be apparent that when current is first supplied to the heating elements both thermostats 8 and 9 will be closed. As soon as the iron reaches a temperature in excess of that for which the lower temperature is set that thermostat will open so the circuit for one of the heating element units will be broken and only the other unit will be supplied with current. That will be the normal ironing temperature.

If the dissipation of moisture in the article to be ironed is very rapid as would be true where the article to be ironed was relatively dry more wattage will be supplied through the single thermostat than is required to heat the iron to the desired temperature. In that event the second thermostat will open so current will be cut off. As soon as the temperature of the iron drops below the determined temperature the second thermostat will close and as it continues to drop the first thermostat will close so that both thermostats will now be closed and both heating units 4 and 5 will be in service. The first thermostat to open will probably be the least active one since it is auxiliary or augmenting current supply control device to maintain the iron at a predetermined temperature, the temperature at which the iron is to operate being substantially fixed. Therefore, it will be apparent that the estimated ironing temperature of the sole plate will be maintained substantially constant on heavy as well as light demands. Therefore, with an iron constructed in accordance with my invention a sensitive control is provided in which there is always an extra supply of wattage available to augment normal wattage required by the iron.

In Figure 6 I have shown a slightly modified form of secondary control in which the fixed contacts 34 and 34', are carried by, but insulated from the block structure 35, supported by the spring arm 36 which is a conductor connected to a lead 37 supplied with current in the usual way and the contacts 38 and 38' are also supplied with current in an obvious manner common to thermostats, the thermostatic structure being old and well known. The block structure 35 is provided with an upstanding pin 39 adapted to be engaged by a cam 40 on a shaft 41 provided with handle 42, the shaft having projections 43 which lie on a collar 44. Therefore, by turning the cam 40 the thermostats can be set to operate at higher or lower temperatures, but their relative settings will be made through the adjusting screws 43 and 44 in a well understood manner. It is understood, of course, that the shaft 44 is mounted in a bushing 45 or its equivalent in the overlying part 46 of the unit carrier 47.

From the foregoing it will be apparent that there is a dual control for the heating element in that fractional parts of the whole heating structure can be cut out and in, in progressive movements of the thermostats since one thermo-

stat will operate at different temperature from the other.

What I claim is:

1. An electrically heated iron comprising a shell, an electric heater in the shell, said heater being divided into two parts, an electric circuit having branches for supplying current to the two parts of the heater in parallel, a pair of thermostats, one for each branch of the circuit, a spring supported block above the two thermostats, independent means carried by the block for setting the two thermostats so that one will operate at a different temperature from the other, and means for varying the position of the block to simultaneously change the settings of the two thermostats.

2. An electrically heated iron comprising a shell, an electric heater in the shell, said heater being divided into two parts, an electric circuit for supplying current to the two parts of the heater in parallel, a pair of thermostats, one for each circuit for each heater part, a spring supported block above the two thermostats, independent means carried by the block for setting the two thermostats so that one will operate at a different temperature from the other and means for varying the position of the block to simultaneously change the settings of the two thermostats.

3. An electrically heated iron comprising a shell, an electric heater in the shell, said heater being divided into two parts, an electric circuit for supplying current to the two parts of the heater in parallel, a pair of thermostats, one for each circuit for each heater part, a spring supported block above the two thermostats, independent means carried by the block for independently setting the two thermostats so that one will operate at a different temperature from

the other, an upstanding pin on the block and a cam movable over the end of the pin in contact therewith.

4. An electrically heated iron comprising a shell and a sole plate, an electric heater in the shell in close thermal contact with the sole plate, said heater being divided into two parts, an electric circuit for supplying current to the two parts of the heaters in parallel, two thermostats in the circuit one for each heater part, each thermostat having a relatively fixed element and a movable heat responsive element, a yieldingly supported block above the relatively fixed elements of the thermostats, independent adjusted screws carried by the block, one for each relatively fixed element so that one relatively fixed element can be adjusted independent of the other and means for simultaneously causing the block to move toward and away from the relatively fixed elements of the thermostats.

5. An electrically heated iron comprising a shell and a sole plate, an electric heater in the shell in close thermal contact with the sole plate, said heater being divided into two parts, an electric circuit for supplying current to the two parts of the heater in parallel, two thermostats, one for each heater part, said thermostats being located adjacent to the sole plate, each thermostat having a relatively fixed element and a movable heat responsive element, a spring arm fastened to the sole plate having a free end and a block carried by the free end of the spring arm, independent adjusting screws carried by the block to independently adjust the positions of the relatively fixed contacts with respect to the movable contacts of the thermostats and means for flexing the spring arm to change the positions of the block.

AMBROSE D. OLDS.