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Electricity in the Home

By FRED C. FENTON
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“W"HEN I attached my iron today there was a flash; now the iron won’t heat, and I couldn’t finish ironing and the lights are off.” This is the all too common story of a modern housekeeper, modern in that she lives in a modern house and has modern equipment, but sadly behind the times in her knowledge of electricity and its use in the home.

Much annoyance can be avoided in the home with electrical equipment if the housekeeper can tell what has happened in case of trouble and is able to make minor repairs. It is not necessary to know a great deal about electricity in order to enjoy the convenience of its use in the home. What is needed, however, is a working knowledge of how to have continuous service in the home and how to make minor repairs.

Any fixture in the home is supplied with electric current by two wires (conductors). One wire brings the current from the source; the other returns the current after it has passed thru the light, flat iron or motor. These two wires must be separated at all times by material which will not permit electricity to pass thru it. Therefore we have the two classes of materials, conductors and non-conductors or insulators. All metals are conductors and copper, being a very good conductor, is most widely used for electric wires. Insulators are materials that do not permit current to pass thru them. Porcelain, glass, rubber, silk and mica are commonly used. A flat iron cord will reveal that it is made up of two wires separately covered with rubber, asbestos and silk.

Most of the troubles encountered in the home might be classified as follows:

1. Troubles due to the interruption of the electric circuit by breaking or disconnecting the wires.
2. Troubles due to short circuits and consequent burning of fuses.
3. Troubles with the equipment itself. It is little wonder, considering the treatment which a vacuum cleaner cord receives, that it soon becomes broken or that the wires are pulled loose from their connections. Such troubles are expected sooner or later, but of course the day of trouble can be postponed by intelligent care of the wires. Constant twisting of the wire will wear away the insulation in a short time. The practice of pulling on the wire instead of the plug when disconnecting a cord, or of course, hand on both the wire and the connections. When a wire is twisted constantly in placing a plug in a receptacle, the result is a thinner or later the breaking or touching of the two wires. When the wires touch together we have a short circuit. A short circuit allows an excessive amount of current to flow. This excessive amount of current will create heat to a dangerous degree. Fires may be caused by short circuits or the wires melted at points difficult to repair. To prevent damage a fuse is placed in the circuit.

Fuses are a blessing, not a nuisance, as many people think. A fuse is a safety switch which burns out and stops the current when an excessive amount flows in the wires. A burned out fuse should be taken as a sign of trouble. The fuse may have been too small and can be replaced by a larger one. But more often there is a short circuit in the line which must be repaired before another fuse is put in. Fuses are rated in amperes, meaning the amount of current they will carry, and are commonly made in 6, 10, 15, 25 and 30 amperes sizes. A thirty ampere fuse is sufficient for the main lines carrying all of the current used in the house, while 10 or 15 amperes is enough for the branch lines. Fuses are extremely important in the electric circuit because they give the only protection against excessive current. Putting in a small coin in the place of the fuse is bad practice and likely to lead to serious troubles. The size of fuse to place in any circuit is the number of amperes required in that circuit. A six ampere fuse will carry a small motor, while with a toaster and several lights on the same circuit a 10 or 15 ampere fuse is needed.

In order to purchase equipment intelligently, one should know on what kind of current such equipment is to be used. Current is classed according to the voltage. Current of 110 volts and 35 volts is in common use. By voltage we mean the electrical pressure or force that causes the current to flow thru the wires. Most current supplied in cities is 110 volt. Current supplied by the small farm lighting plant is commonly 32 volt. No equipment made for 32 volt current will work when placed on the higher 110 volt circuit. The equipment cannot be changed from one circuit to another.

Another classification of current depends on whether it is direct or alternating. Direct current flows continuously in one direction. It is always used where current is stored in a battery. In alternating current there is a frequent change in the direction of the flow. The current comes in pulsations, first in one direction, then in another. Most of the current furnished by municipal plants is alternating current. Lights and heat producing units will operate on either A.C. or D.C. as long as the voltage corresponds to that for which the equipment was intended. On the other hand, motors designed for use on a D.C. circuit will not work on a A.C. circuit.

Electric current is purchased by the kilowatt hour, an average rate being in the neighborhood of 10 cents per K.W.H. One K.W.H. (a thousand watt hours) represents a definite quantity of electric current and will do a definite amount of work which may be definitely measured. For example, one K.W.H. will operate one

Cost of Operation*

<table>
<thead>
<tr>
<th>Name of Equipment</th>
<th>Size</th>
<th>Consumption of Current Watts</th>
<th>Operation Cost per hour at 10c per K.W.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percolator</td>
<td>8 Cups</td>
<td>400</td>
<td>4.0 cents</td>
</tr>
<tr>
<td>Warming Pad</td>
<td></td>
<td>60 to 90</td>
<td>0.6 to 0.9 cents</td>
</tr>
<tr>
<td>Flat Iron</td>
<td>6 lb.</td>
<td>550</td>
<td>5.5 cents</td>
</tr>
<tr>
<td>Vacuum Cleaner</td>
<td>House Size</td>
<td>150</td>
<td>1.5 cents</td>
</tr>
<tr>
<td>Water Pump</td>
<td>250 Gal. per Hour</td>
<td>240</td>
<td>2.4 cents</td>
</tr>
<tr>
<td>Fan</td>
<td>8 in. dia. of blade</td>
<td>50</td>
<td>0.5 cents</td>
</tr>
<tr>
<td>Toaster</td>
<td>Two Slice</td>
<td>680</td>
<td>6.8 cents</td>
</tr>
<tr>
<td>Hot Plate</td>
<td>Medium 800</td>
<td>8.0 to 15 cents</td>
<td>8.0 to 15 cents</td>
</tr>
<tr>
<td></td>
<td>High 1460</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The above figures will vary considerably with different makes of equipment and different operating conditions.
be able to arouse the interest of busy farm people in participating in extension work as demonstrators of improved methods of home making.

The home demonstration agent must be able to meet the people on the basis of their interests and experiences and gradually give them a vision of the farm home that may become the average farm home of the community. Thus it will be seen that the home demonstration agent is logically a woman with good judgment and experience, with training of the broadest and most fundamental character. Most of the states now require for home demonstration work a college or university. In every state the educational standard is rising, though there are still in the service some of the early pioneers in home demonstration work, not college graduates, who bring to it a wealth of vision, experience and judgment.

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(Continued from page 5)

50 watt light for twenty hours. One horse power motor commonly used on washing machines will consume in the neighborhood of 175 to 200 watts and could be operated for five hours on one K.W.H. The power consumption of various pieces of standard equipment and the cost of operating each for an hour is given in the table below.

It is apparent from this table that power from electric current is quite inexpensive. Motors on household equipment consume a very limited amount of current and can be operated very cheaply. On the other hand, heating units such as the flat iron and the toaster require larger amounts of current and are rather expensive in their operation.

The amount of current which a household uses is measured by a meter placed usually in the basement of the house. It is quite desirable that the owners using the current be able to read the electric meter since it is convenient to be able to check their electric bills and to know that they are not being overcharged. Reading an electric meter is simple if the following directions are observed:

1. Notice the unit in which the meter reads and the instructions which are given above the dial. Most meters read in K.W.H. directly. In other meters it is necessary to multiply by ten and the result will be K.W.H. and for others the instruction is given to divide by ten to get the result in K.W.H.

2. The dials should be read beginning at the left hand dial first. The number noted should be the one which the pointer has passed last. That is, if the pointer stands between three and four it should be read three, even though the pointer stands closer to four. If there is any doubt whether the pointer has passed one number this can be definitely told by reading the next dial.

3. One reading of a meter does not give the electric current consumption. Two readings must be taken at intervals. The difference between the two will give the amount of current consumed during this time. A meter may read 3,786 which means 3786 K.W.H. of current has passed thru the meter. Another reading can be taken in a month or two weeks or any period of time and the difference between these readings will give the amount consumed.

Safety in Handling Current

Of course there is some danger connected with the use of electric current. Shocks from an electric current may result in death or very serious injury. There is very little danger from current of 110 volt unless one is placed in such a way as to receive a large quantity of current. A current will pass thru to the ground to moisture in the ground wherever possible. A person standing on a wet floor or in any way connected by the plumbing with the ground is in danger of receiving an electric shock. A woman who takes hold of one end of a flat iron cord and turns on the faucet of the sink with the other hand will in all probability receive a bad shock. If, while standing on a wet floor in the basement, contact is made with an electric iron a very large amount of current will pass thru the body and cause a serious shock. If, while working around electric equipment in the basement, it is well to wear rubbers. They are an excellent insulator and will prevent the passage of current thru the body. However, with ordinary precaution there is little danger of even light shocks.