University of Nebraska - Lincoln
DigitalCommons@University of Nebraska - Lincoln

Historical Materials from University of Nebraska-Lincoln Extension

Extension

1966

EC66-761 Electricity... Our Unseen Friend

Rollin Schnieder

Follow this and additional works at: http://digitalcommons.unl.edu/extensionhist

Schnieder, Rollin, "EC66-761 Electricity... Our Unseen Friend" (1966). *Historical Materials from University of Nebraska-Lincoln Extension*. 3790.
http://digitalcommons.unl.edu/extensionhist/3790

This Article is brought to you for free and open access by the Extension at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Historical Materials from University of Nebraska-Lincoln Extension by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

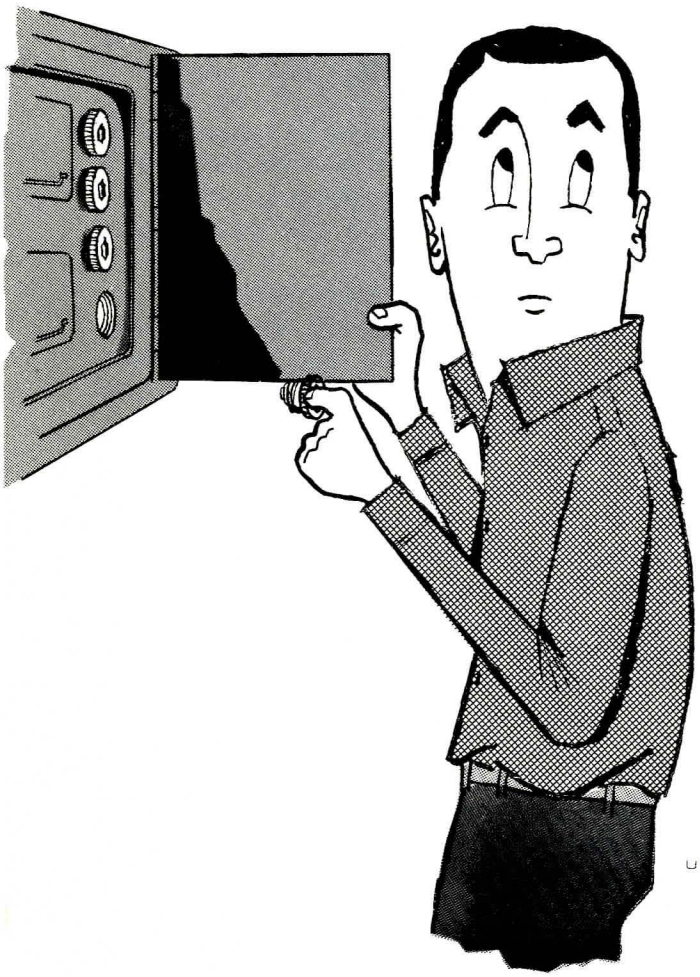
AGRI
S
85
E7
66.761
EC 66-761

E.C. 66-761

RECEIVED
1 8 1972
COLLEGE OF AGRICULTURE
LIBRARY

ELECTRICITY...

Our unseen Friend!



UNIVERSITY OF NEBRASKA COLLEGE OF AGRICULTURE AND HOME ECONOMICS
EXTENSION SERVICE
AND U. S. DEPARTMENT OF AGRICULTURE COOPERATING
E. F. FROLIK, DEAN J. L. ADAMS, DIRECTOR

ELECTRICITY - our unseen friend

By Rollin Schnieder

Extension Specialist, Safety

Many people who wouldn't go within 50 feet of a high-power line, fearlessly fool around with 110-115 volts at home in the mistaken belief that it can't give a deadly shock. It can and often does.

Actually, it is not the number of volts that causes shock, but the amount of current that enters the body. The path of the current plus the duration determines the amount of injury.

Tests show that one milliampere passing through the skin causes a tingling sensation. About 10 milliamperes can rob you of muscular control. One hundred milliamperes can kill you if the shock lasts for one second or longer. The current required to light one 7 1/2 watt Christmas tree bulb is 65 milliamperes. Therefore, the current required to light this bulb could also kill a person.

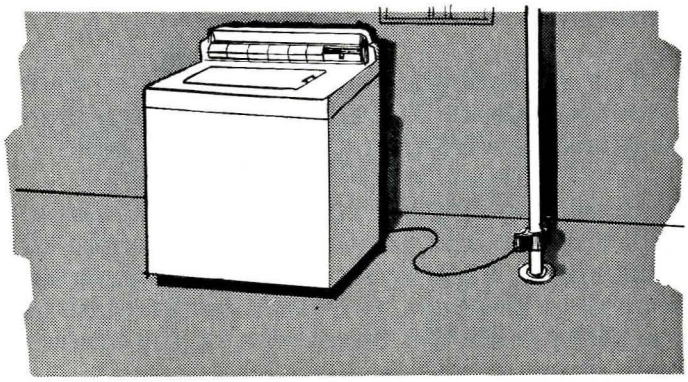
The worst situation is when the electricity moves across the chest by moving into one arm and out the other. The movement of the current can cause stoppage of breathing by paralyzing the respiratory muscles. Such paralysis may still exist after the person has been removed from the source. In this case, artificial respiration and defibrillation of the heart may be necessary. Fibrillation of the heart is a condition whereby the heart does not beat and carry out its function of circulating the blood. Whenever severe electric shock occurs, the victim should have treatment by a physician as soon as possible.

Electricity isn't really attracted to you; however, the electric current is seeking the easiest route to ground. If you are the easiest route to the ground, you can be in for a good shock.

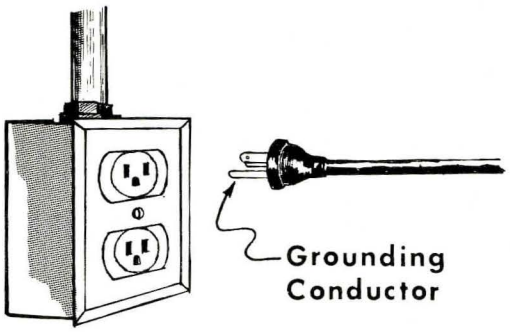
To illustrate, let's suppose that you use an electric tool or appliance and get a slight shock. This indicates that the current is trying to seek another route. You are probably safe as long as you touch nothing else. But you could be in trouble if you touched the appliance with one hand and a good conductor, such as a water faucet, with the other hand. You then become a good conductor for the current.

This same hazard exists when you use a defective appliance while standing directly on the ground or on noninsulated surfaces such as cement or metal.

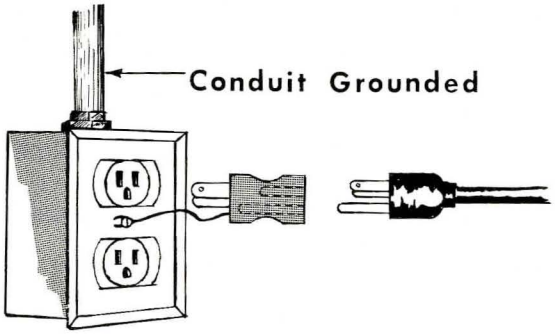
An ungrounded washer is one of the worst hazards since the person doing the washing may be on a damp surface and in contact with the washer at the same time. The washer is one of the worst villains since water and electricity are both present. Ground the noncurrent carrying parts of washing machines so as to prevent shock. This can be done by installing a ground wire from the frame of the machine and attaching this wire to the nearest water pipe. Attach the ground wire before the current is turned on and place the ground wire so no one trips over it.



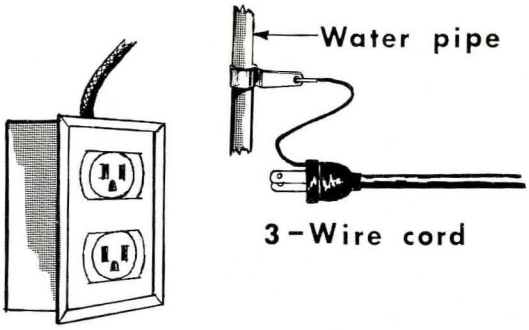
We can make our entire house wiring safe by installing a completely grounded wiring system. This can be done in a number of ways; however, the best way is to have a 3-wire grounded system for all 110-115 volt circuits. Our 220 circuits are already this way. In this system, any stray current will follow back through the ground wire which is hooked to the metal pipe of the water system or to a copper rod driven deep into the ground. Make sure the ground is not hooked to the gas line.



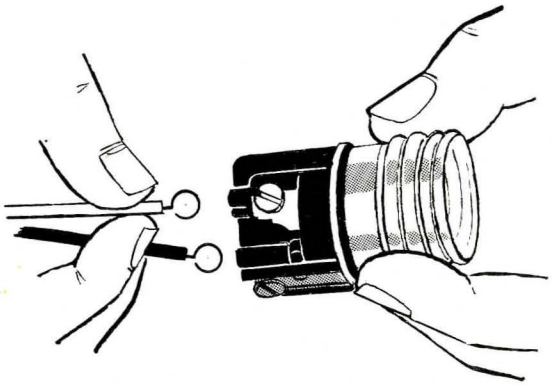
Some homes may have conduit and the conduit serves as the ground or third wire. The conduit is a metal tube through which the wires are run. This is less desirable than the 3-wire hookup since the conduit may not have a good contact at each connection. There is no advantage in attaching the grounding wire to the receptacle screw if the receptacle is not grounded.



Older homes may have the 2-wire hookup without any ground whatsoever. In this case, the 3-wire cord may be used; however, the 3rd wire should be attached to a good conductor such as the water system. This will drain off stray current.



Occasionally, the homemaker will do minor repair jobs on electrical equipment. When doing this, always make sure the wires are properly placed. On a light bulb socket, for example, the neutral or grounded conductor wire is usually white and should be attached to the screw connected to the socket threads. On most sockets and receptacles, the hot side is indicated by a bronze screw, while the connection for the grounded wire is a white or silver screw. Hooking the hot wire to the socket could cause a shock if a person were changing a light bulb in a portable light and accidentally touched the metal part of the lightbulb.



It's always good to check circuits with a trouble light or circuit tester to make sure circuits are hooked up properly.

Some manufacturers are now making power tools with double insulation as a source of protection. This system is better than no grounding; however, it is still not as good as grounding with the third wire or the three-prong plug.

It's also important to buy extension cords that have the 3-wire cord. It may be necessary to use adapters in some places.

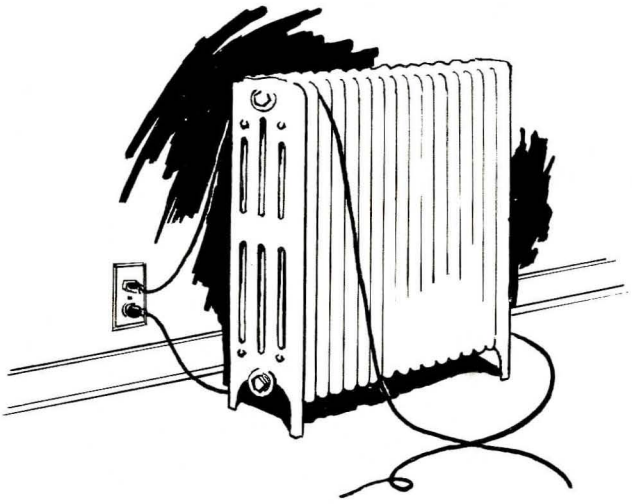
Most homes have extension cords available and most homemakers use these cords at some time during the day. Proper use of these cords is necessary. A few good points to follow are:

1. Make sure the cord is capable of carrying the required amount of current. A cord intended for a lamp is not heavy enough if you want to iron.

2. Buy cord with Underwriters Label approval. On some appliances the cord may be UL approved but not the appliance.

3. Do not leave extension cords plugged in when not in use. Children may put the end of the cord in their mouth.

4. Do not run the cord under rugs, over nails, or for any great distance. Keep away from source of heat such as a radiator.



5. On appliances such as coffee pots, unplug the cord from the wall socket before unplugging from the appliance. Plug in cord to appliances before connecting the outlet.

6. Dispose of all worn or frayed extension cords or have a competent person repair them.

7. Two-wire extension cords on shop tools should be converted to 3-wire grounded cords for increased safety. Either replace the cord completely or add the extra wire.

8. Never use an extension cord or drop-light wire as permanent wiring. Drop cords, lamp cords and extension cords are usually designed with wires of too small capacity to properly accommodate appliances. Even if a drop cord has been especially designed to carry a heavy current, the use of an appliance on it may pull the wires from the ceiling.

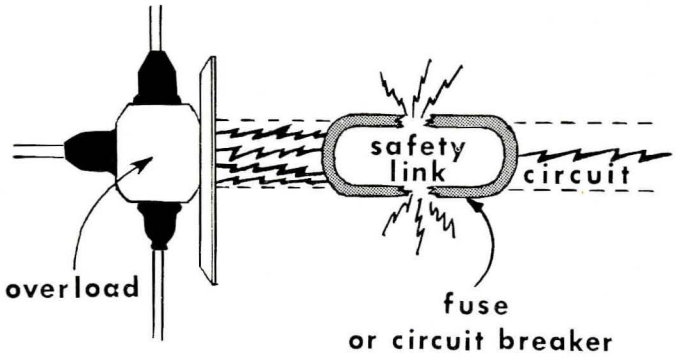
9. Never run loose wires through wall spaces, above ceilings or in concealed spaces.

10. Always grasp plug instead of cord when removing from socket.

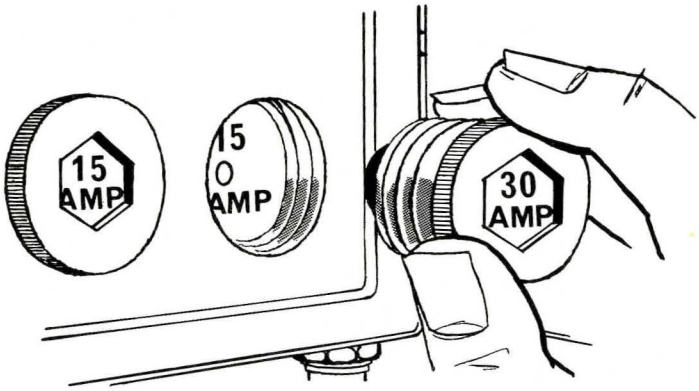
11. Store cords properly, preferably in a cool, dry place. Wipe cords clean, smooth out kinks and wind loosely on holders. Wind loosely so as not to injure fine wires of cords. Wrapping cords too tightly may loosen the connection and eventually break the insulation and wires. Keep grease and solvents away since this can damage the insulation.

It's very important that the house have good wiring throughout. Although wiring will not wear out, it may become overloaded. Replacing this wire with larger diameter wire and installing more circuits can help to distribute the electrical load. Let a competent electrician do the wiring. Make sure your home is wired according to the National Fire Protection Association Code 70. Any licensed electrician is familiar with the requirements of this code.

Fuses or circuit breakers are the safety links in the electrical system. Properly installed fuses or circuit breakers of the required size will open the circuit in case they become overloaded.



Never put a penny behind a fuse and never wrap the fuse in aluminum foil. This will overload your electric system and your safety link will not be there to protect you. The penny and foil are capable of carrying much more current than the required fuse. Therefore, something has to take the load and it will usually be the wiring.



Lighting systems require 15 amp circuits and appliance systems require 20 amp circuits. Larger units require special electrical circuits. Overloading these circuits can cause heating of wires which will eventually break down the insulation which might eventually lead to short circuits in the wiring.

If a fuse does blow out, replace it by following this procedure.

1. Pull the switch which controls the blown fuse, to be sure the current is off.

2. Remove the blown fuse.

3. Insert a new fuse of the proper size.

4. Put the switch back on to see that the fuse does not blow again.

If the fuse blows, it is an indication that the trouble has not been corrected. Call a repairman in this case. You should also stand on a dry board when replacing a fuse so as to lessen the possibility of shock.

If a fuse does blow, it is the indication of something wrong. Some of the causes of blown fuses are:

1. Short circuit caused by two bare wires touching.

2. Too many lamp bulbs or appliances on the same circuit.

3. Defective cords or wiring on lamps and appliances.

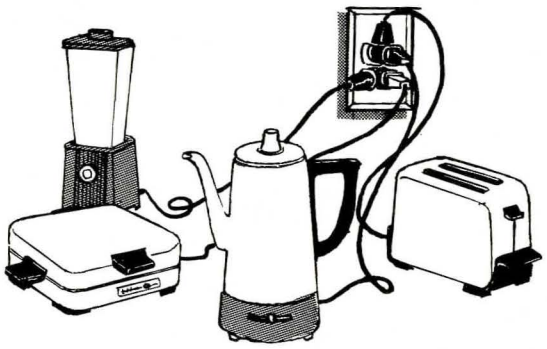
4. Worn or broken insulation which permits bare wires to touch grounded metal.

Yes, electricity is definitely our unseen friend. Used improperly, it can also be your foe. Check your wiring when you go home and then make plans to bring your wiring up to date. Electricity is always on hand and ready to serve you, but like your auto, it must be used with care.

Read the directions on the use of your electric equipment. Do you remember the cautions marked on your electric blanket such as do not wet, do not use pins, do not fold? These rules should always be followed. Look at your household appliances. Some of them have directions that the appliances should not be immersed in water. Are you following this rule?

Do you keep electrical appliances away from the tub or basin in the bathroom? If not you may get the shock of your life.

Do you turn off and unplug the electric iron when not in use?



Do you avoid using "octopus" plug assemblies?

Do you always disconnect metal electric equipment before cleaning it with a damp cloth?

Can you answer yes to these questions? If not, you had better do a little practicing on the safe use of electricity. Electricity can be as hazard free as you want it to be.