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EC55-1104 Repair of Electric Cords

Harold C. Brigham

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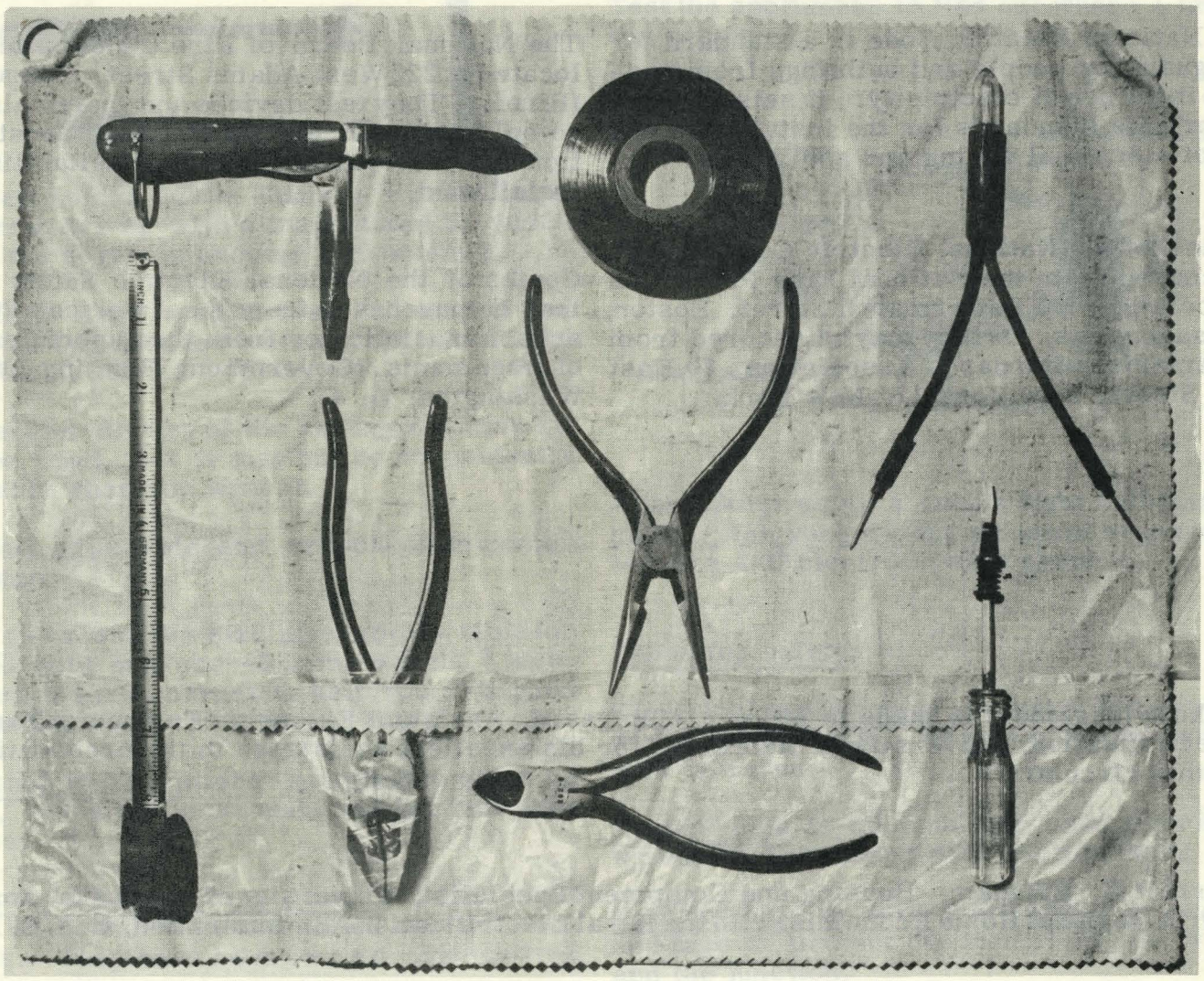
Repair of *Electric Cords*



EXTENSION SERVICE
UNIVERSITY OF NEBRASKA COLLEGE OF AGRICULTURE
AND U. S. DEPARTMENT OF AGRICULTURE
COOPERATING
W. V. LAMBERT, DIRECTOR

BEFORE ATTEMPTING CORD REPAIRS OR BUYING A NEW OR REPLACEMENT CORD, READ - - University of Nebraska Extension Circular 55-1103, "Electric Cords, Their Selection and Care".

The National Electric Code is a standard for safeguarding people and buildings from hazards in the use of electricity. It sets up minimum safe standards for the installation and use of electrical wiring and appliances.

Copies of the National Electric Code may be purchased from the National Fire Protection Association, 60 Battermarch Strret, Boston, Massachusetts. Or they may be secured from the American Standards Association, 70 East 45th Street, New York 17, New York.

The National Board of Fire Underwriters is located at 222 West Adams Street, Chicago 6, Illinois. They test devices and materials for compliance with the standards of construction and performance and their suitability for installation.

Copies of the National Electric Safety Code may be purchased from the American Standards Association or from the Superintendent of Documents, Government Printing Office, Washington, D. C.

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Acknowledgement is made to Milo L. Mumgaard, Assistant Extension Engineer, Farm Electrification, University of Nebraska, for his excellent assistance in the preparation of this circular.

Harriet C. Brigham, Housing and Equipment Specialist, University of Nebraska, formerly Regional Home Economist with the Rural Electrification Administration, U. S. D. A.

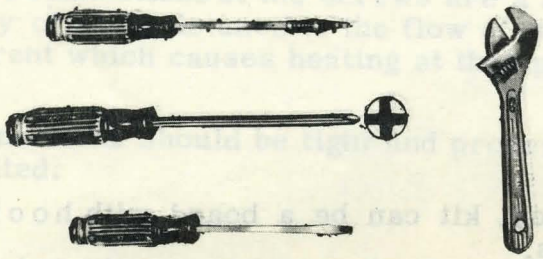
TOOLS FOR ELECTRICAL REPAIRS

Harriet C. Brigham

Your own set of tools stored in a convenient place where the tools are easily accessible simplifies the repair job.

Choose well-made tools which are the right size to fit your hand, the right tool for the job.

Screw drivers - sold according to the length of shank: 1 1/2 inch, 3 inch, 6 inch.



A screw holder on the shank is a great help. A screw driver with a magnetized tip which holds the screw is another convenience.

A phillips-type screwdriver is needed for some screws used in electrical appliances and equipment. It has a "Star" tip.

The screw driver of the sewing machine kit can be used, but it may not be conveniently available when you want it.

A small adjustable-end wrench often comes in handy.

Pliers - choose the size most comfortable for you to hold and use--5 inch, 6 inch, 7 inch. There are various types to help you do a good repair job. (See cover.)

Diagonal-cutting pliers - are good to clean up work, cut away loose ends and get into tight places.

Linemen's side-cutting pliers - either blunt nose or round nose are called electricians' pliers. They have tempered side-cutting jaws.

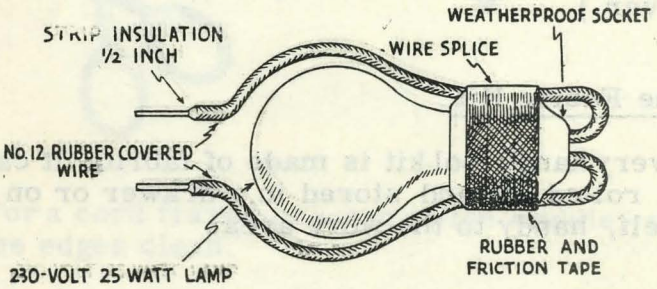
Long-nose pliers - also called needlenose or tapir pliers. They have side cutters and jaws which are round and tapired. They are useful to put a hook in the wire to go under a screw. The tapired point makes it easier to work where parts are close.

Knife - A folding or jack knife is handy to cut insulation and prepare the wires. It may have one sharp blade and one screwdriver blade with a safety catch to hold the blade open when in use.

A paring knife can be used if it is really sharp.

Test light - A neon light bulb with two wires. Costs about 60 cents. (See cover.)

With a test light you can locate trouble. Test the outlet for power source. Test the cord. Test the appliance, to find out where a break has occurred.



A TEST LAMP

A test lamp using a mazda light bulb can be made. Ask your Extension agent or a member of a 4-H electrical club about it.

Tapes for safety:

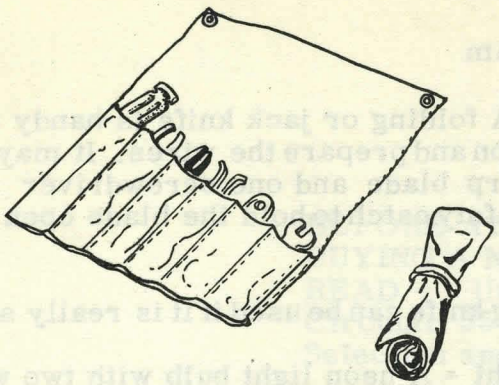
Electrical scotch tape is used for winding wires and junctions. No other tape is needed with this type.

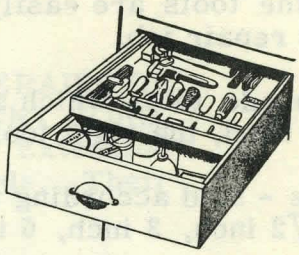
Rubber tape is an insulator used over bare wires and is covered with friction tape.

Friction tape is used over rubber insulation and tape to protect the insulation, the wires and the junction.

Thread in light and dark colors is used to repair fabric cord; used to tie ends of fabric to keep cord from raveling.

Sand paper or steel wool - A fine grade is used to brighten up metal parts or wires in order to get a good electrical connection.





The Tool Kit

Make your own tool kit to fit your tools. (See cover.)

The Fabric Kit

A very handy tool kit is made of fabric. It can be rolled up and stored in a drawer or on a shelf, handy to the work area.

Make one kit for your electrical repair tools. Use another for your other tools. Or make one for a neighbor.

Use denim, oil cloth, heavy plastic or other suitable material.

One-half yard of goods makes two kits about 18 by 18 inches.

To Make the Tool Kit

Fold up one edge of the material three or four inches and stitch it to make five or six pockets.

The opposite edge can have a tape stitched so that you can tie it around your waist to use as an apron with pockets.

Or the edge can have loops or gromets by which to hang the kit over the work area.

If the pockets are made of plastic, it is easier to see the tools to select the one needed. It keeps the kit cleaner.

The tool kit can be a board with hooks or straps.

A well-arranged box with lid and possibly a handy carrying handle could be used.

Whatever method is used, store the tools so that they are where you want them, easily reached and in good order when you need them.

CARE OF TOOLS

Use the tool only for the job for which it was made.

Keep cutting tools sharp; protect sharp edges. Keep tools in good repair, rust-free and lubricated.

Oil moving parts occasionally with light machine oil.

To prevent rust, rub with a few drops of light machine oil, rub dry before storing. A waxed paper can be used. For a rust preventive, mix two ounces of paraffin with one pint of carbon tetrachloride. Rub the metals with this.

Store tools carefully.

Repair Of Electric Cords

Inspect cords frequently. Discard if badly worn.

Always Disconnect the cord and appliance from the outlet before attempting repairs. This means safety for you and for the equipment.

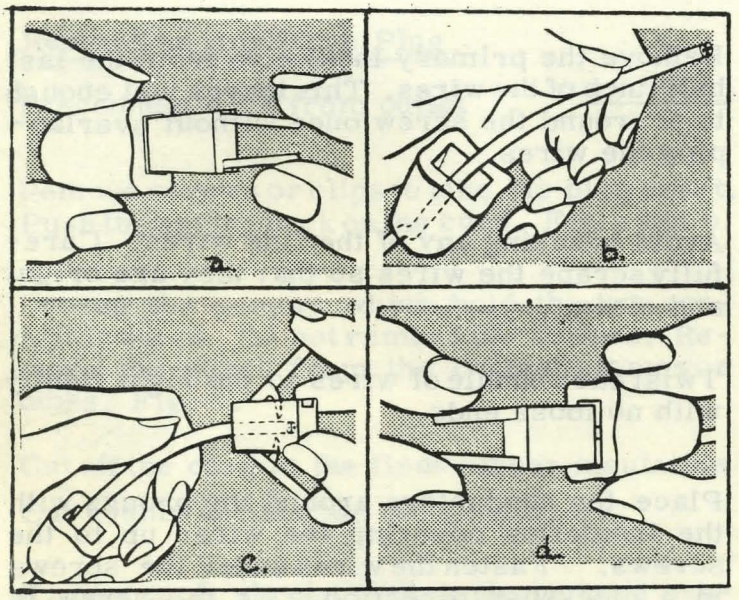
Poor connections are hazardous. Insecure or loose connections at the screws are a hazard. They offer resistance to the flow of electric current which causes heating at that point.

Connections should be tight and properly insulated.

Attach an Automatic Plug

There are several types of automatic plugs for use on light weight molded plastic or rubber cord. These plugs are not suitable for use on heavier cords.

Cut the molded cord straight across. Do not remove the insulation. Follow directions which come with the plug.

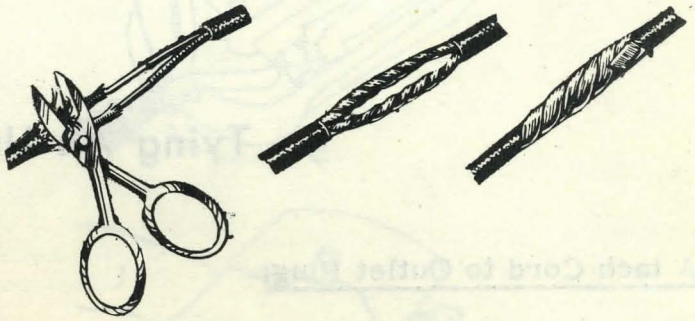


Remove the cover of the plug.
Insert the wire so that the ends of the wires are enclosed in the plug. Adjust the cord. The contact is made through the insulation. Adjust the cover.

No Splicing of Cords

The Electric Code states, "Flexible cord shall be used in continuous lengths without splice or tap."

Replace instead of trying to splice a flexible cord. See that the new cord is no longer than necessary to make the connection.



For a cord frayed or worn in the middle, cut the edges clean.

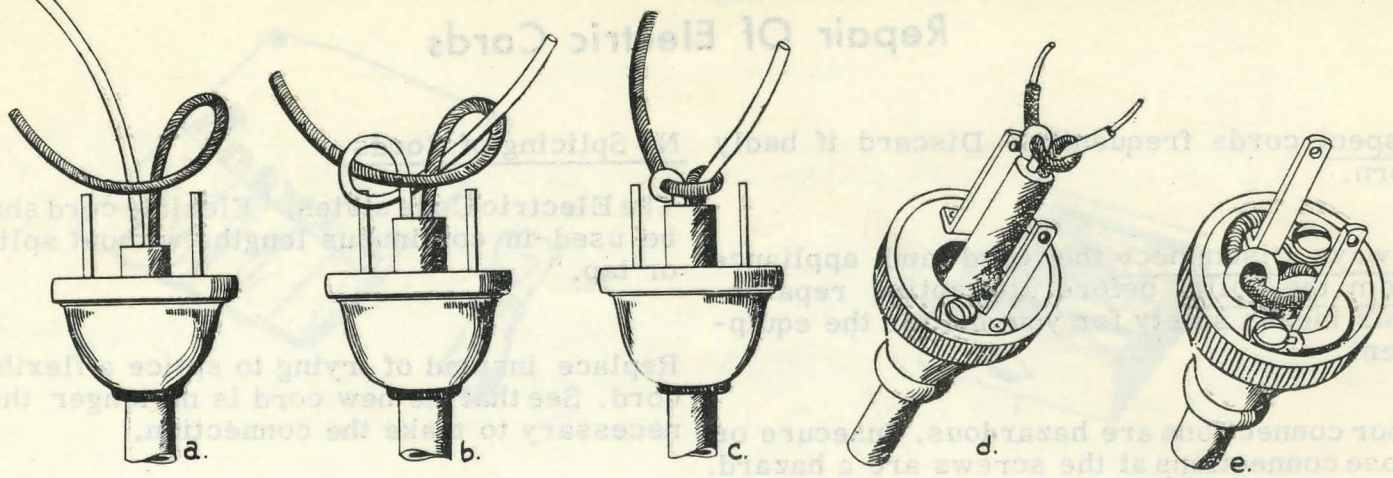
Tape each conductor separately with electrical plastic tape. Then tape the two together with the same type tape.

Rubber tape can be used on the conductors and the two conductors taped together with friction tape.

Make sure the conductors are taped from end to end of the break to completely cover the fine wires.

If the woven fabric covering of a cord is slightly frayed, use matching thread and crochet a new section. Or wrap cord with thread to repair the fabric covering.

It is safer to work with the cord and cap on the table. Use your hands to steady and guide the work. Do not hold it in the air in your hands--less danger of cuts if the screw driver should slip.



Tying An Underwriter's Knot

Attach Cord to Outlet Plug;

Choose the plug you can easily grasp to connect or disconnect. Select the right cord for the job: The electrical dealer will help you if you tell him how the cord will be used.

Remove the fiber protector disk from the plug cap.

Slip the plug cap over the end of the cord.

Remove about 2 1/2 inches of the secondary insulation from the end of the cord. Be careful not to cut the primary insulation which covers the wires.

Cut away the outer covering and fillers, if any.

If cord has fabric covering, wind with matching thread or plastic electrical tape to keep it from fraying.

An Underwriters knot, or holding knot is used so that tension on the cord will not loosen the cord from the screws.

If the size of the cap and wire do not leave room for the knot, omit it. In that case remove only 1 1/2 inches of the secondary insulation instead of the 2 1/2 inches mentioned above.

Bend each conductor around a prong in a clockwise direction. Leave long enough to go under the screw and cut.

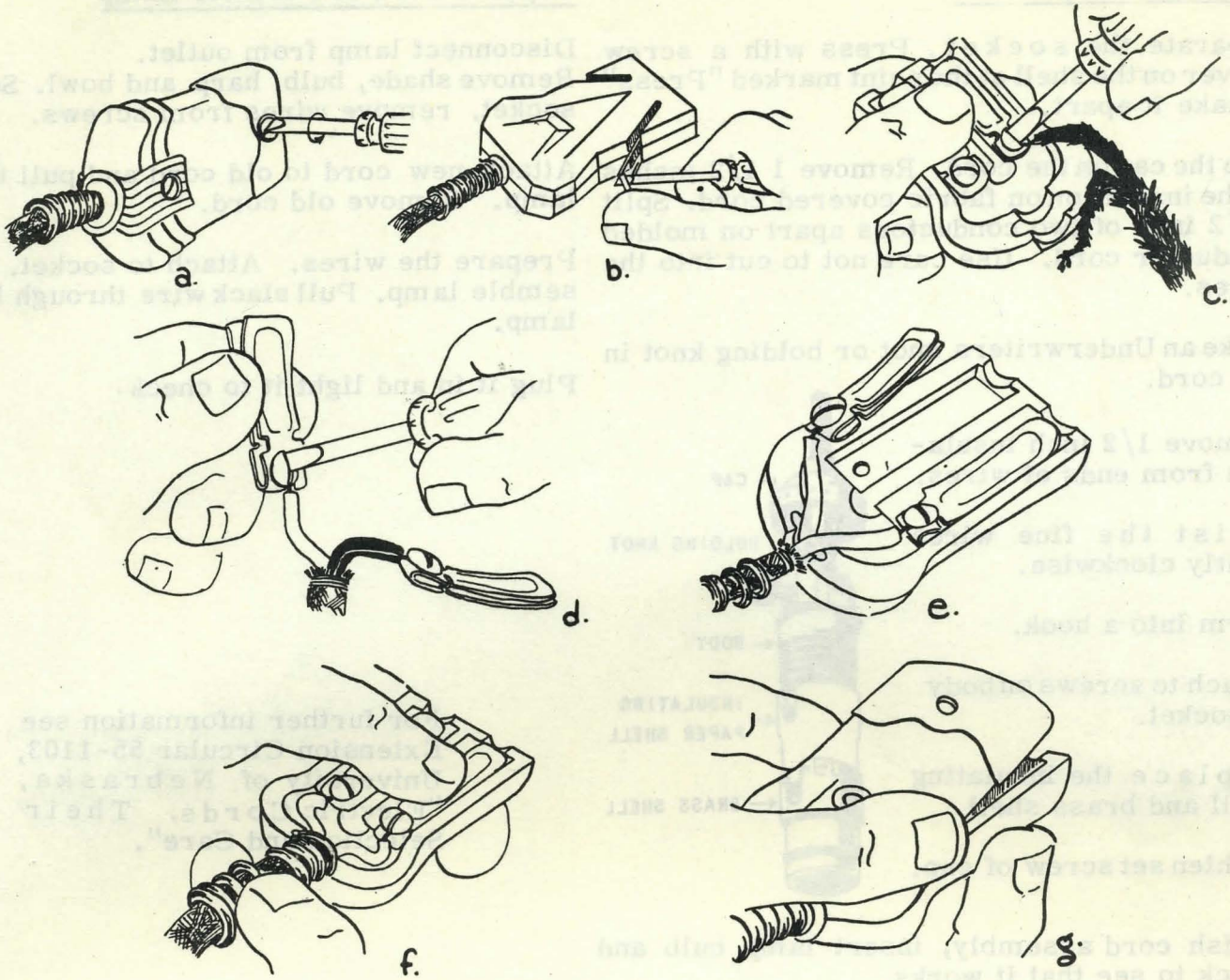
Remove the primary insulation from the last half-inch of the wires. This leaves just enough to go around the screw once without overlapping the wires.

Avoid breaking any of the fine wires. Carefully scrape the wires so that they are bright and clean.

Twist each bundle of wires to the right tightly with no loose ends.

Place the conductors around the prongs with the insulation covering the wires up to the screws. Fasten the wires under the screws in a clockwise direction. As the screw is tightened, the wires are also tightened.

Cut away excess material. Replace the fiber protector disk.



Replace an Appliance Plug

Disconnect cord from outlet

Remove screws or clips to take the plug apart. Push the spring back on the cord. Fig. a and b.

Loosen the screws which hold the two conductor wires. Do not remove the screws. Remove the wires from the contact clamps or tubes. Fig. c.

Cut off the cord to the firm rubber insulation. Cut evenly across the two conductors.

If a new cord, thread it through the cord protector.

About 2 1/2 inches from the end of the cord, wrap electrical tape around the cord to keep the outer covering from fraying. Thread could be used. Fig. d.

Remove 1/2 inch of asbestos insulation from the ends of the conductors.

Wrap remaining asbestos with strong thread to keep it in place.

Remove 1/2 inch of rubber insulation from the wires. Check to see that the ends are cut evenly across.

Twist the wires firmly to the right and form a hook.

Fit wires in a clockwise direction around the screws. Be sure the conductors and the spring fit into the grooves. Fasten screws firmly. Fig. e and f.

Fit the plug parts together and replace clips or screws. Fig. f and g.

Attach a Lamp Socket

Separate the socket. Press with a screw driver on the shell at the point marked "Press" to take it apart.

Slip the cap on the cord. Remove 1 1/2 inches of the insulation on fabric covered cord. Split 1 1/2 inch of two conductors apart on molded conductor cord. Use care not to cut into the wires.

Make an Underwriters knot or holding knot in the cord.

Remove 1/2 inch insulation from ends of wires.

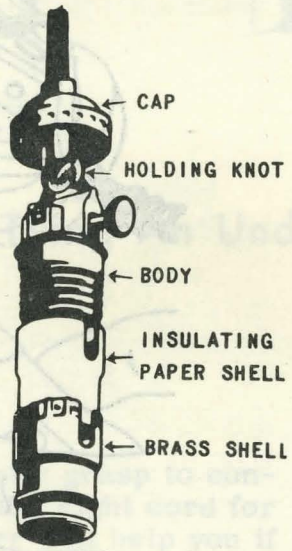
Twist the fine wires tightly clockwise.

Form into a hook.

Attach to screws on body of socket.

Replace the insulating shell and brass shell.

Tighten set screw of cap.



Finish cord assembly, insert lamp bulb and check to see that it works.

Replace Cord in Portable Lamp

Disconnect lamp from outlet.
Remove shade, bulb, harp and bowl. Separate socket, remove wires from screws.

Attach new cord to old cord and pull through lamp. Remove old cord.

Prepare the wires. Attach to socket. Reassemble lamp. Pull slack wire through base of lamp.

Plug it in and light it to check.

For further information see Extension Circular 55-1103, University of Nebraska, "Electric Cords, Their Selection and Care".

Let's Not Forget

Inspect all flexible cords used in the home at least every six months.

Employ a qualified electrician to make repairs and additions to house wiring where additional outlets are needed, instead of using extension cords.

Do not run flexible cords under rugs and carpets, nor over radiators or pipes.

Use convenience outlets to connect appliances. Lamp sockets are for lighting. Sockets are inadequate and expensive as well as unsafe for appliance use.

Do not handle cords or electrical appliances with wet hands.

In removing plug from outlet, grasp the plug itself. Do not yank the cord.

Be sure the floor you stand on is dry when plugging an electric cord into an outlet. A damp floor or puddle is dangerous.

Insist on flag labelled cord sets, also power supply cords and appliances bearing the words "Inspected - Underwriters' Laboratories, Inc."