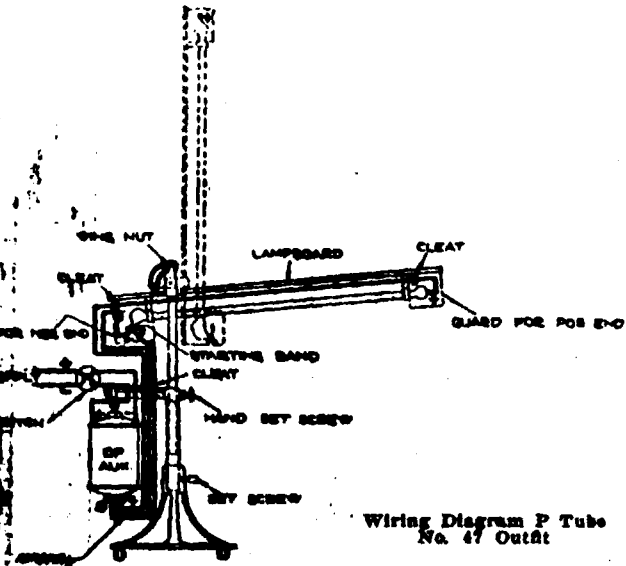
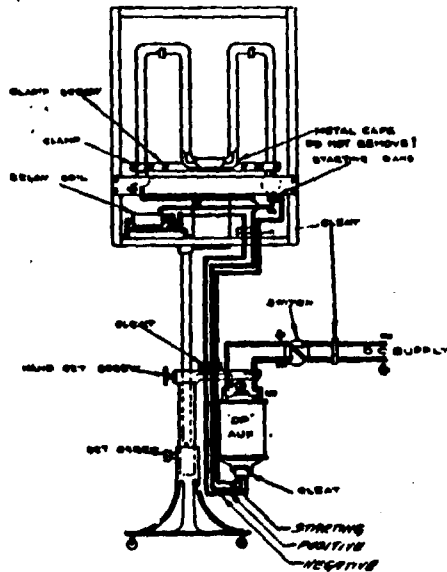


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Wiring Diagram P Tube
No. 47 Outfit



Wiring Diagram P-M Tube
No. 54 Outfit

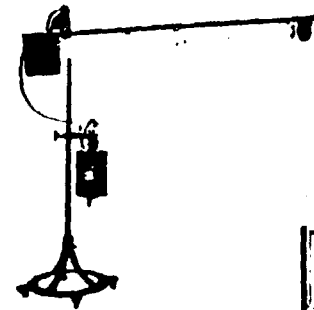
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Instruction Book

No. 30894-C

Cooper Hewitt Lamps

TYPE P STRAIGHT TUBES
TYPE P U-SHAPED TUBES
TYPE P M-SHAPED TUBES



Outfit No. 47
With 36 inch Straight Tube



Outfit No. 52
With U-shaped Tube on Stand



Outfit No. 54
With M-shaped Tube on Stand

All with DP Auxiliaries
FOR DIRECT CURRENT CIRCUITS

COOPER HEWITT ELECTRIC CO. 3991
HOBOKEN, NEW JERSEY

General Offices: 95 River St.

Works: Eighth and Gra



**AUXILIARY TYPE D P
WITH CASING REMOVED**

1. Binding Posts for Supply (2).
2. Adjuster Resistance.
3. Inductance Coils (2).
4. Shifter Resistance.
5. Shifter.
6. Shifter Bearings (2).
7. Binding Posts for Shifter Leads (2).
8. Binding Posts for Leads to Tube (2).
9. Terminal Block.

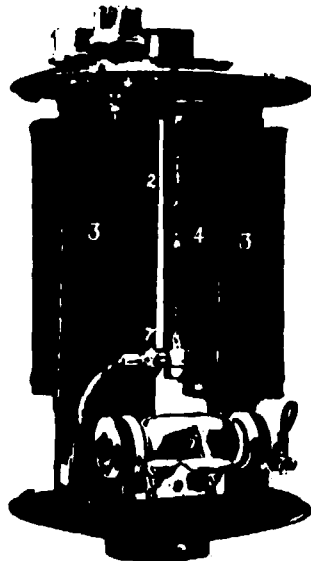


Fig. 2

GENERAL

The standard Type P Lamp is adapted for multiple connections on 100 to 124 volts, Direct Current circuits only, and takes an average of 3½ amperes; average watts 385.

For operation two in series on 200 to 248 volts Direct Current, the Lamp Outfits are very similar except the Auxiliaries have different starting resistance. Average watts 385 for each Lamp, or 770 for the two.

The complete Lamp Outfit consists of one Tube, Auxiliary, Shifter, Reflector-Holder or Holder.

A number of different types of outfits are shown on page 1.

METHOD OF MOUNTING

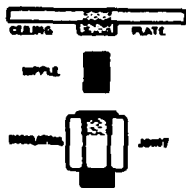


Fig. 3. Detail of Joints, Etc.

When lamps are used for overhead lighting, the Auxiliary should be rigidly fastened to the ceiling with the Tube and Reflector-Holder suspended from it. With each Outfit is furnished a ceiling plate, a nipple and an insulating joint (½ inch x ¾ inch). See Fig. 3. If the Outfit is to be hung at a greater distance from the ceiling than these parts will allow, use ½-inch pipe and hickey (½ x ½ female) between the insulating joint and the Auxiliary.

After the Auxiliary is properly hung, the Reflector-Holder is attached to the same by means of the pivot screws provided.

If the Reflector-Holder is "offset," or hung away from the Auxiliary, well insulated wire leads must be run from the Auxiliary to the Tube to make the connections. These leads must be kept at least 1½ inches from each other.

If Photographic Holders are used, they should be mounted on the iron stand as shown, the Auxiliaries screwed into the insulating joint provided and the connections made from the main to the top binding post on the Auxiliaries and the lead running from the Tube should be connected to the inside binding post on the Auxiliary, due care being taken to observe the markings in order to preserve the proper polarity.

WIRING AND ELECTRICAL CONNECTIONS

Wire according to Fig. 4 and fuse for 10 amperes.

Individual switches must be provided for each and every Lamp Outfit so that the Lamp can be turned off, if for any reason, it refuses to start after 5 minutes' operation of the Shifter (see Starting.)

In connecting supply wires extreme care must be taken to

PRESERVE THE PROPER POLARITY

Polarity paper is furnished with each outfit. If a piece of this paper is moistened and placed across the supply wires, it will turn RED where it touches the NEGATIVE. The wire that turns the paper red should be put into the part marked "—." When the polarity is reversed the Lamp will not start.

The top of the Auxiliary is marked "+" at the positive or "plus" binding post and "—" at the negative or "minus" post.

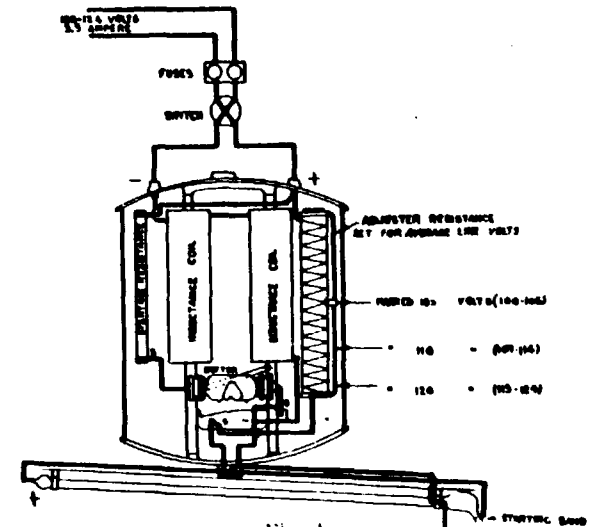


Fig. 4

Wiring Diagram of P Lamp on 100-124 Volts D. C.
Type P Tube, Type D P Auxiliary (Multiple), Type R P Reflector-Holder.

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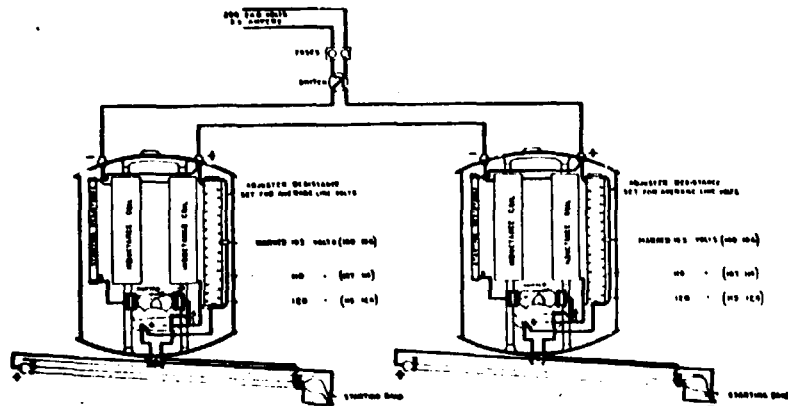


Fig. 5

Wiring Diagram of Two P Lamps in Series on 200 to 248 Volts D. C.
Two Type P Tubes, Two Type D P Auxiliaries (Series), Two Type D P Reflector-Holders

These same markings are used throughout on all terminals and binding posts of the Auxiliary, Holder and Tube.

SHIFTER

With each Auxiliary is furnished a Shifter (a mercury cut-out in an exhausted bulb), which serves for starting or lighting the Lamp.

Place the Shifter in its bearings by slipping the porcelain bushings over the brass terminal caps, setting the bushings into their seats and holding them down with the straps provided. (See Fig. 2.) The insulated pin protruding from the movable armature fits into the slot of the end-cap at one end of the Shifter. The tips of the mercury cups must be pointed downward. Connect Shifter-leads to binding posts marked "S"—"S" (Fig. 4) or marked "7" and "7" (Fig. 2).

When the Shifter is properly placed the mercury forms a bridge between the two cups of mercury into which the two leading-in wires penetrate.

When the current is applied, the magnetism lifts the armature. The Shifter thereby being turned in its bearings ("6" and "6" Fig. 2), the mercury bridge between the leading-in wires breaks and the Lamp starts. Before attempting to start the Lamp ascertain that the moving parts operate freely.

To complete electrical connections, follow the diagram (Fig. 4 or Fig. 5). Attach the leads issuing from the Reflector-Holder to the corresponding binding posts of the terminal block, as indicated by the markings and tags.

LAMP TUBE

Place the Tube in the Holder and tighten the clamps securely.

The negative end, that is the end with the black bulb, should always be pointed down to insure the negative electrode cup being kept full of mercury.

In the bent type of tubes, all the mercury must be run back into the large black bulb before installing. If during the use of the Lamp, the mercury collects in the tubing or at the positive end, the Tube should be taken out and the mercury run back to the negative.



FIG. 6

Connect the leads issuing from the Holder to the terminals of the Tube. There are three leads, one of which is to be connected to the positive terminal. At the negative end one lead connects to the starting band and the other to the negative terminal. These terminals are of different sizes and are not interchangeable.

CURRENT ADJUSTMENT

The successful operation of the Cooper Hewitt Lamp requires that the resistance of the Lamp be properly set for the actual average voltage of the supply on which it is used. This average voltage should be determined accurately with a reliable voltmeter:

The readings being taken across the outside supply binding post on the top of the Auxiliary, and while the Lamps are running with the casing on Auxiliary.

The Auxiliary resistance should then be set accordingly.

Each Auxiliary is provided with an Adjuster Resistance spool (see Fig. 7) for adjusting the Lamp current according to the line voltage. The adjusting resistance has a sliding contact, the guide of which is marked in the standard Auxiliary "103, 110, 120." These three resistance steps cover the following range of line voltage:

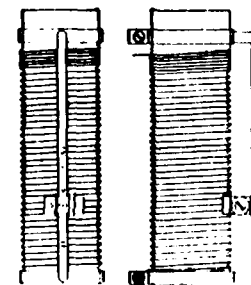


Fig. 7. Detail of Adjuster Resistance

- Mark 103.....Line Volts 100 to 106
- Mark 110.....Line Volts 107 to 114
- Mark 120.....Line Volts 115 to 124

When Lamp Outfits are installed in series on 200 to 248 volts, the above figures should read double and each Lamp set accordingly.

STARTING OR LIGHTING

The Lamp is started or lighted by the action of the Shifter, which operates automatically when the Switch is closed. When the Shifter is lifted by the magnet the current flowing through

100020

the mercury bridge is interrupted, causing the inductance to momentarily impress a voltage between the negative and positive electrodes and between the mercury and the "Starting-Band" sufficiently high to start the Lamp. This momentary high tension is localized in the Lamp and does not enter into the line.

The Shifter will not operate when its vacuum is impaired. A Tube whose vacuum is impaired will not start. In this case, the Shifter will continue to tilt until the Switch is turned off. As the Shifter action produces a strain upon the mechanism and upon the insulation of the Auxiliary, it is advisable never to allow the current to remain in a Lamp Outfit when the Tube will not light.

The Starting-Band is a metallic coating applied to the outside of the enlarged chamber at the negative end of the Tube, opposite the mercury edge. It causes a minute spark at the mercury surface during the action of the Shifter and thereby aids the starting. It is important for the starting that the negative terminal of the Tube is kept clean and free from excessive accumulations of dust.

PRECAUTIONS

The Tube and the Shifter are sealed glass vessels exhausted to a high degree of vacuum, and are useful as long as the vacuum remains unimpaired. When the vacuum is good, the mercury in the Tube or Shifter emits a clicking sound when moved; while the sound of mercury in a dead Tube is dull.

Handle Tube and Shifter with care to prevent breaking.

Don't attempt to start the Lamp with the polarity reversed, as this may ruin the Tube.

Don't allow the mercury to empty out of the negative electrode cup, either by shaking violently or by running the Tube with the negative electrode tilted up, as this will ruin the Tube.

Don't leave the current on Lamps which do not light readily, or on Lamps which have dropped out and have not relighted themselves.

Continual working will eventually impair the Shifter, and also causes considerable strain to the insulation of the Inductance coils of the Auxiliary and the leads between Auxiliary and Tube.

Don't attempt to operate Lamps on voltages other than those called for on the name plate.

Clean the Tubes and the Reflectors when necessary. Accumulations of dust and dirt naturally reduce the efficiency of the Lamps.

Also clean the inside of the Auxiliaries. Accumulations of dirt in the Auxiliary may interfere with the electrical and mechanical operation of the Lamp.

SUGGESTIONS IN CASE OF TROUBLE

(1) Tube does not start but flashes white between all electrodes.

CAUSE: Polarity may be reversed; Tube is either poor starter, the room temperature is too low, or there may be a loose connection in the Auxiliary or at the switch or fuses.

REMEDY: Test for Polarity; Inspect all contacts. With slow starting Tube, a slight shaking of the Tube will facilitate starting. Or, rotate slightly the Tube in the clamps so that the position of the negative tip is changed a little—not more than 10° either way from the vertical (Fig. 6). Or, disconnect Tube, remove it from clamps and tilt it back and forth a couple of times streaming the mercury across the Tube. In case of low temperature, heat the Tube slightly, especially at the negative condensing chamber. Should the Tube repeatedly refuse to start, report to us.

(2) Lamp runs below normal candle power. Flickers or drops out.

CAUSE: Runs on too low a current, either because supply voltage is too low, or because of some poor contact.

REMEDY: Set Lamp, as per Current Adjustment, page 5.

Inspect all electric contacts in Auxiliary and on Lamp Tube. If necessary tighten screws and make sure there are no broken leads.

(3) Lamp runs above normal candle power. Tube blackens quickly. Auxiliary coils are excessively hot and eventually smoke.

CAUSE: Lamp current is too high, either because of the supply voltage being too high or because of a wrong setting of the Adjuster resistance or because of a short circuit in the Auxiliary.

REMEDY: Set Lamp, as per Current Adjustment, page 5.

If this is not sufficient, measure line voltage. Should line voltage be right, look for a possible short circuit. When the Auxiliary has been run long on too high current the insulation is generally impaired, which will result in a poor starting of the Lamp. Then the whole Auxiliary has to be returned for repairs.

(4) Tube does not start, but flashes red.

CAUSE: Vacuum is impaired.

REMEDY: Tube must be replaced.

(5) Tube does not start, nor flash—Shifter operates.

CAUSE (a) Vacuum of Shifter is impaired. Shifter flashes red or mercury mirrors the inside of the Shifter.

REMEDY: Shifter must be replaced.

CAUSE: (b) Same as No. 4.

REMEDY: Same as No. 4.

CAUSE: (c) Impaired insulation.

REMEDY: If impossible to locate and remedy, return Auxiliary for repairs.

(6) Tube does not light and the Shifter does not operate.

CAUSE: The Shifter sticks or the electric supply is interrupted, either in the main circuit or in the Shifter circuit.

REMEDY: Inspect Shifter. Look for cause of interruption in electric circuits using volt meter or incandescent lamp. Inspect fuses and switch.

HOW TO ORDER

I. Complete Lamps:

In ordering Standard Cooper Hewitt Lamps—that is, the Complete Lamp Outfit—it is necessary to give the following:

(1) The nature of the electrical supply, viz.: direct current or alternating current. If alternating current, give frequency (in cycles).

(2) The actual normal voltage of the supply at the Lamp (in volts) with the minimum and maximum variation at the Lamp.

(3) The exact type of Lamps, viz.: Type P or Type F.

(4) State whether Lamps are to be run in multiple or in series.

Particular care must be taken to select the proper Outfit for the voltage of the supply.

Purchasers will appreciate how necessary positive and definite information is on these points. Accepting second-hand or here-say information may result in the shipping of Outfits which will not operate on the actual electric supply, and cause delay in adjusting or exchanging the Outfits to meet the actual conditions.

II. Renewals—(Tubes Only):

Give in each case the type letters and specification numbers from name-plate on auxiliary or tube holder.

III. Parts for Reflector-Holders and Auxiliaries:

In all cases give the specification number from name plate of the Reflector-Holders and Auxiliaries for which the parts are required.

In ordering Series and Shunt Resistance Spools where there is more than one in an Auxiliary, give the location of the spool, and if possible, rough sketch or diagram showing location of part wanted.

PRICES

All prices are F. O. B. our factory, Hoboken, New Jersey; and are subject to change without notice.

We request correspondence before any goods are returned. Unless otherwise agreed, shippers must be responsible for delivery in good condition and must also prepay transportation charges.

Shipments will not be sent C. O. D. unless a remittance sufficient to pay express charges both ways accompanies the order.

Ordering to replace D.P. and

47 Cuttle

Suggest using one Photograph

reference NOV 10 A 221, You can

will make brackets for mounting

your stand slides and
connections to suit.

Approx dimensions of each

is 7" high 2 1/2" long

and 652F Shifter for

interior operation and 504
Shifter bottom cover.