INSTRUCTIONS

FOR THE

Installation
AND
Operation

OF

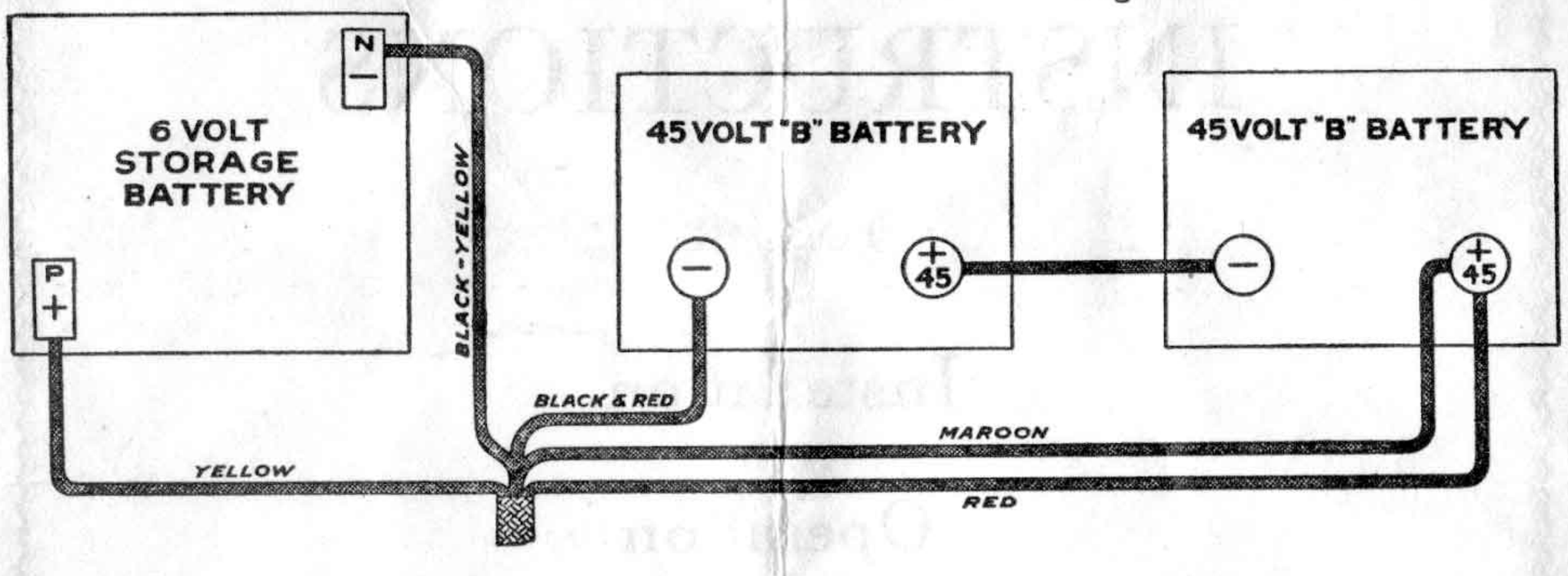
KING-HINNERS
Model A
Neutrodyne
Receivers

KING-HINNERS RADIO CO.
BUFFALO, N. Y., U. S. A.

INSTRUCTIONS

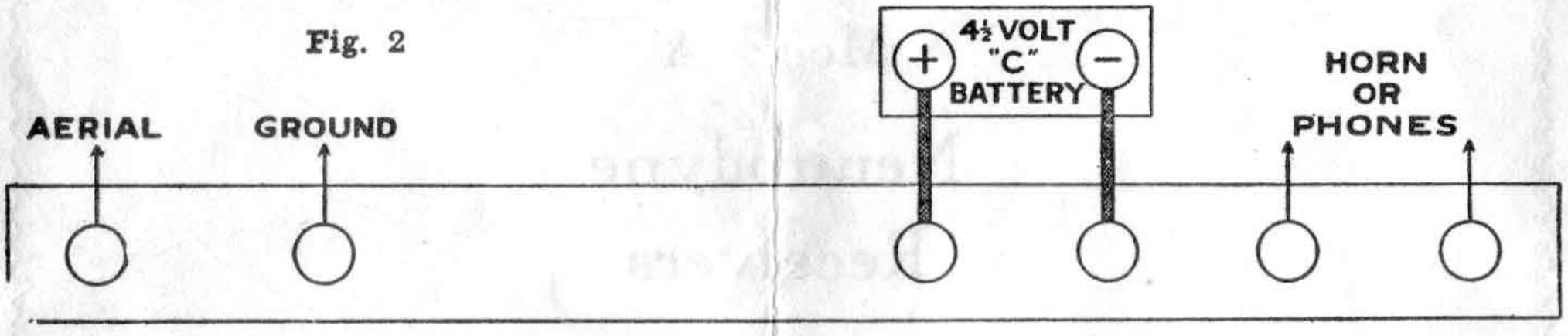
Location of Receiver—Place receiver in a room where it will be as free as possible from any knocks, jars or vibration and where the aerial lead-in and ground connection can be readily established. Do not place receiver too close to a stove or radiator, as excessive heat shortens the life of the batteries.

Fig. 1



Connecting Receiver—Remove all batteries from their packing and lay them out in accordance with diagram shown above. Thoroughly acquaint yourself with the positive (+) and the negative (—) terminals of each battery. Connect the colored cables that are attached to the receiver, in accordance with this hook-up diagram, being very sure not to make a mistake. Use a separate piece of short flexible wire to make the connection between the two "B" batteries.

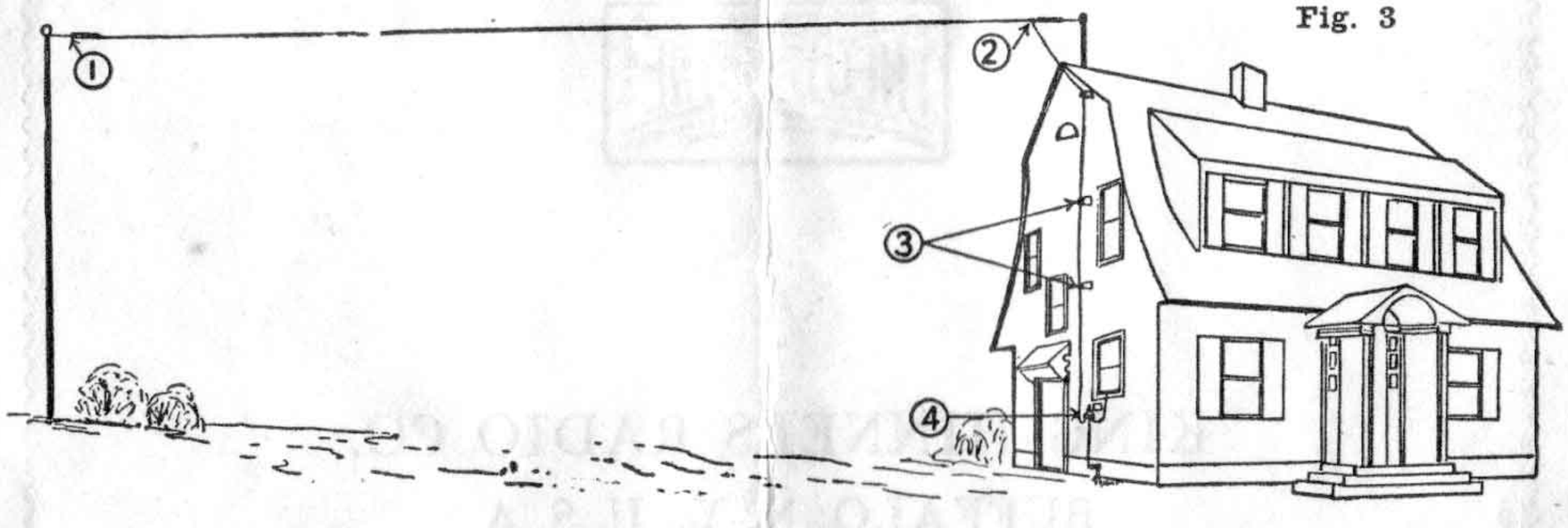
Fig. 2



Aerial and ground wires are to be brought into the receiver and fastened to the binding posts provided for this purpose. Be sure to include a 4½-volt "C" battery.

Do not put the tubes in the receiver until all connections are made and checked back a second time to avoid any possibility of a mistake.

Fig. 3



Outside Aerial—To get the best results, care must be given to the erection of the aerial. Use a single wire or stranded cable about 100 feet long, measuring from the free end of the aerial to the point where the ground wire from the set is actually fastened to the ground. This length should include the horizontal portion of the aerial wire

between the two supporting insulators, the lead-in wire and the ground wire extending from the receiver to ground. If a longer aerial is used, stations may come in with greater volume on the loud speaker, but the ability of the set to separate two or more stations operating on wave lengths close together will be reduced. If near a powerful broadcasting station that cannot be tuned out, try shortening the aerial. An outside aerial should be about 30 feet above the ground; if placed over a tin roof, about 10 feet above the roof.

Do not run your aerial across a street or over a light or power line. Do not secure to an electric light or telegraph pole. Keep aerial from close contact with any metal or grounded object, other outside wires, trees, buildings, etc. At points where aerial is supported, insulators should be used. See Figure 4.

Fig. 4

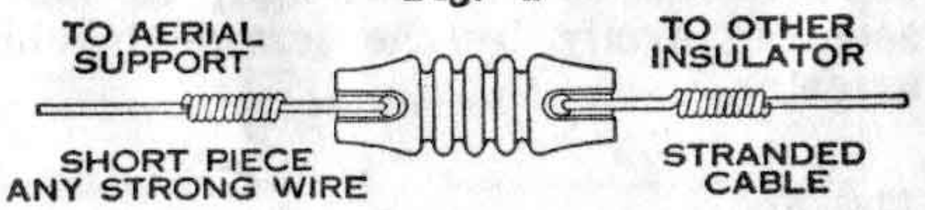
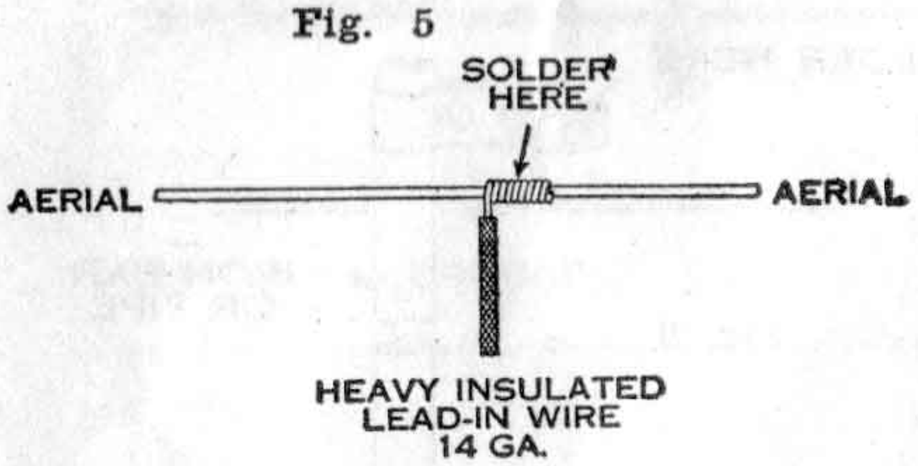
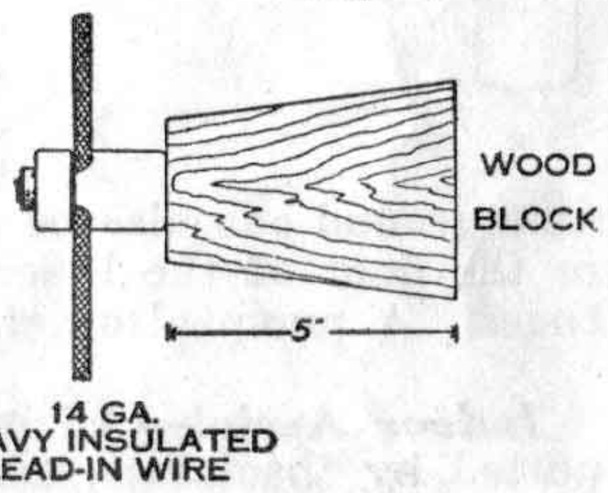


Fig. 5



Lead-In—The lead-in wire should be connected to the horizontal portion of the aerial by means of several tight turns as shown in Figure 5. If aerial wire is enameled, scrape the enamel off, where the lead-in wire is to be connected to it, to get a clean, positive electrical contact. In passing the lead-in wire downward, secure it by porcelain knobs as shown in Figure 6. These knobs should be nailed to 5-inch wood blocks in order to keep the lead-in wire at least 6 inches from the side of the building. It is well to keep the lead-in wire even more than 6 inches away from the building if such an arrangement can be readily accomplished.

Fig. 6



Where the lead-in enters building it should pass through a porcelain tube or be connected to a well insulated flexible metal strip inserted between a window and its sash, as illustrated in Figure 7.

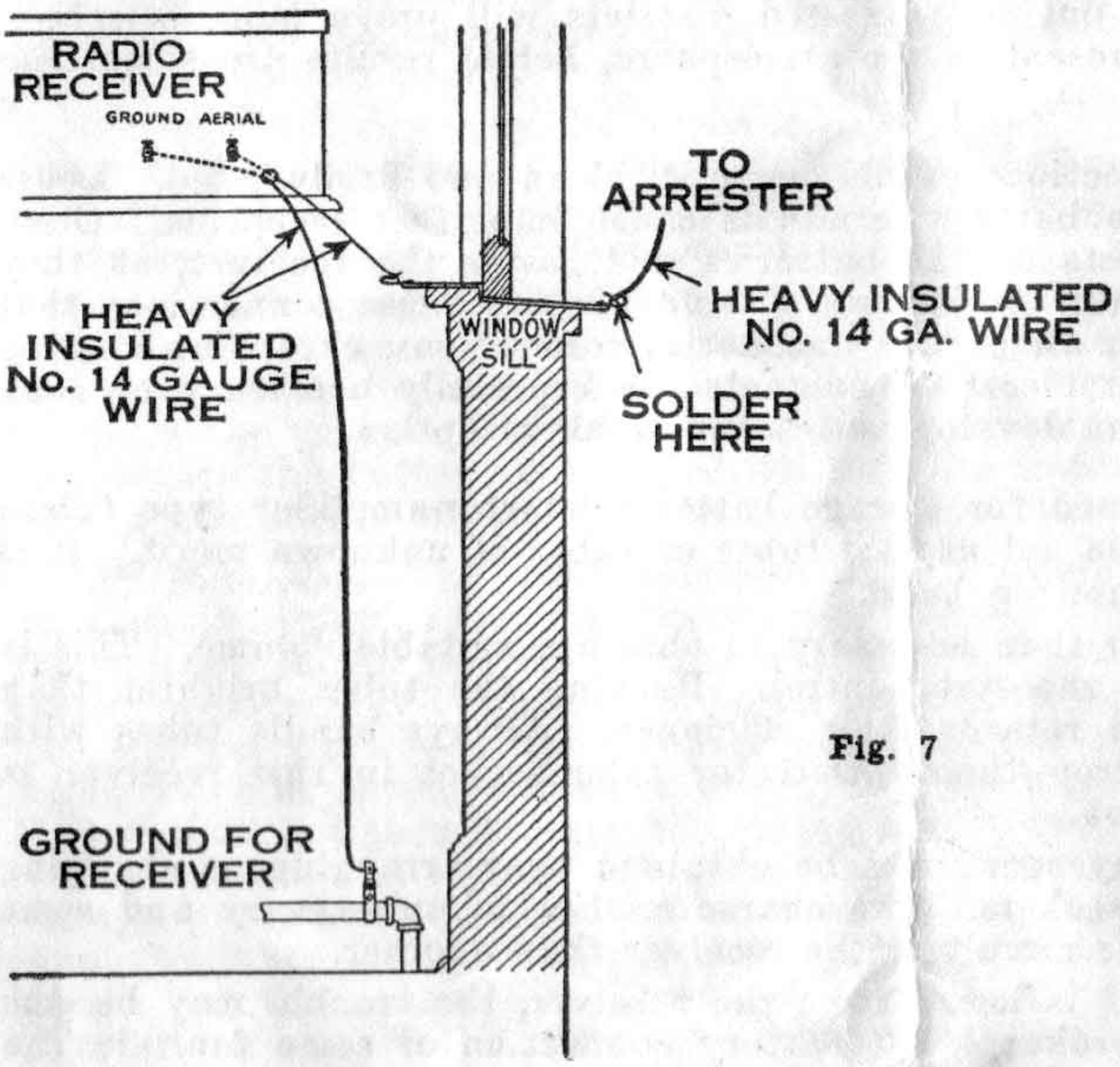
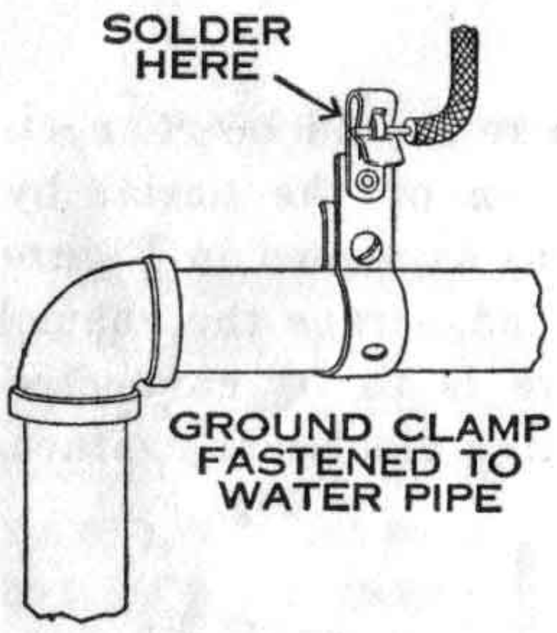


Fig. 7

The wire from the lead-in strip to the set should be as short as possible, and run directly to the binding post of the receiver and not be permitted to run in a parallel manner with the receiver or cross over or touch any battery connecting wires. If the lead-in or the receiver ground wire must pass behind the receiver from right to left, keep these wires three feet from the back of the receiver, if possible.

Lightning Arrester — It is advisable to have a lightning arrester. One means of installation is shown in Figure 9. Instructions showing other ways of installation accompany the arrester. Be sure the arrester is thoroughly grounded. An outside ground, by means of an iron rod or pipe driven deep into earth that is moist at all times, is the most practicable. If this is not possible connect the arrester to a water pipe close to the point where the pipe enters the ground. Do not connect to a gas pipe. It is well to solder all connections to the arrester, in addition to securing firmly by the screws provided with arrester.

Fig. 8



Ground — Ground connection for the receiver can be made to water or steam pipes, provided they are connected with a water supply or are otherwise thoroughly grounded. A gas pipe is not recommended for a ground. Before attaching the wire or the ground clamp, scrape the pipe thoroughly to insure a clean contact. A suitable ground can also be made by driving an iron rod or a piece of pipe into the ground or the floor of the basement until it comes in contact with earth that is moist at all times. A pump also acts as a good ground.

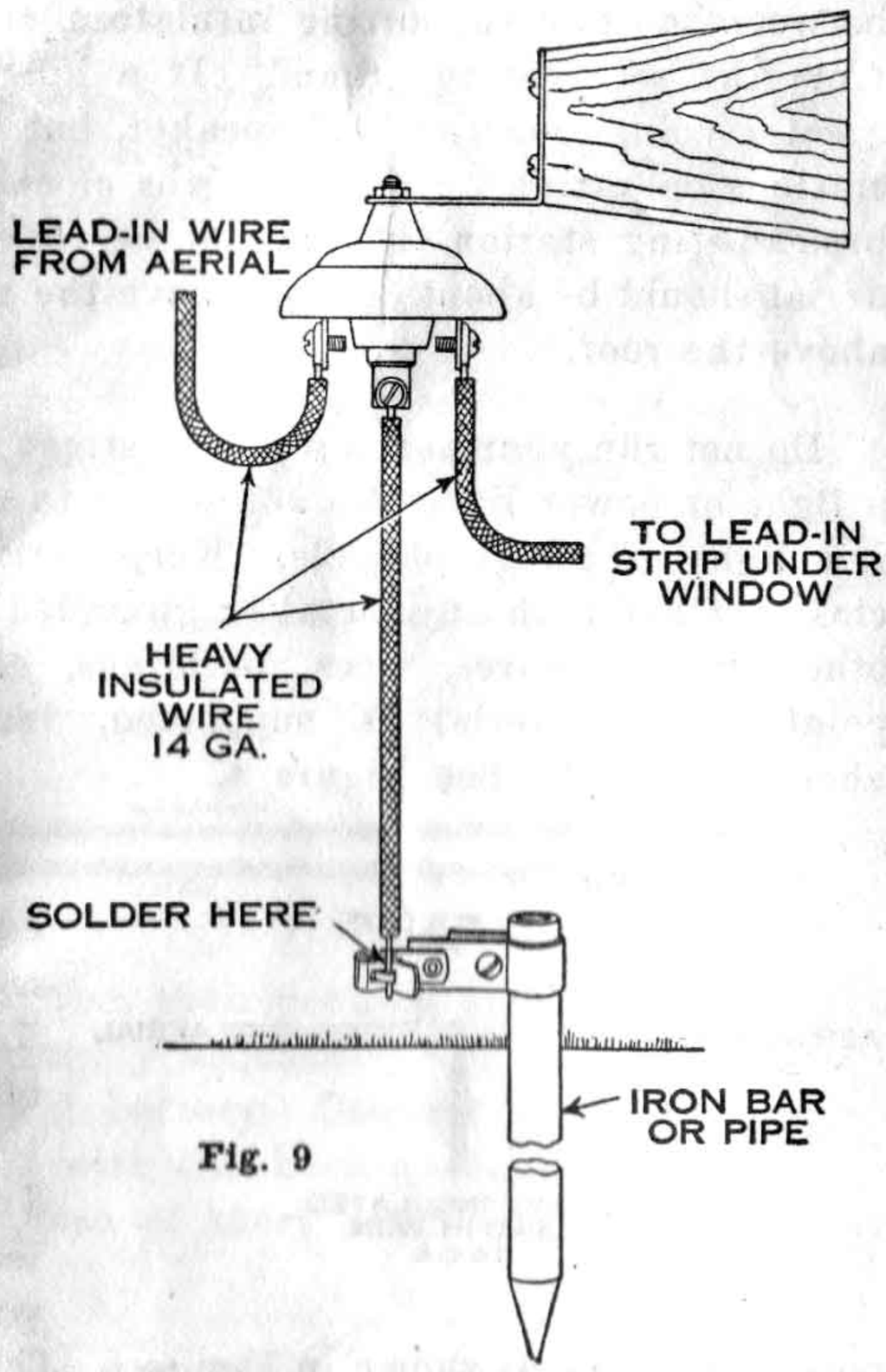


Fig. 9

Indoor Aerial—An indoor aerial can be installed by stretching a single wire, supported by insulators, across an attic or along a hallway, or by running an insulated wire around the picture molding of a living room. The length should total about 50 feet. By comparison with an outdoor aerial, an indoor aerial may reduce the volume and receiving range of the set, but in congested districts will prove more selective. In hot weather, when static is present in the atmosphere, better results are sometimes obtained from an indoor aerial.

Loose Connections—All connections should be neat, clean and firmly fixed. Loose connections and corroded storage battery terminals cause imperfect reception. Occasionally examine the binding posts on the batteries and inside the receiver, as they sometimes work loose; also examine aerial and ground for any loose connections that may develop. It is well to solder all ground and aerial connections, except at binding posts inside of receiver. Perfect electrical contacts are especially necessary on long range reception. Poor connections develop noises and weak reception.

Tubes—This receiver is designed for storage battery detector-amplifier type tubes. such as UX201A and CX301A. Do not use old tubes or tubes of unknown merit. It is well to always keep an extra tube on hand.

Do not burn the tubes brighter than necessary to obtain a suitable volume. This is controlled by turning back the rheostat control. Burning the tubes brighter than necessary shortens their life and retards their efficiency. Always handle tubes with great care. Do not knock or drop them. Detector tube socket in this receiver is spring mounted to absorb vibration.

Improvements in reception may sometimes be obtained by rearranging or changing the tubes about in the various sockets. The characteristics of tubes vary and some may be found more suited for one circuit in the receiver than another.

If tubes light up but no sound is heard from the receiver, the trouble may be due to run down "B" batteries, a broken "B" battery connection or some fault in the aerial or ground wire connections.

Be sure to remove tubes from the receiver when changing batteries, or disconnecting battery leads, also when cleaning or working inside of receiver. If a tube does not light up, it may be burnt out, or is not properly seated in its socket. If all tubes fail to light, check battery connections and condition of the "A" battery.

Power Tubes—If greater volume is desired, a UX112 or CX112 power tube may be used in the third audio socket of this receiver. But then a third 45-volt "B" battery and a second "C" battery are required and should be connected as shown in the diagram below. The use of a power tube, however, results in greater battery expense.

Fig. 10

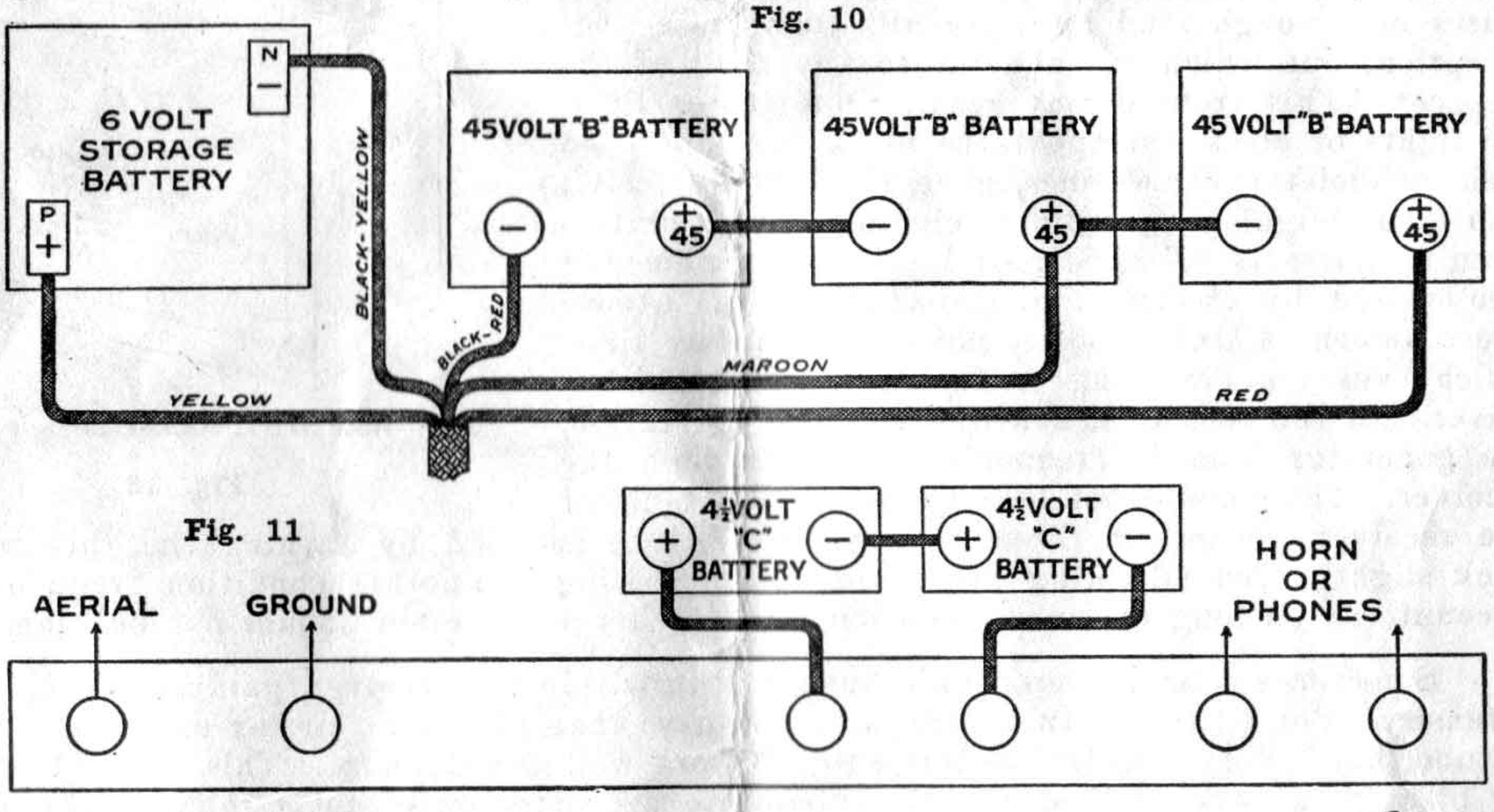


Fig. 11

Storage Battery—Be sure to keep your storage battery properly charged. A hydrometer should be kept at hand and readings taken of the battery occasionally. If the battery tests below 1,150, it should be recharged. A fully charged battery will give a hydrometer reading of 1,280 or more. See illustration. Be careful not to spill any of the liquid on clothing or rugs. Do not permit a storage battery to remain in a discharged condition. Do not use an old storage battery. Best results in reception are had from a new battery of known quality.

Storage batteries may be recharged at home by using a suitable charger connected to your electric light (110 to 115 volts) socket, or they may be taken to the nearest garage or battery service station.

A small amount of distilled water or pure rain water that has not come in contact with a metal container should be added to each cell occasionally, just enough to cover the plates. This should be done preferably just before the battery is charged, so that the water will be thoroughly mixed with the battery solution.

"B" Batteries—The "B" batteries do not require as much attention as the "A" or storage battery, but the voltage should not be permitted to get too low, otherwise clarity and volume will be seriously affected. You will get weak reception. Noises and distortion of sound will also develop with run down "B" batteries. It is well to test them occasionally with a small 0 to 50-volt voltmeter and replace the 45-volt size when the voltage goes down to 37 volts or lower. Readings should be taken when set is turned on. "B" batteries should last three months or longer, depending on use of receiving set. "C" batteries should last about six months.

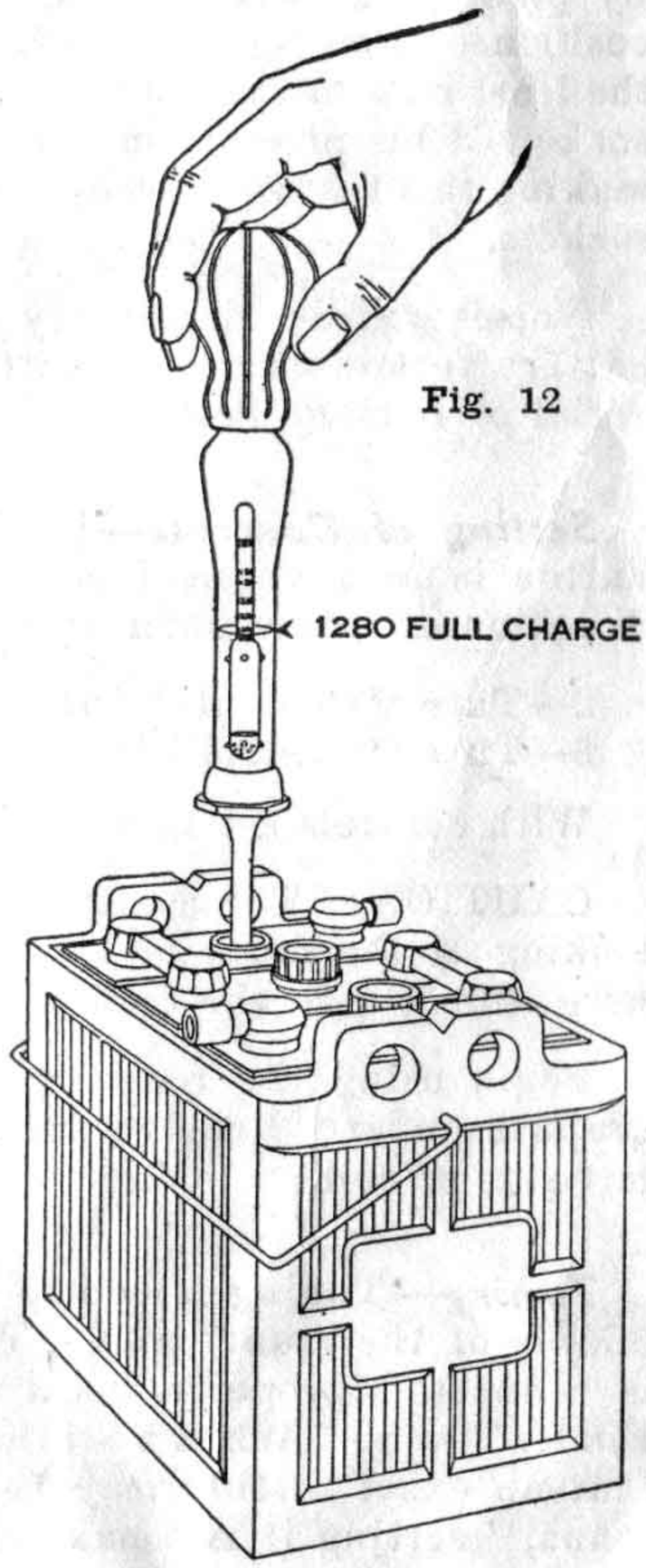
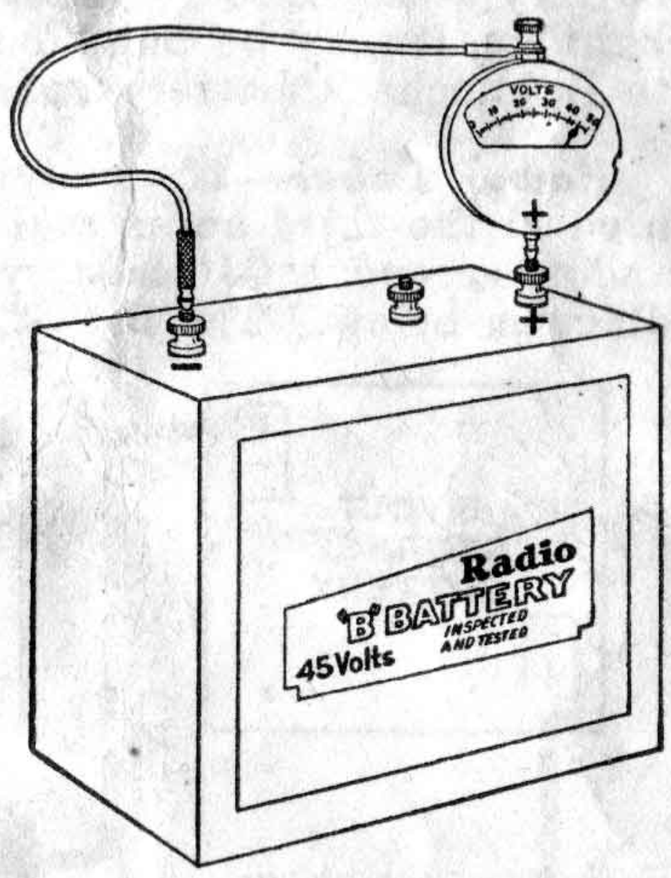


Fig. 12

HOW TO USE HYDROMETER

Speaker or Phones — Connect the red or marked speaker or phone cord to the (+) binding post; the black or unmarked cord to the post marked (—). Do not force reproducer to handle too much volume, as this causes distortion and impairs the quality of reproduction.



HOW TO USE VOLTMETER

Fig. 13

Noises in Receiver — Very frequently crackling noises or a rough loud hum prevails that cause poor reception, but which are not due to any fault of the receiver. This trouble may result from power lines, arc lights or electrical apparatus in the neighborhood such as violet ray machines, generators, motors, etc.; also from neighboring radio receivers whose operators permit their sets to whistle or howl. Interference is also caused by electrical disturbances in the atmosphere known as static, mostly noticed in summer time, which causes a crackling or frying noise in the receiver. In the case of a nearby broadcasting station, the generator hum is frequently heard through the receiver. This should not be recognized as a fault of the receiver. Some of these disturbances can be modfied by turning the rheostats back slightly and adjusting the tuning dial. Fading is another condition frequently encountered on long distance reception, for which your receiver should not be blamed.

Sometimes a loud microphonic hum sets up within the receiver, gaining rapidly in intensity. Some vacuum tubes are more sensitive than others to jarring and vibration. A tube that is very sensitive to jars will not work well as a detector. This can be tested by placing in turn each of the six tubes into the detector socket (which is the one cushioned) and lightly tapping the glass bulb. That tube among the six which produced the least ring in the loud speaker, as it was lightly tapped, should be kept in the detector socket. This precaution will prevent a continuous humming from the loud speaker. In making this test it is necessary to have tubes inserted and burning in the four right hand sockets.

Noises will develop if any of the batteries are permitted to run down; also if storage battery terminals are permitted to corrode or loose connections occur anywhere in the aerial or battery leads.

Setting of Controls—1—Turn on "Switch Control 1" so that arrow on the small button is in a vertical position. Turn larger knob underneath this switch button in direction of arrow until knob hits the stop.

2—Turn "Control 2" in direction of its arrow until it hits the stop.
3—Turn "Control 3" in direction of its arrow until it hits the stop.

With controls set in above manner, all six tubes should now be lighted.

CAUTION: The antenna coil inside of the set, which is the first from the left when looking at the front of the receiver, has an aerial tap connector. Unless this flexible wire connects to the coil, the set will not work.

Begin using the receiver with this connection to right side of the coil. See paragraph 2 under "Receiver Selectivity" for instructions on use of the connection to the left side of coil.

Tuning—Tuning is controlled by the large knob marked "Station Finder" near the middle of the front panel. This controls the "Indicator Dial" to the left. If the set is connected properly, local stations should be picked up by turning the "Station Finder" knob. When a station is heard, reduce the volume by means of "Control 3", so that an exact setting may be obtained. Next turn the knob at the left marked "Antenna," setting it for maximum volume. This adjustment should be made on a station operating between 300 and 400 meters. When this has been done, the set has been

adjusted for the particular antenna in use. turning the "Station Finder" knob. Thus Finder" knob from one end of the scale t your receiving radius will be heard if ope It should be remembered that the set is alw will always be present. In extreme cases obtained by readjusting the "Antenna" k a division scale is provided so that exact

CONTROL 1—With a fully charged sto this knob turned on full. The knob shoul clearest tones. It will be found that there is best volume and that further turning of the k is the best setting.

CONTROL 2—This knob controls the volume produ and gradually. If the control is turned on full the lou reduce the volume it is only necessary to turn back th

CONTROL 3—This control, like Control No. 1, will By means of this control, together with Control No. 2, any de to the listener can be had without distortion.

Receiver Selectivity—This is a term given to describe the abili separate one station from another. Where the wave lengths of differe close together, the following precautions in the adjustment of the receive carried out.

1—The aerial should not exceed 100 feet in length, as stated elsewhere. I located less than five miles from powerful broadcasting stations should use a of less than 80 feet in length. In the extreme case the aerial should be shorten 50 or even 35 feet for best results.

2—To provide more selectivity for very severe conditions, an aerial coil tap connector is fitted to the antenna coil of the receiver. There are two terminals fitted on the right. For most ordinary operation of the receiver best results will be had when connection is made to the right hand terminal. When the utmost in selectivity is demanded, especially on the shorter waves, it will be helpful to connect to the left hand terminal of the antenna coil. When the connector is changed to this terminal it will be necessary to readjust the knob marked "Antenna."

3—The setting of Control No. 3 greatly affects the selectivity of the receiver. As pointed out elsewhere, it is rarely necessary to have this knob advanced to the full position. In cases where stations whose wave lengths are close together are being received, and it is found that complete elimination of the undesired station is not possible, it will be found that by setting back this Control Knob No. 3, the undesired station may sometimes be eliminated. In such cases the volume from the station desired may be reduced, but this sacrifice in signal is inevitable. It should be recognized that this occurs only in few cases.

4—Selectivity may be improved further by turning back Control No. 2 as much as possible. A satisfactory though lesser volume may be obtained from the desired station.

Precautions—Do not forget to turn back battery switch when through using the receiver, thus avoiding an unnecessary drain on the batteries and the tubes.

Be careful not to drop any tools or metal objects inside of the receiver, thus causing a short, burning out a tube or damaging some internal part.

Do not oil, paint or varnish any internal part of receiver. Keep free of dust and dirt.

Do not permit batteries to run down. Remove tubes when cleaning inside set or changing battery connections.

A radio receiver requires care and attention. Unlike many other devices, its performance will not always be uniform, as atmospheric conditions and other disturbances vary considerably. A certain amount of patience is sometimes necessary in the operation of any radio receiver.