

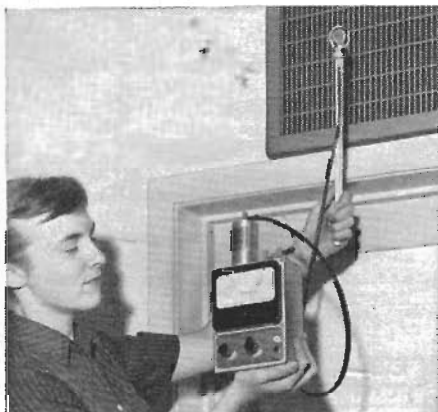
Why we want them, what they do, and how they work

By HAROLD B. McKAY

At one time, air conditioning meant filtering, cooling, dehydrating and circulating the air in a room. Placing the correct electrical charge on the air molecules must now be added to the list. The electronic repairman of the future may have to troubleshoot with the aid of sensitive instruments like the electrometer, or he may have to build an electroscope to find out if an air conditioner is really "conditioning" the air.

Recent discoveries concerning the effect electrically charged air has upon animals and humans show that negatively charged air aids good health. Why ionized air affects humans and animals has been a matter of extensive study by doctors and other researchers.

Recently, the subject has been clarified by the work of two scientists, Albert Krueger and Richard Smith of the Department of Bacteriology, University of California. They conducted experiments in which sections of the



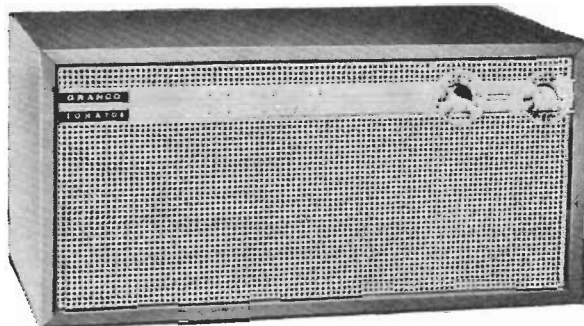
Electrometer and probe can be used to determine if an air conditioner is sending ionized air into a room.

windpipe were taken from rabbits, and the effects of the charged air noted.

The lining of the nasal passages, the trachea and bronchial tubes is surfaced with ciliary cells. These cells have tiny hairlike growths which constantly wave or beat. This action propels fluid upward toward the nose, and is nature's way of ridding our lungs of dust, bacteria, pollens and other irritants.

The experiments showed that negative air causes the fluid of these cells to become less viscous, the cilia to beat faster and thus push particles away faster. Positive air caused the cilia to slow down, the fluid to dry and the specimens to die more quickly.

AIR IONIZERS



The Granco Ionator, a portable health appliance a foot and a half long by about ten inches high and deep that combines mechanical filtering, electrostatic precipitation and negative ionization. Particles as small as one micron in diameter are removed from the air sucked in, and the purified air is charged with negative ions as it is returned into the room.

Some manufacturers have been quick to note these developments, and already electric heaters and air conditioners which embody ionization equipment are on the market.

Normally, when air is ionized, both positive and negative ions are generated, but circumstances may alter the balance between the polarities. The ionization of the atmosphere is constantly changing in polarity.

Ions from heaters

The Wesix Electric Heater Co. became interested when the firm's president found that electric heaters could ionize air. He learned how electric heaters could be modified so they would take advantage of this and contribute a desirable surplus of negative ions to the air.

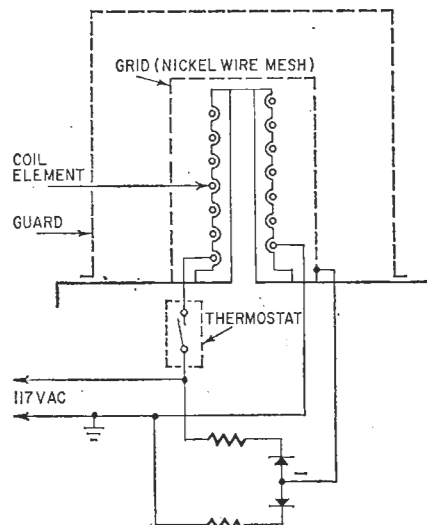


Fig. 1—Arrangement of an electric heater modified to deliver negatively ionized air.

This was done by placing a nickel wire-mesh grid around the ceramic tube on which the heating element is wound (Fig. 1). Under the heater a small rectifier is connected to the ac line. The negative side of the rectifier is connected to the grid which surrounds the heating element.

Operation is like that of a vacuum tube. The heater element, when it



This ionizer resembles a microphone. It is made by the Wesix Electric Heater Co.

reaches incandescence, generates both positive and negative ions. The positive ions are attracted to the negative grid and neutralized. The negative ions are repelled to the heater. When the ac goes through zero, the negative charge on the grid disappears. At this moment, both positive and negative ions pass through the grid. When the grid is again energized, the positive ions which got through are drawn back and neu-

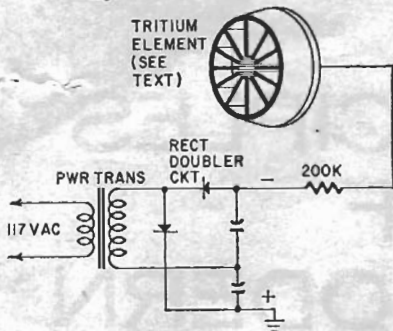


Fig. 2—Circuit for negative-ion generators.

tralized. The negative ions which are outside are repelled by the grid and pushed into the room. The ceramic tube which holds the heater and grid is slightly conductive when hot, and lets the grid charge leak off between ac cycles.

Heatless ionizer

You may not always want the heat on to get ions, so a gadget that looks like a desk microphone was developed for such cases (see photo). It consists of a small plastic disk containing a piece of titanium foil which has been impregnated with heavy hydrogen, tritium (H_2). This is a radioactive material which emits beta particles of .015 mev. It will ionize air, but the particles travel only a short distance, so there is no danger from radioactivity.

Behind the foil a flat plate electrode suppresses the positive ions and repels the negative ions into the room. The base of the desk unit contains a transformer and a voltage-doubling rectifier unit, with a circuit resembling that used in radio receivers (Fig. 2). About 900 volts of negative dc is obtained and this

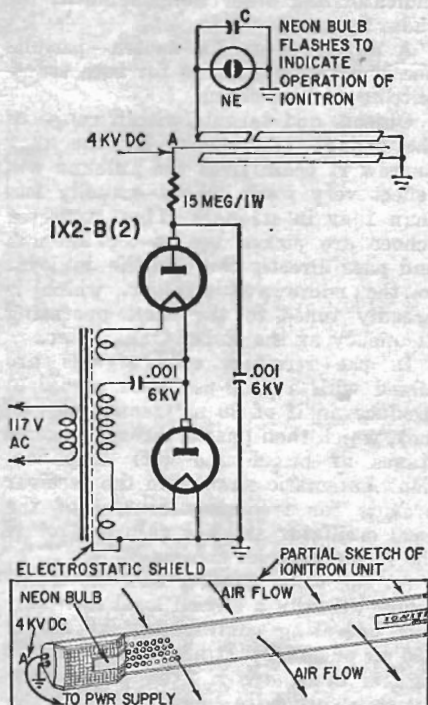
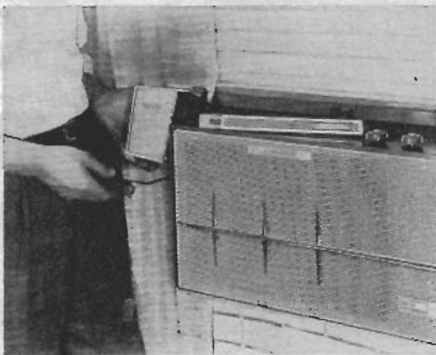


Fig. 3—Circuit of Philco's Ionitron.

is connected to the plate electrode.

In addition to these devices, another manufacturer, Philco, now markets an air-conditioner which embodies an ion control device.

It consists of a power supply which



Philco's Ionitron being attached to an air conditioner.

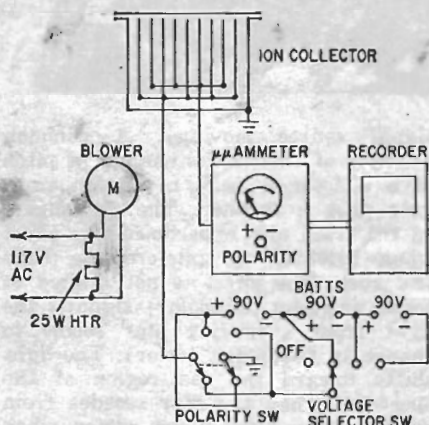


Fig. 4—Setup for measuring ion content and polarity of air.

delivers 4,000 volts dc to an ionizer tube located in the air stream (Fig. 3). The voltage is great enough to ionize the air, but not enough to form ozone or nitrogen oxides.

The polarity and count of atmospheric ions can be measured by apparatus which is fundamentally simple, but nevertheless quite delicate and expensive. All that is required is a set of plates, like an air capacitor, and a micromicroammeter. In principle, a charge from a battery is placed on one set of the plates. The ions in the air carry some of this charge to the other plates, from which it is drawn off through the ammeter and measured (Fig. 4).

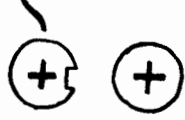
An electrometer can check ions emerging from a suspected source. It is a sensitive vacuum-tube voltmeter type unit which reads in micromicroamperes when used with a shunt. It can be connected to a small probe consisting of a coin-sized disk surrounded by a ring (see photo on preceding page).

These are some of the units now on the market. More will be made and within a short time many more manufacturers will be turning out ionizers—another promising new field for the electronic technician.

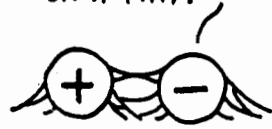


BY NICK ROBERTS

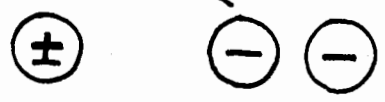
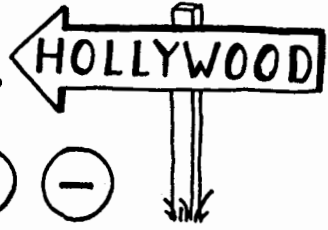
YES, MY CAR DOES HAVE SEAT BELTS. WHY?



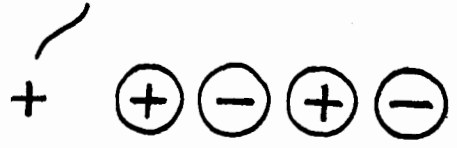
AND THAT'S THE LAST TIME WE GIVE THE KIDS TAFFY ON A TRIP.



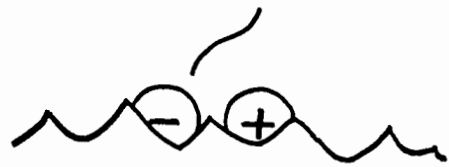
OH LOOK, MABEL! ISN'T THAT TINY TIM?



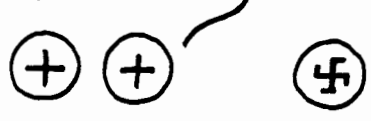
WELCOME TO THE SUNNYVALE NUDDIST RANCH.



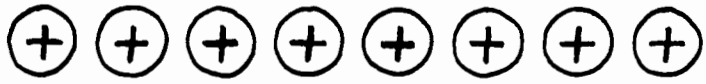
WHEN THAT FARMER SAID TO "FOLLOW THE CREEK", I THINK HE MEANT THE ROAD NEAR THE CREEK.



SURE I HEARD THEY CAME DOWN HERE, BUT I NEVER EXPECTED TO SEE ONE.



ARE THESE REST AREAS ALWAYS THIS CROWDED?



NPR

POPULAR ELECTRONICS