

NEW MEGAPHONE SPREADS SOUND BROADCAST

A new megaphone which distributes sound over a greater area has just been developed by Prof. F. R. Watson of the University of Illinois, authority on acoustics. Already cheerleaders at the Universities of Illinois, Michigan, Wisconsin, and Minnesota have adopted the new instrument and indications are that its use will soon become widespread.

The megaphone is constructed of tin; it is only a foot and a half in length and strangest of all, has only a narrow rectangular opening. It is almost flat in appearance and is used in a horizontal position with the rectangular opening in a vertical plane.

Construction of the megaphone is based on the sound diffraction theory that sound passing through a narrow aperture spreads out. The ordinary megaphone differs from Prof. Watson's in that sound passing through it tends to travel only along the axes of the megaphone and not sideways. It permits only the people in front of the announcer to hear.

Sounds issued through the narrow opening of the new megaphone spread out in a wide area. The commonly used megaphone can be used only to direct sound audibly along one plane.

Prof. Watson conceived the idea of the invention more than 10 years ago when he began research in acoustics. He developed it this year upon the request of Illinois athletic officials who became concerned as to how cheering could be better conducted in the large Illinois Memorial Stadium and the Illinois Basketball Gymnasium.

Since the announcement of the invention, Prof. Watson has received many requests concerning information about its construction. He is interested in having the instrument adopted and will willingly answer any questions.

OXYGEN GAS STERILIZES AND PRESERVES FRUIT JUICES

Oxygen, under ordinary conditions the very essence of the breath of life, is to be used as a means of killing germs and similar organisms and thus bring about the sterilization and preservation of fruit juices without injuring their delicate flavors, by a process which has been perfected recently by Dr. L. R. Cleveland of the Harvard University Medical School.

Dr. Cleveland states that by the use under pressure of the ordinary commercial oxygen gas, sold in cylinders for welding and other industrial purposes, he can kill all germs and other micro-organisms in periods of from twelve hours to four or five days, depending on the nature and quantity of juice under treatment and the amount of pressure used. In bulk, the juices can be enclosed in strong steel drums or barrels, the oxygen run into them up to the proper pressure, and the whole stored away indefinitely. In smaller quantities, as in bottles or cans, the containers can be placed in a pressure tank, and then sealed or capped under sterile conditions in an atmosphere of pure oxygen.

While the process is fatal to all microbes if continued long enough, Dr. Cleveland has found that the pathogens, or disease-causing germs, are the easiest to destroy. High pressures or long exposure periods kill the germs completely, while less drastic treatment will leave them alive but unable to multiply; that is, it will preserve the material without absolutely sterilizing it.

Dr. Cleveland did not discover this process suddenly; it came as the result of a long series of experiments. The first inkling of the principle underlying this new method of preserving fruit juices was discovered while he was studying the minute, one-celled animals or protozoa that live in the digestive tracts of termites or white ants. He wanted to get the insects free of their tiny guests, and tried various methods, including heat treatment, with success. He found finally that if he increased the oxygen present in the atmosphere of the jars in which they were kept, the insects would live while the protozoa inside them died. The difference in the effect of oxygen on the microorganisms in white ants and on the white ants themselves was very great; the ants survived more than forty times, the amount of oxygen required to kill their intestinal guests.

Following this, Dr. Cleveland very soon discovered that many other animals, including even the cold-blooded vertebrates among the higher animals, lost their protozoa when confined in oxygen. Applications of this principle may be made in combating the diseases of economic insects such as silkworms and bees, in freeing young fish of disease-causing parasites, and in testing out the ability of insects to transmit protozoa and spirochaetes to man, animals, and plants.

Turning from the study of the killing effect of oxygen on parasitic microorganisms, Dr. Cleveland found that it was possible to kill such organisms as bacteria, molds, and yeasts living free in nature by confining them in oxygen under pressure. This suggested the query: "Is it possible without rendering food unwholesome to kill the microorganisms which cause it to spoil?" The work on fruit juices is an answer to this question.

NOISELESS GAS CAR FOR SWEDISH RAILWAYS

A "silent" railway motor car without engine vibrations has been achieved, and during its recent trial run over the Swedish State Railways from Malmoe to Stockholm the passengers heard no other noise than that of the wheels clicking against the rail joints. It is the design of a Swedish engineer, Magnus Tacklind, of Stockholm, but has been manufactured in Germany. Except for certain motor parts it will later be built in Sweden.

The absence of the noise and vibration is due to the fact that the motor is not placed on the same frame as the passenger car itself, but is entirely isolated from it, being slung underneath. The power is transferred to the driving axle from the motor through five different sets of gears, which are kept going all the time, so as to make the driving smoother. The speed attained reached over 50 miles per hour while the consumption of fuel, a mixture of benzine and benzol, averaged about eight miles to the gallon, or about twice that of an ordinary taxicab. Its seating capacity is sixty persons, but a trailer with the same number may be coupled behind. It