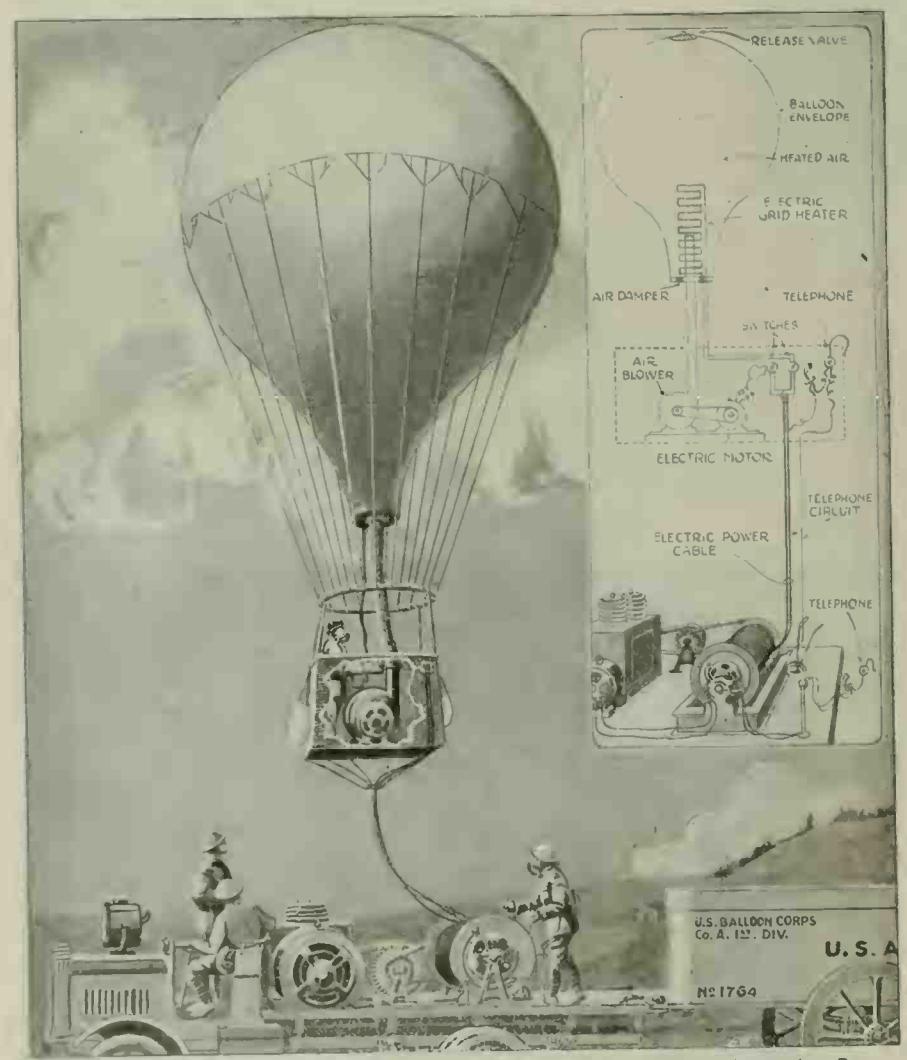
An All-Electric Hot Air Balloon

THE captive balloon as used by the Allied armies at the present time is invariably filled with hydrogen or other gas supplied from steel bottles containing this gas stored at a high pressure, or else it is obtained from manufacturing supply stations on the field. The first balloons ever used—the old "Montgolfières" of 1783—were made to rise by means of hot air, for, as we all know, heated air is lighter than cold air, and will always rise. If the heated air is of sufficient volume, it will also carry a body up with it, such as a balloon envelope for example. All of us have seen the simple balloons which patriotic Americans are wont to liberate on the Fourth-of-July, and which are composed of nothing more than a balloon-shaped paper bag at the bottom opening of which there is secured either an absorbent wick containing gasoline, or a small alcohol lamp. We simply light the lamp, and after a short time the heated air rushing up into the balloon causes the envelope to become very light and it rises in the air. Some of these balloons will travel for miles, and years ago it was not an uncommon sight in Europe to see hot-air balloons ascend with several men.

There has always been, however, a serious objection to a hot-air balloon where the heater was of the flame or similar type, for there was always in this case the constant danger of the balloon becoming ignited, with disastrous results. It has remained for Mr. James N. Lewis of Detroit, Michigan, to invent and patent an all-electric hot-air balloon, which is illustrated in detail in the accompanying illustration. Mr. Lewis makes use of an automobile winch to haul in the balloon, and to act as a mobile station, a trailer being hooked behind the winch, in which to carry the balloon bag and basket while being transported from one point to another. Either the automobile engine or a separate gasoline engine mounted on the truck drives a dynamo, which supplies current for an electric heater in the balloon. By means of suitable clutches, the engine may be caused to drive the dynamo, or else thru a chain drive, it may be connected up to rotate the cable winch drum. The dynamo makes connection to a duplex power cable reeled around the drum, and this leads up to the balloon basket. Also the telephone circuit is carried up to the balloon thru the drum or otherwise, so that those on the ground are in telephonic connection at all times with the observer in the balloon basket, and under battle conditions he would also be in telephonic communication at all times with "field headquarters," so as to report the position of enemy guns, troops, etc.



A New Form of Heated Air Balloon, the Air in the Bag Being Kept Continually Hot, to Any Degree Desired, by an Electric Heater in the Neck of the Envelope. Current is Sent Up to the Balloon Basket from a Gasoline Engine-Dynamo Set Mounted on the Truck Below. Telephone Connection Between the Truck and the Observer Aloft is Available. A Motor-Blower Drives Heated Air into the Balloon Envelope.

Referring to the balloon in detail, we find that it is provided with an electric grid heater, and also a motor-driven blower and connecting tube, so that whenever the blower is operated, air is pumped up into the balloon envelope, the air passing thru the electric grid heater. The balloon bag is fitted with a suitable damper in the lower opening and a relief valve at the top in the usual manner, the relief valve being connected to the observer's basket by means of a small rope. When it is desired to descend, the observer may open the motor blower switch in the basket, and thus aid the hauling in of the balloon, for as the temperature of the air within the balloon bag falls the balloon naturally tends to descend toward the earth.

8,700,000 AMERICAN HOMES LIGHTED BY ELECTRICITY.

From the compilation made by the *Society for Electrical Development* it is shown that there are 20,689,000 families in this country, of which 7,000,000 have yearly incomes of $900 or more. However, the yearly average family income before the war was under $626.

Over 13,000,000 families are too poor, too illiterate, or otherwise unfitted to buy electrical goods. Over 8,700,000 homes are electrically lighted and 120,000,000 sockets contain Mazda lamps. In over 30,000,000 sockets are carbon lamps. It is estimated that 9,000,000 sockets are empty.

Homes lighted by other means, 15,000,000; some are wired but not connected up for service. Electric service is available in 10,613 communities of the United States, compared with 3,545 communities that are being served with gas.

ELECTRIC SEARCHLIGHTS.

Ranges of electrical searchlights vary from between one thousand to two thousand yards in foggy weather to ten thousand yards or more when the air is very clear. The average sea range is approximately six thousand yards, but there are cases on record where ships have been spotted at a distance of nine miles. These figures are based on a sixty-inch mirror and a twenty-thousand watt arc.