

Electricity the Beneficent

By Benjamin G. Lamme

Chief Engineer Westinghouse Electric & Mfg. Company, and Member Civilian Naval Advisory Board*

THE benefits of electricity to mankind are so various and so far-reaching that it is difficult for any one person to fully appreciate them. These benefits are both direct and indirect, the latter sometimes far overshadowing the former. Many of the present generation are so accustomed to electrical appliances and methods that they do not fully perceive the large part such take in our daily life. It has been said that one cannot fully appreciate a thing until he has to do without it. This points to a very effective way of calling attention to the far-reaching influences of electricity in the life of the world.

Let us assume that by some means, all electrical apparatus, methods and usages are suddenly withdrawn from the world. By considering the consequences of this we can possibly get a fair idea of the scope of the electrical field.

Let us consider first the general subject of transportation. Possibly no other activity has had as great a bearing on the present high development of mankind as our modern methods of transportation. Taking steam operation, wherein does electricity play an important or controlling part? Or, by a more specific question, supposing the electric telegraph were suddenly eliminated, how would general railway transportation conditions be affected? They would be completely disorganized temporarily, and would be very greatly handicapped permanently. Rarely is it appreciated to what an extent our great railway systems are conditioned upon means for almost instantaneous communication between distant points. Without such means a busy railroad could only operate upon an exact time schedule. Once that schedule is broken, disorganization and disaster would follow. Incidentally, someone will suggest that if the electric telegraph were eliminated, the railroads would turn to the telephone. But this again is an electrical apparatus.

A second great item in railroad transportation at the present time is electric signaling for the dispatch and control of trains. If eliminated, this would certainly mean a great step backward, especially in sections of very heavy and frequent railway service.

What would be the effect of complete cessation of electrical operation of city, suburban and interurban cars? In the cities we might go back to horse cars for the surface lines. The service would be almost unbearable, but might be possible. Elevated trains in large cities could go back to steam, however, with great objections from adjoining business firms and residents. But subways—here would be a real nut to crack.

In suburban service, the elimination of the electric car service would spell disaster, except to those relatively few individuals who could have their own equipments. How few appreciate that the rapid growth of suburban districts has been consequent upon electric railways. Auto-buses and "jitneys," or some other form of gasoline engine equipment, might furnish a solution eventually, but then, how about the electric spark for ignition?

Again, let us consider interurban car

service. No other means can faintly compare with the electric car systems in bringing the people of city and country together. Steam service, with its infrequent trains, did little in this direction. The figures giving the great growth of passenger traffic between country and city districts following electric car operation, tell a most interesting story.

Electric haulage in coal mines is now standard practice. Decrease in fire risks and increased capacity are two prime rea-

sons which have led to electric operation. Eliminate the electric current and coal mining can doubtless be carried on with more or less success, but with decreased production and increased cost, which must be borne by the public. We can always go back to the old ways of doing things, but we will have to pay the price.

In water transportation electricity, perhaps, has not played such a conspicuous part as on land. Yet if the electric installations on ocean vessels were eliminated, there would have to be quite a reorganization. Electric propulsion of large and high-powered vessels promises to be one of the most important steps in naval engineering in the near future. Wireless telegraphy has become a necessity in modern sea service.

Taking up next our business and industrial life, let us imagine a few of the things which would happen if electricity were entirely eliminated. Without the telegraph, business would be very badly handicapped, although it might limp along after a fashion. But the telephone—here would be the rub, if we had to give it up. Whole systems of conducting business are dependent upon the telephone. Disorganization would be certain to follow in many lines if it were eliminated. Even home-life would be greatly affected.

Let us next consider the elevator. What has been its influences on life and business in the cities? How about the large many-storied department stores? Can anyone conceive of a practicable 20 or 30-story skyscraper without elevators? And one must remember that most of these elevators are electrically operated. True, there are other very good methods of operating them, but nevertheless, the elimination of the electric elevator would make a large gap in our methods of vertical transportation.

This leads us to a very common piece of apparatus, namely, the electric motor. This has come into use so gradually, and with so little ostentation, that we almost feel that it has always been with us. Yet, in less than one generation, it has revolutionized all kinds of manufacturing establishments and industries. Take the electric crane for instance, what would the great industrial works of the present time do without this particular application of

the electric motor? Take the use of electric motors in general throughout such establishments. How would the necessary power be distributed over the vast areas of modern manufacturing plants if electricity were eliminated? Possibly a way could be found, but in most cases it would require a complete reorganization of many of our present industrial methods, and efficiency would take a long step backwards.

In the smaller shops and power applications, the electric motor fills a fully as important place. Small steam plants are utterly impracticable in some places. Gas or gasoline engines are often very objectionable, but still possible. But how about the electric spark for ignition, if electricity is to be eliminated? It must also be kept in mind that many establishments using power have been so designed that the replacement of the electric motor

by any form of steam or gas engine is not practicable for many reasons outside the mere question of ability of the latter to develop the required power. Available space, high temperatures, fire risks, disposal of burnt gases, noise, and many other conditions enter into this matter.

Outside of shops and industrial plants, the electric motor also has a very wide field of application, and many kinds of service have developed simply through the availability of the electric motor as a source of power. This part of the subject is too large to allow consideration in detail in any article of limited scope.

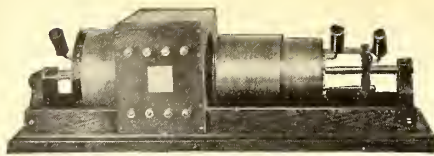
Coming now to one of the oldest and best known fields of electric activity, namely, electric lighting, we find a class of service the abolishment of which would be felt by all classes in civic life. If electric street lighting were abandoned, we could doubtless manage with some other form of illumination, but the results probably could never approach the present standard. In the case of interior lighting, the result of a replacement of the incandescent lamp by other forms of illumination would create still more dissatisfaction than in the case of street lighting. It may be said that the vast majority of electric light users would pay a greatly increased price rather than be obliged to give it up in favor of any other known method of illumination.

Another class of electric service of a comparatively recent period is represented by household utilities, such as electric irons, toasters, coffee percolators, and other electric heating appliances. Motors for general household purposes, for running sewing machines, washing machines, etc., are becoming rather common. These are luxuries which are fast becoming necessities. If these were eliminated a big gap would be created, even though they represent a comparatively new field of application.

The above is only a very incomplete presentation of the direct possibilities which would occur in case there was a complete cessation of all electrical activities. Many of the special applications of electricity such as electro-chemical, electro-metallurgy, electro-fusion, etc., have not even been touched upon, and yet great industries have been built upon them. The

(Continued on page 656.)

* Prepared exclusively for The Electrical Experimenter.



Type AML

The Precision Varicoupler

Patented Mar. 7, 1916, foreign patents pending.

Up-to-date receiving circuits require improved apparatus. You can't get super-sensitiveness with old style couplers. The Precision Varicoupler is PERFECTION in receiving tuners. It has

- No Taps
- No Sliders
- No Switches
- No Delicate Parts
- No "Dead Ends"
- All the Wire in
- No Contacts
- Use all the Time

and is finished in mission oak, genuine cut hard rubber, silver finished wire, etc.

5 Styles, \$10 to \$25

For detailed information write for bulletin PL.

The Precision Radio Equipment Co., Inc.
General Office: 868 Putnam Ave., Brooklyn, N. Y.

AUDIO TRON

BULBS \$6.50

SENSITIVENESS GUARANTEED

200 PER CENT. MORE SENSITIVE THAN ANY OTHER MAKE OR ANY OTHER FORM OF DETECTOR

SEND FOR INTERESTING LITERATURE

CHELCO ELECTRIC CO.
948 N. TRUMBULL AVE., CHICAGO, ILL.
LARGEST DISTRIBUTORS OF AUDIO TRON BULBS

8,000 MILES

is the record (amateur) with our Audio-Tron Detector

THE AUDIO-TRON DETECTOR—AMPLIFIER—OSCILLATOR

Price postpaid \$6.50

Jensen Electric Co.

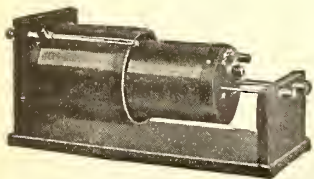
RADIO APPARATUS and SUPPLIES

SEND STAMP FOR CATALOG

1949 Huron Street CHICAGO, ILL.

LOOK! A NEW CHAMBERS COUPLER

No. 744, PRICE ONLY \$4.50



Positively unequalled for the money. Is 6" high, 6" wide, and 14" over all. Wound with Enamelled wire, and has a very unique slider. Wood-work mahogany.

any finished. Try one, you will not be disappointed. 5c. in stamps brings our 64-page illustrated catalogue, B-B-24. None otherwise.

F. B. Chambers & Co. 2046 Arch Street Philadelphia, Pa.

30-kw. sets and the 3,500-ampere-hour battery, so that in the event of current from the main dynamos being unavailable an independent supply is obtainable. Connected to the emergency circuit are about 500 incandescent lamps, fitted throughout all passenger, crew and machinery compartments, at the end of passages and near stairways; also on boat deck, to enable anyone to find the way from one part of the ship to the other. The following are also connected to the emergency circuit by means of change-over switches: Five arc lamps, seven cargo and gangway lanterns, wireless apparatus, boat davits, mast, side and stern lights and all lights on bridge, including those of navigating and chart rooms, wheel house, telegraphs, compasses and Morse signaling lanterns.

Very soon, it is freely predicted, ocean liners will also be driven by electric power, the Government having ordered such an electrical equipment from the General Electric Co. to drive the new battleship California, the largest in the world.

ELECTRICITY, THE BENEFICIENT.

(Continued from page 619.)

great aluminum industry with all its branches, for instance, is directly dependent upon the electric current for the production of the aluminum itself. Acetylene gas which is now used for so many purposes is obtained from calcium carbide, which is produced by means of the electric current. Carborundum, the well-known and widely used abrasive, is a product of one form of the electric furnace. The electric current is used in refining copper on a vast scale, for the purpose of purifying it and for the separation of the precious metals. Numerous other chemical industries are founded upon the use of the electric current. Fixation of atmospheric nitrogen for producing nitrates for fertilizing and other purposes is now accomplished on a large scale by means of the electric current, and it promises to become in time one of the vastest industries in the whole world. In fact, power plants of approximately half a million kilowatts, or more than three-quarters of a million horsepower, concentrated in a single station are now being considered for such production of nitrates. The time is coming when the whole world will be affected by this industry through food production.

Such a cataclysm as the complete cessation of all electrical activities would therefore result in such changes as greatly increased concentration of population around industrial centers, the city and the country would be pushed farther apart, many industries would be disorganized and some would be stopped completely, many great establishments would have to be reconstructed, types of buildings would be changed, methods of business would be modified, the producing capacity of individuals and of industries would be greatly reduced, methods of living would be modified, methods of transportation would be changed and for the worse; in fact, all conditions of life and fields of endeavor would be influenced, either directly or indirectly.

Myriads of times it has been said that "electricity is in its infancy," until people have come to believe that it is a perpetual infant like Buster Brown for instance, but it has now grown to robust stature and unostentatiously has assumed a goodly share of the world's burdens. Its efforts have been productive and not destructive. In this sense it has been one of the most beneficent agents of mankind. In Arabian Nights' parlance it is one of the good geni.

You Can Get Results

with a small condenser and this transformer



UNMOUNTED TRANSFORMER

It is a 1-2 K. W. size and is built on the same specifications as to material and workmanship, etc., as our big central station transformers.

Hundreds of stations are now using these transformers. This transformer gives you 13,200 volts.

Let us tell you how you can do part of he work yourself and get this transformer at a remarkably low cost.

THE PACKARD ELECTRIC CO.
555 Dana Avenue Warren, Ohio

\$11.00 Guaranteed Amplifier Coils \$11.00

TRANSFORMERS

Built for Wireless

The Pittsburgh Wireless Equipment Co.

are under new management at

RIDGWAY, PENNSYLVANIA

and are on DECK to give you a SQUARE DEAL and 100% value in our

Superior Radio Apparatus

for every dollar's worth purchased

Send 10c. for our complete catalog. Parts catalog free.

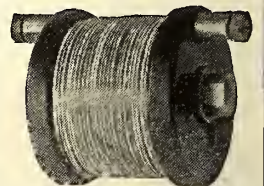
PITTSBURGH WIRELESS EQUIPMENT CO.

Department "R"

RIDGWAY, PENNSYLVANIA

"MONOTONE" QUENCHED SPARK GAP

Why dissipate your radio energy in sound and light waves? Carry it to the diaphragm of the distant receiver on pure waves of Radio Energy. Every station should be equipped with "Monotone" Quenched Spark Gaps for penetrating great distances. Spun that "freak" distance every night. Silent in operation. Arcless. In single units as illustrated for spark coils. Two units in series and multiple for every quarter K. W. power of transformer. Price per unit, \$1.50, prepaid.



RICHARDSON COMPANY, Commerce Bldg. ERIE, PA.

WIRELESS TELEGRAPHY

Make your own "Wireless," also Dynamos, Batteries, Motors, Telegraph, Telephone, Lights, Bells, Alarms, Coils, Current Reverser, Electric Engines, etc. Book with 75 Illustrations; by experts so anyone can understand it. With Catalog. All 10c, 3 for 25c, pp

J. C. Dorn, 705 So. Dearborn St., Dept. 118, Chicago, Ill.