

ELECTRICITY AS AN AID TO AGRICULTURE—A DESCRIPTION OF TWO MODEL ELECTRICAL FARMS.

BY EMILE GUARINI.

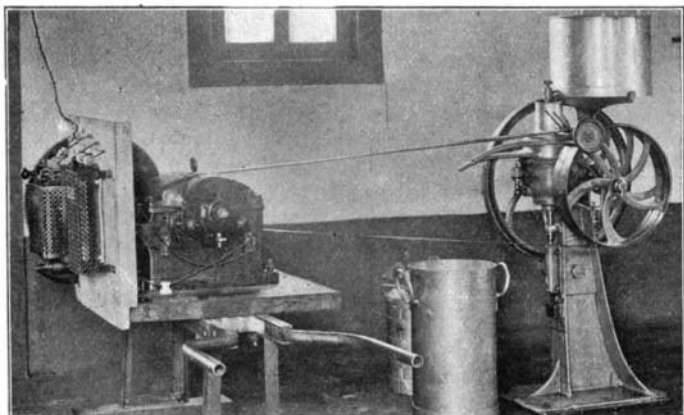
Perhaps the only use to which electricity has been applied in agriculture, with which our readers are familiar, is the electrification of seeds in order to accelerate germination. Still, other applications of electricity to the needs of the farm have been crowned with notable success. Electric plows have been found to do their work better than draft animals harnessed to the old-time share; for the soil is turned up from a greater depth. To protect the soil from insects and worms, electricity has proved itself a valuable aid. In harvesting, too, it has been found that work can be lightened and results improved by the judicious use of electrically-driven apparatus.

necessary. For electric plows, threshing machines, and for movable agricultural implements in general, the Helios Company has designed a special portable transformer, for the purpose of stepping down the high-tension current before it is sent to the motors. The same company has recently installed two model electric farms, the one at Quednau and the other at Simmern.

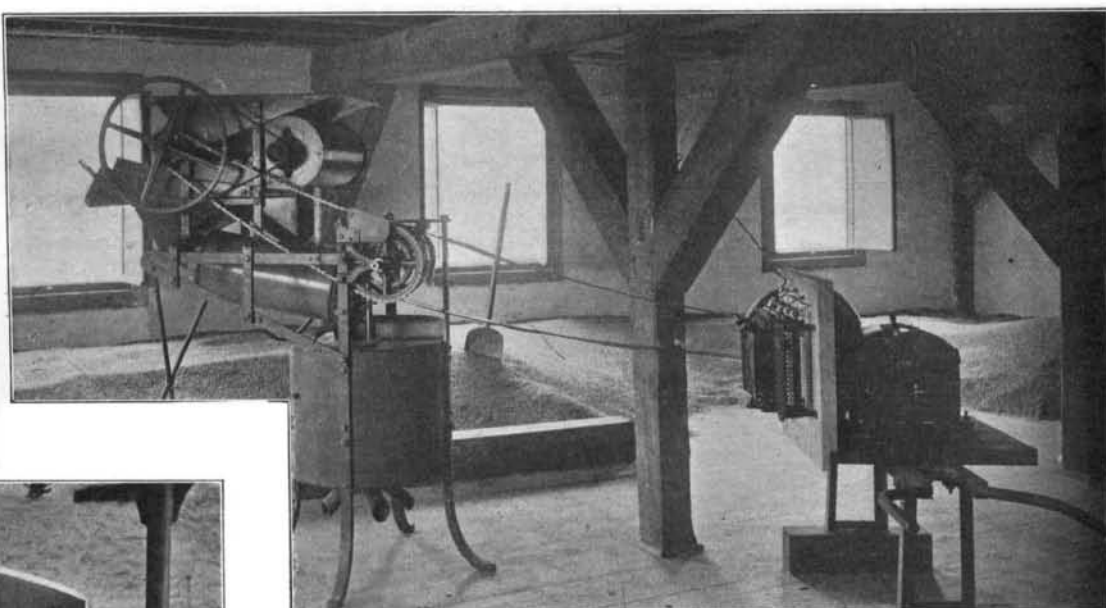
The Quednau farm is superintended by Prof. Backhaus of the Agricultural Institute of the University of Königsberg. The farm is situated near Königsberg, and covers about 181 hectares (447 acres). The enterprise not being very extensive, a dairy is operated in conjunction with it, the output being 10,000 liters (2,200 gallons) of milk per day. The central station comprises two divisions—the one a gen-

to drive a carrot-cutting machine. The other two are portable, and can be employed as may be desired for driving milling machinery, a machine for crushing flaxseed, a pump, a circular saw, a threshing-machine, and other purposes. On the Quednau farm an electric plow is also employed.

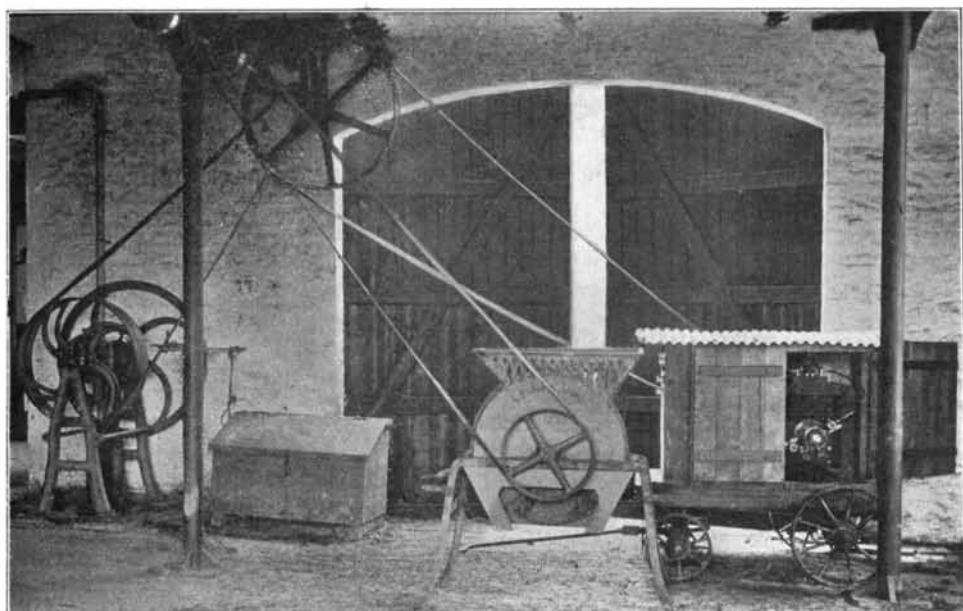
The Simmern farm differs from that of Quednau chiefly in the manner of generating the current. Turbine-driven dynamos are employed, the Simmern River furnishing all the water power that can be desired. The turbine used is of the Béché type, and drives a Helios dynamo of 11 kilowatts, generating a current at a pressure of 110 volts. Since the transmission distances are not great, direct current is generated. The dynamos are also employed to charge a Hagen storage battery of 62 elements. In installing



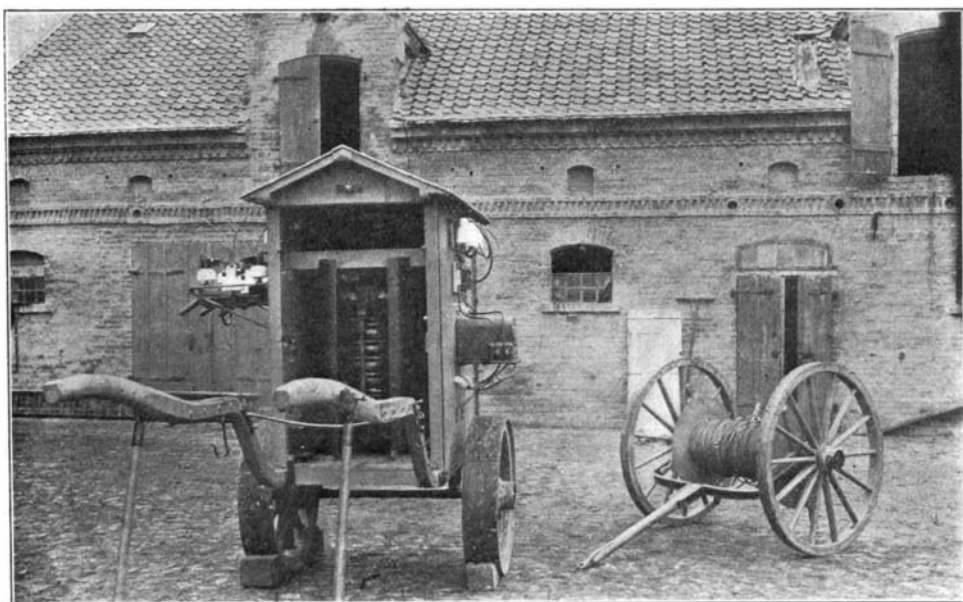
Motor Driving a Cream Separator.



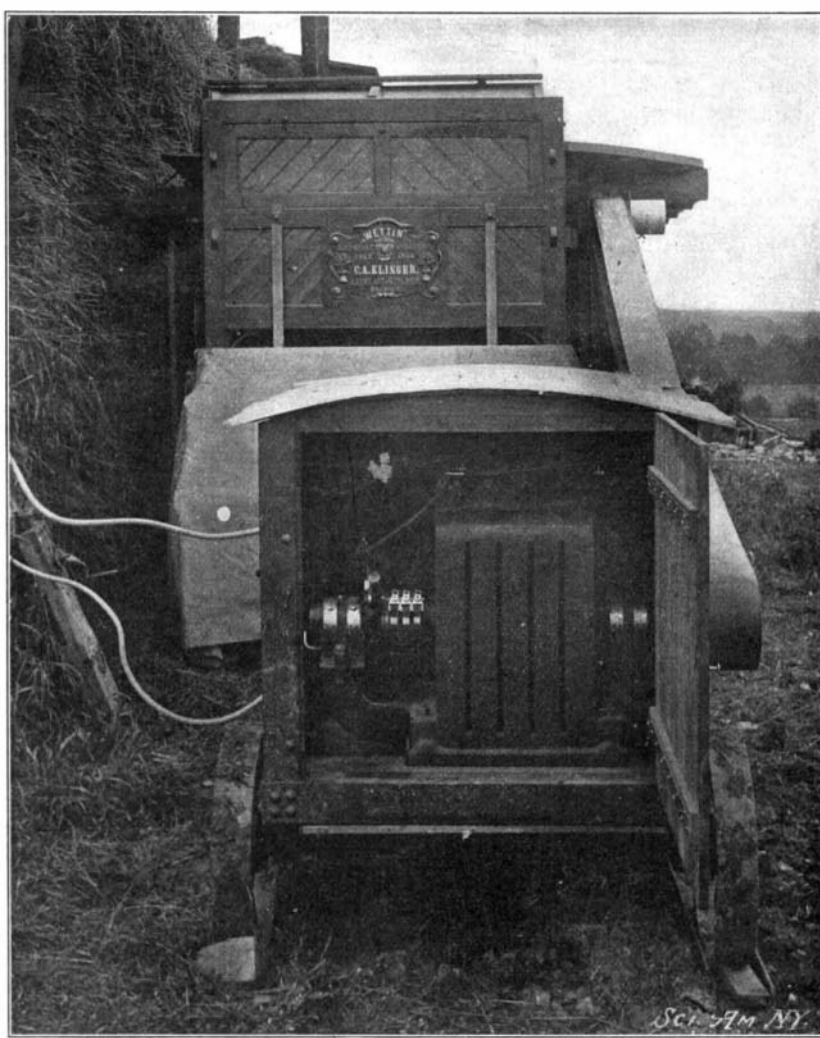
Grain Cleaner Driven by Portable Motor (Simmern Farm.)



Portable Motor Driving an Overhead Shaft.



Transformer Cart.



Portable Motor Driving a Threshing Machine on the Simmern Farm.

ELECTRICAL APPARATUS FOR FARM WORK.

Threshing-machines, winnowing-machines, saws, and pumps for irrigation have been driven by electric motors with great efficiency and economy. Furthermore, by means of electricity the wine grower can age his wine, the olive grower can purify his oil, and the turf-cutter can carbonize his peat.

In carrying out all these manifold operations it is, of course, necessary to have a source of electrical power. For the purpose of showing how an electrical plant can be installed at a small cost for work in the field, three German companies, the Union, Schuckert & Co., and the Helios Company, have installed model farms on which most of the farm work is done by means of electricity.

In order to cut down expenses, central stations have been built which distribute the current for many miles at a very reasonable rate. Transformers are, of course,

erating plant, the other an electric lighting plant. The power house is equipped with an engine of 50 horse power, which drives a four-pole dynamo. A current of 90 amperes at 500 volts is generated. A small two-pole dynamo is employed for electric lighting, the current generated having an intensity of 30 amperes and a pressure of 220 volts, or an intensity of 18 amperes and a pressure of 320 volts when it is used for charging a Pollak storage battery of 120 volts.

The electric lighting plant is so designed that the lamp capacity can be doubled by the utilization of a secondary dynamo. It will, however, hardly be necessary to use supplementary lamps. For cooking and for heating the living rooms electricity is also used.

Three electric motors drive the agricultural machinery. One, having a horse power of $2\frac{1}{2}$, is used

this farm it was sought to do away with manual labor as much as possible. For that reason it became necessary to design motors which should be small, light, and readily portable. The Simmern farm has two such motors. The first is of 10 horse power and has a voltage of 110, with a speed of 1,200 revolutions per minute. When mounted on wheels it usually drives four small machines, namely, a carrot-cutting machine having an output of 690 kilogrammes (1,518 pounds) an hour; a machine for crushing flaxseed having an output of 500 kilogrammes (1,100 pounds) an hour; a straw-cutting machine having a capacity of 190 kilogrammes (418 pounds) an hour, and a pump. By means of a fast and loose pulley, the four machines can be set in operation at once or can be worked independently. The same motor also drives a threshing machine, having an output of 900.

kilogrammes (1,980 pounds) an hour. The second motor is fastened to a bed-board and is portable. It has a horse power of three-quarters and drives a centrifugal cream separator having a capacity of 450 liters of milk per hour, or a mechanical winnower placed in the wheat bin.

TATTOOING.

BY RANDOLPH I. GEARE.

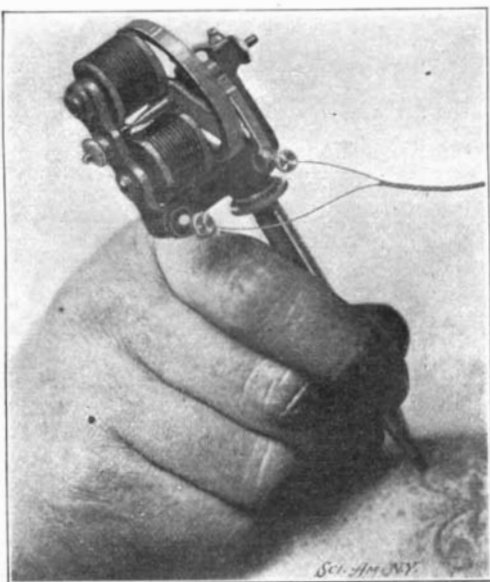
The custom of tattooing originated among savage people, and was primarily established, it is believed, as a substitute for writing and as a means of permanently recording facts in their lives. The word "tattoo" is derived from the Polynesian *tattaw*, and was

arose the practice there of tattooing the men instead of the women.

There are two principal methods of tattooing, i. e.,

the skin which is afterward pricked in, and to which various coloring matters are applied, so as to produce a permanent picture. Tattooing has its modern votaries among civilized people, and that it may be made a lucrative business seems proven by the fact that some years ago a device was originated by O'Reilly, of New York city, for making tattoo marks. Briefly stated, it consists of a hollow ink reservoir surrounding a suitable set of needles which are reciprocated by electric power. This implement is here shown; and that its inventor had no difficulty in obtaining customers is indicated by the examples illustrated in this connection.

For lack of space only two or three methods of tat-



The Electric Tattooing Needle.



Marquesas Warrior.



Head of a Savage in Goettingen Museum, Showing Large Amount of Post-Mortem Tattooing.

first anglicized by Captain Cook. The practice has been defined by Berchon as "that strange and very ancient custom which consists in the introduction under the cutaneous epidermis, at different depths, of coloring matter, in order to produce some design which will be of very long duration, though it is not absolutely indelible."

The significations of tattooing in different regions have become so varied that collectively they may be regarded as the visible expressions of certain racial motives and impulses. Love of ornamentation, substitution for clothing, a desire to show fortitude under physical suffering, the wish to perpetuate tribal symbolism, and among women the indication of marriage, are some of them. Others, again, believed that by engraving the image of a deity on their flesh, they furnished proof of their devotion.

In some countries only the men were tattooed, while in others women alone were thus adorned. In Samoa there is a curious legend that the goddesses of tattooing swam there from Fiji, for the purpose of introducing the custom, and had been ordered to sing all the way "Tattoo the women but not the men." Having to repeat these words so often, they became confused, and when they arrived at Samoa, they were singing just the reverse; and hence

by making cuts in the flesh so as to leave a cicatrized mark, but generally without the addition of any coloring matter; and by drawing a pattern on

tattooing can be here described. In the current SUPPLEMENT, however, will be found an account of the tattooing practices of various savage races.

In all Polynesia there is no place where tattooing is so widespread or varied in character as in the Marquesas Islands. Every part of the body is decorated, from the crown of the head to the fingers and toes. This applies principally to the men, the women generally having only a bracelet or two, or other small ornaments, tattooed on their arms. One writer states that women, even princesses, have no right to tattoo any parts but their hands and feet, although at Mukahiva "noble ladies" are permitted to wear more numerous tattoo marks than the women of the lower ranks. Old men have their bald heads covered with tattoo marks.

The figures to be tattooed are chosen carefully and with appropriateness to the part to be decorated. Sometimes animals are depicted, while again other objects are employed which have special reference to the manners and customs of the people. Rows of punctures are separated by curved lines, diamonds and other designs. A man's head is completely covered, his breast is commonly ornamented with a



Tattooed Japanese.



Tattooed Marquesas Islander.



Japanese Tattooing.



TATTOOING IN SAVAGE AND CIVILIZED LANDS.



Specimen of Tattooing Done by the Electric Needle.