that the first cost is almost the whole cost, for with the modern flume system of installation the plant can be operated as easily in winter as in summer No coal is required, very little attendance is needed and in many cases small municipalities nearby are glad to grant a franchise for electric village and town lighting, the profit from which will more than amount to the current running expenses. The electric power in that case practically becomes free as far as farming purposes are concerned.

An artesian well may be made to produce enough electric power to operate every piece of machinery on a farm.

There is an artesian well near Chamberlain, S.D., for instance, operating the electric plant from which a current is obtained to light up the city at night. This current could be used for power purposes on the farm instead of for lighting purposes. This well is situated in what is known as the artesian well basin of South Dakota. Other wells are plentiful in all directions and several more private electric plants have been projected Some of these will be partly used for farming purposes so that we may soon have an electric farm in operation in the United States. The well at Chamberlain is 675 feet deep and eight inches in diameter. When left to itself, without a nozzle, the water will shoot up in widening column, 12½ feet If it is caused to flow through a 2¼ nozzle it will shoot up 162 feet Tests have shown that it flows at the rate of 4,430 gallons a minute and with a pressure of 110 pounds to the square inch. It is computed that the effective energy of the moving water equals 100 horse-power constantly exerted The water is led through a pipe and caused to infringe on the cups of a water wheel. The result is that a 500-light dynamo is successfully operated. About 1,100 volts are generated, but the well power is capable of operating a larger dynamo. In fact the installation of a larger machine is intended.

The newest project in Chamberlain is to utilize the excess or lost power of the well for operating a creamery, a project right in the line of electric farming. There is no reason why this current should not be transmitted across country to any distant farm and so be made to operate at long range. It is indeed a wonderful well that can supply a city with water, electric light, heat, power and swell a nearby creek until it has become a very respectable river, with a current sufficient to carry away all the sewage of the place' Why could not wells of this kind more limited in power perhaps, but as effective up to a certain point, be sunk in many parts of the United States and electrical farming be practiced on a large scale.

There are 1,000,000 windmills in operation in this country at the present time. Every one of these mills can be adapted to the generation of electric power for farm purposes. According to computation, windmills are sold at the rate of 100,000 a year. Many of these are exported, to be sure, but the number of effective mills is constantly increasing. Here is another local means of obtaining current. It is already being obtained in various parts of the country. Professor Brush, of arc-lighting fame, lights his residence near Cleveland, Ohio, with current obtained primarily from a windmill. The plant has been in operation nine years and there has been no breakage or stoppage during all that time. The power could be generated on any farm and there are already many installations of the kind in France. The practice is to operate a dynamo the armature of which is turned by the mill. Storage batteries collect the current and hold it in reserve during the days when there is little or no wind. It takes but little wind to generate a practicable electric current. A six mile an hour wind will easily drive a mill, and when a velocity of sixteen miles an hour is projected against a sixteen foot mill it will produce 1.5 horse-power constantly exerted. A few years ago a private lighting plant was installed in which steam was used to drive the dynamo. The steam plant cost $1,000 to install and the lowest estimate on the running expenses of each lamp was $4.23 for a year. Seventy-five lamps were used. The steam plant was afterwards replaced by a windmill plant. The cost for operating each of the 127 lamps now is $2.00 a year. This will serve to illustrate how cheaply electric power may be produced in the country, not to mention the cleanliness and lack of trouble of the one method as opposed to the inconvenience, dirt and grime of the other. With a windmill electric plant farmers could rent out power to their neighbors. The transmission could be easily accomplished Poles, trees and fences could carry the wires.

It has been often suggested that the currents of rivers might be utilized for power purposes. This is already being done near Chicago. It is accomplished by anchoring a pontoon in a river, the pontoon carrying a number of large paddle wheels which are revolved by the action of the current. Attached to the paddle-wheel shaft is an endless chain, which is also attached to and in fact operates a series of water buckets The buckets are part of an elevator system and travel up and down a high staging. They pick up the river water and lift it to the top of the staging, from which they pump it into a flume. Thus a great head of water may be obtained, depending of course on the velocity of the river. So far the water thus raised has been used in irrigation, but efforts are being made to adapt the raised water to the operation of a water wheel, in which case electric current could be generated and transmitted any distance. This is another case wherein the farmer may be benefited by the adaptable quality of the modern system.

But having procured his electric current by one method or another, the farmer will want to know what to do with it. In the West electricity is operating a fifteen blade gang plow which will cut a furrow six feet wide. The blade revolve and the plow is pulled across the field by means of a cable which passes around the drum of an electric motor on the plow In New York State there is a trolley plow in operation. Wires are stretched along the edge of the field and carry current to a cross wire, which, as in the case of the plow mentioned above, passes around the drum of a motor. But in this case the motor is attached to the axle of the plow wheels and turns the latter with its own power. Current in this case is transmitted overland for some distance from the power-house.

An electric plow has recently been tested near Chicago which will run in any direction and at any speed, irrespective of its surrounding. It consists of a two-wheel platform, a motor and a plow. The wheels are iron frames having sharp ridges at intervals so as to obtain a good purchase on the ground. There is a resistance box to regulate the amount of current and a reel carrying a coil or flexible wire much the same as is used for incandescent lighting, only larger. The