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The Editor is always glad to receive for examination illustrated articles on subjects of timely interest. If the photographs are *sharp*, the articles *short*, and the facts *authentic*, the contributions will receive special attention. Accepted articles will be paid for at regular space rates.

EDISON AND THE PATENT OFFICE.

Inventors and attorneys whose dealings with the Patent Office have rendered them intimately familiar with its administration must have received, with something like a shock of surprise, the charges recently brought by Thomas A. Edison against its officials. The Patent Office, it is true, has for years been overburdened with pending applications; and yet, its examiners have succeeded in the main in disposing of them with all the celerity that could reasonably be asked for under the circumstances, and with a thoroughness of examination that has added not a little to the Office's reputation for efficiency. So far as we are aware, no such sweeping accusation as that of Mr. Edison's, involving "incompetence, neglect of duty, and mal-administration," has ever been brought against the Office. For that reason the dismissal of all but one of the charges which have been brought brings with it a feeling of relief.

Until the publication of the Commissioner's report, containing an intelligible statement of the issues involved, it is impossible to give more than a meager statement of the actual facts. The controversy involves the validity of Ernst W. Jungner's patent for a reversible galvanic battery, in principle practically similar to the storage battery which Edison invented, and which has been prominently before the public for some three years. It would seem that, following the usual German practice, Jungner, in filing an application in this country, covered his invention in claims which were comparatively few in number and exceedingly limited in their scope. In order to comply with the Patent Office's rules of procedure, Jungner was requested to divide his application, because it was deemed to include two inventions. This was done. Subsequently an interference was declared between the original application of Jungner and Edison's application. Pending this interference, Jungner's alleged divisional application, covering one of the inventions claimed in his parent application, was passed to issue. The substance of Edison's first charge is that the issuing of this patent was fraudulent, for the reason that in Jungner's original application a narrow invention in storage batteries was disclosed, whereas, in the patent issued, a greatly enlarged invention was claimed. In his report the Commissioner concedes that the examiners failed to appreciate the nature of the enlarged description, that they were guilty of no intentional wrong-doing, and that the patent issued should never have been treated as a divided application, because it describes an invention quite different from that originally disclosed. No injury however resulted to anyone by calling the second application a "division."

Edison's second charge accuses the examiners of allowing claims to issue in the Jungner patent which they knew were unpatentable, which they had admitted were unpatentable, and which Jungner himself acknowledged were unpatentable. Only four claims, however, are specifically referred to in this charge. The Commissioner finds that the claims were properly issued, and that they covered patentable subject matter. This second charge can be discussed only after a full statement of the facts has been published. For the time being we must accept the Commissioner's decision as conclusive.

The third charge, in substance, is much the same as the second. It accuses the examiners of granting to Jungner a patent on an inoperative combination with full knowledge. This, like the second charge, was dismissed. It may be mentioned, however, that conflicting affidavits were submitted on both sides as to the operativeness of Jungner's invention, tending to show that the question was at best an open one.

Mr. Edison also took issue with the Patent Office in its declaration of the interference previously mentioned, asserting that the interference was improper, and that it deprived him of the opportunity of proving that Jungner's invention was inoperative. The Commissioner held that the examiner, in view of all the circumstances, had followed a time-honored custom of the Patent Office, and that, so far from having been refused a hearing in proving the inoperativeness of the Jungner device, Mr. Edison had been given every opportunity to prove his point, but had failed to take advantage of it.

From this view of the controversy, necessarily cursory by reason of the inadequate information given out by the Patent Office, it would seem that at best an error of judgment has been committed by one of the examining force—an error of a nature which even a justice of a Federal court might commit.

WIND-DRIVEN GENERATORS FOR FARMING.

The special attention called recently to farming by means of electrical power makes prominent the work being accomplished in harnessing the wind for similar purposes. In Germany, where several experimental electric farms have been successfully established, some attention has been given to the question of utilizing any natural source of power, such as water or wind. Both at Simmern and Quidnau the electric power is derived chiefly from steam engines, although at the former place there has recently been installed a turbine-driven dynamo, which is operated by the power from the river. In the West, where electrical plowing and harvesting have been used both experimentally and practically, the prime mover is operated by steam. Only on the California coast, where long-distance transmission of electrical power is obtained from the mountain streams, has any systematic attempt been made to harness the rivers for direct farming purposes.

The question of utilizing the wind for driving farm machines is of more practical importance to the farmers of the great prairie States than any other. There are no large streams for them to harness, and what few there are generally run low and nearly dry in summer. Water is at a premium in hot summers in the great corn and wheat belt; but wind is abundant. The southwest winds blow incessantly, carrying with them hot blasts of air, which often ruin the crops. This wind has been harnessed by the farmers for years past to irrigate their fields. The windmill has become almost as characteristic of many parts of the central West as it is of Holland. These windmills are employed solely for pumping water from the underground reservoirs, and without them thousands of acres of rich crops would annually be lost.

The variety of these home-made and commercial windmills is so great that the Department of Agriculture recently issued a special bulletin describing them, and giving such additional information as would tend to help farmers in other parts of the country to build similar structures. A good many of the windmills utilized the trees growing on the farms, and the apparatus was nearly all of a unique, home-made nature. But larger and more substantial windmills are now being put up in the rich farming regions, and private irrigation of farms is thus being extensively improved.

Since the investigations by the Department of Agriculture, a good many of these newer mills have been put to other uses than pumping water for irrigation. The wind has been harnessed for generating electricity to use generally on the farm. The first of these windmills were employed experimentally to generate electricity for lighting the barns and homes; but later their success stimulated some to more ambitious efforts. To-day a good many of them are being run to generate sufficient power to operate small motors.

The use of windmill power for generating electricity was tried successfully two years ago in Europe. At Hamburg and near Leipsic there are electrically-driven plants which derive their power entirely from the wind. The windmills are strongly built, and designed to take the wind at any angle. The regulation of the motor is obtained by means of an automatic switch, which cuts out the battery when the wind falls to a low pressure.

In the West windmills constructed for utilizing the power for electric generation are of the ordinary types, built to transmit the full power of the moving air currents to the generator located at the bottom of the structure. As the wind blows pretty constantly through the summer and fall months, there is seldom any lack of electric power for lighting or operating the small motors. In addition to generating electric power, the windmills are made so that the generator can be cut off, and the power can be used directly for pumping water in the usual way. During the months of July and August, when the droughts are at their highest, the need of water for irrigation is more imperative than power for operating farm implements. It is a season of comparative idleness on the farm until harvesting begins. By coupling the windmill to irrigating pumps at such times, the farmers secure double advantage. Later, when the crops are ready for harvesting, the windmills are once more harnessed to the electrical generator, and work with the machines begins.

Several windmills are worked together on some farms to operate the generators, and in this way ten-horse-power motors are working in the field continually. Several motors of two and three horse-power are operated in the field, and better results are obtained in this way than by one large single motor. By distributing the windmills and motors in different parts of the farms, more favorable results are obtained than by any other method.

A single large windmill of the home-made type or of modern commercial form will generate sufficient power to run a two, three, four, or even five-horse-power motor. Even when the wind is low and blowing only five or six miles an hour, sufficient power is obtained to develop two horse-power. When the wind increases to ten, fifteen, or twenty miles an hour, the capacity of the windmill becomes increasingly great. Ten-horse-power motors are then operated with as much ease as the two-horse-power in a low wind.

In order to take advantage of the change in the power of the winds, experiments are being made to adjust the generators to suit the force of the air currents. To accomplish this, a series of dynamos and motors are used, which are coupled together or uncoupled according to the state of the weather.

The possibilities in harnessing the wind for electrical farming are certainly alluring, and the experiments now being conducted indicate general interest in the subject. For the small farmer with a score or two acres of land, this method of using electricity for doing the mechanical work of his farm will prove far more beneficial than for the owner of thousands of acres. The latter will find water or steam power for operating his electric plant more satisfactory; but such installation would prove too costly for the ordinary small farmer. And after all, the small farmer is largely in the majority, and his needs are really paramount to those of the other class.

WOOD ALCOHOL FOR INDUSTRIAL PURPOSES.

The art of manufacturing and refining wood alcohol has steadily improved in this country in the past few years, and it is now equal to grain alcohol for nearly every manufacturing and industrial purpose. Its distribution has been widespread, and our exports of the alcohol have become an important item in the by-products of our forests. Simultaneous with the increase in the distillation of wood alcohol by improved methods has been the increase in its use. There are more than threescore industries that are quite dependent upon wood alcohol for their success, and anything that cheapens its cost and increases its supply intimately affects these industries.

But the cost of manufacturing wood alcohol has been too high in the past to make its use general in many other industries, that stand ready to utilize it as soon as some cheaper method of distilling it is invented. One of these is the burning of alcohol in motors for power production. The steady improvement of the alcohol motor abroad indicates that for certain purposes this form of motor will prove of general value, and in Germany several types of alcohol motors are quite commonly used. But the cost of the fuel must determine in this country at least the success or failure of the alcohol motor. With cheap crude-oil engines and the gas-engine, the alcohol motor would have formidable competitors in the field, and it may be questioned whether the latter will prove universally successful here for many years to come.

The manufacture of wood alcohol, however, has a direct and important bearing on the iron industries throughout the country. The charcoal that was formerly used for the manufacture of pig iron was almost exclusively the product of the charcoal pits established for this purpose. The charcoal iron furnaces of Pennsylvania, New York, Maryland, and Michigan depended entirely upon the charcoal burners for their supply of this fuel, and the cost was always high and exorbitant. It was only when wood alcohol became an important by-product of charcoal that chemical works were constructed to supply the iron furnaces with their charcoal. In New York and Pennsylvania there are over eighty wood-alcohol and acetic-acid plants, which make a business of supplying the iron foundries with charcoal and producing alcohol as a by-product.

The chemical charcoal from the alcohol plants is made almost entirely of beech, birch, and maple trees that are fit for few other industries, and also from the tops and branches of hardwood trees which the lumbermen waste. Instead of destroying the forests, the modern chemical factories are working to preserve the supply of wood, for with the raw material exhausted they would be forced out of existence. It is estimated that fully ten thousand men are engaged in Pennsylvania and New York alone in cutting wood for the alcohol plants, and that their total product amounts to more than a million and a half gallons a year. The charcoal produced by the chemical plants equals more than a million bushels of the fuel per month. This