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THE SCIENTIFIC AMERICAN SUPPLEMENT

No. 331,

For the Week ending May 6, 1882.

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LIGHT, HEAT, AND POWER AT LITTLE COST.

Among the most interesting exhibits to be seen at the Electrical Exhibition now going on at the Crystal Palace, London, is the new secondary electrical battery of Sellon and Volkmar, the operation of which appears to mark the opening of a new era in electrical progress. If all that is said of the new invention be true, the storage of power by electrical means is now reduced to commercial practice, and, as results, we may soon expect to observe some curious changes in the arts, habits, and wants of the people.

For example, anybody who chooses to put a windmill upon his house or barn will be able, by means of the secondary battery, to light his dwelling at night, supply it with heat and hot water for washing and cooking, drive sewing machines, churns, washers, pumps, keep electrical carriages that will run anywhere about town without horses, do his plowing, draw mowers, reapers, seeders, propel boats, and perform almost any sort of work that may be required. The rotation of the windmill, running day or night steadily or intermittently, costing nothing except repairs, will have its power stored up and held in the secondary battery, and by the touch of a button to be instantly delivered and put to use when wanted in the form of light, heat, or power. The battery forms in effect a reservoir of force, which when connected with an electrical lamp yields light, or with an electric machine yields heat or motive power. Furthermore, the battery is quite portable, and may be placed in an ordinary carriage, giving motion thereto, like a locomotive. But there is no boiler to explode, and no fuel or water to be supplied. Women and children may safely use it. Every class of society, from highest to lowest, every art and industry in the civilized world, will benefit by its adoption. These, we say, are only some of the indicated uses and advantages of the new invention, if all that is claimed for it be true.

A trial and exhibition of the new battery was lately given at the Crystal Palace, before a large number of distinguished guests, among whom were Mr. Warren de la Rue, Professor Crookes, Professor Hughes, Professor Dewar, Dr. Huggins, Alexander Siemens, Professor Thompson, Professor Adams. Mr. Sellon, the principal originator of the invention, was called on for a speech and gave the following particulars. He stated that the capital stock of the new company, "The Electrical Power Storage Company," was $4,000,000, that it was all subscribed within a few hours, and that he could have obtained ten times the amount had he desired. The distinctive peculiarity of the Sellon-Volkmar battery is that the plates composing the cells are made of perforated plates, the oxides used being held by and within the perforations. Heretofore, as, for example, in the Faure battery, it has been necessary to hold the oxides in contact with the plates by means of packings or wrappings of cloth or other fibrous substances, the use of which was always attended with expense and difficulty, and has prevented the actual success of the instrument. The action of the acids soon destroyed the wraps.

In this new form of battery all the clumsy wrappings are removed, and simple perforated plates are used, the result being the production of durable and more powerful cells than heretofore. Mr. Sellon said that he looked forward to the time when huge plates of half a ton or a ton each will be used, and thousands of lamps supplied from one battery or reservoir. He further said:

"Of the sizes now made, one standard size of the dimensions of forty-three one hundredths of a cubic foot, and containing of metallic composition about 62 pounds, will yield when properly charged an aggregate amount of current equivalent to fully one horse power of electrical energy for one hour, giving off from 350 to 400 amperes at any required rate up to 40 amperes per hour. The next standard size contains of metallic composition rather less than 300 pounds, and can yield five horse power of electrical energy for an hour—giving up its 1,800 to 2,000 amperes at any rate up to 200 or 250 if required. One set of 39 such cells will be seen working 200 Lane-Fox lamps in the Alhambra Courts. The plates have no supports, and are simply in appearance solid pieces of metal separated by slips of wood, and immersed in acidulated water. In reality they are full of interstices or holes, which contain the packed material. This is applied in such a form that it makes a solid alloy (if I may use the term) with the plates themselves."

He then proceeded to request that a scientific committee should be appointed to examine and verify his statements and test the battery. He then continued:

"Now as to the practical application of these batteries. To my mind their employment will be almost unlimited. I can conceive no installation of domestic electric lighting to be complete without them, whether as a supplying or as a regulating medium. For motive power I anticipate immense demand; and although the factory now nearly in course of construction is upon a scale somewhat commensurate with the business in hand, yet I feel confident that it will form but the nucleus of an immense and important industry.

"The application of the forces of nature, such as wind, running and tidal water power, will now, doubtless, receive more engineering attention than heretofore; and electrical energy, which upon its generation can now be stored and reserved for use as required, must become a much sought for and highly prized source of power. To regard the use of these batteries only as a small matter of personal convenience, take, for instance, my own case. Up to the introduction of these batteries it had been necessary for me to keep one of my gardeners every evening attending to the engine and dynamo machine up to whatever hour light might be required; for the future he need only set the charging of the batteries in action during the day, and my store will be ready for evening use without fluctuation or intermission. The durability of the incandescent lamps is also greatly increased, and the lights can be regulated to any required degree of intensity if you diminish your electromotive force by cutting off so many cells, and you thereby conserve so much of your electrical power."

The practical exhibition of the new battery is described as having been attended with great success. Many lights were shown, the brilliancy of which could be readily increased or diminished by switching on or off one or more cells of the battery.

THE PROTECTION OF SMALL INVENTIONS.

A characteristic feature of the American patent system, and one toward which the patent laws of other countries have been steadily approximating, is the encouragement which it offers to all men, poor as well as rich, to make inventions and publish them to the world under the protection of letters patent. The smallness of the official fees and the exceptionally thorough protection offered have been very fruitful in calling out and making public inventions which, like the Bessemer bronze powders (elsewhere commented, upon), are easily open to spoliation; hence the rapid and enormous multiplication here of individually small devices which have had in the aggregate such a shaping, helping, and enriching influence upon all our industries. Not unfrequently has it happened that seemingly minute and unimportant devices, inventions which could not have been patented elsewhere or which the inventors would have been unable to patent on account of the cost, have here brought liberal fortunes to their patentees, vastly greater profit to the public, and sometimes have furnished the beginnings of great industries.

Such results are possible only where the inventors' rights, easily secured, are rigorously guarded. One of the strongest safeguards to patents upon easily marketable inventions of general utility is the law which makes the buyer of infringing devices measurably responsible for the wrong done the rightful patentee, thereby spoiling the market for dishonest and unlawful products. This vital truth has repeatedly been recognized by past Congresses, and quite recently again by the Congress now sitting in Washington, in defeating projects calculated to sacrifice the rights of patentees of articles of small market value. The action of the Senate upon Senate bill No. 1238, a few days ago, may serve as an example. The first section of the bill provides that in suits for infringement, where the defendant's purchase was made "in good faith for his own use and not for sale, and not in any manufacturing process," the plaintiff must recover $20 or he cannot recover costs; while the second section requires the plaintiff to deposit "a reasonable sum not exceeding $50," as security for the defendant's costs and expenses.

The chairman of the Senate Patent Committee strenuously urged the passage of this bill; but the objections to it were so strong that it was withdrawn, it is to be hoped permanently. The provisions of the bill (as will be obvious to any one) would reach a very numerous class of patentees whose rights would be sacrificed entirely.

A still more reprehensible attempt to remove the legal safeguards of patentees is said to be favored by the Patent Committee of the House. According to the *Evening Post* of April 25, the committee that day directed a favorable report to be made to the House on a bill providing that no action for damages or proceeding in equity shall be sustained, nor the party held liable under sections 4919 or 4921 of the Revised Statutes, for the use of any patented article or device, "when it shall appear on the trial that the defendant in such action or proceeding purchased said article for a valuable consideration in the open market."

It is incredible that the House can lend itself to the furtherance of a measure so palpably intended to lay the property rights of patentees open to general invasion. Still less possible is it that both Houses can agree to such an unjustifiable reversion of the spirit which has thus far ruled in American patent legislation. There must be some mistake in our contemporary's report of the committee proceedings. The country is too deeply indebted to the ingenuity of our inventors, and has too much to hope for from the future working of their genius, to abandon the profitable practice of dealing justly with and by them.

BESSEMER'S BRONZE POWDER.—HOW THE PUBLIC GAINS BY GRANTING PATENTS FOR INVENTION.

About forty years ago Mr., now Sir Henry Bessemer, had occasion to buy some bronze powder, for which he was charged seven shillings (about $1.75) an ounce. On examination he found that the metal of the powder was worth less than a penny an ounce. So large a margin for profit set him to thinking, and his thinking resulted in a machine for making bronze powders rapidly and cheaply.

Having small faith in the adequacy of the protection rendered by the patent laws of England as administered at that time, Mr. Bessemer determined to keep his invention secret. He made working drawings of the machinery, and had the various parts constructed by different machinists in Liverpool, Manchester, Birmingham, and London, so that no one should be able to guess what the entire machine was intended to be. With two trusted assistants he put his machinery together, and thereafter only himself and those two ever entered his factory. At first he charged eighty shillings ($20) a pound. The same machines, under the super-