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THE SCIENTIFIC AMERICAN SUPPLEMENT

No. 454,

For the Week ending September 13, 1884.

Price 10 cents For sale by all newsdealers.

THE INTERNATIONAL ELECTRICAL EXPOSITION.

Elsewhere in this number will be found a description of the International Electrical Exposition, which opened last week in Philadelphia. As will be seen from this, the projectors of the enterprise have succeeded in collecting under one roof, with few exceptions, all the important electrical apparatus of the day.

Probably at no other exhibition held in this country was foreign workmanship so readily distinguished from domestic. We are a practical people, and we are not always disinclined to boast of this practicality, but as we look over the European exhibits in this exposition, observe the nicety of the philosophical apparatus and instruments of precision, consider the carefully worked out theories and laws upon which they are constructed, and then turn to our own exhibits, confined as they are almost exclusively to practical applications, for money getting, it seems after all as though we had been better off were we not quite so practical, and loitered a little more in the paths of pure science.

The arc and incandescence lights of the various systems which ornament the pillars and hang in festoons from the walls have resulted from the application of laws discovered by Faraday and Oersted; and while the inventors of these applications have deservedly won no little fame and are credited with making a deal of money, the men without whose efforts such applications would have been impossible gained little of the former and scarcely enough of the latter to insure them a livelihood.

The principal objects sought by that admirable society, the Franklin Institute, under the auspices of which the present exhibition is given, might, perhaps, be fairly laid down as: 1st. To give the American electrician the opportunity to compare his work not only with the latest European models, but also with the handiwork of his fellow on this side the water. 2d. To exhibit the excellence of American electrical applications.

In regard to the first, it is well known that many practical and ingenious workmen are in the habit of keeping to themselves, for fear their ideas should be taken from them. That this is, in great part, a mistake is well illustrated by the small number of really successful applications in electrical science compared with the number of workmen that have struggled tirelessly over what has not given nor is likely in the future to give much promise of success. These men, or some of them, are searching for that which is not or for that which the interposition of a natural law prevents them from finding, at least in the manner they have proposed to themselves.

The opportunity of seeing what has gone before, what has already been done, and for mutual comparison of work, is likely to be of inestimable advantage, and the collection at one point, as at the present Electrical Exposition, of working models of the best construction up to date must, for reasons so obvious as not to require demonstration, be of incalculable assistance to the struggling and ambitious electrician and mechanician. As to what may be regarded as another principal reason for the exposition, viz., the exposure of domestic wares to a foreign audience interested in enterprises for which they are designed, much might also be said. Novelties require more than a casual introduction into a new market. A supply will not always insure an immediate demand. There was no demand for India-rubber galoshes, but the practical demonstration of their usefulness begat a demand. The case of the telephone is a striking illustration of this. Though now known to be a commercial success in the broadest meaning of the term, its usefulness, speaking from a purely commercial standpoint, remained for a long time unrecognized abroad. More than fifty million dollars had been invested in this country in the telephone plant ere it really went into general use abroad.

For these and other reasons the present exposition is likely to further the interests of American electricians, mechanics, and manufacturers, and they have reason to congratulate themselves that it was planned and is now being managed by so estimable a society as the Franklin Institute.

EMERY WHEELS.

The solid emery wheels have made possible a wonderful advance in the surfacing and polishing of metals in the shop, in truing centers, sharpening tools, and in other processes. Yet in some cases they are not equal to the homemade wheel for one reason—they become smaller by using, like the grindstone; and there are jobs where it is very desirable that the emery wheel should retain its original and uniform size. It is well, therefore, to give a few words of this almost forgotten shop lore.

The emery wheel should be of soft wood—pine is to be preferred—made of alternate layers of boards planed to make good joints, put together with glue and screws, the grain crossing each alternate layer of boards, which should be not more than three-quarters of an inch thick; half inch boards are better. Make the wheel slightly thicker than it is to be when finished, as it is to be turned and trued on the sides as well as the face. With a band saw or gig saw shape the glued-up and screwed boards to a circle, chuck it in a lathe, and bore and turn a hole and recess at the center to receive a disk, or gland, of iron that has been bored and faced up, having screw holes in its flange. The hub of the gland should be seated in the wooden wheel. When the gland is in place and secured, the wheel is ready to be turned to finish. It is mounted on an arbor for this purpose. Some wheels are to run on a threaded arbor, and the gland is therefore threaded.

After turning to size, peg a belt or band of wet belt leather with shoe pegs to cover the rim of the wheel, flesh side of the belt outside. This makes a hard wheel. If one with a yielding surface is desired, peg on layers of Canton (cotton) flannel to the requisite thickness, carrying them over the edges of the face to make a round edge. Cover the whole, not with leather, but with strong denim or bed ticking, pegging or tacking it on the sides of the wheel. This makes a soft or stuffed wheel, which is for polishing—not grinding—and it will do work of a somewhat irregular form.

Brush the face of the wheel with hot glue, pass a round bar through the center, and roll the wheel in emery that is spread in a shallow trough or on a clean table. Any particles of iron or steel filings in your emery will make trouble; have the table or trough perfectly clean. One coating of glue and emery is better than more, for when the outer coating is worn off the glue will glaze. Do not rap off any of the loose particles of emory until the wheel is perfectly dry; the reason is obvious: the undried glue will not hold the particles in place.

When the wheel has been worn, the glue and emery is to be removed by soaking in water, and the facing repeated. If the use of these wheels is sufficient to warrant the trouble, it is well to have a trough of water in which two iron rolls revolve by power, the faces of the rolls far enough apart to allow an emery wheel to ride and roll between them, the shafts of the rolls to be connected at one end by gear wheels and an intermediate, so that they both turn in the same direction, and the emery wheel standing on its face will be slowly revolved by their combined action, the water in the trough being at a sufficient height to just wet the face of the wheel as it turns. This method prevents the whole wheel from being wet and warped. If this method is not feasible, repeated hand washings of the face must be made to soften the glue.

WHITE PINE ORNAMENTATION.

Some recent attempts with white pine appears to give it a value as an ornamental wood which its common uses have not heretofore suggested. The softness of its texture and its susceptibility to injury may have had some influence in preventing its general use for ornamental purposes, but the wood can be "filled," so that much of this objection is removed. Its pure white color—white as compared with other woods—recommends it for purposes for which holly has been heretofore used; and the size of the timber from which clear lumber may be cut is greatly in its favor, boards of a width of sixteen and even twenty inches being not uncommon, with no shade of distinction between sap wood and heart, and only the faintest perceptible grain.

Some specimens lately examined show a greatly enhanced beauty by very simple treatment—the filling with warm shellac varnish, bleached shellac in alcohol, applied with a brush while warm. Several coats are given, the last coat being rubbed with pumice and rotten stone moistened with water, not oil. A finish of a flowing coat of copal varnish completes the preparation. Thus treated the wood is of a faint creamy tint with an appearance of semi-transparency. Beautiful gradations of tone were obtained by panels of this prepared pine, mouldings of holly, and stiles of curly or birdseye maple, and fine contrasts were made with the pine and oiled black walnut.

The pine is too soft for floors, but for doors, casings, and chamber furniture it seems to be admirably adapted. The finest specimens of the wood noted come from Michigan, having fewer pitchy streaks and being of a more uniform color than the Maine product. Its ease of working by carving, and the coherence of its grain, are being utilized by masters and amateurs in interior wood decorations. A beautiful carved mantel relieved by pilasters of oiled black walnut has been recently finished, which suggests the mellow tints of statuary marble after a short exposure to the atmosphere, while being free from the chilling sparkle and sheen of the marble.

Work of the British Association at Montreal.

After a most busy week, in which results were put on record of the recent work of a great number of savants in numerous departments of investigation, the British Association for the Advancement of Science closed up the business of its first meeting in America, at Montreal, September 3. The number of papers read has been great, and the discussions were always interesting, but there have been no such wonderful discoveries announced or original theories advanced as stand out so prominently in the *Transactions* of the British Association of many former years, as exemplified in Bessemer's thrilling description of how to make steel from cast iron without fuel, Sir William Siemens' accounts of his regenerative furnace and the Siemens-Martin modifications thereof, or of his bold advances in the field of electrical science, or the numerous and equally valuable contributions of Tyndall, Huxley, Sir William Thomson, and scores of others. It would not be just, however, to assume that on this account the work done indicates any less keenness in scientific research. Great discoveries do not come at regularly prescribed intervals, and perhaps the great amount of thorough examination and careful study of the ground already traversed, which the numerous papers read before the several sections indicate, are only the necessary preliminary work in clearing the way for still more important advances.