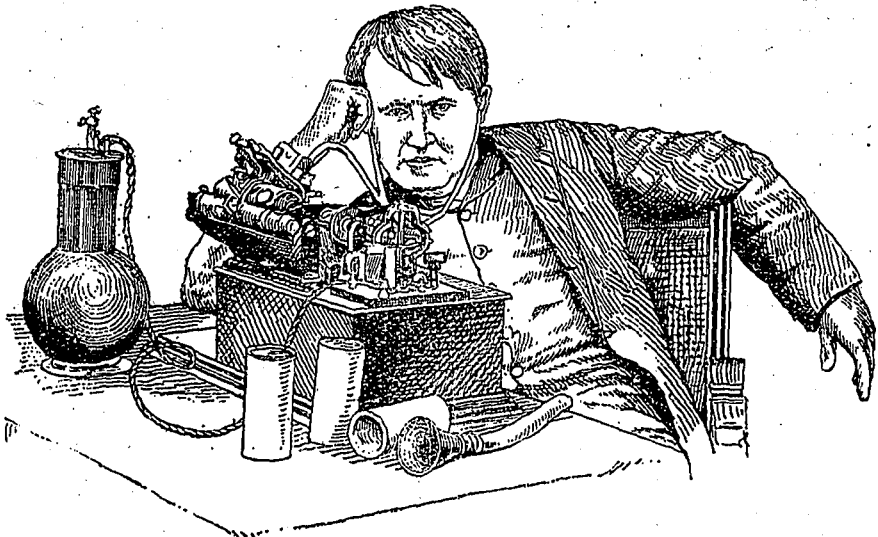


DEVOTED TO TEMPERANCE, SCIENCE, EDUCATION, AND LITERATURE.

VOLUME XXVII., No. 2.

MONTREAL & NEW YORK, JANUARY 22, 1892.

30 Cts. Per An. Post-Paid.



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#### A DAY WITH EDISON AT SCHENECTADY.

Passing swiftly through the suburbs of the sedate old city of Schenectady, on the New York Central Railway, one's attention is arrested by a huge range of factory buildings and by the numerous signs of pressing activity in and around them. The contrast with the surrounding pastoral scenery does but accentuate all the evidences presented of busy toil. Beyond the factory, as it lies solidly athwart the view, with its long facade to the railway and its remote rear bordered by the Erie Canal, winds and doubles the placid Mohawk river, hemmed in by green banks and girdled by uprolling mountains well away to the northward. It is a pleasant reminiscence of one of his nearest friends that just at the time of the demonstration of the commercial feasibility and practicability of the incandescent light Mr. Edison remarked to him one day, as they were passing the Singer Sewing Machine works at Elizabethport, N. J., that he hoped before long to be able himself to give employment to as many men as were there engaged. Within the decade the laudable wish had been gratified.

In Dr. Benson Lossing's admirable *History of American Industries and Arts*, issued at the time of the Centennial Exposition, there is no mention of a dynamo building. The fact is significant as to the youth of the new industry and as to its growth.

These shops are well placed for the handling of freight, and their advantages have been enhanced by the laying of rails all through the yards and shops. There is a total of nearly two miles of track, and the finished product can be loaded into the cars at five different shipping points.

The works employ from 750 to 850 hands, according to the season of the year, and at the time of the writer's visit about 775 were on the rolls.

The machine shop is not less than 122 feet wide and 306 feet long, and deservedly claims our attention first. Its central aisle is 40 feet wide, and there is a cathedral-

like airiness and distance in its long perspectives. Five hundred men can easily find elbow room here for their work, with all the machinery. Here are 6,000 feet of shafting and some 50,000 feet of belting, driving nearly 400 separate mechanisms, in the production of apparatus whose birth was yesterday. Right and left are gigantic machine tools of every kind and style; here a planer 60 by 60 inches and 32 feet long; there a special boring mill, built to order at a cost of \$6,000. The value of the tools, in fact, runs up into hundreds of thousands of dollars, and their multiplicity is understood on looking at the variety and extent of the work in hand.

The aspect of the floor in this vast shop, with the huge generators lying amid the motors, like stately lionesses surrounded by their whelps, is very suggestive of the new order of things. "Numerous attempts have been made," says Herbert Spencer in his treatise on education, "to construct electro-magnetic engines, in the hope of superseding steam, but had those who supplied the money understood the general law of the correlation and the equivalence of forces, they might have had better balances at their bankers." And yet, here we are, looking at literal hundreds of these very electro-magnetic engines, some of them intended to take the place and do the work of steam locomotives, while the remainder go to join thousands more already at work in nearly 150 industries in which they have been given the preference over steam engines and every other kind of motor. There is after all some truth in the remark, even when applied to philosophers, that "the world requires half-a-dozen years to learn of any advance and half-a-dozen more to understand it."

One might linger in this shop a week, so endless are the points of interest that it presents. A casual question as to some strange tool elicits the information that the company construct all their own tools here, except those ordinarily to be had in the market. All the machinery for the

foundry department is made here, and a month or two ago, upon the receipt of an order for 25,000 feet of a specially insulated cable, the machinery was at once designed and built on the spot. Resources of this nature give an establishment courage and daring for the most onerous enterprises.

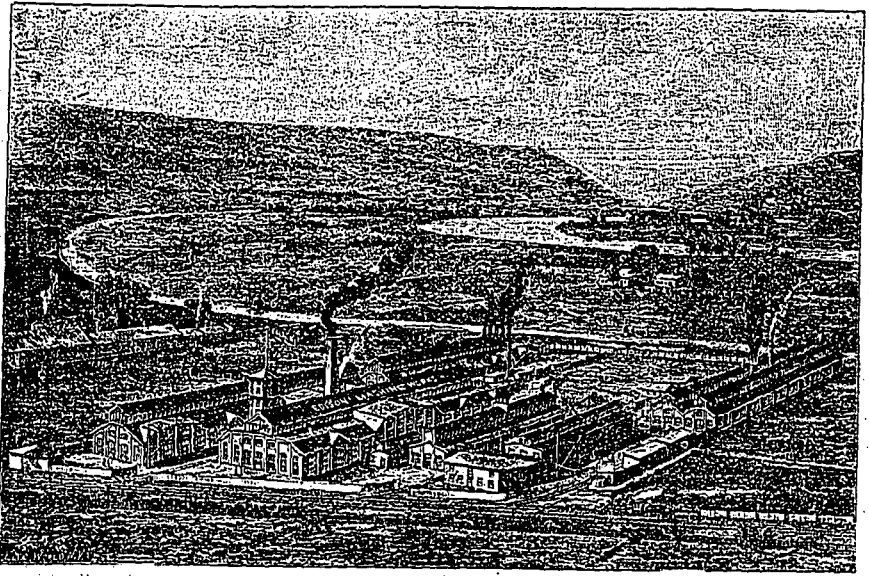
By natural transition our thoughts now wander from the heavy work connected with the dynamo construction to the finer and more delicate manipulation required in the production of an armature, and we find our way to shop No. 1, where the extensive department of armature winding is situated. It is only the lazy man who does any hard labor here; the busy man, in a hurry, at once avails himself of the conveniences provided for speedy work. It is an evidence of the progress in this department that the repair work brought in is barely 25 percent of what it was when the company was doing but a quarter of its present business. At first it was the practice to keep a complete gang of armature winders engaged on repair work, but there is now so little of it that it is done at odd times.

Mr. Edison made up his mind at the outset of his work in electric lighting that the conductors ought to be placed underground, and, having reached that conclusion, he proceeded with characteristic doggedness and ingenuity to elaborate the methods. He adopted iron pipe as the external mechanical protection of his conductors, his object being to provide something analogous to the means of distribution employed by gas and water companies, something which could withstand the strain of street traffic, the disintegrating influences of soil and climate, and the sudden onslaught of unfriendly pick or shovel. Inside this pipe he placed the conductors, carefully wrapped and insulated by an extremely viscous, almost solid compound.

The next branch of the business to be visited is the wire-insulating department. It affords a striking contrast with the scene just quitted, for while the conductors there

became so large that they looked like sections of shafting, here they tend to the other extreme, at last being as fine as human hair; and all the machinery is naturally in keeping. This department was originally established to provide the dynamo and motor shops with insulated wire for the field magnets and armatures, but its usefulness and economy were so signally proved, that it was developed and extended, until now the works make insulated wire of all kinds, not only for themselves, but for outside customers of all classes. The wire covered runs from the largest sizes for heavy currents down to .0015, a conductor so small that it makes 32 miles to the pound; and the insulation work includes not only cotton and silk, but rubber. Some of the machinery is a marvel in its comprehensive ability, for it does everything, apparently, except label the completed wire. In one of the machines the bare stranded wire goes through seven distinct operations, and is delivered ready for use, with the exception, in some instances, of receiving a final coat of compound, which is necessarily applied in another place devoted to the less cleanly processes of that nature. Some of the machines run at high rates of speed. In one the spindle makes seven thousand revolutions a minute, and keeps it up with the utmost ease and indifference.

Since the first Edison dynamo was built—that for the unfortunate "Jeannette," and now lying with her in the cold depths of arctic ocean—140 central stations and 1,500 isolated plants, with a capacity of 1,250,000 lamps, have been installed in America alone to supply the Edison incandescent light, and the growth is going on at an accelerating pace. These figures are in themselves almost a fair justification of the imaginings in which the newspapers luxuriated when the electric light was in its infancy; and they certainly support beyond a cavil the remark made by Mr. Edison in an article published nearly four years ago on the "Commercial Evolution of Elec-



THE EDISON MACHINE WORKS, SCHENECTADY, N.Y.