

AN ELECTRIC INCUBATOR.

A successful manufacturer of incubators, Mr. George H. Stahl, of Quincy, Illinois, has recently placed on the market an incubator which is heated and regulated by electricity. In this incubator, which is shown in the accompanying illustration, it is said that the temperature can be adjusted to be held for weeks within a fraction of a degree of the desired point. The incubator casing has the usual double walls inclosing a filling of mineral wool, and the heat is supplied from the water tank at the top, the heating and setting up of a circulation in the water being effected through a small connected reservoir at one side. In the old style incubators the heating of the water was effected by a lamp, there being a lamp regulator controlling the flame, and a valve regulator acted upon by the heat of the water before entering the tank, while both regulators were actuated by an improved thermostat.

In the electric incubator, or "Electric Hen," as it is called, the water is heated by a resistance box, the current through which can be regulated with extreme nicety. The same manufacturer is now also building an incubator with a combination heater in which oil, gas or electricity may be used.

A New Car Fender.

The invention of Mr. Wm. B. Altick, of Lancaster, Pa., is so arranged that the instant the front padded bar strikes a person, an inside gum roller connected with the safety netting drops automatically on the track, thus rendering it impossible for the object struck to pass under the fender. If a person when struck should fail to fall into the netting, and fall in front, the additional pressure of the moving car against the body would cause the front cushioned bar to drop also, and would push the body along the track until the car was stopped. The person might be bruised or otherwise injured, but the danger of being crushed under the wheels would be obviated.

A POLE RAILWAY.

We give a picture, from Black and White, of a picnic party celebrating the opening of a pole railway in the province of Nova Scotia. It is a novel line, thirteen miles in length, and is the third of its kind in the province. For the most part it is utilized in bringing the deposits of silica found in the lakes down the mountains to shipping ports. The way is of spruce poles. The engine has sufficient power to draw four empty cars up the heavy grade of the railway. By taxing the motor to its utmost, and by a liberal use of sand on the rails, eighty excursionists were taken up the incline on the occasion represented.

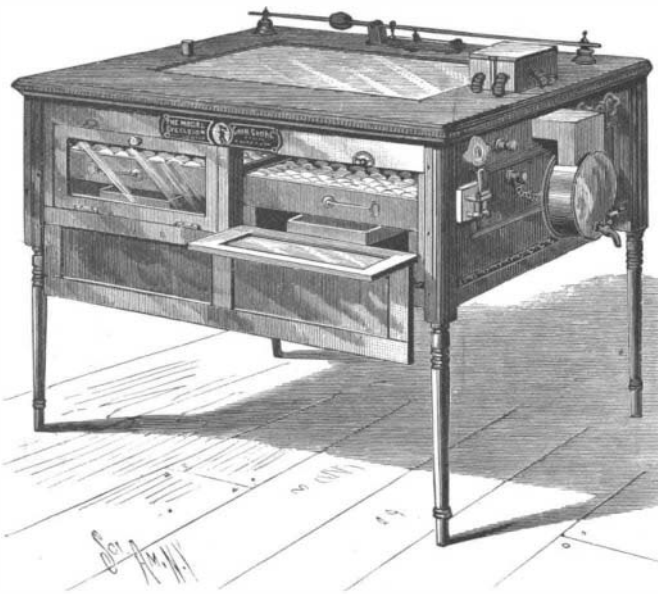
The pole railway is probably the most economical form of steam roadway that has been produced. It is of American origin and has been in vogue in different parts of the country for the past quarter of a century.

It is especially adapted for use in forest regions, where lumbering is the principal industry.

A first class, substantial road built of poles will cost

anywhere from seventy-five to two hundred and fifty dollars per mile, according to local circumstances. The expense, of course, is greater when the road has to be carried across ravines, as indicated in our engraving. The poles employed for rails should not be less than nine inches in diameter at the smaller end, and should consist as far as possible of the heart, or they will decay before they wear out.

In the best roads, a bed is hollowed out in the butt end of the pole to receive the small end of the one adjoining, so as to make a secure junction. The bed is made about nine inches in length and deep enough to permit the smaller end to come up flush with the

**STAHL'S EXCELSIOR ELECTRIC INCUBATOR.**

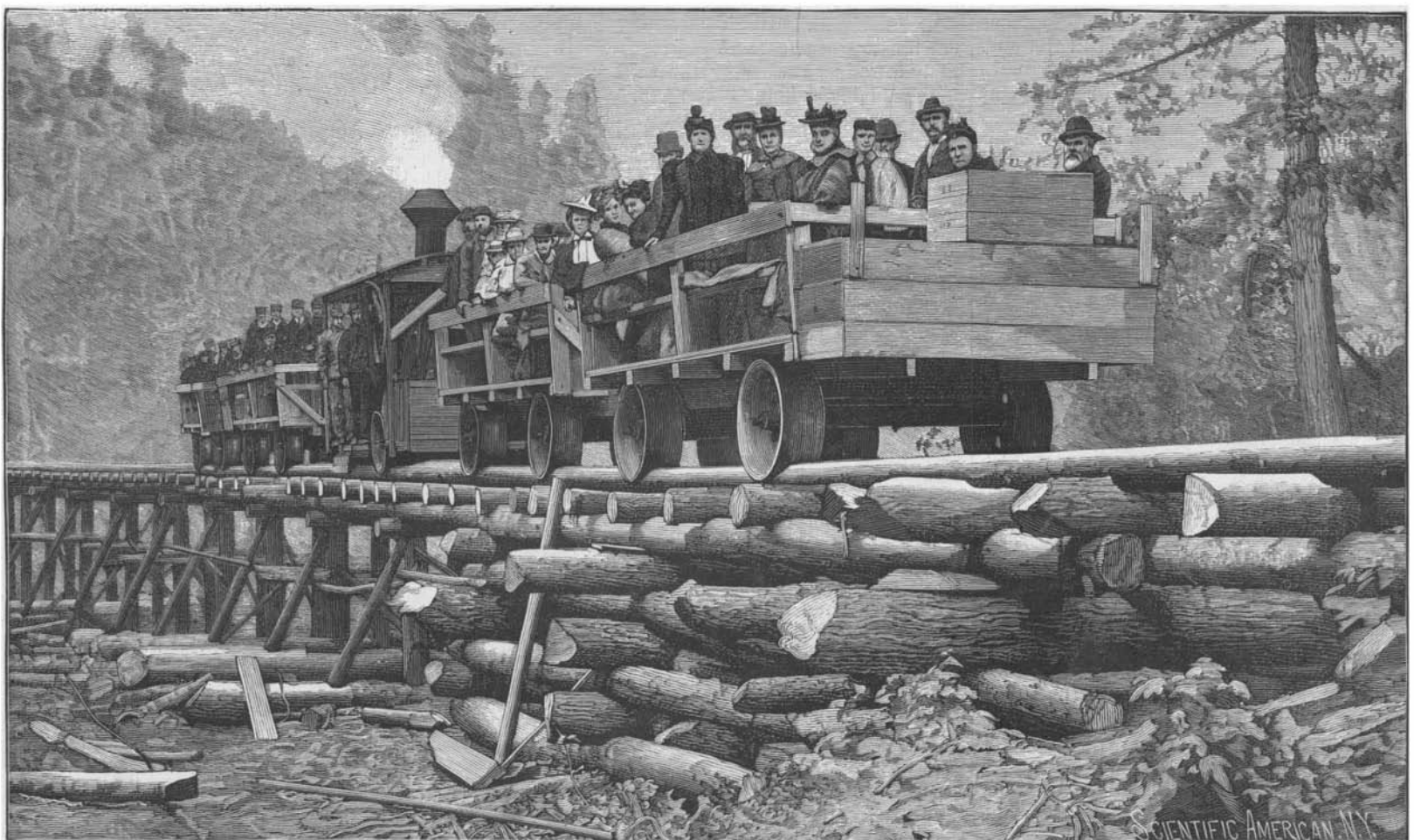
larger. The poles are simply laid on top of the ground, except when the surface is very uneven, dirt thrown on each side and trampled down to form a solid bed. After they are in place, they are slightly trimmed down with an adz. When a crook of any kind occurs in the poles, it is of course turned down in laying the track. No cross ties are necessary, as the locomotives and cars are so constructed that they exert no lateral pressure. After a few trains have passed over the road there is no fear of the poles becoming displaced. Curves are made up of a succession of short poles, care being taken that the joints come opposite to each other. The switching is readily accomplished in the ordinary way. Where heavy grades are encountered, it is the practice in some localities to place the locomotive in the middle of the train, and at the particularly steep grades to cut away half the train, push up the other half, uncouple, and return for the remaining cars. In this manner, trains of six loaded cars have been taken over grades of 700 feet to the mile with the use of only one locomotive. The wheels of the cars and locomotives have very broad treads deeply grooved, so as to fit the curvature of the poles.

The Invisible Spectrum.

It is known to all students of science that the band of colored light produced by a prism, through which sunlight is passing, appears to stop with dark red rays one way and with deep violet rays in the opposite direction. Much interest has been awakened by attempted study of this color band thought of as going below the visible red end and above the ultra violet. In a recent lecture before the Royal Institution, Dr. William Huggins spoke of these points and the methods of study of them now in use, as follows:

"Beyond the violet end of the spectrum there is a whole gamut of invisible rays, which only reveal themselves by their effect in promoting chemical action. Similarly, beyond the other end of the visible scale—the deep red—there is a gamut of invisible or dark rays, which are only perceived by their heating effects. Some idea of the importance of the 'ultra red' may be gathered from the fact that it has been traced to a distance nearly ten times as long as the whole range of the visible or light-giving region of the spectrum. To learn the character of these mysterious dark rays, then, it is clearly necessary for science to fit itself with some new sort of eyes that can see what ordinary eyes cannot—namely, heat rays and chemical rays. The photographic plate has answered admirably as an eye for the chemical rays, and brought out some wonderful facts. But with the invisible heat rays the problem was more difficult. Something in the nature of an extremely delicate thermometer is here required, which will pick out all the fine absorption lines as colder spots in the spectrum. The beautiful instrument known as the bolometer has recently been used by Professor Langley in feeling for these absorption lines, which, being regions from which the rays are stopped out, are, of course, colder than the remainder of the spectrum. The bolometer, like all the finest applications of science, is an extremely simple thing. It is a strip of fine wire, through which a feeble current of electricity is always flowing. This wire is slowly passed along the invisible gamut of the spectrum, and as soon as it comes to one of the absorption lines the spot is shown by a minute fall of temperature in the wire. This has an instantaneous effect on the flow of the electrical current. More current will pass through a cool wire than a warmer one, and the alteration is promptly shown by a delicate mirror galvanometer, which flashes its mimic signals onto a slowly revolving photographic ribbon. In this way Professor Langley has been able to pick out and locate hundreds of dark absorption lines in the great invisible spectrum which lies beyond the red. Not only is the absorption of rays by the solar atmosphere shown by this method, but the absorption lines of the earth's atmosphere are equally apparent. Dr. Huggins anticipates that the meteorologist will soon be applying the system to weather forecasts."

NEARLY all the glass eyes used in the world are made in Thuringia, Germany.

**OPENING OF A POLE RAILWAY IN NOVA SCOTIA.**