SCIENTIFIC AMERICAN

[Entered at the Post Office of New York, N. Y., as Second Class Matter.]

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES.

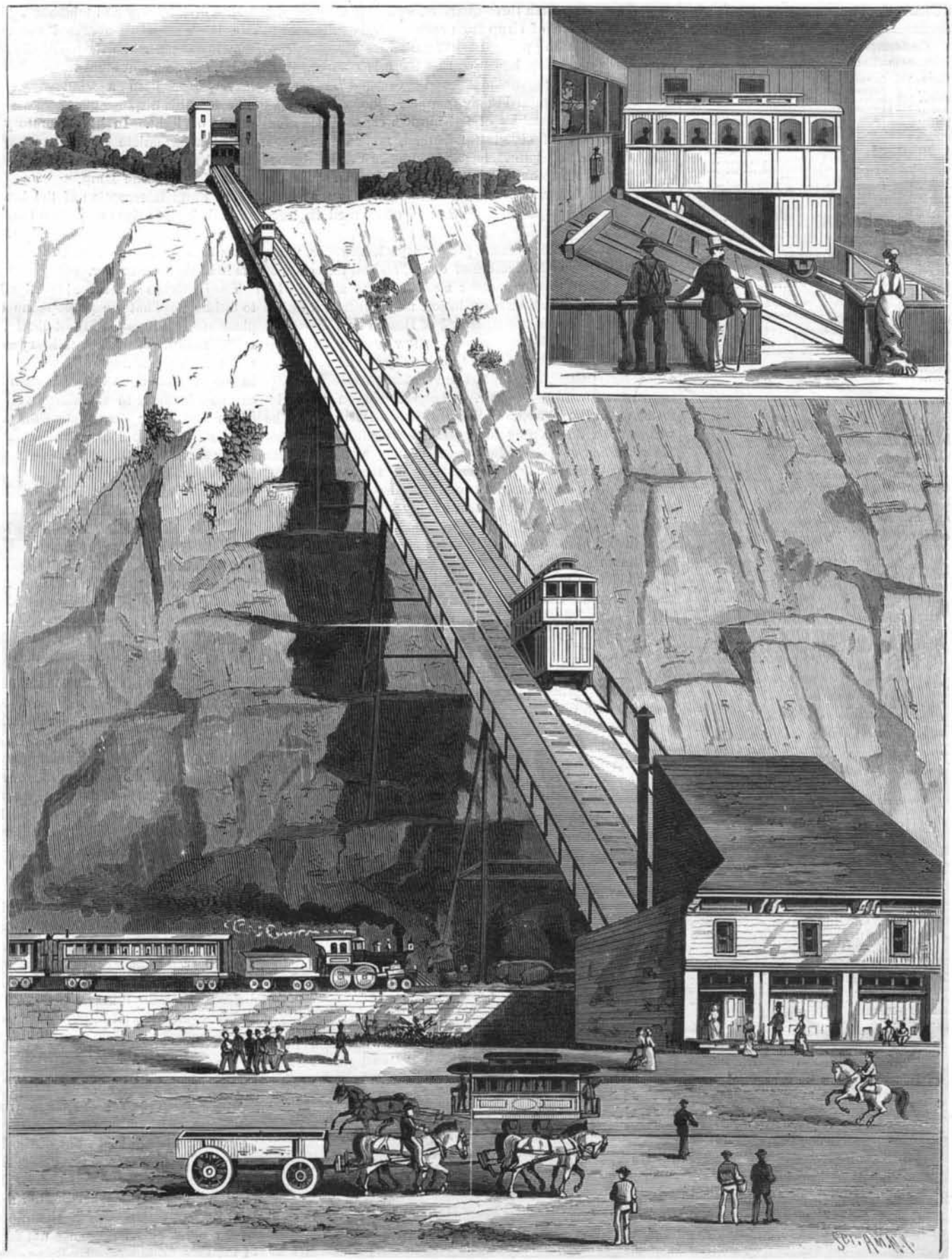
Vol. XLIII.—No. 12. [NEW SERIES.] NEW YORK, SEPTEMBER 18, 1880. [$3.20 per Annum. [POSTAGE PREPAID.]

MODERN HILL CLIMBING.

The topography of many Western cities is such that, as the corporate limits enlarge, their most populous portions include districts embodying very rugged features. At Pittsburg and at Cincinnati steep hills, or rather mountains, bordering the Ohio, have long since been absorbed by the cities named, and these are covered with a dense and growing population. This has been of late years rendered the more possible by the general introduction of the inclined railway, which makes hill climbing a luxury. A fair sample of such a railway is noted in the Duquesne Incline Plane Company's roadway at Pittsburg, Pa. In this case the object in view was to surmount the hill known as Mt. Washington, located at the mouth of the Monongahela River and directly overlooking the site of the famous stronghold whose name is given the modern enterprise. The Duquesne is the latest and most complete of four similar enterprises climbing the same mountain. It was opened to the public in May, 1877, and up to September 1, 1880, had carried 500,000 passengers without injury to any one. The perpendicular height reached is 400 feet, length of incline 793 feet, rate of ascent 30½ degrees. The roadway comprises, of course, a double track, one car ascending while its fellow descends, and *vice versa*.

The motive power, consisting of a double engine of 70 horse power, is located at the top of the incline, and motion is communicated to the cars by the means of a large drum carrying steel wire cables of 1¼ inch diameter. A supplementary or safety cable, of 1⅛ inch diameter, is also in constant use. These cables are each 900 feet in length, and are capable of sustaining a perpendicular strain of 50 tons, while the actual working strain is about one-tenth that amount. The safety cable passes around a system of sheaves so arranged that should the working cable part the safety cable will tighten about the sheaves and bring the cars to stop. The cars, neatly and strongly built, will each seat 25 persons, and in the angle beneath them and between the upper and lower tracks there is a space available for light freight. In the Duquesne roadway there is a 360 foot section of wrought iron bridge work spanning the tracks of the "Pan Handle" Railroad. The rails are of the T pattern, 40 pounds to the foot, and the gauge is 5 feet, the double trackway being 20 feet wide, allowing 3 feet between the cars at the passing point.

Rollers of locust and "gum" wood, located at regular distances between the rails, bear the cables in their passage above them. In operating the cars, the engineer in the "cab" at the apex of the incline has absolute control of engine and cars by means of two levers. One operates the reversing mechanism of the engines and the other starts and stops the same. A brake, operated by the engineer's foot, brings sufficient friction to bear upon the cable drum to stop its revolutions even should steam be on. This drum, it might be added, is 12 feet in diameter, with a grooved periphery, and a width of 3 feet 10 inches. The cable winds into these grooves, and the movement of engines, drum, cables, and sheaves is almost noiseless, and indicates little or no strain upon any of the machinery. Experience in this plane has shown that popular prejudice against this mode of travel has ceased, and on Sundays during the summer 6,000 passengers are carried during the day and evening, the cars ascending and descending as rapidly as filled and emptied. Ordinarily trips are made every five minutes, the trip occupying two minutes. The engines, it might be added, are 24 inch stroke and 14 inch cylinders, operating a shaft bearing a driving pinion of 30 inches diameter, gearing into the main driving wheel, which is 12 feet in diameter, 12 inch face. To operate the entire affair for nineteen hours out of the twenty-four requires the services of only five men, namely, two engineers, one conductor, one fireman, and one trackman. The total cost of this incline, cars, real estate, etc., was $47,000, and it is considered a paying enterprise by the stockholders. The single fares are 6 cents. The road enjoys a growing popularity as a means of best obtaining a beautiful and comprehensive view of the "Iron City."



THE INCLINED PASSENGER RAILWAY, PITTSBURG, PA.

M. H. Bateham.

Mr. M. H. Bateham, one of the best known and most active of the promoters of scientific agriculture in Ohio, died recently at his residence in Painesville. Mr. Bateham was born in Kent, England, in 1813; came to this country in 1825, and for the next twenty years resided in Rochester, N. Y. During recent years he has been prominently identified with the agricultural and horticultural interests of Ohio, as Secretary of the State Board of Agriculture and as a leading member of the State Horticultural Society. He was for a number of years editor of the *Genesee Farmer*, after which he founded and edited for ten years the *Ohio Cultivator*. His contributions have been many and valuable in the *Ohio Farmer*, the *Rural New Yorker*, the *American Agriculturist*, and other papers of this class.

The American Institute Fair.

It is to be hoped that exhibitors at the coming fair of the American Institute will be prompt in getting their goods and machinery in place. It is a loss to exhibitors as well as a disappointment to the public to have the fair begin, as it so often does, in a general state of unreadiness.

The Chicago Mastodon.

Portions of a mastodon of enormous size were discovered recently in Wicker's Park, Chicago, in excavating for a sewer. The indications are that the huge animal perished in an ancient marsh or quagmire, and there is hope of the recovery of the rest of the skeleton. The curved tusks are about 7 feet long.