# SCIENCE

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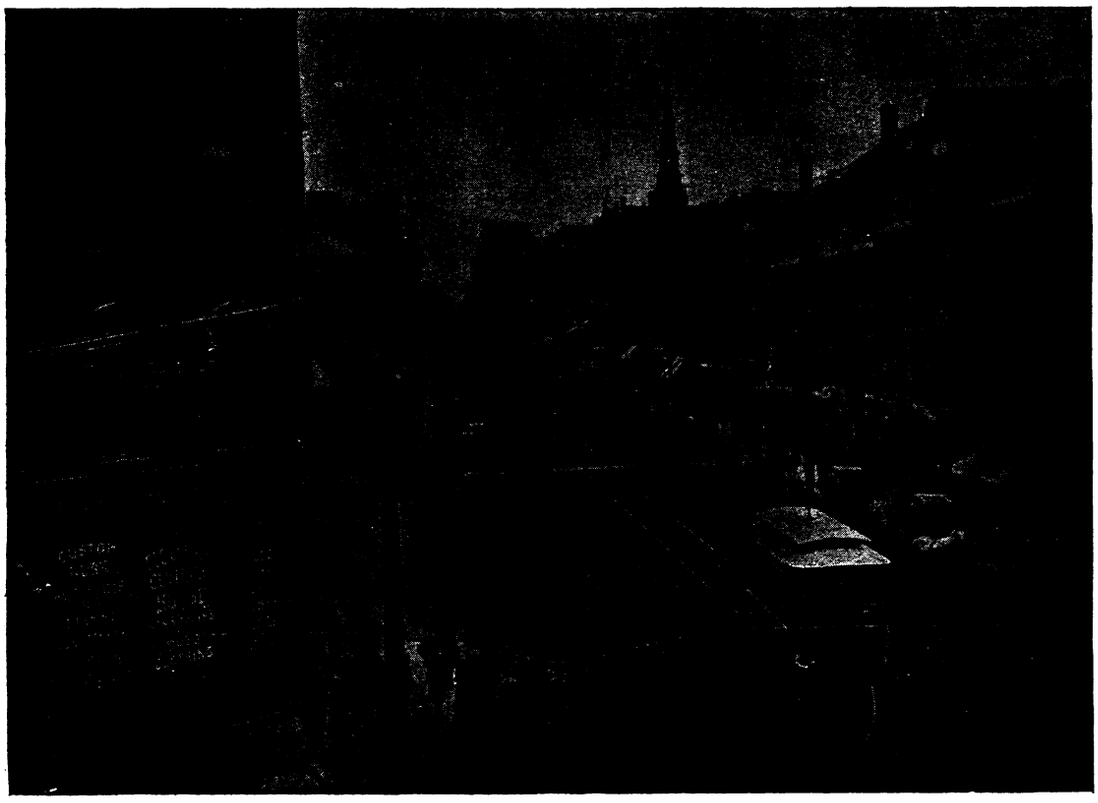
## THE THOMSON-HOUSTON ROAD IN BANGOR, ME.

THE accompanying cuts illustrate the new electric railway which has been put in at Bangor, Me. One of the cuts shows the car on Main Street Hill, opposite the Opera House, a grade of 7 per cent; and the other, the car in West Market Square, the very heart of the city. The road at Bangor is three miles in length, single track, with three turnouts, and contains many sharp curves and grades, the most severe of which is a curve of 35 feet radius, which occurs on a grade of 7 per cent. There is one stretch of the road, about three-fourths of a mile in length, which has five curves and an average gradient of 5 per cent. No difficulty, however, is experienced here, and the cars climb these grades with a scarcely perceptible diminution of speed. The nature of the overhead work necessitated by these can readily be seen from the accompanying map, on which the situation of the road is indicated by a heavy line.

There are four 16-foot cars, made by the Newburyport Car Manufacturing Company, which are handsomely finished, and equipped with two 15-horse-power Thomson Houston motors. Three cars are in operation from 6 A.M. till 11.30 P.M., the fourth being held in reserve for special occasions.

The power-plant consists of one 80-horse-power Thomson-Houston generator, with the necessary station-fittings, which is driven by a 14 by 13 Armington & Sims engine, running at a speed of 250 revolutions per minute. This is the only tramway which has ever been constructed in Bangor, and it has, from the very start, given the utmost satisfaction, but one schedule trip being missed since the day of starting, May 21. The travel has been very heavy, averaging 1,600 passengers per day, and on one day 3,000 were carried by three cars. The success of the road has been such, that extensions have been asked for in many parts of the city, and it is probable that before long the equipment will be greatly increased.



**THOMSON-HOUSTON ELECTRIC ROAD IN BANGOR, ME.**

## THE USE OF OIL ABOARD UNITED STATES NAVAL VESSELS.

MANY hundreds of reports have been published on the "Atlantic Pilot Chart," and elsewhere, relative to the great benefits derived by means of the use of oil to prevent heavy seas from breaking on board vessels. By far the greater number of these reports have been received from merchant vessels, very many of which have undoubtedly been saved, with all on board, by the use of a

few gallons of oil in the manner recommended by the United States Hydrographic Office. The following reports from United States naval vessels show that even aboard men-of-war, with their complete equipment and large crews, the use of oil is regarded as of the greatest value : —

Commander W. C. Wise, U.S.N., commanding the "Juniata," on passage from Hong-Kong to Singapore, used oil on three occasions during a typhoon in the China Sea, Sept. 28 and 29, 1888. "Oil was used, and marked effect shown in lessening amount of water coming on board. . . . A bag containing oil was towed from the weather bow, and decreased the violence of the seas to a marked degree."

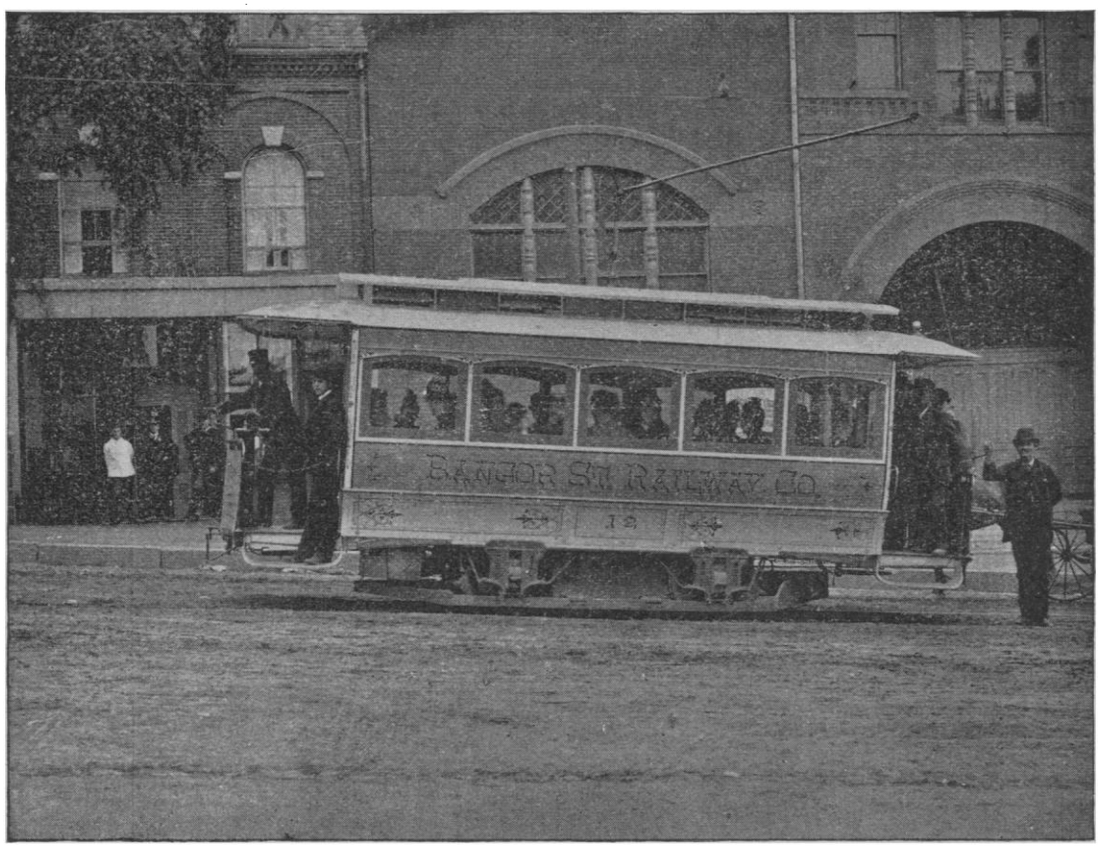
On April 4 and 5, 1889, the "Swatara," Commander John McGowan, U.S.N., was in a hurricane in latitude 41° south, longitude 9° west. On the previous day the wind had veered from west-south-west to north-west, and then to north-north-east. From 9 P.M. to 4 A.M. it blew with a force of 11, and the wind shifted to west, kicking up an ugly confused sea. The ship had been hove to on the port tack early in the morning, with oil-bags over at the fore and mizzen chains. Their effect was such that not a drop of water came on board. April 5, scudding with the wind about two points on the starboard quarter and an oil-bag towing at the starboard fore-chains, "the angry-looking crests simply disappeared, leaving one to wonder what had become of them." Again, on the 8th, "Blowing a living gale of wind, force 11, having backed from north-west to north-north-west. Hove to, and put oil-bags over from fore and mizzen chains, with excellent results. The sea was exceedingly heavy, and the ship rolled deeply; and although considerable water came on board, yet not once did a sea break over the rail. The angry, towering crests of the huge waves disappeared as if by magic."

Lieut. C. F. Norton, U.S.N., of the "Kearsarge," reports that in the storm of the 6th, 7th, and 8th of April, off Hatteras, they used oil with good effect, pouring it through the forward water-closet. At first, olive-oil was used, which did fairly well; but later they used lard-oil, and that gave perfect satisfaction, keeping the water from coming on board. Oil was used a part of two days, while hove to.

Finally, the "Yantic," Commander C. H. Rockwell, U.S.N., encountered a terrific hurricane, May 21, in latitude 38° 35′ north, longitude 68° 30′ west. While on her beam ends, with heavy sea sweeping over her, "oil in large quantities was thrown overboard from the weather bow, and even in that terrible scene its effect was immediately apparent."

## A HISTORY OF HABITATIONS.

THE French have always exhibited a fondness for the study of comparative architecture, and have made themselves masters of a peculiarly interesting portion of art history in which other peoples have scarcely made more than beginnings. For some years the story of the evolution of the dwelling has been known chiefly through "The Story of a House," by M. Viollet-le-Duc, which has been the most accessible, if not the only, work of its kind extant. In the Paris Exhibition of 1878, one of the most interesting features was the "Street of Nations," which was lined with typical specimens of architecture of all lands, and was unquestionably the most complete exhibition of comparative architecture that had been made up to that time. The present exhibition, however, has, thanks to the rare skill and energy of M. Charles Garnier and a body of enthusiastic assistants, an exhibition of comparative architecture that is by far the most elaborate yet attempted. A series of thirty-two edifices have been erected on the Quai d'Orsay, representing the evolution of the dwelling, from the earliest form of a rude breakwind and cave, to the completed residence of the Renaissance. It is an unfortunate fact that much of the material for such a display exists only in a fragmentary or much-scattered form. The dwellings of antiquity are known to us chiefly by meagre descriptions, rough, sketchy carvings in the sculptures, and other data that are quite as apt to mislead as to indicate the right direction. Yet M. Garnier has not been content to accept mere hearsay, nor even to adopt the results of the imagination, but, on the contrary, has




A 7-PER-CENT GRADE ON THE THOMSON-HOUSTON ROAD IN BANGOR, ME.