THE PERFECTED DURYEA CARRIAGE.

Motor carriages are now occupying great attention both in Europe and America, and we may look for excellent results as the consequence of this interest. Inventors, in this country at least, have been heavily handicapped by lack of funds to carry out the expensive experiments which are requisite to the perfecting of the carriage. In England there appears to be now no lack of capital, but a sad lack of practical carriages. We have already illustrated the principal carriages of domestic origin and we now present an engraving of the Duryea motor wagon, which made an exceedingly creditable run in the recent inaugural trip from London to Brighton on November 14. The Duryea carriage won the first prize in the Times-Herald race in 1895 and also the prize in the Cosmopolitan race on Decoration Day, 1896. The run to Brighton was not a race, but a "go-as-you-please" run, still the time was taken, and once started the vehicles tried to pass one another, so that it was virtually a race in spite of all efforts to make it a procession. Out of fifty entries only some thirty carriages materialized, and many of them were left by the wayside between London and Brighton, to the great delight of writers for some of the dailies and weeklies, who now had a new object of ridicule. That some of the carriages greatly exceeded the legal limit of twelve miles an hour is shown by the time in which a Bollee car covered the entire distance, which was two hours thirty minutes.

The Duryea carriages were late entries and were placed at the rear of the procession. While in the city it was not possible to turn out and pass the vehicles, but once in the open country the American carriages began to pull past carriage after carriage until they reached Reigate (22 miles) 30 minutes ahead of the next similar vehicle. Here lunch was served, and some of the carriages kept right on without waiting, which accounts for the remarkable time shown in some of the published reports; this has been the cause of much misunderstanding. When the procession reformed, the Duryea carriage again forged ahead and reached Brighton forty minutes in advance, making a total gain of seventy minutes in about four hours. The roads were very heavy on account of the rain. It is said that the Duryea wagons were the only ones which were turned over to stable boys to be cleaned off with a hose; the other carriages, having exposed parts, had to be wiped off like a locomotive.

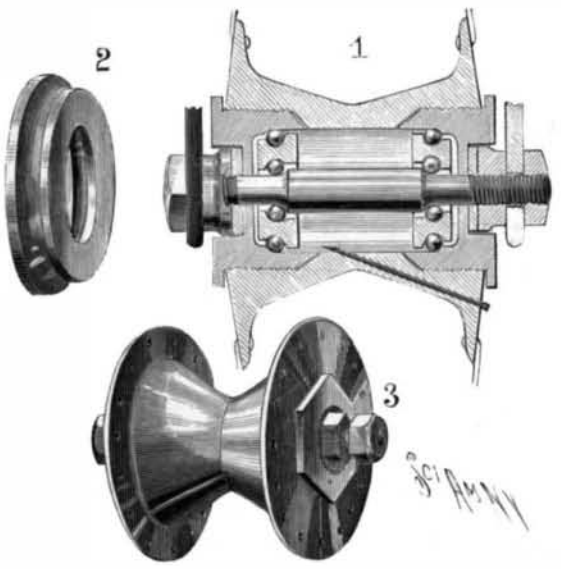
The Duryea carriage was described in the SCIENTIFIC AMERICAN for November 9, 1895. Various improvements have been introduced since that time, such as decrease of weight, an accurate adjustment of the explosive mixture, an improved muffler and arrangements for starting. While ordinary stove gasoline or naphtha is used, the motors can be quickly adjusted to use kerosene or other hydrocarbon.

Heat of Flowers.

Herr G. Kraus has investigated (Annales Jard. Bot. Buitenzorg, 1896) the extent and purpose of the rise of temperature at the time of flowering of various species of Acaceæ, Cycadeæ, and Palmæ. In Ceratozamia longifolia he found this elevation to take place only in the daytime, the maximum attained being 38·5° C., or 11·7° above that of the air. Similar results were obtained with Macrozamia. In the Acaceæ examined the period of maximum elevation is more variable, but it is never in the night. In this order the seat of the elevation of temperature is not the reproductive organs themselves, but the club-shaped appendix to the inflorescence, and it is accompanied by a rapid consumption of starch and sugar. All the plants in which this phenomenon occurs are entomophilous, and Dr. Stahl sees in it a contrivance for attracting insects to assist in pollination.

IMPROVED BALL BEARING FOR BICYCLE HUBS.

A ball bearing of simple and durable construction, designed to reduce friction to a minimum, and well



STEPHENS' FRICTIONLESS BICYCLE HUBS.

adapted for use on bicycles and other vehicles and machines, is shown in the accompanying illustration, and has been patented by Harry A. Stephens, of Missoula, Montana. Fig. 1 is a sectional view of a bicycle hub on which the improvement is applied; Fig. 3 being an exterior view of the hub, and Fig. 2 representing a novel form of bearing ring employed between the outer and inner sets of ball bearings. The stationary axle is engaged by members of the fork resting with their inner faces on nuts, whose inner faces abut against washers resting on annular flanges formed on ring-shaped bearings screwing into the ends of the hub, carrying the spokes of the wheel. The washers thus close the bearings and prevent access of dust to the inside of the hub. On the inner surfaces of each of the exterior bearings is a ball seat engaged by an outer row of balls held in a peripheral groove of an annulus or bearing ring, shown in Fig. 2, which also has an internal annular groove engaged by a second row of balls fitted onto a seat formed by the shoulder connecting the middle large portion of the axle with the outer reduced end. The ring interposed between the two rows of balls does not come in contact with any of the other parts of the device, and should a ball break in one of the rows, the other bearing would still be operative, so as not to interfere, at least for a time, with the progress of the rider. In the ordinary ball bearings, the difference in length between the outer and inner bearings causes a partial sliding of the balls, which is obviated in this case by the freely moving bearing ring, whereby the friction is reduced to a minimum.

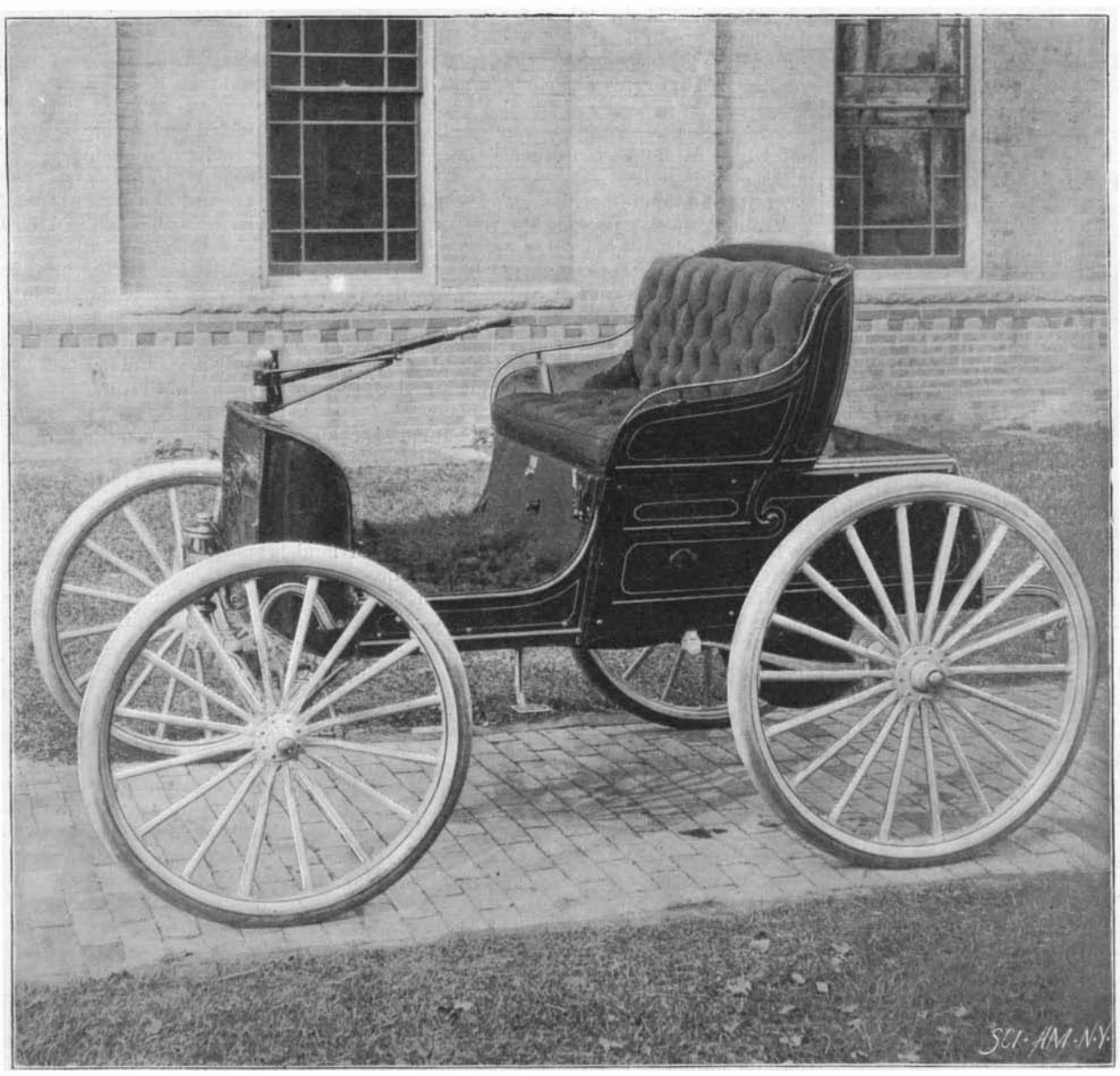
The Destruction of Sodom and Gomorrah.

The destruction of the oldest seats of civilization and culture in the Jordan Valley and the Dead Sea districts, namely, that of the four cities of Sodom, Gomorrah, Admah, and Zeboim, is one of the fixed facts of earliest tradition, and for the critical geologist the phenomenon presents no difficulty, as far as it can be traced at all. The tragedy was caused by a sudden break of the valley basin in the southern part of the Dead Sea, resulting in the sinking of the soil, a phenomenon which, without any doubt, was in intimate connection with a catastrophe in nature, or an earthquake accompanied by such a sinking of the soil along one or more rents in the earth, whereby these cities were destroyed or "overturned," so that the Salt Sea now occupies their territory. The view that this sea did not exist at all before this catastrophe, or that the Jordan before this period flowed into the Mediterranean Sea, contradicts throughout all geological and natural science teachings concerning the formation of this whole region. . . . That the Pentapolis at one time was situated in the southern part of the Dead Sea, which is now called Sebcha, is proved also, among other things, by the probable location at this place of Zoar, the place which escaped destruction in the days of Lot; in accordance, too, with the writers of antiquity and of the middle ages, including the Arabian geographers. As yet nothing certain can be determined concerning the location of the four other cities, viz., Sodom, Gomorrah, Admah, and Zeboim, of which names only that of Sodom, in Djebel Usdum, is found reflected in any place in these precincts. And even apart from geological and geographical reasons, this seems to be the natural thing, as the book of Genesis represents these places as having been thoroughly destroyed without leaving any trace or remnant behind. The fact that now these districts are a dreary waste, and by the Arabian geographer Mukaddasi called a "hill," is no evidence that in earlier times this was not different, and this valley not really a vision of paradise.—Dr. Max Blanckenhorn.

The New York Aquarium.

The New York Aquarium was formally opened on December 9, and on December 10 it was thrown open to the public, and for hours the crowd was so great that the visitors had to stand in line, 14,000 persons seeing the collection during the day. The dingy old building, which was formerly used for the reception of emigrants, has been completely transformed. Only the seven pools and the thirty-two wall tanks are in use. There is at present no exhibition in the galleries, but in time its fifty-six tanks will be stocked. The aquarium was described in the SCIENTIFIC AMERICAN for December 15, 1894. It is open daily except Sundays and Mondays. Dr. T. H. Bean is the superintendent.

THE first use of Niagara's power was made in 1725, a primitive sawmill being operated. Nothing more was done in this line until 1842, when Augustus Porter conceived the plan of hydraulic canals, and in 1861 one was completed. The Cataract Construction Company, from whose plant power has just been delivered in Buffalo, was incorporated in 1889.



THE DURYEA CARRIAGE USED IN THE RACE FROM LONDON TO BRIGHTON.