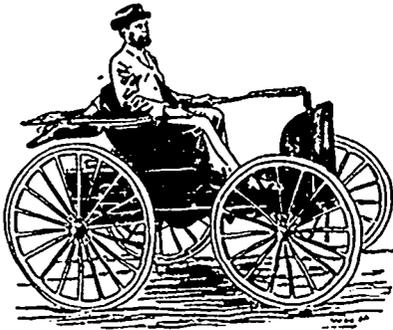


has been fixed upon by experiment, there is no more convenient way of rating the power of others of the same style.

(Concluded in next issue.)

### THE HORSELESS VEHICLE CONTEST IN CHICAGO

Thousands of pedestrians and vehicles were congregated on the Midway Plaisance at Chicago, on the morning of the 28th ult., to witness the start of the horseless vehicles for the \$5,000 prizes to be awarded to the victors in the race. The interest was increased by the miserable condition of the roads along the line of route. Against tremendous odds, through deep snow and mud, and over "ruts" which would have tried horses to their utmost, six moto-cycles sped on their way. A number of those who came to Chicago, and were entered for the race, declined to run, as they were sure they would not succeed in getting through the route. After more than ten hours' struggle through the snow, the Duryea motor wagon was the winner of



DURVEA MACHINE, WINNER OF THE MOTO-CYCLE RACE.

the first prize of \$2,000 and a gold medal. The wagon belonging to H. Mueller & Co. arrived second. The latter won the *Times-Herald* prize of \$500 on November 2nd, and may get the second purse of \$1,500. The third moto-cycle that seemed to be in the race belonged to R. G. Macey & Co., of New York city, but its steering gear was broken before it had run over one-half of the course, so that it failed to reach the winning post. The Mueller wagon arrived one hour and thirty minutes after the Duryea.

The further tests to be made will form a basis for improvements in moto-cycles for all purposes.

On the evening before the race twelve competitors declared their intention to start, and of these four were electric. At the start three gasoline machines and three electric machines were in the race. The longest distance traveled by the electrobats was 10 to 15 miles; while their power lasted they made a gallant struggle, but owing to the impossibility of renewing their power along the route, they gave up the contest. The actual time the winner of the race was under power was somewhat over 8 hours, or about  $7\frac{1}{2}$  miles per hour. Considering the very bad condition of the roads, and the numerous stoppages at railway crossings and from other causes, the machine did wonders, for it was the general opinion of those who saw the start made that not one of the vehicles would get back to the winning post. It is worthy of remark that three wagons which distanced all competitors were of German make. It is claimed, however, that some American improvements had been made on them. The De La Vergne, which won the first prize in the Paris-Bordeaux race, was also a German one. All of these named were propelled by Benz motors, but this failed to drive this vehicle through the deep snow, so it dropped out of the race also.

The influence of this contest cannot be estimated by a glance at the results. It is astounding to think that a self-propelled vehicle could be driven 54 miles through a sea of snow, slush and mud, at a speed that would kill more than one team of horses. It is also remarkable that vehicles could be guided over a course covered with pleasure carriages and electric tracks, without accident to the drivers or the users of the highways. While this does not settle the question of automobile propulsion, it has shown its adaptability to do rough work. There can be no doubt that many improvements will be made when the perfected American machine will be placed on the market. No less than 200 different types of American moto-cycle machines are now in process of construction, and 500 applications for patents for improvements on these machines have passed through the United States Patent Office.

There can be no doubt that the recent contest will be of untold advantage to the public, and to those now and to be engaged in the construction of vehicles. It will help to immediately inaugurate a new and immensely increasing business on this continent, and for which there is sure to be a large and growing demand. It will also lead to a great change in the character of the public highways, to adapt them to the motor vehicles; in fact, in every direction, it will lead to great changes in both passenger and freight transport, all to the public advantage.

Many persons who are inclined to doubt the future of the horseless carriage, notwithstanding what has been done, and is now being done in Europe and the United States, will be forced to recognize its admitted mechanical achievements and its adaptability to some of the most urgent needs of modern civilization. While it is not yet settled what kind of motor is best adapted to general use, yet enough has been demonstrated to show that it will work great changes in future methods of transport, not only on the public highways, but in its future adaptability to tramway, passenger and freight traffic. It will enable the farmer to have easier access to the large markets, and do away with the necessity of having small grain elevators in unimportant positions, as it will concentrate the business in larger centres of trade. It will also give the country districts a cheap source of power for general purposes on their farms, as well as for the propulsion of their wagons, while it will be of great advantage to city mercantile houses for receiving and delivery wagons, and for doctors, commercial travelers and others whose business requires numerous calls, as it has been sufficiently demonstrated that the cost of transport is far below that of any other method.

For THE CANADIAN ENGINEER.

### CONCRETE CONSTRUCTION.

By MAJOR HENRY A. GRAY, M. INST. C.E., M. CAN. SOC. C.E., ENGINEER IN CHARGE PUBLIC WORKS OF CANADA, DISTRICT OF WESTERN ONTARIO.

Concluded from last issue.

Much has been said in favor of using rubble blocks of concrete matrix between the blocks, such matrix being not less than 3 inches thick in the body of the structure, and between the blocks and the face of the walls not less than 6 inches. The portion of rubble blocks which can be introduced into the building naturally varies with their size. The larger the blocks, the greater must be the ratio which they bear to the surrounding matrix. The saving is, of course, effected