

A FOLDING BICYCLE.

The bicycle, as ordinarily constructed, has only one real fault, which is that it is a clumsy machine to transport. It is difficult to ship an uncrated bicycle by rail or water without its running some risk of being injured. The folding bicycle largely obviates this difficulty and also permits of the wheel being stored in houses with great convenience, but the folding bicycle has another and often more valuable use. In France, where the bicycle has been made considerable use of in military maneuvers, the folding bicycle has been used with great success. The construction of the ordinary bicycle, valuable as it is in transporting soldiers, becomes, as soon as he dismounts, a hindrance to his motions and a burden which cannot be carried with ease, but must be trundled along.

Under such circumstances it is difficult to see how a soldier can handle a gun. If he lays his bicycle upon the ground, it runs a great risk of being injured and would offer an impediment to the free movement of the troops, and, if surprised by the enemy, it may cost him the loss of it; like a rider without a horse, he would be very liable to be captured. Military bicycles often have to be transported very long distances through woods and swamps and hoisted over hedges and walls. The difficulty appears to have been solved by causing a machine to be constructed which can be carried by man when man cannot be carried by the machine. Various devices have been made to permit this folding. We illustrate an American invention of this class, the wheel in our engraving being made by the Dwyer Folding Bicycle Company, of Danbury, Conn. We illustrated the folding military bicycle of Capt. Gérard in our SUPPLEMENT, No. 1044. This bicycle has been put to actual use in military maneuvers and has been found very satisfactory. The Dwyer machine is arranged so that both diamond and drop frame wheels can be built capable of folding.

In the diamond frame wheel the joint is arranged in the middle of the frame, and in the drop frame wheels a similar plan is employed. The wheel is manipulated as follows: Stand on the left side with the left hand on the handle bar (to keep the front wheel from falling around) and the right hand on rear brace. Then press bolts forward and into recesses in locking tube, and with right hand lay rear wheel around against the front. If an ordinary handle bar is used, set the handle bar and saddle so that the handle bar will go under or over the horn of the saddle. Special handle bars make the folding more compact. The military wheels are especially ingenious and do not differ much in appearance from the ordinary drop frame wheel. It is the work of an instant to fold the bicycle. The soldier can then have free use of his hands to assist him in climbing or handling his gun while the wheel is hung over his shoulder. The folding bicycle proves especially valuable to those who wish to make excursions on boats and cars. The wheel can be folded up and placed in the cabin of a very small yacht. The folding bicycle is especially convenient when it is desired to take it into the house, and the wheel is reduced to so small a compass that it can be readily packed in a trunk or box. The wheel has as much strength as the ordinary bicycle and it weighs only twenty-five pounds.

THE Chilean government telegraph lines comprise 7,500 miles.

AN ELECTRIC HANSOM.

During the past year we have received hundreds of letters regarding horseless carriages. These letters have come from all over the civilized world. The correspondents have usually either anxiously inquired

or those who may not be favorably disposed toward the new vehicle. The three races which have been held in America have had the effect of awakening public interest in the subject, if they have subserved no other useful purpose. If the manufacturers had greater capital at their command, the perfecting of their machines would have proceeded at a more rapid rate, but the results would probably not have been more satisfactory. We are glad to be able to chronicle the fact that for the first time in America the horseless vehicle has now entered into competition with the public cab in the city of New York.

The Electric Carriage and Wagon Company, which has offices at 66 Broadway and a depot where cabs may be hired at 140 West Thirty-ninth Street, has now several electric hansom cabs which will be hired at the legal rate of the public cabs. In a short time twelve of these vehicles will be at the disposal of the public and an electric brougham will probably be added. It will be little wonder if the public does not take favorably to these handsome vehicles, which seem the perfection of the carriage maker's art.

Unlike the ordinary hansom cab, they are mounted on four wheels. To an ordinary cab body a battery box is attached, forming an extension in the rear. Upon this is situated the seat for the driver. The weight of the carriage is about 2,500 pounds, the weight of the batteries alone being from 800 to 900 pounds. The diameter of the large wheels is 43 inches, while the diameter of the small wheels is 32 inches. The wheels run on ball bearings that have tangent wire spokes, steel rims and thick pneumatic tires. Each of the front wheels is connected with a motor of the Lundell type, of nominal $1\frac{1}{2}$ horse power. Each motor is inclosed in an iron case and drives each wheel independently. The pinion from the armature shaft meshes with the internal gears of the wheels. The internal gears permit of turning corners with ease. The storage batteries which are used are supplied by the Electric Storage Battery Company, of Philadelphia, Pa.

They are chloride accumulators of 70 ampere hours capacity. It is arranged so that automatic connection is made when the batteries are run into the battery container, by means of contact plates, and fuses are provided as a safeguard. The controller is situated at the left side of the driver's seat, so that it is easily manipulated with the left hand. There are three speeds forward and one speed backward. The first notch of the controller gives a speed of five miles per hour; the second notch, eight to ten miles; the third, thirteen to fifteen miles. Fifteen miles may be regarded as about the maximum speed which is desired or can be obtained

with the hansoms. These speeds are obtained by various groupings of the batteries and motors in series and parallel.

Directly in front of the driver is a lever which controls the steering mechanism, which is extremely ingenious. The steering is accomplished by turning the rear wheels parallel with each other from a point directly over the tread of the wheel. The wheels are connected by rods to a vertical lever of a convenient height to be operated from the front seat of the carriage. In reality the steering mechanism looks like an enormous hollow hub which turns freely, horizontally, upon the vertical rod which supports the body of the carriage. The steering mechanism enables the carriage to be turned completely around in a very short space.

A powerful roll-



THE DWYER FOLDING BICYCLE.

whether the automobile vehicle was in reality a practical means of transportation or where such vehicles could be purchased.

The number of American built motor carriages which have been offered for sale has been small, and the few manufacturers who have pretended to do any business have been somewhat reluctant to put carriages upon the market. In this respect they have been wise, and their action will only result in doing good to the motor industry. In its present state of development the horseless carriage can hardly be trusted in the hands of those who have not some acquaintance with machinery



THE NEW ELECTRIC HANSOM CABS IN USE IN NEW YORK CITY.