

STEAM WAGONS FOR MILITARY PURPOSES.

In a communication to the *Railway Review*, Mr. J. F. Holloway, of Cuyahoga Falls, Ohio, describes a steam wagon, which appears to have some important improvements for traveling on common roads. He says:—"I use a single driving wheel, which extends across the after end of the machine, and externally is not unlike that used by Mr. Fawkes. The external arrangement, however, is different. The drum consists of an outer and inner shell, there being from 12 to 16 inches space between them. This space, being enclosed at the ends, serves the double purpose of a water tank and heater, and to some extent that of a condenser connected to the exhaust pipe of one or both cylinders, and also to the eduction pipe of the feed pump, or to an 'ejector.' By this arrangement the entire weight is brought low towards the ground. . . . The water in the tank remains stationary in the bottom of the annular space while the drum revolves. Within this drum the boiler is also placed, and has within the fire box, combustion chamber and return flues. . . . The drum, boiler, and water tank are all in the best position to give adhesion, a low center of gravity, and freedom from friction."

Mr. Holloway also suggests the application of steam wagons for military purposes. He says:—"It is to be hoped that the unreliability of railroads in or near an enemy's country, as a means of military transit, as shown by recent events at Harper's Ferry and Baltimore will serve as an inducement to the engineering talent of our country to conceive, and perfect some plan of a traction engine that may, in time of war, be used to transport troops and supplies on the common roads, and which may also be used in peace times in the cultivation of millions of acres of land now lying idle in the West."

These sensible suggestions should arrest the attention of all our inventors.

RAILWAY ACCIDENTS.

The last number of the *North British Review* contains a laborious article on this subject in relation to British railways. What social changes have taken place since the days of the stage coach and the canal packet! The speed of five miles per hour was exhilarating in those days; now travelers would die of *ennui* if subjected to less than from 20 to 40 miles per hour. And yet with this great increase of speed in traveling, life appears to be more safe than ever. This is especially so on the other side of the Atlantic. The number of miles of English railroads now open is 9,506. For eight years past, only one person has been killed out of every 6,480,013 passengers carried, and one injured out of 325,222 carried.

Various causes for accidents are set forth. One is defective permanent way (track), rails frequently laminate, split, and fracture. Very heavy locomotives are now used on all the British railways; these try the rails severely, more especially as the speed is very high, being usually from 30 to 45 miles per hour. The way of testing the strength of rails is by permitting a heavy weight to fall upon them from a height of sixteen feet. This method is better fitted to discover defects than by subjecting them to gradual pressure. Several self-acting switches have been introduced, but careful railroad inspectors have denounced them, a number of accidents having resulted from their use. Careful personal inspection of the switches is advocated. The surface of rails have been covered with steel in several instances; this has increased their durability.

So excellent are the arrangements on some of the English railroads, such as the London and North-western, that of 7,900,000 passengers carried in 1851, only one was killed, and this accident was caused by positive gross disobedience of orders.

Captain Huish has published a table entitled "Analysis of One Thousand Cases of Engine Failures and Defects on the London and Northwestern and Subsidiary Railway, the Stock Engines being 587." There were 157 had tubes burst, 92 had springs broken, 89 broken valve-spindles, 77 broken pumps, 40 broken piston rods, 13 broken cranks, 13 broken reversing levers. Most of these breaks were due to defective metal and imperfect forging on these engines. Continuous brakes are recommended, because they can all be applied at once by the engineer. A great many

experiments have been made with different brakes, and it has been found that a train of 12 cars may be stopped within a space equal to the length of the train. It has also been determined that a conductor situated on the back of the twelfth carriage of a train frequently could not hear the whistle of a locomotive in front, so that a whistle is not a reliable signal. A bell is said to be more distinct and superior as a sound signal. Many persons entertain a different opinion, but both are used on American locomotives, so that we are doubly insured.

AMERICA AT THE WORLD'S FAIR IN 1861.

Efficient measures have been taken, and extensive preparations are now in progress for holding the next World's Fair in London, on the same site nearly as the one held in 1851. No less than £408,000 have already been subscribed by manufacturers and others for conducting it, and the Bank of England has agreed to make an advance sufficient to defray the necessary expenses of the entire preparations.

Her Majesty's commissioners have fixed upon the 1st of May, 1862, as the day of opening, and the people of all nations are invited to become exhibitors. The question very naturally arises, "What part shall America play in this great international exhibition?" Our present rebellion troubles, and the mighty issues involved in the struggle, are questions of such vast importance, that all others sink into insignificance. It cannot therefore be expected that our agriculturists, mechanics and manufacturers can take such an interest or part in the next World's Fair as they did in the last one, and for this very reason we require to be represented in London by the most able and respectable persons our country can furnish.

We were misrepresented at the last London Fair by a chief commissioner unqualified for the duties. It was an appointment not fit to be made, and it did the country incredible injury. Such a blunder ought not be committed again, unless it is desirable to bring our country once more into disgrace. This is the point to which we wish to direct the attention of the President and Secretary of State. A United States commissioner for the World's Fair ought to be appointed at an early date, because the Queen's commissioners will not communicate with exhibitors but through those who are appointed by the central authority. It is therefore necessary that the appointment of a competent person as chief commissioner should be made at an early date, so as to give all necessary information to those who intend to be exhibitors.

It is well known to the American exhibitors at the last World's Fair that B. P. Johnson, Esq., Secretary of the New York State Agricultural Society, did our country great credit as State Commissioner in 1851. He has a perfect knowledge of all the duties to fill such a situation, as he has superintended all the New York Annual Fairs for the past twenty years. We suggest his name, as the right man for the right place.

All the articles to be exhibited must have been produced since 1850. None but the best specimens should be permitted to be sent. We can make a most respectable appearance in London if proper measures are taken in due season to encourage exhibitors, and facilitate the transmission of articles.

We are unrivaled in the manufacture of several classes of articles, complete specimens of which should be exhibited. American implements of agriculture, light carriages, sewing and knitting machines, all classes of machines for working in wood, printing presses, book folders, binding machines, steam fire-engines, rotary pumps, rope machines, locks and safes should be exhibited. We should also exhibit our natural products of farinaceous substances—wheat, corn, &c.; our leather, wood, and all other peculiar products.

The government ought to give encouragement to those who desire to offer articles for exhibition, as through the medium of international fairs we are able to exhibit to the world our peculiar products, and thus open the way to their introduction.

VERY extensive lead diggings have lately been discovered and profitably worked at Wetherels Mill, Bucks county, Pa. The ore contains about 60 per cent of the metal. The supply appears to be almost inexhaustible.

IRON SHIPS NOT INVULNERABLE.

The progress of the art of gunnery is so rapid that it is difficult to keep pace with it. It is but a short time since the whole world seemed to have come to the conclusion that a coating of 4½-inch iron plates rendered ships practically invulnerable to cannon shot; but the increase in the size of rifled cannon is disturbing if it does not overthrow this conclusion. *Mitchell's Steam Shipping Journal*, of London, says that in some recent trials at Shoeburyness, one of Sir W. Armstrong's 120-pounders was tried against a 10-inch plate. The target consisted of a solid mass of iron, dovetailed on Thorneycroft's system, backed with massive timber and braced with iron bars. The 68-pounder made no impression on this bulk, but when it was submitted to an Armstrong projectile of 126 lbs. the destruction was instantaneous. The first shot, at a range of 600 yards, cleaned out one of the 10-inch plates, at the same time carrying away the back support. The next gun fired was one of the ordinary 100-pounder Armstrongs, with a solid projectile weighing 110 lbs. The battery was struck in another part, and a breach was made clean through the structure, the fabric itself being so weakened as to insure destruction. The third shot, with the same weight of projectile, was directed against another part of the battery, and the result was conclusive, as the whole fabric of the battery (already weakened) came down above the point that was struck.

It will be remembered that Major Barnard, Capt. Rodman and other officers of our army, have been steadily of opinion that no vessel, however thickly plated, could resist the crushing effect of the 400-pounders which they were endeavoring to introduce into our sea-coast fortifications.

If Capt. Rodman's 12-inch rifled cannon should prove successful, and we have the greatest confidence that it will, it will probably be more formidable to vessels than any other piece of ordnance that has ever been constructed. If the forts around this harbor were armed with this gun, they would probably be able to crush any iron-clad ships that should attempt to pass them, like so many egg shells.

MAKING STEEL RIFLED CANNON.

Messrs. Carpenter & Plass, corner of Twenty-ninth street and First avenue, in this city, are manufacturing rifled cannon from the puddled steel which is made at Troy, in this State. The masses of steel are first heated and subjected to a vigorous pounding under a powerful steam hammer, and are then turned, bored and rifled. One gun has been finished weighing about 700 lbs., and of the following dimensions:—Length, 4 ft. 4 in.; length of caliber, 3 ft. 6 in.; diameter of bore, 2 6-10 in.; external diameter at breech, 10 in.; external diameter at muzzle, 5½ in. It is rifled with eight grooves 1-16th of an inch in depth, and just twice the width of the lands between them; the grooves being 5-8ths of an inch in width, and the lands 5-16ths. The grooves pass half round the caliber in the course of its length, with an increasing twist. They are of the same depth throughout, in other words, their bottoms are curves concentric with the axis of the gun. The manufacturers say that, with the construction of rifling machines, &c., this first gun has cost them about \$3,000. They have others in process of manufacture, one of much larger dimensions. The proper machinery for their manufacture being constructed, the cost of these guns will be about one dollar per pound. That of bronze guns is 70 cents. The great strength and durability are the qualities relied on to offset this greater cost. The quality of artillery is far more important than its expense.

In regard to the danger of flaws, which would naturally be apprehended in this material, Messrs. Carpenter & Plass say that the heating and hammering to which they subject the steel, render it perfectly homogeneous, and that this is proved by the strength of their finished gun, which has been subjected to the most thorough trial with proof charges. We wish this patriotic firm the most complete success in their bold enterprise.

CAPT. JAMES H. WARD, U. S. N., who commanded the gun-boat *Freeborn*, and was lately killed at Matthias Point, was the author of a practical treatise on naval gunnery, a history of naval tactics, and the simple but useful treatise, "Steam for the Million."