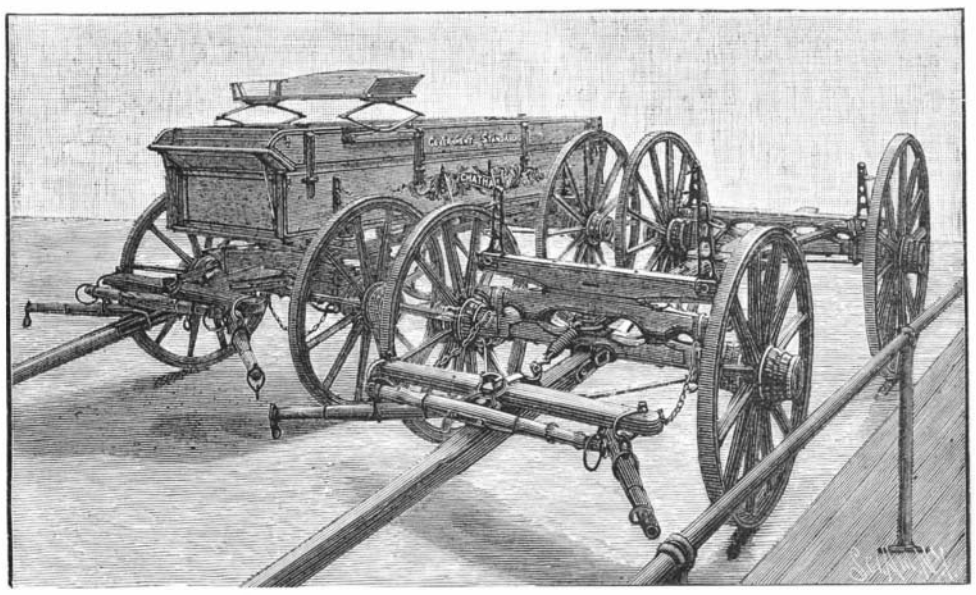
HEAVY WAGONS SHOWN AT THE FAIR.

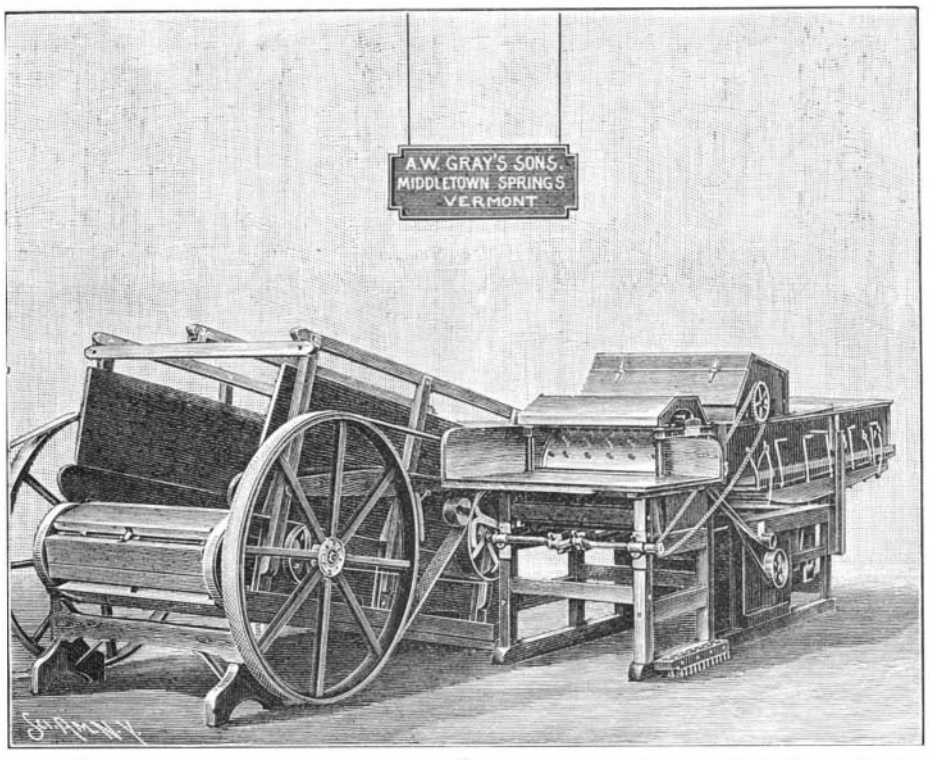
In the display of wagons for heavy work at the Exposition, the exhibit of the Chatham Manufacturing Co. (Limited), ofChatham, Ontario, Canada, occupies a prominent position, and has attracted much attention. These wagons, though not so tawdrily got up as some, are among the best and most mechanically constructed of any wagons shown for the hard usage such wagons get in actual service. The exhibit consists of one "Chautauqua Giant" farm wagon gearing and one complete "Chatham Giant" wagon, there being used on both the peculiar style of arms or thimble skeins patented by Mr. D. R. Van Allen, the president of the company. This thimble skein or arm strengthens the axle through what was formerly its weakest portion, and practically does away with the old time breaking point of axles, also dispensing with the use of truss rods. The arm admits of the sand board and front axle and bolster and hind axle being combined, forming a complete and solid truss, the one reacting upon the other in such a way as to strengthen all the parts. By means of this improvement the wagons of the company adapted to carry the heaviest loads are yet so light that the gearings weigh only one-eighth of their carrying capacity, and the three by ten inch cast thimble skeins or arms have carried five to five and a half tons without straining. Another noticeable feature of this display is the Simpson patent malleable adjustable stake, used on wagons or farm trucks not intended for logging. These stakes on narrow track wagons are adjustable from thirty-eight to forty inches merely by slackening two nuts to a stake, admitting of very much stronger wagon bolsters, because there is no big mortise through the ends, and the iron plating on top of the bolsters runs from end to end. The upper box and seat of the complete wagon is quarter-sawed sycamore, and the lower box is quarter-sawed white oak.



THE WORLD'S COLUMBIAN EXPOSITION—EXHIBIT OF HEAVY WAGONS OF THE CHATHAM MANUFACTURING COMPANY.

A. W. GRAY'S SONS EXHIBIT OF "HORSE POWERS."

The exhibit made by A. W. Gray's Sons, of Middletown Springs, Vt., at the World's Columbian Exposition is an especially fine one in a line in which manufacturers in this country have always held a leading position. It comprises horse power, grain thrashing and wood sawing machines, the horse powers being used for running a wide variety of machinery in wagon shops, bakeries, dairies, for pumping, grinding apples for cider, cutting feed for stock, operating grist mills, etc. The planks of the platform on which the horse walks, in the horse powers, are fastened together on the under side by a steel gear, connected by steel rods, which serve as axles for rollers, moving with the platform, the gear meshing with pinions on a shaft from which power is furnished to the various kinds of machinery. The speed of the band wheel with horses walking ordinarily fast is ninety revolutions per minute. These horse powers with grain thrashing outfits may be conveniently moved from place to place to do thrashing on different farms as desired. Drag saws and machines for sawing logs, and circular saw machines, adapted for most convenient and efficient operation by these horse powers, have also been for many years a leading specialty with the firm, which was established over fifty years ago, the present proprietors having been brought up as boys in the shop. Besides having a practical familiarity with every part of the work, they have invented and perfected many of the devices in use in the machines. The illustrated catalogue which they send on application gives full detailed information of the construction and operation of the machines.



THE WORLD'S COLUMBIAN EXPOSITION—"HORSE POWERS," THRASHING MACHINES, ETC., SHOWN BY A. W. GRAY'S SONS, OF MIDDLETOWN SPRINGS, VT.

The United States Leads.

The United States is now the leading manufacturing country in the world. We have far outstripped all other nations in the magnitude of our industrial operations. It is almost incomprehensible that in ten years the increase in capital invested in manufactures should exceed the total invested only twenty years ago. The value of our manufactured products increased about 60 percent; add 60 per cent to the output of 1890 and we would have $12,700,000,000 in 1900—but that is too much to expect. The same rate of growth in mining interests in this decade as in the last would make our mineral output in 1900 nearly $1,200,000,000, while a smaller percentage of gain, only equaling in volume the total increase in 1890 over 1880, would bring the figures to over $950,000,000. If our coal miners add to the output of 1890 as many tons as they added to that of 1889, ignoring in this the percentage of growth, 317,000,000 tons will be the production of 1900. No other country in the world ever advanced in population and wealth as the United States is doing. The progress of the past shows no signs of halting. In fact, the development of our foreign and domestic trade and commerce and of our industrial interests is steadily broadening out.

Contrast our position and condition with Europe; with resources surpassing those of all Europe, with wealth-creating possibilities in soil, minerals, timber, and climate unequaled by Europe, and practically without limit to their profitable utilization, with a homogeneous population of 65,000,000 people unvexed by the arbitrary regulations of half a dozen different governments, and free from the drain of standing armies, the United States justly commands the wonder and admiration of the world.

Great Britain is no longer the manufacturing center of the world, for we have taken the foremost position in that line. Its vast iron and steel business is yearly increasing in cost of production, while ours is decreasing. It cannot meet the world's growing demand for iron and steel, because it cannot increase its production to any great extent. It produces less pig iron now than it did ten years ago. Much of its ore it imports from distant countries. Its cotton is all imported. It spends about $750,000,000 a year for foreign foodstuffs. On the Continent every nation is burdened with debt, and none of them can hope to pay off its obligations. Measured by their natural resources and advantages for continued growth against their debts, and the many disadvantages under which they labor, they are practically bankrupt. In all of them the cost of production and living must steadily increase. In the United States we have scarcely laid the foundation for our future greatness. In natural resources we are richer than all of Europe; we are paying off our debts faster than they are due, we have barely scratched the ground in the development of our mineral wealth, and our agricultural growth can scarcely be limited.—*Engineering Magazine.*

Manila Sugar.

In a paper on the Philippine Islands by Mr. H. A. McPherson, and published in *The Sugar Cane*, it is stated that the canes of that country are very rich, and that with better appliances the product, which is now very poor, might be made equal to any in the world. Agriculture is carried on almost entirely on the metayer or share system, the owner of the land providing the implements, animals, machinery and seed, and the produce is divided between the owner and the laborer, and it is said that the latter rarely gets a fair share. The laborer is generally in debt to the landlord for advances and there is usually a balance against him at the end of the year. The landlord, however, also suffers in the same way, he working on borrowed capital, advanced by local capitalists.

The cultivation of sugar is practically confined to four islands, Luson, Panay, Negros and Cebu, the first supplying what is known as Manila sugar, the second and third Ilo Ilo and the last Cebu sugar according to the ports from which it is shipped. None of the sugar is of very high grade, owing to the absence of high class machinery. Each district produces what is called dry and wet sugar, the former being divided into various grades. The Manila sugar is what is called clayed, which means that after the juice is boiled in open pans the mass is poured into an earthenware receptacle like an inverted cone and a thin layer of liquid mud is then put on top, the moisture of which gradually percolates through the mass, washing the molasses from the crystals and carrying the bulk of it through an aperture at the bottom into earthern jars below. After standing for some weeks or months, the sugar is ready for further manipulation on the dry grounds, which are entirely in the hands of the Chinese, who purchase the raw material from the planters. When they are opened the sugar is almost white at the top and gradually becomes darker toward the bottom; the white and dark sugars are mixed together in certain proportions according to the grade which is to be produced. It is then spread on mats to dry in the sun, for which one day is sufficient in dry, hot weather. When dried, it is packed in mat bags and is ready for shipment.

The Brown Wire Gun.

First Lieutenant G. N. Whistler, U. S. A., gives some interesting details in regard to the Brown segmental wire-wound gun, over the tests of which, on August 25, at Sandy Hook, he presided. The muzzle velocity was 2,875 foot seconds. The muzzle velocity of 2,875 feet per second, Lieutenant Whistler says, shows a muzzle energy of 3,557 foot tons, or 856 foot tons per ton of gun. This is the highest record, he declares, ever obtained with any gun. The muzzle energy per pound of powder is 169 foot tons, according to Lieutenant Whistler, and which, he says, has never been exceeded so far as he knows in a 45 caliber gun under similar conditions of loading. The gun which was tested fired a projecilte weighing 62 pounds. The gun is a 5 inch weapon, 45 calibers long. This is 5 calibers longer than the most high-powered ordnance rifle now in use in the navy. Long calibers are unhandy, particularly at sea; but the increased calibers length insures a longer and more thorough burning of the powder, so that the chances of unignited grains of powder being thrown out are reduced to a minimum. The record of the Brown wire gun, so far, shows that the projectile fired with Leonard smokeless powder would penetrate 16·08 inches of wrought iron.

IN New York all the bonded warehouses are at present packed solid with foreign goods, waiting the improvement of the times, there being now comparatively little demand for such merchandise.