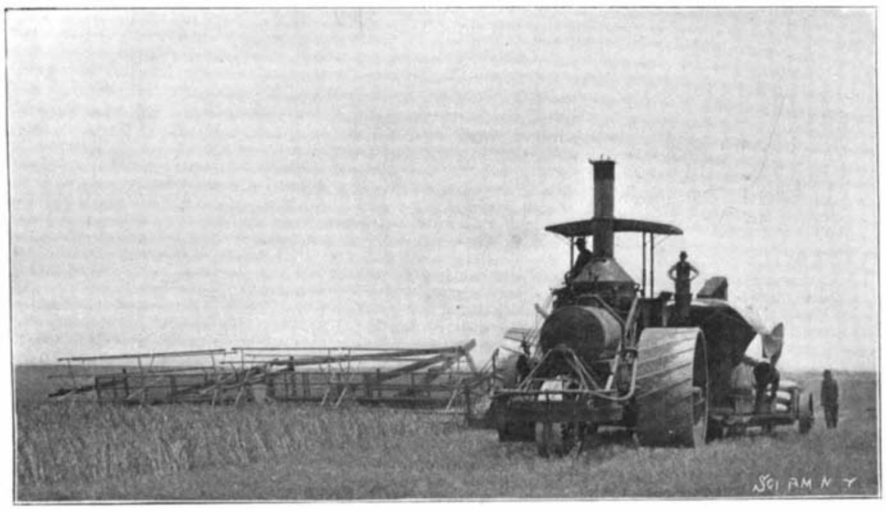
A MAMMOTH COMBINED HARVESTER.

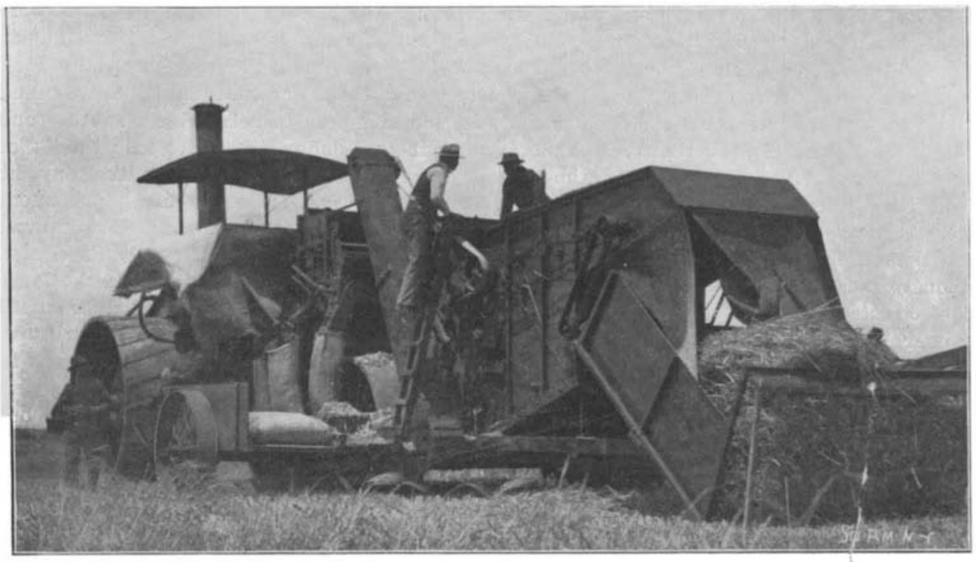
Our Western States with their thousands of acres of farms are continually astonishing the world with the enormous proportions of their agricultural machinery. Just now our attention is called to a combined harvester, which we illustrate herewith, and which is claimed to be the largest in the world. This harvester has a very wide reach, having a cutting-bar 35 feet long. The entire process of harvesting and threshing is accomplished in the machine. The stalks are cut and conveyed by a suitable means to the threshing mechanism. Here by the use of a system of cylinder, separator and recleaner, the grain is separated out, cleaned, and fed into sacks, as shown in one of our illustrations; the straw at the same time is conducted to the straw box at the rear of the machine. The threshing cylinder is 28 inches in diameter and the separator has a width of 54 inches. An automatic governor on the fans governs the blast so that at any speed at which the harvester may be traveling, the wind is automatically regulated and prevents clogging of the shoe and the carrying of grain over into the straw—a difficulty which often occurs in harvesters which are regulated by hand, because this part of the operation is very often forgotten or neglected.



FRONT VIEW OF THE COMBINED HARVESTER.

The harvester is entirely steam-driven and is connected by suitable coupling to a 50 horse power traction engine by which it is propelled. The usual method of operating such machines is by means of gearing and universal joint connection with the traction engine. This machine is, however, entirely independent of the traction engine for its motive power, being provided with an auxiliary engine of 8½-inch bore and 7-inch stroke, which is located on the frame of the harvester. This engine is driven by steam, conducted through a flexible tube from the boiler of the traction engine. It furnishes all the necessary power for operating the mechanism and fills a deficiency which will be readily appreciated by those who are acquainted with the requirements of such a machine. Heretofore these parts were dependent upon the travel of the traction engine for their operation. Now a steady, uniform motion is assured at all times, no matter what the condition of the grain may be, or at what speed the traction engine may be traveling.

The traction engine is designed to burn either coal, wood, oil or straw. When straw is used as fuel, an endless carrier is provided for conveying the material from the straw-box to the fuel-box of the engine. It is interesting to note that in California, where this machine is in use, oil has proved to be the most economical fuel, the consumption per day being coal, 1 ton at $8.50 per ton; wood, 2 cords at $4.50 per cord; oil, 330 gallons, at 70 cents per barrel. The capacity of this machine is from 1,000 to 1,500 sacks, or from 70 to 100 acres harvested in a day. This too, at a cost not exceeding 50 cents per acre for cutting, threshing, recleaning and sacking the grain.



A MAMMOTH COMBINED HARVESTER—THE THRESHING MECHANISM.

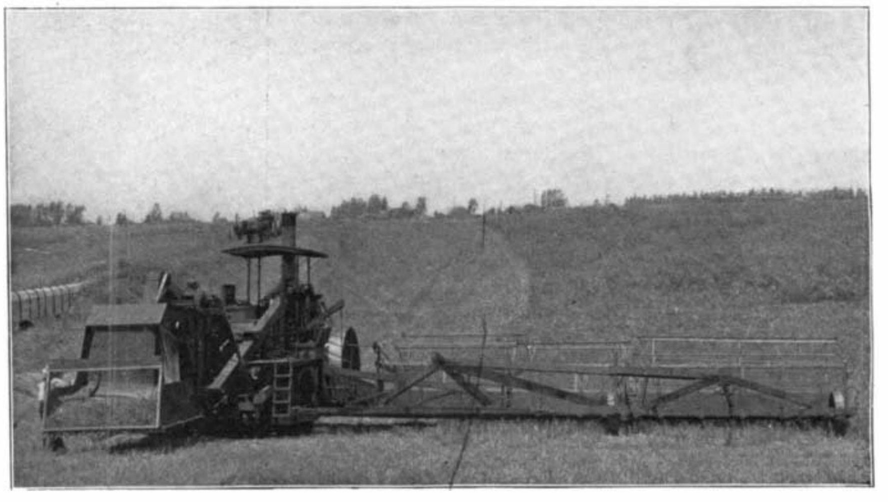
A Large Western Cotton Mill.

BY DAY ALLEN WILLEY.

The erection of a cotton mill in the vicinity of Kansas City, Mo., is of unusual interest not only on account of the remarkable size of the proposed plant but from the fact that it is to be located in a new site for the textile industry and marks the beginning of what may be an important industrial development in the Southwest. The mills will contain an equipment of 12,000 looms and 500,000 spindles—being by far the largest plant of the kind in the world. The Amoskeag Manufacturing Company of New England is at present the most extensive, being greater in dimensions than any of the factories in the Lancashire district of Great Britain, but the Western company will exceed the Amoskeag by 200,000 spindles and 2,000 looms. The equipment will be installed for manufacturing plain sheetings ranging in size from 2½-yard drills to print cloths as well as 4 and 5-yard sheetings. The yarns produced will run from Nos. 8 to 20 for the drills and 30 to 50 for the larger goods. A further idea of the capacity of the plant can be gained when it is stated that its estimated annual output when running to its full capacity will be 75,000,000 pounds of finished goods and its consumption of cotton 170,000 bales.

The mechanical features connected with the building of the Western factory are also of unusual interest. Its electrical equipment will be very elaborate in character and contain the latest devices for the economical driving of the weaving and spinning rooms by motors. No water power is to be secured at the site, as at many points in the Piedmont section of the South and in New England, so that the necessary current will be generated by steam power, the engines being direct connected to large dynamos or belted to them. From the generators the current will be distributed to the battery or series of motors each operating its individual set of looms or spindles. The plan followed in general will be similar to that utilized in equipping the Olympia Cotton Mill, of Columbia, S. C., where the machinery is driven entirely by electricity. The motors serving the spinning frames are to be of 150 horse power each operated at a current ranging from 575 to 580 volts, and are of the three-phase pattern. Each motor will serve 10,000 spindles, so that the total number alone in this department will be 50. Motors of the same size will be installed in the weave rooms on an average of one to 750 looms, representing five looms per horse power. The motors will be attached to the ceiling and connected with the apparatus by as short circuits of wiring as possible with the view of economizing power to the greatest possible extent. By this system it is calculated that a saving ranging from 15 to 20 per cent in power will be effected, compared with a plant operated by steam direct, for it will be noted that one section of the factory can be operated by its own motor entirely independent of the others, allowing any part of the equipment to be run during a dull season or while repairs are being made to the other portions, yet without waste of power or needless wear and tear of equipment. It is hardly necessary to say that the textile industry as yet is comparatively unknown west of the Mississippi River. In fact it has scarcely obtained a foothold even in Texas, which in recent years has produced over one-third of the American cotton crop. A few statistics will emphasize this fact. Out of about 425 mills now in operation in all the Southern States, but 15 are running in Texas, Louisiana, Arkansas and Missouri, combined with two or three in Indian and Oklahoma Territories. All combined represent but 140,000 spindles out of the 4,375,000 in the South. As will be noted, the Kansas City plant when entirely completed will contain over one-tenth of the total number of spindles at present installed in the South. It is unnecessary to say that raw material is abundant, as the last few years have demonstrated that Indian and Oklahoma Territories, as well as Arkansas, are as favorably situated for raising middling cotton of a good grade as the territory in Georgia and the Carolinas. They have equal advantages, not only in climate, but in quality of soil. Already the two Territories mentioned plant 700,000 acres annually in the staple, while the average acreage of Texas is nearly 8,000,000.

As it is expected to provide the plant described with furnaces for burning oil or for solid fuel, advantage will be taken of the extensive deposits of petroleum in Texas, which can be shipped to it by rail in tank cars. Coal can be obtained from the McAlester mines in Indian Territory and in this way the question of fuel supply is disposed of. It is expected to secure a fair grade of labor from Kansas City, as well as the farming population in the vicinity, which will be trained by experts from New England and South Carolina. As to the market for the product, the company expects to sell mostly in the West and on the Pacific coast, but will make a grade of goods suitable for the Chinese and Japanese demand. As is well known, the market in the Orient has taken a very large quantity of the goods from the Carolinas, Georgia and Alabama mills within the last few years, and this trade will be catered to.



REAR VIEW—SHOWING THE GREAT REACH.

The Mystery of a Spider's Spinning.

How does a spider spin a thread from one bush to another at a height from the ground and then draw it so tight? asks a correspondent in the New Century. Everyone who has ever walked through a country lane early in the morning has felt the strained threads upon the face, and often these threads are many yards long, but the way in which it is done remains a mystery. He does not fly across, drawing the thread after him, for he has no wings. Neither does he descend to the ground and then climb the opposite bush, for this would lead to immediate and hopeless entanglement of the gossamer filament. How then does he do it?

M. Favier, a French scientist, has discovered that a thread, one yard long, will support by its own buoyancy in the air the weight of a young spider. It would thus be in the power of a juvenile to spin a thread of that length and trust to air currents to carry it across and attach it to an opposite bush so that he himself could then pass over and draw it tight. But many of these threads, to judge from their strength and consistency, are not the work of young spiders, and, as every observer knows, they are often many yards long and drawn so tightly that the face is instantly aware of their presence when breaking them.

The work is nearly always done in the night time, so that observation is difficult.

If the spider had any human nature in his make-up—and many of his habits would lead us to suppose that he has—he would be gratified at the perplexity which he causes and would advertise his performances as zealously as do less gifted human gymnasts and even some popular preachers.