NIAGARA POWER IN BUFFALO.

There have been for some time past, says the *Electrical Review*, rumors that electric power was soon to be transmitted from the plant of the Niagara Falls Power Company, at Niagara Falls, and to be used in Buffalo, N.Y. It took some time, however, to secure the proper right of way, and as the work involved was of an original and novel character, considerable time was devoted to the consideration of the best means of carrying the current. A few weeks ago the Cataract Construction Company made a contract with the White-Crosby Company, of New York, for the complete design and construction of the transmission line. Work will be commenced at once, and, when finished, the line will have cost in the neighborhood of $500,000.

VOLTAGE 10,000 OR 20,000.

Three-phase alternating currents at 2,000 volts at the generating station at Niagara Falls will be raised by means of step-up transformers to 10,000 or 20,000 volts, and transmitted at this voltage to Buffalo, where they will be reduced to 500 or 1,000 volts by means of step-down transformers. The exact voltage at which the transmission will be accomplished has not been definitely fixed, but will be between the limits mentioned The transmission will be by overhead conductors, carried on cedar poles from 35 to 50 feet in length. The cross arms, two in number, are of hard yellow pine, four inches by six inches by twelve feet. There is also a smaller cross-arm, which will carry a private telephone line from the power house at Niagara Falls to the transformer station in the city of Buffalo. The lower of the two large arms carries at its extremities steel guards to protect the conductors from accidental contact with other wires The top cross arm carries similar guards, which will support a galvanized iron barbed fence wire, which will be used as a lightning conductor. The conductors are of bare stranded copper wire, and the pole line is designed for twelve of these conductors.

The transmission line will run over a private right of way from the Niagara Falls Power Company's station, at Niagara Falls, to Tonawanda, and thence down one bank of the Erie Canal to Buffalo. The entire line will be fenced in. Induction effects will be overcome by a transposition of the conductors from pole to pole, the combination being such that the entire line is shifted on five poles. Special porcelain insulators will be employed, designed so as to have strength and large insulating surface, as well as to prevent the formation of icicles.

The total capacity of the transmission line will be 20,000-horse power. The current will be three-phase alternating, and each half of each of the long cross arms will support three wires, carrying in all 5,000-horse power. The contract calls for the completion of this line by November 15th, but the White-Crosby Company expect to be able to deliver 5,000-horse powers of current in Buffalo on or before November 1st. Arrangements have been made by which the Buffalo Railway Company will take the first 1,000-horse power delivered in the city.

WIRE AND CUT NAILS.

The Sibley *Journal of Mechanical Engineering* gives the results of some experiments to determine the comparative holding power of wire and cut nails. The tests were made on pieces of white pine, joined with simple lap joints fastened by the nails. These were subjected to transverse stresses, in some cases parallel to the axes of the nails, in others at right angles When the load was applied perpendicular to the nails, the wood was often split and the cut nails were often broken, while the wire nail joints were broken by bending and drawing the nails. When the load was applied in the direction in which the nails were driven, the joints were broken by nails being drawn almost without being bent. Under this same manner of loading, the nails were started by smaller loads than the cut nails, yet when the cut nails were started they yielded rapidly, while the wire nails held nearly as well as at first. In all the cases tried the cut nails were found superior in strength and rigidity, while in one-half the cases wire nails gave the joints greater resilience than the cut nails.

RELATIVE STRENGTH OF METAL AND TIMBER.

In a comparison made by Prof. R. H. Thurston of the relative strength of metal and timber, cast iron, he states, which weighs 444 pounds to the cubic foot, will sustain in a one-inch square bar a weight of 16,500 pounds; bronze, weight 525 pounds, tenacity 36,000; wrought iron, weight 480, tenacity 50,000: hard "struck" steel, weight 490, tenacity 78,000; aluminum, weight 168, tenacity 26,000. In comparing equal weights of wood and metal, the latter does not always prove the stouter, the instance being cited of a bar of pine just as heavy as a bar of steel an inch square and holding up 125,000 pounds, the best ash 175,000, and some hemlock, 200,000 pounds. The best steel castings made for the United States navy are rated at a tenacity of 65,000 to 75,000 pounds to the square inch. By solidifying such castings under a great pressure, Whitworth got a tensile strength of 80,000 to 150,000 pounds. Fine steel wires and ribbons from ingots give a tenacity of 300,000 pounds to the square inch of cross section. Ordinary aluminum is only one-third as heavy as steel; a bar of it, with a square section of three inches, will hold up 78,000 pounds.

THE WATER COURSES OF INDIA.

For some time past various Anglo-Indian scientists have made a study of the water courses of India, it is stated, with a view to determining in what way the destruction and waste which those rivers cause can best be met and neutralized. The streams rushing down from the sides of the Himalaya mountains bring with them a vast quantity of pebbles and silt; the former is quickly dropped when the plains of northern India are encountered, and from a rapid torrent the stream becomes a sluggish river, while the silt is precipitated all along the entire water course, although it is estimated that enough is left when the rivers reach the ocean to make deposits in the Bay of Bengal equal to what would be dumped into the sea by 14,000 vessels which should each daily throw overboard some 1,300 tons of gravel. In northern India the effect of these river deposits is to bring about the rapid filling up of the rivers' beds until, as the sides of the streams are protected to prevent a flooding of the possibly cultivated land on either side, the time soon comes when the river is converted into a sort of elevated canal. Then, in some seasons of flood, the dikes are broken through at the cost, often, of farms, villages and towns.

COMPRESSED AIR MOTOR CARS.

One of the three new air-motor cars recently equipped for the Third Avenue Street Railroad in New York was privately tested on July 30th, with satisfactory results. The car was run twice over the 125th street road from the North River to the Harlem River. It went at the will of the motorman at a speed from four to fifteen miles an hour, and the McPherson brake with which it is fitted acted with promptness and efficiency. Each car is supplied with a sand box, and dumps a quantity of sand on the track when an emergency requires that the car be stopped with more than usual promptness. The sand box was tried when the car was moving at the rate of 12 miles an hour, and the car was stopped in a little more than its length. The compressed air reservoir had a pressure of 2,000 pounds to the square inch when the car started on its trip. The pressure was reduced one-half when the car had completed its journey of eight miles. It is estimated that the reservoir will hold enough compressed air to propel the car a distance of 15 miles.

Ten of the Metropolitan Traction Company's cars are being equipped with the new motor. The air is carried in two cylindrical steel tanks, placed between the trucks and beneath the floor of the car, and they are charged at an initial pressure of 2,000 pounds to the square inch. The power house will contain a 500 h.p. Greene-Wheelock engine and a Minerva air compressor, the reservoir capacity of the plant being 5,000 cubic feet. The compressed air motor is being adopted in preference to trolley or cable traction, not merely from motives of economy, but also with a view of securing a service which shall be free from the interruptions to which the cable and trolley systems are liable.

COTTON CROPS AND PRICES.

Official reports of the Government show the following range of cotton crops and prices:

	Pounds, gross weight	Farm value, cents per pound.
1893	3,352,658,458	8·00
1894	3,769,381,478	7·00
1895	5,036,964,409	5·21

Increase of crop in three years, 50 per cent.; fall in price at the baling press, 35 per cent. So there was, after all, a liberal gain to the producer, for it cost him only a trifle more to grow and gather and bale the crop of 1895 than it cost to produce and make ready for market the smaller crop of 1893. Of course, it is not surprising that prices fell. We need no occult philosophy of currency to tell why they fell. Cotton growers need go no farther than the crop returns to ascertain why prices are higher and lower at different times. The cotton grower who imagines that unlimited silver money or a flood of fiat paper money, or any form of debased "cheap" money, would do him any permanent good, is badly fooled. The one thing that will help the cotton planter is diversification, so as to always have some crop that would bring a good price.—*Chattanooga Tradesman.*

STRENGTH OF A WELD.

An eight-inch iron pipe one-quarter inch thick, with flanges electrically welded on, when tested to destruction at Lloyd's Proving House, Netherton, England, according to an exchange, broke in the body of the pipe at 88 tons, the welded part remaining intact, and a similar pipe of steel broke in the welded part of the flange at over 101 tons. These tests were tensile only, and were carried out with the view of proving the absolute soundness and consequent strength of the flanges electrically welded on.

WHISKY DISTILLERS SHUT DOWN.

A press despatch from Louisville says that Aug. 1 all but six of Kentucky's 300 distilleries shut down to remain closed for eighteen months. At the expiration of that period limited production will be begun, but it will be at least three and a half years thereafter before a drink of Kentucky bourbon is put on the market. Thus the suspension of operations means in reality that no Kentucky whisky is to be marketed for four or four and a half years. This suspension of the distilleries is in consequence of over production. The increase of the tax from 90 cents to $1.10 per gallon is one cause of the present depressed market. Another cause is the fact that in 1893 the production of whisky in Kentucky was vastly overdone. In that year 45,000,000 gallons was sent from the stills, although consumption had even then begun to dwindle from 30,000,000 to 20,000,000 gallons annually. Since 1893 the surplus whisky stored in the bonded warehouses of the State increased so rapidly that fine Kentucky whisky became almost a drug on the market; competition, in order to get a sale for a product for which there was a continually decreasing demand, became so great that prices were cut to the bone; values went away below par, and in many cases the distiller could not get the cost of production and carriage for his goods. There are now in the bonded warehouses of Kentucky 88,000,000 gallons of spirits of all kinds.

RAILROADS IN CHINA.

A writer in *Le Mouvement Colonial*, of Paris, says that if railroads are introduced to any extent in China the personnel must be exclusively European and American, or recruited from the literary class. He says the Chinese Government will not take foreigners into its service, and that the educated men of China, who alone among the people have sufficient knowledge of the written language to be intrusted with the actual running of trains, would refuse most emphatically to be either train hands or station agents.

This is one of the many small stumbling blocks in the way of China's progress, but it is quite effective in its way.

—Surgical instruments are now made of wood, which is afterwards completely covered with a layer of nickel, electrically deposited.