

American Competition in the Australian Colonies.

The following is an extract from a letter newly received by one of the leading colonial houses in Birmingham from their Melbourne correspondents, which we copy from the *Ironmonger* (London):

"We call your attention once more," says the writer, "to the enormous increase in the number of articles we are buying from America. A few years since some half dozen articles were about all we ordered of American make; now, as you will see by the indents we send you, the items specially ordered of American make are to be counted by hundreds. This increase is still maintained, and is, indeed, still growing. Your English manufacturers would do well to take a lesson from their American rivals. The American goods exactly suit the requirements of the market. The timber they have will always command a certain trade, but why should they excel English makers of shovels, axes, picks, and all classes of edge tools? It is annoying to those of us who have English sympathy to see so much trade go away from the old country. The general characteristics of American goods, as contrasted with home-made, are: quality more reliable, better finish, not an ounce of unnecessary material, better packing, and the articles themselves thoroughly adapted to the use to which they are to be put. Some of the things they make have been found unsuitable, and once ordered have never been repeated. Their cutlery will not bear comparison with the English make, and the same may be said of their plated ware. In wire-work as well as cast and wrought iron hollow ware England carries all before it. In all the cheaper kinds of cutlery Germany is becoming a very strong competitor, and also in steel toys and many other lines. Your English makers must bestir themselves, or they will certainly lose the larger part of their Australian and New Zealand trade."

[In addition to the reasons for the impetus given to trade in our products in the English colonies, we have an idea that one of the causes which has benefited our export traffic very much is the fact that our manufacturers and merchants advertise their wares in the export editions of newspapers which are circulated quite largely of late in the English colonies, South American countries, and Spanish islands.—Ed.]

An Aged Inventor Gone.

The old fashioned pins used by our grandmothers were made by sharpening a bit of wire and twisting another bit as a head. They were valued more than the much finer ones made now. One of the first lessons of an honest childhood was in the words, "It is a sin to steal a pin." Economy was to be shown by carefully saving these little instruments, and they were commonly kept in service till they were actually worn out. Even among wedding presents, "a half a thousand of pins" was not a gift to be despised.

As recently as 1836 it occurred to Dr. J. J. Howe, that pins might be made cheaper and better by machinery than by hand. He interested a New York merchant, named Jarvis Brush, in his ideas to such an extent that the latter furnished the capital for proceeding with the experiments; and when, in 1840, the American Howe Pin Company, of Birmingham, Conn., was founded, Mr. Brush was at its head, and sent out the first solid headed pins the world ever saw. The new business increased so rapidly that in the next ten years it secured a monopoly of the pin trade, and manufactured nearly all sold in the United States, besides exporting large quantities to Europe.

Hundreds of tons of copper and steel were annually consumed in the manufacture, and numerous improvements were made until the modern silvered and polished pin is an elegant work of art compared with the far more costly but clumsy affair of fifty years ago. One of Mr. Brush's most useful inventions was for sticking the pins in paper, an operation that had been previously done tediously by hand; a few being inserted at a time, and six dozen papers being regarded as a full day's work. This he superseded by self-acting machinery, dispensing with numerous manual operations, and enabling one hand to stick one or two hundred dozen papers a day, and to do the work better than it had formerly been done.

In 1850 Mr. Brush retired from the active management of the pin company, but remained a director for life. Having accumulated a handsome fortune, he spent his declining years very happily with his only son, Prof. George J. Brush, the eminent mineralogist and executive officer of the Sheffield Scientific School, in New Haven. Mr. Jarvis Brush died April 10, after a brief illness of four days, with pneumonia, and his remains were interred in Greenwood Cemetery. His age was 86 years; but such were his active and companionable habits that he seemed much younger than was really the case. Like many other inventors, only perhaps in a higher degree, he was genial as well as useful, and courteous as well as clear headed; and this no doubt had its share in prolonging his days.

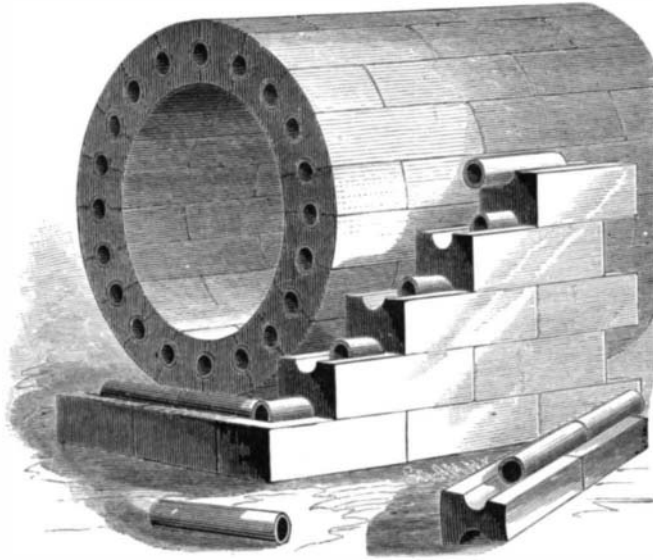
THE *Lancet* thinks that if children would wear woolen next the skin, and wear longer clothing, suspending it from the shoulders, we would hear more of boisterous health and less of back aches and pains.

IMPROVEMENT IN TUNNEL AND HOUSE BUILDING.

We give an engraving showing an improved method of building brick structures, applicable to general house building, culverts, tunnels, vaults, sidewalks, walls for tanks, cisterns, and wells, and many other purposes.

The device, as will be seen by reference to our engraving, consists of longitudinally grooved blocks of suitable material, preferably such as the first quality of strong brick is made of, and a tube of the same material laid in the groove and breaking joints with the blocks. This tube is strongly bound in the block by the cement, which tends to expand so as to compress the tube and hold it firmly in its place in the block.

This construction insures hollow walls of the most desir-



BRYANT & TOSTEVIN'S IMPROVEMENT IN TUNNEL AND HOUSE BUILDING.

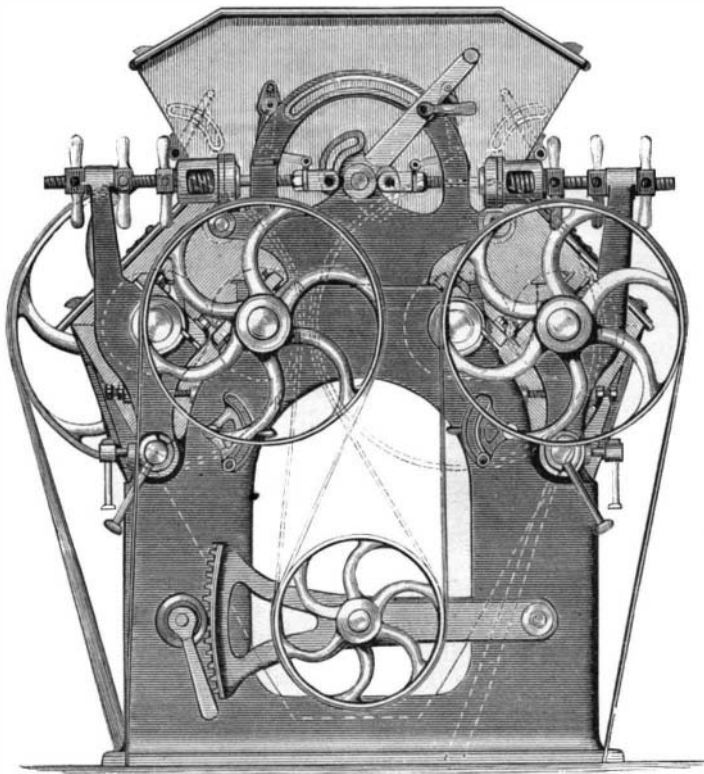
able form, which in the case of buildings may be used in summer for cooling and in winter for warming. An arch built in this way is as strong when completed as an old arch. It will be noticed that the tubes are supported on all sides, and at the same time serve as a perfect key to retain the blocks in position.

The inventors of this system of building claim that they can put in a railroad tunnel of this material cheaper than a deep cut can be made, and at the same time land slides will be prevented.

Messrs. R. T. Bryant and David Tostevin, of Council Bluffs, Iowa, are the patentees of this invention.

AUTOMATIC FOUR-ROLLER MILL.

We are indebted to the London *Miller* for the following description and accompanying engraving of a new roller mill, which is being manufactured by Mr. F. Nell, of London, and represents the latest example of a machine of this class.



AUTOMATIC FOUR-ROLLER MILL.

It will be seen from the illustration that the mill is driven by belts, but gear is provided if preferred. The outside rolls are the slow, and the inside rolls the fast, both sets being operated by belts, which run over a tightening pulley, shown in the center of the lower part of the engraving, regulated by a lever, shown on the left of the engraving, in connection with a ratchet. The following are some of the improvements comprised in this machine:

On each side there is a swing arm, worked by a lever and cam, shown in the center of the upper part of the engraving.

This lever has a double object: it throws out the two outer rolls and shuts off the feed simultaneously, and by reversing the lever it brings back the two rolls again and also the feed. At the bottom of the swing arms is placed a set screw, which prevents these arms being brought so close as to allow the rolls to touch, the set screw being adjustable at will. Underneath the driving pulleys will be observed another lever, which is only used, should the brasses at all wear, for the purpose of setting up the journals.

On either side of this lever is a quadrant which regulates the brushes under the rolls, used to keep the latter clean. While the lever acting upon the arms opens and shuts, there is still a further adjustment of the feed made by the two quadrants on the hopper shown on each side of the lever, and which adjust the feed to whatever nicety is required. When the feed adjustment is once set it requires, it is stated, no further interference with from one week's end to the other, the lock nuts preventing any alteration in the position of the rolls. A box hopper is provided to prevent the products from the rolls coming in contact with the iron work of the machine. The rolls may be smooth or corrugated, as may be required for the purpose for which they are to be used, and when they are corrugated, scrapers are used instead of brushes for keeping them clean.

Genesis of a New World.

On a beautiful summer's night, August 22, 1794, Jerome and Lefrançois de Lalande noticed a star in Aquarius, which they estimated of the $7\frac{1}{2}$ magnitude. Six years later they thought it of the 8 magnitude. In appearance it resembles a star which is not exactly in the focus of the telescope. Herschel had observed it in September, 1783, and recorded it as an admirable planetary nebula, very brilliant, small, and elliptical. Lord Rosse and Lassell perceived that it was surrounded by a ring, which gives it somewhat the appearance of Saturn. The spectroscopic observation of Huggins indicate that it is a gaseous mass, in which nitrogen and hydrogen predominate. Most of the

other planetary and annular nebulae give similar results. In 1871 and 1872 Brunnow, the Irish Astronomer Royal, measured its parallax and concluded that its distance is more than 404,000 times as great as that of the sun, and its diameter is probably greater than that of the entire solar system. This would make its volume more than 338,896,800,000,000,000,000 times as great as that of the earth. We have thus before our eyes a new system, which is probably undergoing the process of condensation through which our sun and its attendant planets passed hundreds of millions of years ago.—*L'Astronomie*.

The Electrical Transmission of Power.

In view of the claims of electricians to be able to distribute power as well as light, by means of wires charged with electromotive force, it is right, says the *Journal of Gas Lighting*, to take account of the results of a recent course of experiments made in Paris upon the electrical transmission of power. So long ago as October, 1881, M. Marcel Deprez declared at the International Congress of Electricians that the economic duty of two dynamo machines connected for the transmission of power was 65 per cent. That is to say, that if 100 horse power were absorbed by one machine, 65 horse power would be given out by a machine receiving the current from the first.

This assertion, like so many others emanating from electricians before and since that time, was accepted with enthusiasm, and has formed the basis of all the wild projects since mooted for the utilization of so-called natural forces for industrial purposes. A French syndicate has, however, put the system of M. Deprez to a practical test in the workshops of the Northern Railway Company in Paris, under the direction of M. Tresca. The result is disastrous to the assumption held since 1881, or to confess to something more than an error of judgment. It is even doubted by the *Revue Industrielle* whether M. Tresca's results, small as they are, could be relied upon in the case of a system of distribution established out of doors in the ordinary way, and

with the usual liabilities to waste through bad insulation and insufficient connections. At any rate, the claim of electricians to the present possession of means for the economical distribution of power is seriously prejudiced by these statements.

FROM a study of the maximum temperatures naturally occurring, Mr. L. Liebermann says that a mineral oil, the flashing point of which exceeds 60° , may be safely used in all parts of Europe.