

vated positions is more rich in tannin than that of low and badly drained, damp, and shady locations. In hemlock bark the inner layer contains about 8 per cent of tannin, the middle part about 5 per cent, and the outer part about $3\frac{1}{2}$ per cent.

BOSTON HORSE-RAILROADS.

The recent report of the Boston Board of Aldermen respecting horse-railroads has attracted considerable attention from its liberal policy towards these corporations. The report presents some facts about the passengers transported, which we think are not fully realized by the public. It says:—The number of passengers carried upon our horse-railroads for the last year was nearly 8,000,000, and it must soon exceed 10,000,000 per year. This is over 27,000 passengers per day, Sundays included. The transportation of this number through the streets by omnibuses, or any other kind of carriages, would operate as a thorough blockade.

The number of passengers carried on the Metropolitan road alone, for the present year, is estimated at 5,000,000, or 15,000 per day. To transport this number in omnibuses would require one to start about every 30 seconds, for 15 hours each day. But as the rush of passengers is at morning and evening, the transport of this number by omnibuses would be next to an impossibility, and yet the Metropolitan road carried, on the 4th of July, over 50,000 passengers.

For safety, this mode of conveyance is, we think, in advance of all others, and stands 36 to 1 against steam roads, the fatal accidents on the latter in 1858 being at the rate of $4\frac{1}{2}$ in 1,000,000 passengers, and on horse roads 1 in 8,000,000.—*Boston Courier*.

[These statistics are interesting and valuable regarding the capacity of city railroads for conveying passengers in comparison with stages. There is one expression in the latter paragraph of the *Courier*—which requires explanation. It states that the accidents on the horse railroads have been only as 1 in 36 in comparison with steam railroads, which conveys the idea that the steam-power causes the excess of the accidents, independently of the greater velocity with which locomotives are run. The fact is that steam-engines are just as safe for running carriages as horses according to their speed; there can be no difference in this respect, because they are as easily governed.—Eds.]

LAKE SUPERIOR IRON ORE.

The iron ore of this region is, perhaps, the best in the world, and it is now shipped in large quantities to Ohio and Pennsylvania. We think it is not too much to say that the introduction of Lake Superior ore has redeemed the business of making pig-iron throughout the bituminous coal region of eastern Ohio and western Pennsylvania, from the situation of a difficult and uncertain enterprise, and has placed it on a footing of sure prosperity. It has made its way steadily and surely, in spite of natural prejudice, and all the disadvantages of inexperience in its use; and, wherever it has gone, it has made new friends and customers. Next year, not less than 40 furnaces will use it wholly or in part, to supply which will require between 150,000 and 200,000 tons. The iron ore companies of Lake Superior are making preparations to supply a largely-increased demand next season, to do which, it is only necessary to uncover surface and enlarge openings at the mines, so as to enable a larger number of men to be employed to advantage. If coal was abundant in the Lake Superior regions, of course the iron would be manufactured on the spot. No less than 75,000 tons of ore have been shipped this season; and the demand was far greater than the companies at the mines could supply.

A BAKE OVEN FOR PARIS.—There has been constructed at one of the machine-shops in the north-western part of this city a large automaton bake oven designed for a company in Paris. It is 20 feet high, and contains 30 cars for pans. The construction of the oven is similar to the one now in use at the mechanical bakery in this city, but the power to move it is entirely different. Steam is only used for the purpose of moving a hydraulic pump, which is so arranged that the cars are moved by this power alone. By this arrangement a large number of wheels are dispensed with and the whole operation of the oven much simplified, and but little steam-power is required to keep it in motion.—*Philadelphia Ledger*.

THE GROWTH OF THE SEWING-MACHINE BUSINESS.

In 1848, we were sitting, with several gentlemen, in an office in Broadway, in this city, when a person came in and invited us to go up the street a few doors to see a new invention which he had to exhibit there. Some of the party went with the gentleman, and in the course of half an hour they returned and made their report. They said it was all a humbug. They found the room full of tailors, and the man had a little machine for sewing cloth. It was worked by a treadle, and, at first sight, seemed to be perfect, sewing with surprising rapidity, and making a straight, handsome seam. But one of the tailors, observing that the exhibitor, before he handed the finished work to the spectators, very deftly tied a knot in the thread, took the liberty of breaking the thread, when the whole seam unraveled as readily as a knit stocking. The company separated with a laugh of derision at the mortified exhibitor. It seems a very short time since this incident occurred, and when we yesterday recalled the recollection of it, while standing in Grover & Baker's new and magnificent establishment for the sale of their sewing-machines, we were impressed, more forcibly than we ever were before, with the marvelous rapidity with which the arts, and especially new arts, are developed in this wonderful age in which we live. This establishment occupies an entire building in the most fashionable part of Broadway, with 25 feet front, and running through 200 feet to Mercer-street. The front is a single iron Gothic arch, three stories high, the two lower stories being formed of eight panes of plate glass, four in the lower story, each $14\frac{1}{2}$ by 5 feet, and four in the second story, each $11\frac{1}{2}$ by 6 feet. The basement is used for setting-up and packing the machines, the space under the Broadway sidewalk making a nice shop for repairs, and the space under the Mercer-street sidewalk being occupied for generating the steam by which the building is heated.

On the first floor is the beautiful salesroom, 25 by 150 feet, 50 feet in the rear being used for receiving, delivering and storing the machines as they come from the manufactory. In the second story, directly over the salesroom, is the receiving-room, where ladies who purchase machines are taught the art of using them. This is an elegant drawing-room, richly carpeted and furnished with the most costly rosewood chairs, lounges, tete-a-tetes, sofas, a piano, &c., and is to be supplied with a select library. The bronze chandeliers in this room were made by Haughwout & Co., in a style corresponding with the architecture of the building. Adjoining the drawing-room is the ladies' toilet room, containing a looking-glass, a marble wash-stand, pins for hanging cloaks, &c.

We were informed that this company have already sold about 30,000 of their machines; this, at an average of \$100 apiece, would amount to \$3,000,000. The machines are made in Boston, and more than 400 men are employed in the manufactory.

The machines manufactured by this company are too well known by the public at large to need any recommendations at our hands, and we will simply add that we have had one of them in use in our family for some time past, and it is considered the most useful article in the house, next to the cradle, and no less indispensable than that. In No. 2, of the present volume of the SCIENTIFIC AMERICAN, we published an illustration showing the mechanical principles of the Grover & Baker machine. By reference to that illustration, the form of the stitch will be seen, and its security from ripping, as well as its superior elasticity, will be readily understood.

FORWARD CHILDREN NOT APT TO LIVE.—When Lord Palmerston, the present prime minister of England, was a child, he was very feeble and very precocious, so much so that his physician, on account of his health, forbade his continuing his studies. But an indulgent aunt, thinking that depriving the boy of his studies, of which he was excessively fond, would do him more harm than good, continued to instruct him in private. As his health improved rapidly under this treatment, little blame was attributed to the aunt, when she disclosed the practice; though the physician was greatly mortified to find that the recovery was not owing to his prescription. This forward, feeble boy is now, in his 76th year, administering the government of the most powerful empire which the world has ever seen, and is as ready to quarrel with all the nations of the earth as he has been at any time during his long, contentious career.

A COLUMN OF INTERESTING VARIETIES.

Compasses on board of iron ships are subject to so great variations as to render them unreliable guides in navigation. The British Association for the Advancement of Science are making extensive investigations in this matter, and it seems that the mere rolling of the ship sometimes varies the compass to the amount of 24° ; but if the ship is built with her head to the south-east, the rolling effects the compasses very little if any..... The motion of the sun and solar system through space toward the constellation, Hercules, is positively known, but the line and velocity of this motion have not yet been ascertained; some observations, however, indicate that the motion may be in an orbit about a point in the vicinity of the Pleiades, and that it will require 18,200,000 years to accomplish one revolution..... Nearly 30 years ago an engine was run in England 32 miles an hour over a common turnpike road..... The vibrations communicated to the air by the human voice are occasionally sufficient to break glass vessels..... When the Croton water was cut off from a large part of this city, Oct. 21st, in consequence of the busting of a pipe, some of the newspaper-offices paid a dollar per barrel for water to run their engines..... Captain Denham sounded in the South Atlantic, between Rio de Janeiro and the Cape of Good Hope, 7,706 fathoms, or nearly 7.7 geographical miles. The appearance of spots upon the sun, with which appearance terrestrial magnetism is so intimately connected, increases and decreases in regular periods of 11 years and 40 days..... Persons sailing in balloons hear the echo of their voices returned from the earth, and, by the time that elapses between the call and the echo, form a rough estimate of their altitude..... The first steamship which made the voyage, under steam throughout, across the Atlantic, was the *Royal William* in 1833. This vessel was of 180 horse power and 1,000 tons burthen, and was built at a place called Three Rivers, on the St. Lawrence, in Canada. The voyage was made from Pictou, Nova Scotia, to Cowes, Isle of Wight..... The heat produced in the body of a healthy man in the course of 24 hours, if it could be applied, would be sufficient to raise about 7,000 tons to the height of one foot..... It is stated that 10,000,000 of hooped skirts are manufactured in this city per year. However, the demand is more than 2,000 per day, and still cannot execute their orders. In the name of lost pins where can such a world of emptiness go?..... The presence of cotton in flannel may be detected by boiling a fragment or sample of it in a solution of potash. The flannel will be converted into soap, whereas the cotton will be but little altered, and may be collected and weighed..... Eight millions of bottles are annually made at a manufactory of bottles at Folembay, France. It is the largest manufactory of the kind in the world..... Mr. Tite has estimated that a work like the Great Pyramid could not now be constructed, with all the aids of modern science, for less than £30,000,000..... It is calculated that in all Europe the male population would, judging from the births, surpass the female by 4,000,000, if this excess were not daily counteracted by the numerous accidents to which the males are exposed, and which materially diminish their numbers..... There are in Salem, Ala., 14 artesian wells, which have an average depth of about 400 feet..... Insurance on ships was first practiced in the reign of Cæsar in the year 45. It was a general custom in Europe in 1194. Insurance offices were first established in London, in 1667..... Books of astronomy and geometry were destroyed, as infected with magic, in England, under the reign of Edward VI. in the year 1552..... Banks were first established by Lombard Jews in Italy. The name is derived from banco (bench), benches being erected in the market places for the exchange of money &c. The first public bank was at Venice, about 1550. The bank of England was established in 1693. In 1699 its notes were at 20 per cent discount..... Book-keeping was first introduced into England from Italy by Peele in 1556. It was derived from a system of algebra, published at Venice, by Burgo..... Notaries public were first appointed by the fathers of the Christian church, to collect the acts and memoirs of the martyrs in the first century..... The administration of the oath in civil cases is of high antiquity. See Exodus, xxii., 10. Swearing on the Gospels was first used in 528. The oath was first administered in judicial proceedings in England by the Saxons in 600. The words, "So help me God, and all saints," concluded an oath till the year 1550.