English and American Railroads.

MESSRS EDITORS.—Number 30 of your paper contains a letter from A. J. Downing, on English Railways. He gives us the fact that they make a great deal less noise than we do, but does not tell us why. I was delighted to see the article, and was in hopes he would go deeper into the subject, but, like many others, he neglects the essential part, *i. e.*, working details. I hope some Americans, conversant with railways, will, while on a visit to the World's Fair, take such notes of the superior management of English railways as shall produce a much-needed change in that of our own.

Although a native of New York, I served my apprenticeship on English built and managed railroads, in France, and have worked and rode on railroads in England, and can, therefore, speak from positive knowledge and experience.

In England the railroad is enclosed properly by the Company, and all persons other than those employed upon it, are prosecuted for trespass if found upon the Company's premises, except as passengers, and in that case they are not admitted upon the platform of the station until the train has arrived. All common roads are carried over or under the railroad, if possible, and if crossed on the level of the rails, then gates, with watchmen, are provided, and guards are stationed every mile or two on the line to keep the track clear and give notice of danger to an approaching train; these men are generally native citizens, and their salary is sufficient to support them. Thus you perceive the necessity of ringing bells and blowing whistles is done away with, and the engine drivers are relieved from that responsibility and consequent anxiety and fear of running over human beings and cattle, as well as teams and trains.

In this country the railroad is as much a thoroughfare for foot passengers as the common roads, because it is perfectly open, in every sense, to the public; the station houses are used as public property and rendezvous for loafers; and when a train approaches a station, it is generally through a crowd of men and horses, and in order to get to the platform without harm, it is necessary to make all the discord possible to frighten the one and the other off the track; and if, perchance, any one gets hurt, an investigation is established at once to see if the bell was rung, the whistle blown, etc. etc , and all means tried to lay the blame on the engineer, if possible.

The fences that line the road are built by the farmers through whoseland the road passes, and consequently there is no regularity of form or material, and in many cases no fence at all, or a mere apology for one. All road crossings are on a level with the rails, if possible, to avoid the expense of bridging. No gates or guards are placed at these crossings—merely a pit dug on each side of the common road, to deter cattle frompassing on the length of the road, a very ineffectual barrier,—and nothing to prevent them or a team from remaining or being on the crossing at the passing of a train. A small bell is placed upon the engine, to be rung on approaching these crossings, from within eighty rods, under a penalty for the neglect of the duty. It is the habit of the owners of cattle in the Eastern States to turn them out on the roads to feed, and then they find their way upon the railroad track, where the grass is more abundant than on the common roads. Here they are often killed by the trains passing, and it happens not unfrequently that they throw the train off the track, and cause much harm to life and property. On the New York and New Haven road there are 14 stations and 105 road level crossings; you may therefore judge how the engineer's time is occupied, and if he is altogether to blame if accidents do occur. The bell to be rung in all, exclusive of stations, 8,400 rods, in going 74 miles. The danger of the single track, however, exceeds all the rest put together. M. C.

New Haven, Conn., April 13.

[We are glad that our correspondent has spoken out for the engineers, and directed attention in such a practical, sensible, and comprehensive manner to the evils of the railway system. The whole system requires reformation, and it would be well for all the various railroad companies to have a Convention and consult about the best mode of action to carry out a universally improved system of American Railroad management.

For the Scientific American.

Illuminated Clocks.

I had, the other night, occasion to stand several hours by the City Hall, and consequently watching the time. The illuminated face of the clock does not at all answer the purpose intended. The figures are far too small in surface, as well as the hands which can scarcely be seen from a short distance. In Paris (my birth place), there are several clocks of that description; some are common dials, in front of which is a strong light with a parabolic or segment of a spheric reflector; they answer very well, the figures being large and heavy. One in particular is on the same principle as that or the City Hall, with inside light, but the face is of an opposite kind—the ground is dark and the figures transparent.

Another, which, in my judgment, answers the best purpose, is in St. Paul's church, Rue Saint Antoine. There is a common dial to show the time by daylight; and just above it is a small aperture which is illuminated as soon as it becomes dark. This aperture is divided in two parts—the upper one being large enough only to contain one of the twelve numbers of the dial, indicating the hours; and the lower one, one of the numbers 5, 10, 15, 20, and so on, indicating the inutes. Those numbers indicating the hours and minutes are set on a separate circle, which is moving at the proper rate, and brings each of them to the light, the upper ones changing every hour, and the lower ones changing every five minutes, by a sudden motion scarcely appreciable to the eye. This disposition permits figures to be made of a large size, and as all the surrounding parts are completely dark, there is no confusion, and the lighted numbers show to the best advantage, being cut out of a metallic circular plate, moving in front of an unpolished glass. E. B.

New York, 1851.

Walnut Leaves in the Treatment of Disease.

Dr. Negrier, physician at Angiers, France, has published a statement of his success in the treatment of scrofulous disease, in different forms, by preparations of walnut leaves. He has tried the walnut leaves for ten years, and out of 56 patients, afflicted in different forms, 31 were completely cured, and there were only four who appeared to have obtained no advantage.

The infusions of the walnut tree leaves are made by cutting them and infusing about a good pinch between the thumb and fore-finger, in half a pint of boiling water, and then sweetening it with sugar. To a grown person M. Negrier prescribed from two to three teacupsfull of this daily. This medicine is a slightly aromatic bitter, its efficiency is nearly uniform in scrofulous disorders, and it is stated never to have caused any unpleasant effects. It augments the activity of circulation and digestion, and to the functions imparts much energy. It is supposed to act upon the lymphatic system, as under its influence the muscles become firm, and the skin acquires a ruddier hue. Dry leaves may be used throughout the winter, but a syrup made of the green leaves is more aromatic. A salve made of a strong extract of the leaves mixed along with clean lard, and a few drops of the oil of bergamot is most excellent for sores. A strong decoction of the leaves is excellent for washing them.

The salutary effects of this medicine do not appear on a sudden—no visible effect may be noticed for 20 days, but perseverence in it, says M. Negrier will certainly effect a cure.

As walnut-tree leaves are plenty and cheap enough in America, and as the extract of them is in no way dangerous nor unpleasant to use; and as scrofula cases are not uncommon, a trial of this simple medicine should be made. In directing attention to it, good results may be expected. It is our opinion that every country has within its own borders those medicines best suited to the wants of its inhabitants—to discover where and what those medicines are should engage the attention of our physicians.

Electricity, Metals and Water.

MESSRS. EDITORS—The simple announcement that water could be readily converted into gases suitable for purposes of light and heat, by mechanical electricity, had nothing in it to startle the scientific world; but the statement that came with it, that water was convertible wholly into the one gas or the other at the option of the experimenter, raised a clamor among chemists that nothing short of years of demonstration will silence.

As a matter of some interest and perhaps useful amusement to your readers, I propose to show by argument and demonstration in as short a space as possible, that the experiments in the "decomposition" of water from Humphrey Davy's day up to the present time, have all been based upon two false positions; first that the decomposition was due to the passage of the electric current through the the electrolytes: and second, that two separate poles or electrodes were required to enter the electrolyte, such an arrangement being necessary to effect the first mentioned requirement. That these propositions are othodox, I quote Prof. Brande. "When the electrodes of the voltaic battery are brought near to each other in certain liqiuds . . . . . so that the *current of electricity passes through them*, decomposition ensues; that is, certain elements are evolved in obedience to certain laws; the water, for instance, yields oxygen and hydrogen. . . . . . In these cases the ultimate and proximate elements appear at the electrodes; not indiscriminately, or indifferently, but oxygen and acids are develeped at the mode, *or surface at which the electricity enters the electrolyte*, and hydrogen and alkaline bases at the cathode, or surface at which the electric current leaves the body under decomposition.

Now if it is shown that water can be decomposed by voltaic or other electrical action *without* a current of electricity passing through —or without two poles or electrodes conveying said current into the electrolyte, then all the fine theories of Faraday, Brande, Silliman, and others, must be set aside. In proof that water can be so decomposed or resolved into the gaseous state, I submit the following demonstration :—Make two half circles, one of zinc and the other of platina; solder them together so as to form a circle, and then immerse it in water sufficiently acidulated to act on the zinc, when hydrogen will be rapidly evolved from the platina. Where are the two poles ? Or where is the current of electricity passing through the electrolyte ? In the making of hydrogen with zinc and acidulated water, we say the oxygen goes to the zinc and forms itc oxide; when water is decomposed by the voltaic battery with a platina electrode for the negative, and a copper rod for the positive poles, we say that the oxygen goes to the copper and forms its oxide; but this little experiment with the ring raises a question as to the truth of these say-sos. The zinc of the ring can only yield or form its relative quantity of oxide in proportion to the hydrogen liberated, and as the platina does not oxidize, what becomes of the atoms of oxygen which, according to the atomic theory, must be liberated at the same time the platina is evolving hydrogen ?

Without venturing to construct a theory, I will venture to remark, that it will yet be discovered that electricity combines with different metals so as to produce different results when acting on the same electrolyte, or, in other words, water may be wholly transformed into different sub-elements, by electricity in combination with different metals. Yours,

H. M. PAINE.

Working Sails by a Steam Engine.

A ship called the Medora, is about to sail from Glasgow, Scotland, for San Francisco, which has on board a small steam engine, intended to weigh the anchor, pump ship, hoist the topsails, and do any other hard hauling that may be required, in addition to hoisting out and in cargo. It is placed upon deck near the fore hat hway, and is covered by an erection about as large as a cook's galley.

American Association for the Advancement of Science.

CINCINNATI MEETING.—The next meeting of this Association will be held at Cincinnati, commencing on Monday, May 5th, inst., and will continue through the week. The Local Committee of Cincinnati have provided gratuitous entertainment for members attending, and will be in attendance at the Burnet House on Monday to direct members to the quarters assigned to them. The meetings are to be held at the College Hall, Walnut street. Thomas Rainey, Esq., is Secretary of the Cincinnati Session, and the Cincinnatians have made ample preparations for the entertainment of the *savans* belonging to this most respectable association. It is a source of no little pride to us in being able to point to so many eminent philosophers in our country, and to the hearty good feeling displayed by our own people, as is now exhibited by our friends in Cincinnati, in doing them honor. We hope that our scientific friends in the West will attend in solid column, as this is the first meeting of the Association in one of the Western States. We congratulate the people of Cincinnati in having such an able and efficient local Secretary as Mr. Rainey.

A Curiosity.

The Florida Sentinel says, "While Governor Brown was in Key West, he was presented by the Hon. A. Patterson with a miniature bust of Gen. Washington, found ten years ago, in the neighborhood of Mr. Patterson's premises, imbedded in the limestone which forms the island. The bust is of marble, and is evidently the work of a master. The expression is said to be identical with that of the famous statue of Washington at Richmond, allowed to be the best likeness in existence. The little bust is in a state of perfect preservation; all the delicate chiselling in the plaits of a ruffled shirt remaining as sharp and well-defined as ever, and the marble without discoloration. Across the shoulders is inscribed the word "Wasington"—a spelling which seems to indicate an Italian origin. In the same spot, two English guineas were found, the dates and inscription of which we did not learn. All were probably deposites by some freebooter of the olden time."

Magnificent Present.

We have just had the pleasure of seeing a a present sent by the King of Prussia to our countrymen, Prof. Morse, in acknowledgement of his success in perfecting his Electro-Magnetic Telegraph, which is pronounced by his Majesty's Commissioner, after comparison and expellment, to be the most efficient of any in the world for great distances. The present consists of a magnificent gold snuff box, of elaborate workmanship and design, enclosing the Prussian Gold Medal for Scientific Merit. The medal has on the face the medallion head of the King, Frederick William the IVth, surrounded by exquisitely executed emblems of religion, jurisprudence, medicine and the arts; on the reverse, Appollo drawn by four fiery steeds, in the charriot of the sun, traversing the zodiac, while from the head of the god the rays of light are darting abroad.—[N. Y. Observer.

Amoskeag Machine Shop.

The Manchester Mirror says there is now being manufactured at this shop, "machinery for several muslin de laine mills, in different parts of New England, one we believe in Providence, and another in Woonsocket, R. I.—a fact showing that the high stand taken by the goods at the Manchester muslin de laine mills in the market is beginning to excite considerable competition among manufacturers. The machinery for the Manchester new mill, (muslin de laine) is also manufactured here. They have also an order from Lowell, for seventy carpet looms. The company intend to turn out two locomotives per month, during the present year."

A farmer in the neighborhood of Paisley, Scotland, states that, by putting garlic in the bottom of his grain stacks, he has for some years past kept them free from rats and mice. The garlic is placed at a sufficient distance from the corn to prevent its imparting a flavor.

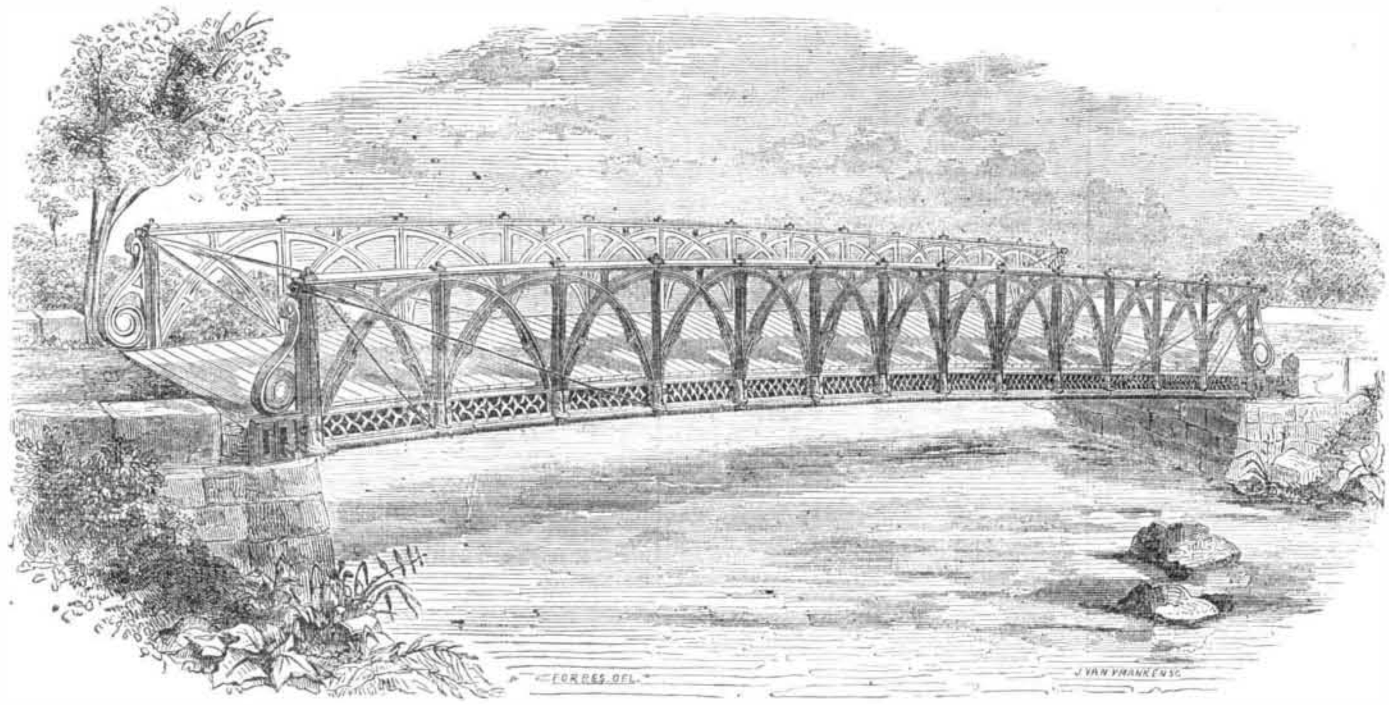
BENJAMIN SEVERSON'S IRON BRIDGE.

This bridge is the invention of Mr. Benjamin Severson, Schenectady, N. Y.

Fig. 1 is a perspective view of the bridge; it is cambered about 1 in 80 or 100, or a versed-sine of 1 to a chord of 80 or 100—the whole combined forming a trussed girder—a portion of a great circle. The sides or body of the trusses, when made of cast-iron, will be composed of pieces, or voussoirs, with their upper and lower parts corresponding with the circle; their ends radial and the whole, together with the cable underneath them, to have one common centre. Thus, the upper and lower parts of the voussoirs, and the tie beneath them, will form three concentric arcs. The ends and joints between the voussoirs being radii, the lower arc or tie, will be the shortest of three arcs; and it will be impossible to bring the three arcs down to a straight line, (they being held parallel by means of the radial rods,) without extending the tie or shortest arc to the length of the two rigid arcs above it; or else compressing the two arcs to the length of the tie. This arrangement will insure a tightening of the whole system under the pressure of a load, and prevent the tie from becoming slack under any depression of the structure; but it would be otherwise if the tie were not acompanied by a longer and rigid arc. There may be more ties added to a truss, and they may be placed in a straight position, provided that they do not come below the highest part of the cambered tie; but it is important to have at least one of the ties in each truss cambered, as they will in this situation more effectually prevent vertical vibration; and for canal bridges it is important, in many situations, to camber the bridge to make room for the passage of boats, and yet keep the ends of the bridge as low as may be. To guard still further against vertical vibration in railroad bridges, a small wire cable or wrought-iron bar may be substituted and used tensionally, for the longitudinal binding effect of the caps represented in Fig. 2.

The quarter-braces, made of wire cables or wrought-iron rods, starting from the ends of the upper arcs and connected at different points to the lower parts of the voussiors, add much to the strength of the structure. At the middle of the length of the truss, the positive and negative forces act horizontally on the abutments. The amount of vertical pressure at intermediate points, is in proportion to the distance of each point from the ends of the middle of the truss; and regarding these braces as resultants, acting in the direction of their length, an analysis of the forces will show that the amount of vertical support given by each brace, will also be in proportion

Figure 1.



to the amount of vertical pressure occurring at their several points of construction with the lower part of the truss. And these braces being connected to the end pieces, opposite the ends of the upper rigid arc, and by means of screws made to press firmly against the ends of the arc, the arcs being cambered, it is evident that any downward bending of the structure will produce a horizontal thrust of the ends of the arcs against the upper ends of these braces; thus regulating the intensity of their tension, by the amount of pressure of a load on the Bridge,—hence, the amount of vertical support, rendered by each brace at its upper end, from the end of the arc bearing against it; thus the tension of the braces will at all times act with an intensity in proportion to the pressure of a load on the bridge.

It will be observed that the action of these braces comes within the length of the truss, and does not depend on a tower outside of it, as is the case with suspension Bridges; and therefore the whole will be alike affected by a variation of temperature, or contraction and expansion, and as the braces are straight, they will not produce any undulating, vibratory motion, which is entirely incompatible with the safety of a rigid structure; but undulation will always occur where the catenarian form of braces or suspenders is used, whether attached to a tower or confined within the length of the structure.

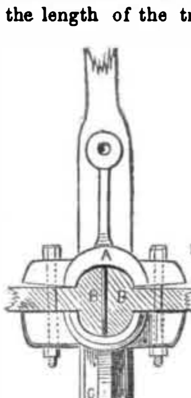
In No. 1, at F, is represented a portion of the floor as seen from above. A the upper rail, or arc. G G and H H the quarter-braces. E, end pieces. At B is half the bridge as seen from below. D D bottom of end pieces. C C main cables, or ties. The sway-braces and under side of girders between C C at B.

No. 2 represents the manner of joining the upper parts of two adjacent voussoirs, with a cap embracing circular raised parts of each; the cap, being held down by means of a screw and nut at the upper end of the radial rod, will bind the voussiors firmly together, and the joint between the three parts being circular, is simple and not liable to fracture, should any change occur in consequence of a slight settlement of the structure.

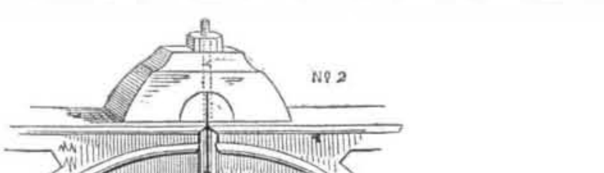
No. 3.—A is the end of the girder. B B lower part of voussoirs. C outside brackets made concave to correspond with the concave end of the girder, for the purpose of embracing convex parts of the voussoirs, B B. The whole to be firmly bound together by means of screw-bolts passing through the flanges of A and C. The circular form of joint is here also adopted to provide for any change that may occur in the bearing of the joints. There are two holes represented by dark spots in A and C through which to pass the lower ends of the radial rods. These rods are divided into two parts near the cap above. Their lower ends pass through the holes, and are secured by means of screws and nuts underneath the girder and bracket, A and C. Thus the radial rods form tensional braces to hold the upper arc or truss in line. When another roadway is added to the side of the first, its girders will take the place of the bracket, C Then the radial rods of the middle truss will pass through the ends of opposite girders.

No 4 is a portion of a wire cable, with a bow or staple-bolt, with screws and nuts by means of which the cable is drawn to a proper degree of tension.

This bridge is exceedingly beautiful in design, as well as being strong and durable in its construction. Bridges on this plan may be made of sufficient strength for railroads to



No 4.



No 2

No 3.

No 1.

an extent of 500 feet span. A bridge built on this plan, 72 feet span, weight 14½ tons, was tested before Peter Rowe, Esq., Mayor of Schenectady, and some other gentlemen, who have published a certificate respecting its qualities and behavior. Forty-two tons of iron were left on it for 30 hours, without any sign being given that this was anything like a test of its strength. Besides the trusses for sustaining loads on this bridge, the girders and abutting end pieces are an addition to the truss of 72 feet clean span, and they are made strong and heavy to form a protection to the bridge. The four ends weighs each 505 lbs. The 13 beams weigh each 590 lbs.—9,690 in all, which, when deducted from 14½ tons, the entire weight of the bridge, will bring the metal in the sustaining parts to less than 10 tons.

Messrs. Clute, Brothers, of the Schenectady Foundry and Machine Shop, make this bridge, and communications sent to them will meet with prompt attention, and what they undertake to do we know will be well done.

Improvement in Presses.

Mr. George B. Whiting, of Harvard, Worcester Co., Mass., has invented a very novel and ingenious press, for which he has taken measures to secure a patent. The press is constructed with three circular thick metal plates having spirally inclined ways upon their faces which are placed towards each other with metal balls between them. The middle plate has cog teeth upon its periphery extending nearly around it; into this is geared a worm screw on a shaft, which, by turning, causes the said plate to revolve, and the balls—(or rollers may be used) to travel down the spiral inclines. The top and bottom plates, not moving round, are acted upon by the balls running in the inclined faces, so as to push down the lower plate to act with great force as a platten in the compression of any material that may be placed between it and the bottom part of the frame.

This press is adapted to press cotton, tobacco, paper, books, and bales of any kind of merchandise.