

NEW YORK MECHANICS' INSTITUTE.

This Institute has lately removed to the large building at the junction of Division street and the Bowery, as represented in the engraving below. This spacious building, comprising four floors, each containing 3,500 square feet, has been taken on a lease of five years, and it is resolved to devote the whole of this large space, except so much as is required for the Library and Reading Room (which has been tastefully fitted up on a part of the first floor), to the purpose of a Polytechnic Institute like that in London. An opportunity will thus be afforded to Mechanics, Inventors, and Artists, at all times, to bring into public notice the products of their ingenuity and skill; and to the public not only to see collected in one place

specimens of rare and excellent workmanship in the various branches of art, but to inspect the actual operations of workmen in the more curious, new, and ornamental fabrications. A steam engine will be provided to drive such as require power, and for the proper display of the machinery on exhibition. Familiar lectures will be delivered as frequently as may be, on chemical, mechanical, and other scientific subjects, and illustrative of the objects and operations exhibited, and every effort will be made to render the exhibition worthy of this Institute, and of our city and country.

The Exhibition will be permanently open after this week, and we cordially commend it to the public. Those who desire to exhibit

machinery in this city, will find power and room there to do so, at all times.

There is nothing on this continent, except the Annual Fairs held in our large cities, in the least resembling this contemplated exhibition; and they, being held for a few weeks only in each year, cannot afford to the public or to inventors and artisans, the advantages which will thus be extended to them.

But along with the permanent Polytechnic Exhibition, we would sincerely recommend the instituting of a great Annual Exhibition or Fair, by the Institute, to be held about the latter part of August or the early part of September every year. A Fair, conducted in an impartial manner, and by such an intelligent

bend the truss, the forces will act horizontally at the middle of its length and vertically at the ends. That at intermediate points their moment or intensity will be proportional. That at the outer ends of the upper arc or rail, the horizontal forces will be zero—liable however to be moved or thrust outward horizontally in consequence of the increased horizontal pressure at the middle, produced by an increase of load, such as would bend the cambered truss downwards. Now, to prevent this horizontal outward movement at the ends of the upper arc, and the consequent racking of vousoirs, he uses the quarter braces, and by having their ends attached against the ends of said arcs, and at different points to the lower part of the truss, the degree of inclination of each brace will ensure an amount of vertical support, in proportion to the amount of vertical pressure occurring at their several points of connection at their lower ends. Whatever amount of vertical pressure is intercepted by these braces, will be conveyed through their length without further intermingling with the truss, and lodged at their upper ends, directly over the abutments, thence downwards. And at the same time that these braces meet and dispose of the requirements of the unequal vertical pressure, they will equalize the horizontal forces in the upper arcs, changing their ends from zero, to a pressure if not quite equal to that of the middle. And yet the original direction of the forces, to the extent they are left to act on each part, will not be changed, though their intensity will be equalized.

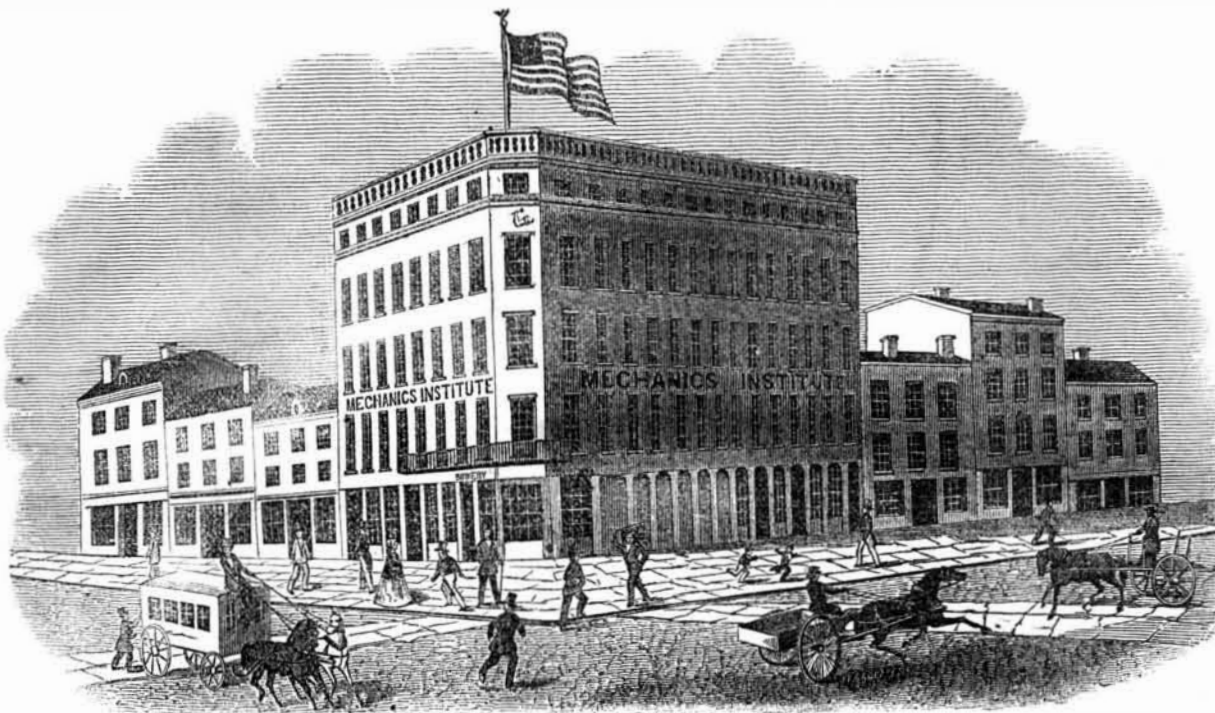
It has been supposed by many that the science of Bridge Building was perfect, that nothing new could be elicited, that all the resources of mechanical philosophy had been expended, and every pressure and thrust to sustain a bridge was well known, but we see now many new ideas advanced and we have no doubt but they are correct ones. The innumerable quantity of bridges which have been constructed on our railroads have incited the genius and directed the attention of observing and skillful men to every point at issue and not at issue in Bridge Building. Mr. Herman Haupt, of Penn., in his late able work on Bridges, advances some excellent ideas from page 63 to 170, and he distinctly points out a vertical strain, the very thing which is provided against by the counter braces in Severson's bridge.

Plank Roads in Missouri.

The St. Louis Intelligencer says:—A belief in the importance and value of plank road seems to be fast gaining ground, and already we find several about being commenced in our State. Among others, we note the Ste. Genevieve, Iron Mountain, and Pilot Knob plank road. This company have secured the service of Mr. Kirkwood, the Chief Engineer of the Pacific Railroad Company, under whose directions a reconnaissance of the country has just been made, and the instrumental survey about being commenced. It is the intention to push this work to completion as fast as possible, and the contract is to be made in July next. The capital stock has been subscribed. We understand the report of the reconnaissance is very favorable, and that the practicability and value of the proposed road is undoubted. The distance of Ste. Genevieve to the Iron Mountain is about 45 miles, with a branch of nine miles to the Pilot Knob, the route of the road passing through a fine agricultural country, where there is an abundance of oak and pine timber of good quality.

We believe the company purpose building branches to the lead mines in the neighborhood of Frederickton, and also to Potosi. Farmington lies on the main route.

A rare literary curiosity is noticed by the Philadelphia North American as being in the possession of Mr. E. Waterman, of that city. It is a vellum volume done in the year 1200, long before the art of printing was discovered, and the type-like clearness, regularity and compactness of the lettering, as well as the exquisite delicacy and beauty of the ornamental writing in colors, which illuminates every page of the book, constitute it one of the most remarkable relics that have descended to us from the times anterior to types and printers.



examining corps as can be furnished by the many able mechanics belonging to the Institute. is demanded of the city of New York, to expiate the many wrongs she has done to exhibitors, who have come here from a distance to other Fairs, and to show to the whole country that we have the clear ringing metal of worth among our celebrated engineering community—many of whom belong to the Mechanics' Institute. In order to avoid the errors into which other Fair-holding institutions have fallen, let us give a few words of advice, as we have paid particular attention to such matters, and have heard (as we always do hear) the complaints of those who have been wronged and dealt with in a partial manner.

1st. The Mechanics' Institute should not look to mere money-making for the purpose of supporting a few favored men, as its first object. The payment of the expenses—such as fair salaries for the permanent offices, is necessary, but no more. Many institutions become mere hives of drones, being managed by a few very incompetent men, so far as scientific and mechanical qualifications are concerned.

2nd. The examining corps must be able and impartial men; they must not say to one man "pay for the gold and you will have a gold medal next year; this year we have given one to your neighbor, because we gave him only a diploma last year, and he has paid for the metal."

3rd. The Institute should conduct its Fairs without respect to persons—not forbidding one man to exhibit one thing with some quack excuse, and allowing another man to exhibit as much quackery as he pleases.

4th. To do their duty without fear. They cannot expect to please all, and we would say, "do not try it by subterfuge and favor."

5th. Let all the actions of the Institute be above board, upright in principle, downright in action.

The City of New York can support one of the best Mechanics' Institutes in the world. The Institute, about which we are now speaking, has made a grand move in the right di-

rection; we like to see it, and as long as it is conducted well we will heartily advocate the good cause. We have occupied, and will always occupy, the position of freedom from partial influences, so as to be independent of all parties and cliques, and thereby untrammelled by any considerations but truth and right. When we see wrong done, it makes no matter what the Institute may be, we will speak out as we always have done. We like the plan of the Mechanics' Institute, it is a good one,—let it be carried out perseveringly and impartially, and great good will result from it. Let our mechanics support it with heart and hand; let them consider their honor at stake in doing so. No city in the world presents so many advantages as this for conducting such an institution. Its officers are not retired generals, nor do such titles afford certificates of promotion to judge of the merits of works of art and engineering. Many of our most able engineers are members of it, and it is to be hoped that all will become so.

The Institute occupies four large rooms; on the first floor above the stores are the Library and Reading Rooms, and there is to be a fountain for hydraulic machines, &c. On the second floor, steam engines, machinery, and working models will be exhibited. On the third is the Lecture Room, where machinery, if necessary, will be exhibited; the fourth floor will be devoted to classes in modelling, and the exhibition of less finished articles.

We would state that there is a most excellent school connected with the Institute, in which the children of the members receive a good education on reasonable terms. We have, upon a number of occasions, spoken well of the object of this Institute, and within the past three years have happily witnessed its exit from the cellar in the City Hall to its present large and respectable rooms. If five thousand of our young mechanics would walk up and put down \$3 each, before the Fourth of July, they would become members, and thus render to themselves the privilege of the use of a large library. They would afterwards be able to keep Independence Day with a clear conscience.

More about Severson's Bridge.

Two weeks ago we published an illustrated description of the iron Bridge invented by Mr. Benjamin Severson, of Schenectady, N. Y. As there are some principles mentioned in Haupt's late work on Bridge Building, as new and which attracted Mr. Severson's attention some years ago, and are embraced in his bridge, we publish the following about the quarter braces and refer our readers to the engraving to make a re-examination.

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 vousoirs, add much to the strength of the structure. At the middle of the length of the truss, the positive and negative forces act horizontally, and at the ends act vertically on the abutments. The amount of vertical pressure at intermediate points, is in proportion to the distance of each point from the ends or 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 to the amount of vertical support at their several points of connection 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 lower end, will be governed by the amount of thrust or pressure received 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.

In the construction of his iron bridge, Mr. Severson has assumed that in the truss without the quarter braces, when the load does not