Scientific American.

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 partof 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, Institute, and of our city and country. at all times, to bring into public notice the

in the various branches of art, but to inspect room there to do so, at all times. 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

specimens of rare and excellent workmanship | machinery in this city, will find power and 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

The Exhibition will be permanently open latter part of August or the early part of September every year. A Fair, conducted in an products of their ingenuity and skill; and to after this week, and we cordially commend it the public not only to see collected in one place to the public. Those who desire to exhibit impartial manner, and by such an intelligent



many able mechanicians belonging to the Into explain 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 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 be- is to be hoped that all will become so. come 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 medal next year; this year we have given

examining corps as can be furnished by the rection ; we like to see it, and as long as it is conducted well we will heartily advocate the stitute. is demanded of the city of New York, 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 relook to mere money-making for the purpose of tired 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

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 "pay for the gold and you will have a gold third is the Lecture Room, where machinery, if necessary, will be exhibited ; the fourth one to your neighbor, because we gave him floor will be devoted to classes in modelling, only a diploma last year, and he has paid for and the exhibition of less finished articles.

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 te 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 voussoirs, 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 analy sis of the forces will show that the amount of vertical support given by each brace, will also be in proportion to the amount ofvertical sup port 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 the ends of the arc, the arcs being cambered, evident that

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 voussiors, 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 vertitical 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 zere, 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 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 reconnoissance 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 reconnoissance 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 counmeans of screws made to press firmly against try, where there is an abundance of oak and pine timber of good quality.

We believe the company purpose building

- 11	the metal."	we would state that there is a most excel-	To is conditione that any downward bonding of		
	3rd. The Institute should conduct its Fairs	lent school connected with the Institute, in	the structure will produce a horizontal thrust	branches to the lead mines in the neighborhood	
	without respect to persons-not forbidding one	which the children of the members receive a	of the ends of the arcs against the upper ends	of Frederickton, and also to Potosi. Farming-	
	man to exhibit one thing with some quack ex-	good education on reasonable terms. We	of these braces; thus regulating the intensity	ton lies on the main route.	
	cuse, and allowing another man to exhibit as	have, upon a number of occasions, spoken	of their tension, by the amount of pressure of a	A rare literary curiosity is noticed by the	
	much quackery as he pleases.	well of the object of this Institute, and with-	load on the bridge,-hence, the amount of	Philadelphia North American as being in the	
	4th. To do their duty without fear. They	in the past three years have happily witnessed	vertical support, rendered by each brace at its	possession of Mr. E. Waterman, of that city.	
	cannot expect to please all, and we would say,	its exit from the cellar in the City Hall to its	lower end, will be governed by the amount of	It is a vellum volume done in the year 1200,	
	" do not try it by subterfuge and favor.	present large and respectable rooms. If five	thrust or pressure received at its upper end,	long before the art of printing was discovered,	
	5th. Let all the actions of the Institute be	thousand of our young mechanics would walk	from the end of the arc bearing against it;	and the type-like clearness, regularity and com-	
	above board, upright in principle, downright	up and put down \$3 each, before the Fourth	thus the tension of the braces will at all times	pactness of the lettering, as well as the exqui-	
	in action.	of July, they would become members, and thus	act with an intensity in proportion to the	site delicacy and beauty of the ornamental	
	The City of New York can support one of	render to themselves the privilege of the use of	pressure of a load on the bridge.	writing in colors, which illuminates every	
1	the best Mechanics' Institutes in the world.	a large library. They would afterwards be	In the construction of his iron bridge, Mr.	page of the book, constitute it one of the most	
4	The Institute, about which we are now speak.	able to keep Independence Day with a clear	Severson has assumed that in the truss with-	remarkable relics that have descended to us	
L	🚡 ing, has made a grand move in the right di-	conscience.	out the quarter braces, when the load does not	from the times anterior to types and printers.	
9	<u>9-</u> 2			9-24	í.
ų				20919	Į.