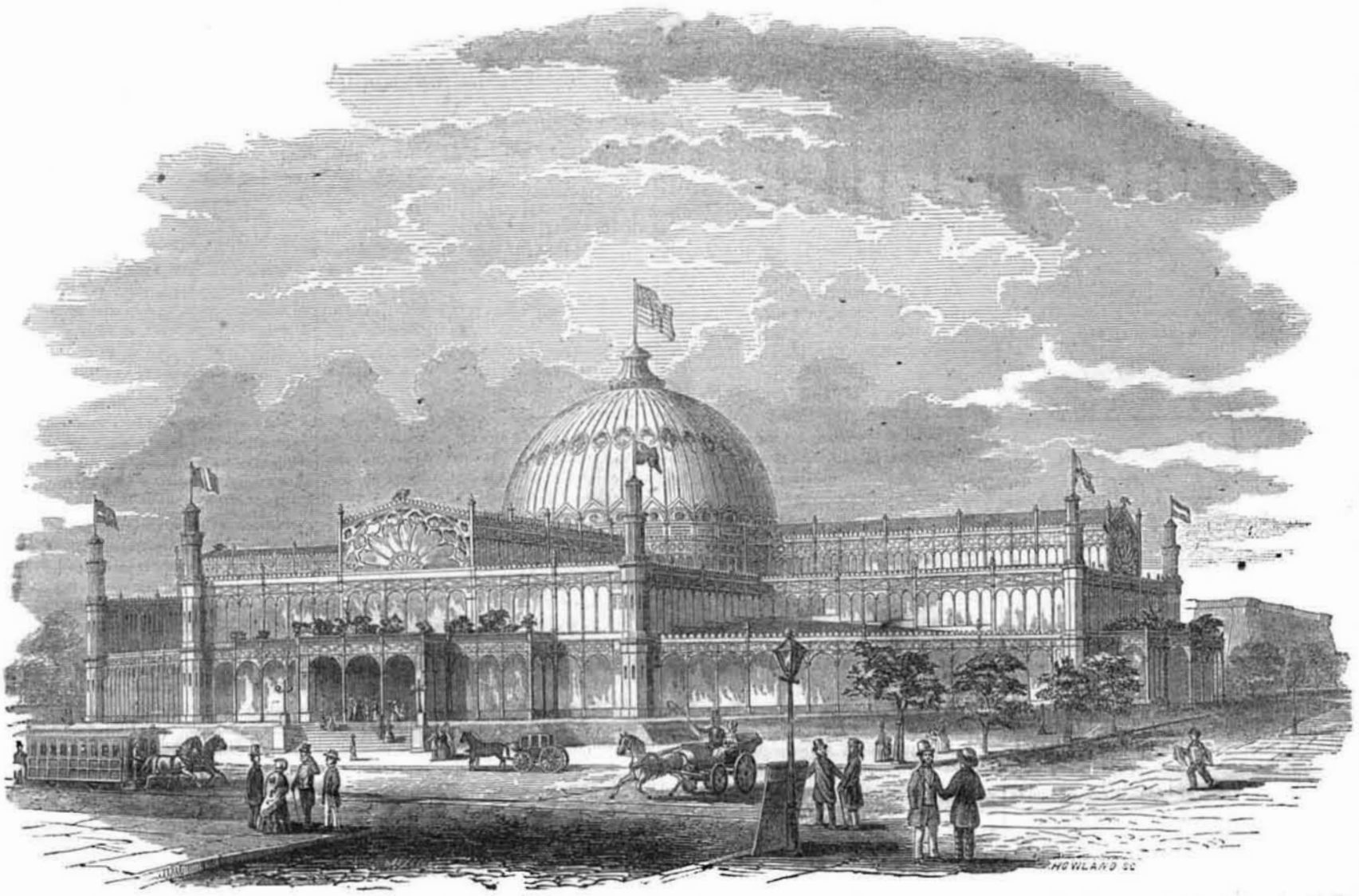
Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOLUME VIII.] NEW-YORK, OCTOBER 23, 1852. [NUMBER 6.

NEW YORK CRYSTAL PALACE FOR THE EXHIBITION OF INDUSTRIAL PRODUCTS.



At great expense this beautiful view of the New York Crystal Palace has been drawn and engraved expressly for the Scientific American. Among the many designs exhibited to the "Association for the Exhibition of Industry," that of Messrs. Carstensen & Gildmeister, of this city, was accepted, and it is here presented to our readers. The outside form of the building is that of a Greek cross.

Each diameter of the cross will be 365 feet 5 inches long. There will be three similar entrances—one on the Sixth avenue, one on Fortieth, and one on Forty-second street.—Each entrance will be 47 feet wide, and that on the Sixth avenue will be approached by a flight of eight steps. Each arm of the cross is, on the ground plan, 149 feet broad, this is divided into a central nave and two aisles, one on each side—the nave 41 feet wide—each aisle 54 feet wide. On each front is a large semicircular fan-light 41 feet wide and 21 feet high. The nave or central portion is 67 feet high, and is of an arch 41 feet in diameter. There are to be two arched naves crossing one another at right angles. The exterior width of the ridgeway of the nave is 71 feet. The central dome is 100 feet in diameter—68 feet inside from the floor to the spring of the arch, and 118 feet to the crown; and on the outside, with the lantern, 149 feet. At each angle is an octagonal tower, eight feet in diameter, and 75 feet high. Each aisle is covered by a gallery of its own width, 24 feet from the floor.

The number of the columns on the ground floor will be 190, all hollow and of 8 inches diameter, and of different thicknesses from ½ to 1 inch. On the gallery floor there will be 122 columns, and the whole structure will be constructed of glass and iron.

This Palace is to be erected at Reservoir Square, in this city, a place granted to the Association at a nominal rent for the term of five years. It is situated about two miles from the City Hall, and persons will be enabled to reach it from the lower part of the city in half an hour.

The building will be octagonal, the double cross being the galleries. With the three public entrances there will also be a private entrance. The ground floor is divided into four compartments separated from one another by the naves and transepts running at right angles with two tiers of galleries. The whole of the building is to be lighted by the large dome in the centre.

The building will be seen for a considerable distance, and it will command an extensive view of the city. It will be a larger building than any ever erected in our country, and will contain, on its ground floor, 111,000 square feet of space, and in its galleries, which are 54 feet wide, 62,000 square feet more, making a total area of 173,000 square feet for the purposes of exhibition. The interior view of this building will be larger and more expansive than any structure in our land, and those who have been astounded with the first view of a great assembly under a huge tent, will, when they first behold the inside of this structure next year, teeming with a living moving mass of congregated thousands "hold their breath for a time." There are larger buildings in the world, such as St. Peter's at Rome, and it is small in proportion to the London Crystal Palace, still it will be "a thing of beauty," and will attract thousands upon thousands to this city who never visited it before. It is now a subject of common conversation in the remote districts of this great and growing country, and already have young men and old men, too, begun to lay by a few shillings weekly or monthly that they may be enabled to come from the far prairie and backwoods to see the Crystal Palace in New York.

Measures have been adopted to obtain the exhibition of goods and articles from all parts of the world. The inhabitants of all nations have been invited to become exhibitors, and it will certainly be a matter of no small interest for the Egyptian, who boasts of his country as the cradle of civilization, to meet here and shake hands with his brother Yankee, who boasts of his country as the model of civilization—a country, too, which three hundred years ago was trod only by the foot of savage man, whose habitation was only the wigwam of branches or the cave in the cleft of the rock.

We understand that the castings have all been contracted for and given out, and the utmost energy is being displayed to have the building completed so as to be opened by the 3rd of May. Men are now busily engaged on the foundations; great activity, however, will have to be displayed to have it finished at the time promised; indeed, we believe it will not be done, for so many contractors will, in all likelihood, fulfill the old saying, "too many cooks spoil the soup." However, we hope they will all get their work done in time, and done well, but it is a very different thing to have the work done all by one large firm like Fox & Henderson, than to have it done by a number of independent companies. We being democratic, however, in our notions, like to see large contracts divided up, so as to give every one a share of the spoils; but here will we hold, we do not believe that any of the contractors will grow very fat on their profits. We expected that the plan of Mr. Bogardus, of this city, would have been selected, and the contract given to him exclusively. His inventive talents, and his great experience (in fact he is the only practical man in our country) in the construction of iron buildings; his superior patented mode of arching, bracing, and uniting the different parts together, pointed him out to us as "the man for the hour." The Committee of the Association thought differently from us, and we do not presume to know their business so well as they do themselves; but one thing we will say, and that as a prediction, the building will cost the company far more than what it would have been contracted for as a total, by "the American inventor of cast-iron buildings."

Since we are to have a World's Fair in New York next year, we now hope it will be an honor to our country, in every respect. We have not altered the views hitherto expressed, respecting the objects which led to the erection of this building and the holding of a World's Fair in this city. But we now hope that our countrymen of every art and trade are preparing themselves to exhibit machines and apparatus which will make us proud of their genius and artistic skill. We have seen it stated that England will do everything to decry our effort; such language exhibits a silly fear, in which there is not the least necessity for indulging. From time to time, as matters of interest *turn up*, we will report progress to our readers; we shall keep them posted up on all things new, and the Scientific American is determined to keep up its first and prominent position in making the best reports, and illustrating the newest and most interesting machines, &c.,

that will be displayed in this great American Crystal Palace. We have named this building the American Crystal Palace, not after the European fashion which gives that name to royal residences, and those which have been honored with royalty sleeping in them, but because it will be taken possession of by a whole army of old and young American kings and queens next year. We do not expect to see them carried to it in carriages drawn by cream colored Arabian horses, but in the royal cars of the Sixth avenue railroad which will take as many passengers as may choose to go, from Chambers street to the Palace, for only one five-cent piece each. We should all be glad if Queen Victoria would come over here to pay us a visit and see our "New York World's Fair;" she would meet with a really true and kind welcome: American gallantry would exhibit itself in manly respect and dignified courtesy. We are confident that she would go away heartily pleased with her American cousins, who believe her to be a good wife and mother, and a great deal better *man*, so far as good sense and the government of her people are concerned, than many men who have a considerable reputation for statesmanship.

We will furnish stereotype cuts of the above beautiful engraving for the low price of $10 each. This we do to remunerate ourselves in part for the great expense we have incurred in securing it in advance of all other publications.

MISCELLANEOUS.

Fair of the American Institute.

[Continued from page 34.]

According to our promise of last week, we have given, in the present number of the Scientific American, a more extended account of the various objects on exhibition at the Fair. For the better convenience of reference, these are classified under separate heads, so that our readers may be able to discern at a glance those subjects that are more particularly interesting to themselves.

RAILROADS.

Under this head are placed those inventions that have reference to locomotive travelling, and two divisions of it are particularly rich in new inventions, namely, that for the purpose of Ventilation, and that which we have assigned to Brakes.

Ventilation of Railroad Cars.—Here we have two leading principles by which most of the inventors appear to have been actuated—either of admitting the air by the top or else by the under-side of the car; we shall, however, give a description of each invention separately, and leave it to the Judges to decide to whom the premium is due—"*Palmam qui meruit ferat.*"

Mr. Paine was there, of course, with his ventilating apparatus, but as his plan has already been fully described and illustrated by us on page 244, Vol. 7, it will be unnecessary to say anything further upon the subject.

A. R. Church, of Dansville, Ohio, obtains his mode of ventilation by means of a large pipe placed on the top of the car with a funnel at the end to catch the wind. A small pipe connected with the above is carried round the outside of each window with an open groove in the centre; this latter, by giving a vent for the wind, causes a current of air that prevents the dust from blowing into the car, acting in fact as a counter-current.

In Daniel Flynn's arrangement, underneath the car is fixed a refrigerator filled with ice or water, which purifies the air above intended for ventilation, there being between the floor of the car and the refrigerator a false bottom. At the top of the refrigerator are two self-acting valves, one of which is closed when the other is open. By this means fresh air is supplied to the car, from underneath the flooring, through apertures furnished with registers to moderate the current at pleasure. The foul air is driven out by the windows and thus prevents the entrance of dust. In case the windows are shut, there is a series of self-acting valves above which answer the same purpose, and which can be severally closed by a handle inside, at the option of each passenger.

Mr. Jeffrey's invention consists in a long flexible tube, running the whole length of the train from the fire-box of the locomotive, with branch pipes let into the top of each car, the commencement of the pipe near the engineer being funnel-shaped, so that the air can easily rush in. There is one objection to this plan which struck us particularly, and for which we do not recollect to have seen any remedy: should the engine be pushing the train, instead of drawing it, the apparatus would of course be of no avail.

The plan of W. Atwood, of Waterbury, Ct., consists of a rectangular frame-work placed before the door of each car, of a larger size than the latter, and made, apparently, of textile india rubber. It will thus be seen that when two cars are coupled the india rubber framing of both, which is shaped like a bellows, closely approach each other, and prevent the admission of the dust, while the air can pass through.

Clinton Roosevelt has a plan which consists of a fan and bellows on the top of the car, one at each end, which are driven by bands connected to the wheels, the one for rapid and the other for slow motion. Another invention of the same party consists in obtaining the necessary ventilation by fixing at the ends of the car a frame-work of buck-skin leather, which is sufficiently porous to allow the air to pass through, and yet can exclude the dust. This latter point is almost as great a desideratum as the ventilator, for no one travelling much on railroads can fail to find the dust an intolerable nuisance.

J. C. Symmes, of West Troy, N. Y., presents a car with a gable-shaped roof, forming an air vessel at the top of the carriage; a rectangular funnel at one end, and a species of shutter-blind at the other, complete the arrangement.

As we are on the subject of ventilation, we may as well, in this place, make reference to Robinson's Ship Ventilator, which is also on exhibition, but which we do not consider valuable in every instance, especially where foul air has been permitted to accumulate in the holds of ships. For ordinary purposes it may, perhaps, be of use, but we do not think that it would be found effectual in all cases.

Railroad Brakes—The Brakes which we saw—and they are rather numerous—fail in one important particular, viz.—originality; they are nearly all similar in the main principle to the brake in common use. In fact they nearly all act on the system of forcing a segment of a ring of wood or iron against the periphery of the wheel, which, it is well known, is far from being *a new idea.* The system of levers, by which such a result is effected, is a mere secondary consideration, and combinations of them may be made *ad infinitum*, without entitling the contrivers to the honorable name of an inventor. We may be asked, "What then would you have?" We reply, "*Something of which nobody has hitherto thought,*"—and that is what we call an invention.

But to return to a description of the articles before us, something original we have in Jackson's long action brake, in which, discarding the idea of friction against the wheel, he applies the pressure against the rail by means of a long bar extending nearly the whole length between the axles of the car. This is raised or forced down by levers. There are objections to this plan, one of which is, that it might have a tendency towards throwing the cars off the rail.

Hand and Steam Brake—By T. Walker, of New York.—This invention consists in applying the brake blocks to each side of each wheel, thereby more effectually equalizing the strain on the axles and wheels. In order to be worked either by hand or steam, the brake is fitted with an apparatus by which each car can be stopped by hand without interfering with the action of the steam on the brakes, thus rendering the steam and hand-breaking power independent of each other.

Henry Olds, of New Haven, Ct., exhibits a brake, intended to exert against the wheel more or less pressure, as required, which is effected by forming the brake in the shape of the letter C, and suspending it from a joint, not exactly in the middle of the arc, so that more or less of the periphery of the wheel is subjected to the pressure of the brake as required. The patentee has connected with this brake a mode of ventilating cars, expecting the wheel to act as a fan in drawing off the air, whilst fresh air is admitted from the bottom, passing through a layer of sponge to deprive it of dust, &c.

A. A. Church, of Painesville, Ohio, effects the application of the brake by the operation of two men stationed in front of the engineer, who let fall a friction wheel on the track by means of a lever, and which winds up a chain connected by rods to the brake. The brake consists of slides which press upon the rail when it is required to stop the train.

Car Wheel—By H. Gardiner, of Schoharie, N. Y.—This is a good strong wheel, with wrought-iron spokes, but we observed nothing new about it.

Railroad Car Seat—By A. B. Buell, of Westmoreland, Oneida Co., N. Y.—(See page 305, Vol. 7). The nature of this improvement consists in attaching to the backs of the ordinary car seats outer sliding backs, which may be raised or lowered as required. By this means there is obtained a very compact car seat, with a back equal to a concaved high-backed chair, and it is so arranged that two persons sitting on the same seat, who may choose to have the backs at different elevations, can be accommodated to their heart's desire.

W. Warren, of Cincinnati, Ohio, exhibits two new seats, which, for convenience, change of form, and adaptation to different postures, are superior to anything that we have hitherto seen.

Guard Cars—By Booth & Ripley, of Troy, N. Y.—This is an elaborate contrivance to receive the first shock of anything on the road, and consists of a huge clumsy-looking iron car stationed in front of the train.

We also noticed two passenger cars of sheet-iron, which have the advantage of extreme lightness—one by Thomas E. Warren, of New York, illustrated and described on page 388, Vol. 6, Scientific American; the other by M. C. Butler, of New York.

The fearful accidents which occur from cars running off the track or the breaking of an axle, has caused several contrivances to prevent this danger. Wm. Gee, of 66 Gold st., N. Y., has a pencil sketch of an invention of this kind, and has affixed letters of reference with it, but has neglected to give the corresponding explanation; so far, however, as we can understand his drawing, he proposes to form the wheel with a recess of large diameter, into which he fits a strong circular plate, having a box working loosely on the axle, and enabling it to be clamped to the framing; a strong plate is screwed against the inner side of the wheel to keep the whole secure. Should the axle break it is evident that the wheel will be retained in its place.

A. L. Finch, of New Haven, Conn., has a plan with a similar intention; he encloses the wheel in a sort of frame, which, of course, would be similarly effectual.

Station Indicator.—By M. F. Potter, of Charlemonnt, Massachusetts.—The owner of this invention is not so ambitious in his aspirations, he aims only at benevolently preventing unlucky or heedless passengers from being carried beyond their destination. For this purpose he has a species of scale inscribed with the names of the various stations on the road, and a variety of other information. This scale is suspended near the roof of the car, and when a station is approached, the name on the scale is brought forward; when the station is passed, the name is rolled up out of sight, and the next place brought under notice. The operation is effected by means of toothed wheels set in motion by the axle. We fear that the slip of the wheel is liable to deteriorate from its efficiency.

Engine and Car Truck—By Edwin Stanley.—This truck, in addition to the usual advantages, is also intended to act as a relief to axles and outside rails at curves, as well as a brake, which is thus effected:—the truck has independent bearings or springs and also a guarded lateral motion, allowing the flanges of the running wheels to only touch the outside rails.

Self-directing Railroad Cars—By Lander & Harding.—The principle embraced in this invention is, first, an independent motion to the opposite wheels, by means of separate axles; second, the bringing the axles into the line of the radii of the curve, thereby causing the wheels to follow the same on a curved or straight road.

Compound Car Axle—By P. G. Gardiner, of New York.—This appears to be an ingenious invention to overcome the difficulty which occurs from the wheels being keyed on to the axle. It is obvious that when traversing a curve, the wheel on the rails which has the smallest radius requires to move at a less velocity than the other. The impossibility of doing this is a fruitful source of accidents, but is obviated by this plan. An axle box, somewhat similar to that used for wagons, is placed on the axle, and on this box the wheel is secured. The axle box is held in its place by a V-shaped collar, a rim of metal to correspond with the inner edge of the V is screwed on to the box, which can thus be made to act as a species of friction clutch. In ordinary cases the axle itself will revolve, but should a sudden strain occur in a curve, the axle box will work loose, and the wheel thus be enabled to acquire the diminished velocity required.

Self-adjusting Railroad Switch—By R. H. Middleton, of New York.—The right or the left wheel of the car, according to which line of rails it is upon, on approaching the switch, acts upon a short lever, so arranged that the wheel, in passing presses it down, and thus the switch is adjusted to receive the train.

STEAM MACHINERY.

The steam engine and its numerous appendages attract the lively curiosity of visitors, whilst the boilers give a practical illustration of the mode of setting recommended by Dr. Griffin.

Stillman's Gauges are attached, as they usually are, to all well-managed boilers, and we noticed a neatly-made counter fixed to the engine, which was rapidly numbering its quick strokes. We are glad to see this excellent little invention of James Watt brought forward for the use of land engines, and regret the omission of an Indicator. Sloan & Leggatt's Hydrostat is attached to the Boiler, and gives ample proof of its efficiency in regulating the supply of feed-water.

Mr. Morris, of Duane street, N. Y., has a model of an engine with two oscillating cylinders inclined at an angle to each other. The idea is somewhat similar to that of the original engines of the Great Britain, designed by Brunel, with the exception that the latter were fixed.

Boardman's Boiler—The inventor proposes to supplant the common locomotive boiler by his plan, but it seems to us that the vertical position of the tubes is a great drawback. There is doubtless an enormous sacrifice of fuel in locomotive boilers, but railway companies are willing to suffer that loss to attain a high rate of speed. If the tubes according to the model, are to be fixed vertically, we doubt their superiority for a rapid generation of steam. For stationary purposes, where economy of fuel is an important object, this may probably be a desideratum.

E. Gould, of Newark, N. J., D. & M. Saunders, of Hopkinton, R. I., and others, exhibit some excellent machinists' tools.

Baldwin & Cunningham, of Nashua, N. H., exhibit an excellent machine for boring locomotive cylinders without the necessity of removing the cylinder from its place. All locomotive managers will be aware of the utility of this invention.

Ingersoll exhibits a useful Drill Brace, in the mode of working somewhat similar to the ratchet brace, but with the advantage of moving the drill during the back stroke.

Steam Paddle—By Carpenter, of Flushing, L. I.—The float blades are here made to feather by rods which slide upon an elliptical frame. The main objection to all these plans of adjustable paddles, is the liability to get out of repair, otherwise they are far superior to the common paddle.

Rotary Pendulum Governor—By J. Tremper, of Buffalo, N. Y.—We noticed this governor revolving at a tremendous rate, but the fans which the maker has attached to the cylinder, make it rather embarrassing to discern. It is a modification of the ordinary governor, but must evidently be much cheaper;