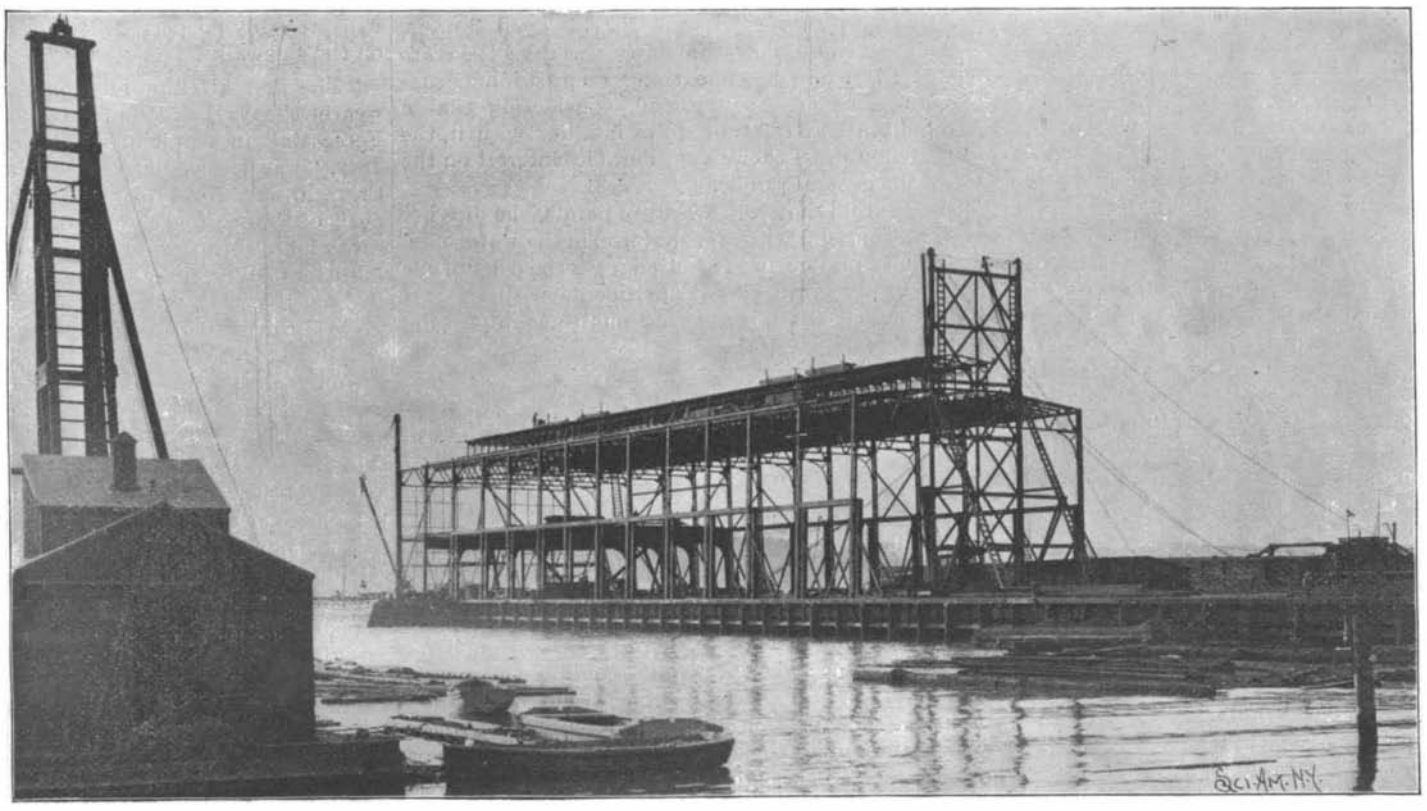
COLLAPSE OF THE WILSON LINE PIER SHED AT NEW YORK.

Brief reference was made in our last issue to the remarkable wreck of a large pier shed which is in course of erection for the Wilson Line of steamships in this city. The shed is one of a set of five that are being constructed on the New York side of the Hudson River, a little to the north of the present Christopher Street ferry. Two of these are for the White Star Line, two are for the Cunard Line, and the fifth for the Wilson Line of steamships. One of the sheds for the White Star Line has been completed, and at the time of the accident the framework for the Wilson shed and for one of the Cunard sheds was partially erected but not inclosed. Both structures were advanced to about the stage shown in the accompanying illustration of the Cunard pier and building.



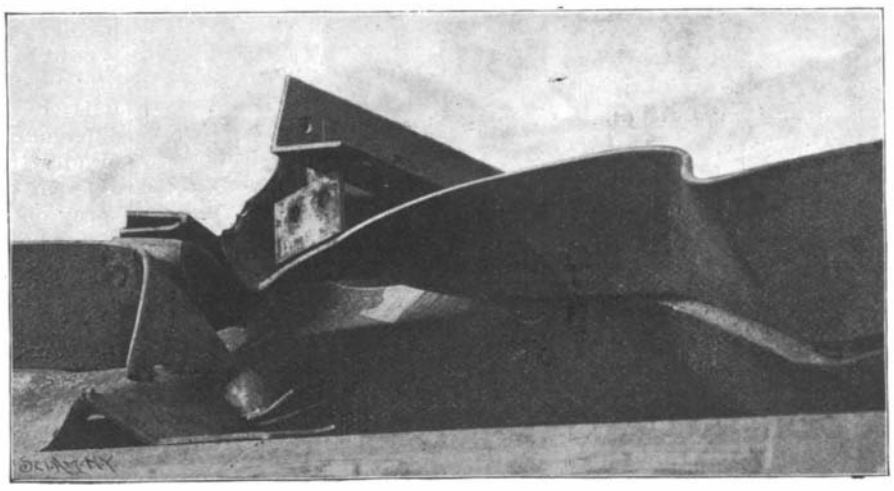
CUNARD PIER SHED IN COURSE OF ERECTION.
(This building, adjoining the Wilson Line Shed, survived the storm.)

The storm which wrecked the Wilson Line building was in one respect the most severe on record. the velocity of the wind reaching a maximum of 72 miles an hour, which lasted for fully 5 minutes. This has been exceeded in the history of the city, but the maximum intensity of the storms has never lasted for so long a period. A remarkable feature about the storm was the total absence of any premonitory warning further than a gathering of heavy clouds in the southwest. The full strength of the blast struck the building diagonally, the direction of the pier being approximately east and west, and the whole of the iron work, including fourteen bents, with their heavy transverse floor girders and roof trusses, fell over to the east, each bent pivoting on its foundation plate and falling upon the neighboring bent to the east.

The cause of the disaster is to be found in the extraordinary force of the wind, coupled with the small amount of longitudinal wind-bracing throughout the structure. This insufficiency (we had almost said entire absence) of longitudinal wind-bracing is not peculiar to this pier shed, which is a structure of the first class, is of the standard type of construction used in the large pier sheds of this port, and is being built by the firm which has put up all the notable buildings of the kind erected in New York during the past few years. We venture to say that the same absence of longitudinal bracing will be found to characterize in greater or less degree many of the pier sheds, warehouses, and train sheds throughout the country.

By the courtesy of Chief Engineer J. A. Bensel, of the Dock Board, and W. S. White, the resident engineer in charge of the work, we were enabled to inspect the work and take the accompanying photographs of the wreck. The plans of the building were prepared by the engineers of the Wilson Line and were passed by the Dock Board, the matter of detailed inspection during erection being arranged between the Wilson Line and the contractors. The building was erected upon a pile pier, and, when completed, will cover an area 120 feet wide by about 730 feet long.

The structure was two stories in height, the height from the first or pier floor to the second floor being 25 feet and the height from the second floor to the under side of the roof trusses being 16½ feet. The total height from the pier to the roof of the lantern was 63 feet. The walls consisted of built-up columns, spaced with an average distance of 22½ feet between centers, and tied together with two lines of horizontal struts of rectangular section, one at the second floor level and the second line at the top of the posts.

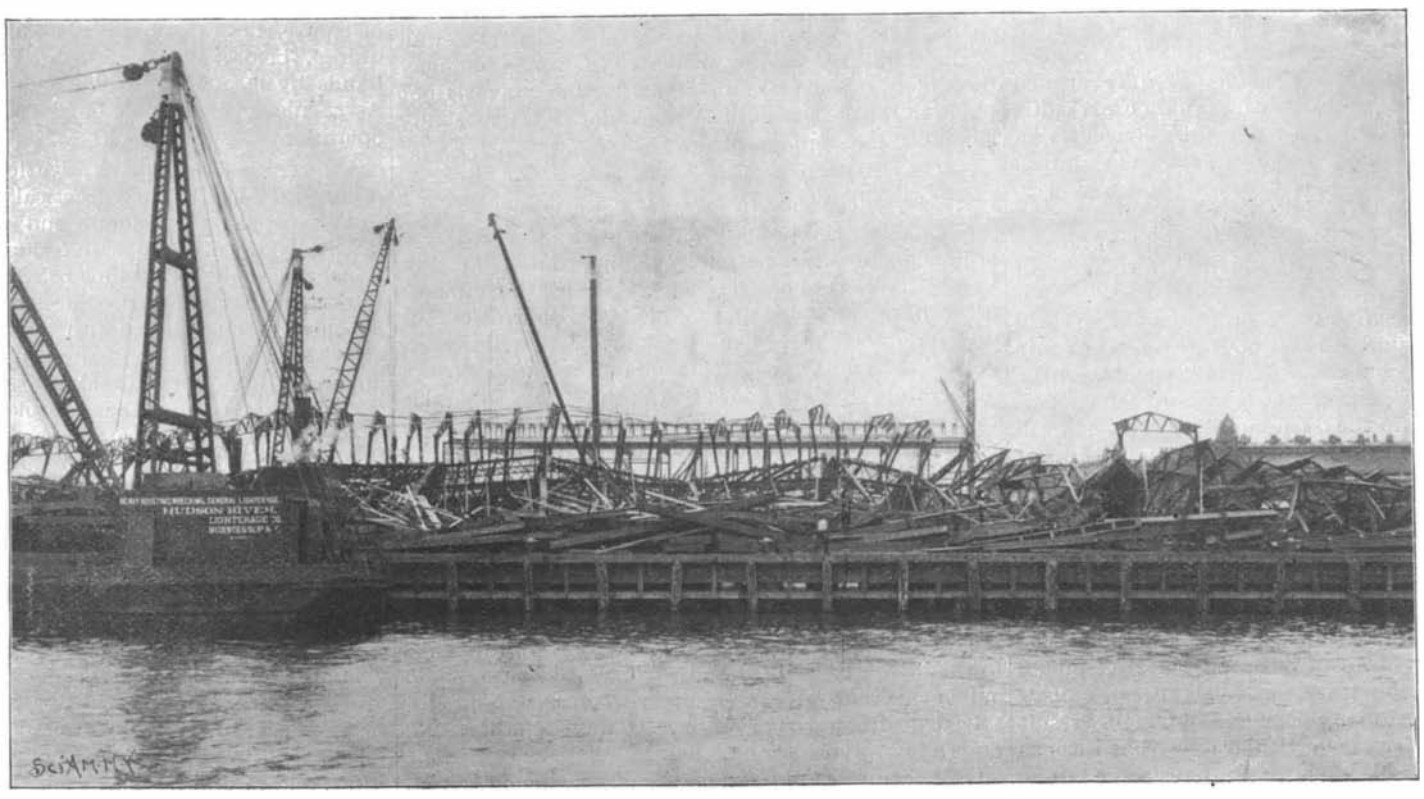


DETAIL VIEW SHOWING FRACTURE OF ONE OF THE POSTS IN PIER SHED.

The second floor was carried on transverse plate girders 4 feet deep, one at each bent, the girders being riveted to the posts and the connection being stiffened by plate knee braces. The roof, which was of 120 feet span, was carried on lattice trusses which were supported at each end upon and riveted to the posts, open lattice knee braces being riveted at the connection to both trusses and posts. At the center of each main truss was the framing of the lantern, consisting of two posts and a smaller lattice truss of 35 feet span, raised 10 feet above the hips of the main roof trusses.

The columns were tied together longitudinally by two lines of box struts extending between the bents. The upper line, 10 inches in depth, was riveted to the columns just below the roof trusses, and the lower line, 12 inches in depth, was riveted to the columns at the level of the top of the plate girders that carried the second floor. The roof trusses were also tied together by two lines of longitudinal lattice trusses located at the hips of the trusses, that is to say, in the plane of the side walls of the lantern.

Now, in respect of lateral wind bracing, the structure was well provided, the knees uniting the floor girders and the roof trusses to the columns and the riveting of these girders to the columns giving the necessary stability; but in respect of lateral bracing, especially during erection, when the wind was able to take hold of every individual truss and floor girder, the whole structure was altogether deficient. The only resistance presented by the metallic structure itself to the overturning of the fourteen bents that had been erected was the holding power of the rivets and angles by which the longitudinal struts were riveted to the columns. The nature of the attachment of the bases of the columns to the pier was such that they presented very little resistance to overturning. It consisted of four 1-inch lag-screws, which passed through holes in the corners of the base plate, and fastened it to the flooring of the pier. It is true that some attempt to stiffen the structure had been made by introducing temporary 6 by 6-inch timber struts between the bents, the struts bedding against chocks of wood spiked to the floor and



WRECK OF A STEAMSHIP PIER SHED AT NEW YORK CITY.

against the lattice work of the columns, and the westernmost bent was secured to the pier by two 1-inch wire rope guys; but, when the storm struck the building, the ropes broke and the chocks were either sheared off or the struts collapsed by buckling.

When a building of this kind has been sheathed, the longitudinal overturning moment is that due to the pressure on the end of the building, and it is resisted by every longitudinal riveted connection throughout the length of the structure. But, should a storm strike it before the sheathing is put on, the total overturning moment is that due to the action of the wind on the total area of every post, girder, and truss in the naked structure. The overturning moment in this case is far greater than it is on the completed building, and if the storm be of unusual severity, the building is in great danger of overturning and folding up, as in the case of the structure in question.

A study of the photograph, showing the fracture of one of the posts at its point of connection with the longitudinal waling members, shows how great was the wrenching effect at this point.

The fact that the Cunard Line shed did not fall is due either to the fact that it is only 60 feet wide, and presented not much over one-half the area to the storm that the fallen pier did, or that a gust of special violence struck the wrecked structure.

The accident, as a whole, emphasizes the necessity for providing ample longitudinal bracing in buildings of this character during erection, and, indeed, in all skeleton structures, whether they be low train or pier sheds or lofty office buildings.

Green Carnations.

Mr. S. W. Williams, of East Orange, N. J., having seen a quotation from The Gardener's Chronicle, regarding the staining of carnations, undertook some experiments to determine its correctness and kindly sends The Druggist's Circular the following report:

"Acid wool green B will answer the purpose. If the stalks of white carnations are allowed to stand for a few hours in a solution of this dye, the color is readily taken into the circulation, following the veining of the petals and producing a beautiful effect. Any depth of color from the faintest tint to a brilliant green may be obtained by varying the strength of the solution. A comparatively strong solution usually has the effect of giving a rich green border to the petals, with a more delicate tracing of the veining toward the center of the flower. Dilute solutions give a more natural effect. Naphthol green B acts slowly, but gives a very pretty tint.

"There are very likely many other green dyes which will answer the purpose, and perhaps better; but the writer tried malachite green, direct green, and a number of others with negative results. An 'acid' yellow worked with indigo carmine may be made to produce colors ranging through apple to the more yellow greens, while the same blue used in combination with the wool green should give bluish greens.

"The Circular certainly did its part fully in securing the statement of an expert in this line. It is easy to understand how his actual experiments were misleading. Of the many dyes tried by the writer, but about one in five was taken into the circulation of the plant. One theory to account for this is that 'basic' dyes may be intercepted by tannins or other incompatible principles in the stalk, whereas 'acid' colors may be allowed to pass on to the flower. As a number of 'acid' dyes failed, however, to enter the circulation, the writer would seek to offer no explanation without further study. It is strange also that, of several flowers of the same kind placed in the same solution, some appropriated the color much better than others. One theory for this is that a flower not fully opened would naturally draw up the solution more readily than another which had more completely matured. The writer's experiments, however, have not proved this to be necessarily so, nearly full blown flowers seeming to act about as well as any.

"As to the comparative lasting qualities of flowers thus treated, some seem even superior in this respect to those not dyed.

"Crocein scarlet, in rather dilute solution, will readily change a white Alaska or Harrison white into a beautiful pine carnation, much resembling the 'daybreak,' the veining of the perianth being, however, more marked in the dyed samples. This dye will pass four or five joints in the stem and color the flowers pink within an hour, acting far more rapidly than most of the other colors.

"Cyanole, extra, works satisfactorily where a blue tint is desired.

"While this question is outside the domain of pharmacy, to whom will the interested citizen more naturally go for information on the subject than to the pharmacist—the 'chemist to the people'? A bunch of artificially colored natural flowers, on the druggist's counter, will interest many persons and possibly result in numerous calls for the particular dyes that work so well. Anything of this kind that interests the public leads people to ask questions and to want material which will enable them to produce the same effects, and should afford a good and legitimate means of advertising.

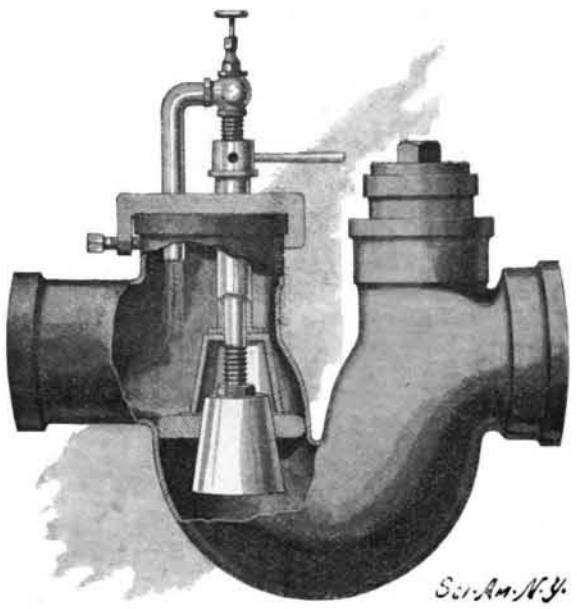
"An East Orange florist informed the writer that about seven years ago a Long Island man launched the green carnation on an unsuspecting public, and, while others were charging a dollar per hundred for carnations of natural color, this man was getting about two hundred per cent advance for his dyed flowers. When it was found how the thing was done the craze died out; but as the same thing seems to have appeared again on the scene, and, considering that a metropolitan florist is not quite familiar with it, the idea will doubtless excite considerable interest on the part of the general public.

"We are told that, when Nature paints, she dips her brush in iron, and it is said that iron in the water used or naturally present in the soil changes the color of one of the white hydrangeas. Experiments with some of the inorganic salts might bring out some interesting points."

A NEW TESTING VALVE.

We present herewith an engraving of a new valve for testing sewer pipes, which is the invention of Gottlob E. Loeble and Frederick Katzenberger, 45 Grand Street, New York city.

Referring to our sectional view, in which the valve is shown applied to a hand hole, it will be seen that the valve comprises an expansion ring made of rubber, mounted on an expanding block in the form of a frustum of a cone. The testing pipe forms the shank of the expanding block. This pipe communicates with the interior of the expanding block and extends up through a tube, as seen in the illustration. A valve controls the communication between this tube and the outlet pipe, which extends downward to discharge water through the hand hole into the outlet of the



LOEBLE AND KATZENBERGER'S TESTING VALVE.

trap. On the lower end of the tube is a hollow pressure block engaging the upper side of the expanding ring. On the upper end of the tube is a nut engaging with a thread formed on the testing pipe and having a series of holes to receive a handle. The device is held in position by a clamp.

After placing the valve in the trap, by turning the nut, the expanding block will be drawn up to force the expanding ring to a tight connection with the wall of the trap. By opening the valve the water test may be made. It is evident that this testing valve is not liable to break so readily as the inflated bags usually employed for stopping pipes.

Vesuvius in Active Eruption.

Mount Vesuvius promises a dangerous eruption. Lava is flowing in torrents from seven new outlets in addition to the central crater. Prof. Tasconi, the director of the observatory, at first said that he did not expect any serious damage would be done. Later, however, part of the roadway from the mountain leading to the observatory and the lower station of the funicular railroad was destroyed by a lava stream and the observatory is considered in danger. The stream along the foot of Monte Somma burned the chestnut forests. From a spectacular standpoint the eruption is finer than any since 1872.

Negative Varnish.

Dissolve eight parts of borax and two parts of carbonate of soda in 160 parts of hot water, and dissolve in this 32 parts of bleached shellac broken up small. When this is dissolved, add one part of glycerine dissolved in 160 parts of water. If any deposit forms after a few days, filter off.

This varnish can be run on the plate while it is wet, hence the plate dries once for all.—Dun, in Photo. News.

Science Notes.

The bureau of police and health officers of Pittsburg, Pa., have placed conspicuously around that city printed signs requesting all persons not to spit on the sidewalks or street crossings, says Municipal Engineering. This effort is made in the interest of public health, and if it does not have the desired effect, an ordinance will probably be passed fixing a penalty for spitting on the sidewalks.

"The first attempt at scientific forecasting of the weather," says E. J. Prindle, in an article on "Weather Forecasts" in Appleton's Popular Science Monthly, July, "was the result of a storm which, during the Crimean war, November 14, 1854, almost destroyed the fleets of France and England. As a storm had raged several days earlier in France, Vaillant, the French Minister of War, directed that investigations be made to see if the two storms were the same, and if the progress of the disturbances could have been foretold. It was demonstrated that the two were in reality one storm, and that its path could have been ascertained and the fleet forewarned in ample time to reach safety."

In a recent issue of The American Journal of Science are given the results of tests of a large number of magnets made of self-hardening steel, now in common use for lathe tools. The object of these tests was to search for a material for standard measuring magnets, which would be as permanent as possible, and have a small temperature and induction coefficient. The experiments show that comparatively short seasoned magnets made of this steel have decidedly smaller induction coefficients than magnets of the same dimensions made of tool steel; the difference in the temperature coefficient is much less, but the advantage is still on the side of those made of self-hardening steel; the temperature and induction coefficients of long magnets of the two kinds of steel do not seem to be very different.

Few photographers seem to be aware of the immense force exerted by gelatine in its contraction. The thing is, however, well known to collotypists, often to their cost. If a collotype plate be over-dried, the power of the gelatine, in its contraction, is so great that it tears away the surface of the glass itself, breaking it up in peculiar fern-like pattern. The surface of the collotype plate is always ground, and it is that which gives so firm a hold to the gelatine that the glass is torn away. It is a curious fact in connection with the matter that different characters of gelatine produce a different pattern fracture. A brittle kind of gelatine produces a different pattern from that yielded by a tough and horny one. This property has been taken advantage of, commercially, for many years past in the manufacture of that kind of ornamental glass known as "crystalline glass," so general for decorative purposes. —British Journal of Photography.

The practice of Dr. Miculicz, professor of surgery at Breslau, is to wear gloves while performing most of his operations, and especially when engaged in laparotomy, but if, however, the intervention is connected with regions specially exposed to infection, he does not cover his hands, holding that gloves under such circumstances could only favor contamination, by helping to convey noxious germs from diseased parts to those still remaining healthy. Unlike some others, he makes no use of India rubber gloves, as he finds them embarrassing, but employs the ordinary thread article, which can be readily washed and sterilized under steam. All the assistants and attendants have also to wear gloves like the surgeon, but as thread gloves are, of course, far from impermeable, the wearers are required, before putting them on, to disinfect their hands by means of alcohol and corrosive sublimate. As a rule, a single pair of gloves suffices for a short operation.

An extended series of observations in La Pitié Hospital, Paris, has led to a practical determination as to the alterations, their shape and volume, which occur in the hearts of persons suffering from nervous affections, the results being thus briefly stated: In normal subjects moderate exercise does not cause any perceptible changes in the heart with regard to shape, volume, or position; in subjects whose nervous systems have undergone deterioration in consequence of hysteria, neurasthenia, or any reflex trouble having its point of departure in a special part of the organism, the heart grows hyperexcitable and changes in shape or position the moment it is called upon to do some slight extra work. This alteration may present itself in three typical ways, as follows: The whole cardiac area may be uniformly enlarged, or the increase may be partial and irregular; or the heart may become retracted and diminished in volume; finally, the organ may be dislocated laterally, with or without changes of shape and volume, the displacement being directed toward the mesial line, or, more frequently, toward the axilla. It is stated that in the prosecution of these researches use was made of a modified form of Bianchi's phonendoscope, and careful tracings were also executed, showing the contour of the heart region before and after exercise.