[For the Scientific American.]

The Malt House Ruins.

On the 2d of December last, a new malt house in Bethune street, in this city, fell, and was the cause of two men, who were working in it, losing their lives. As this accident necessarily led to an investigation as to the cause of the catastrophe, various opinions were expressed by the witnesses examined, and some of them contradicted one another. As it involves important questions in architectural engineering, the following article on the subject, will be found deeply interesting, not only to merely scientific, but to all practical men:—EDS.

What was the cause of the "accident"? Were the floor beams or the posts at fault? Upon this point the builders who testified before the Coroner did not agree. An investigation into the strength and strain may decide the question.

First, of the floor beams. Experiments made to test the strength of hemlock when exposed to a cross strain, (as is the case with a floor beam,) show that 363 pounds is the weight that will break a piece one inch square and one foot long—the weight being at the middle. This is the average of seven experiments. From this unit of strength the resistance of beams of any size may be computed, by the well-known laws of pressure. The floor beams in question were 4×12 inches, and about 18 feet long; they were placed 18 inches apart from centers. To break one of these beams it would require, upon the above data, 11,616 lbs. at the middle, or twice this amount if equally distributed over its length, which is equal to 860 lbs. upon every superficial foot of the flooring on the beams. This is the breaking weight. What was the load? Barley weighs about 35 lbs. per cubic foot. The barley on the floor appears to have been from four to five feet deep. The weight, therefore, per foot superficial, could not have been more than about 175 lbs.—equal to about one-fifth of the weight required to break the beams. The barley might have been raised to the hight of 24 feet upon the floor before the beams would have broken. Hence it is clear that the barley, being only five feet deep, could not have broken the beams. Yet one of the builders testified "that the size and quality of the beams used in that building were positively insufficient."

In regard to the comparative value of pine and hemlock, experiments show that pine will bear only seven or eight per cent more than hemlock; yet one of the witnesses testified that it would bear 150 (!) per cent more, and another witness subscribed to this, and these witnesses were both practical builders. The unit of strength derived from several experiments on the three kinds of wood, spruce, hemlock and pine, are respectively 345, 363 and 390 lbs. Yet one witness said: "I consider spruce as strong as pine, but hemlock I look upon as insufficient." This witness was correct, however, as regards the elasticity of pine, for experiment shows that pine will suffer a greater deflection without injury than either spruce or hemlock, and it requires a greater load to deflect it through an equal space.

Now the posts. These were of red cedar, and of various sizes, those in the second and third stories being from five to eight inches diameter at the smallest end. They were in their natural shape, and some of them so crooked that the largest perfect straight post that could have been sawed from them would have been about 9×5 inches, or, at the most, 3½×5½ inches. This is the effective size, the length nine feet. Now what weight is required to break such a post? Experiments have been made to test the strength of oak, chestnut and locust posts, but not of red cedar. The latter is, probably, stronger than either oak or chestnut, but not locust, although it may be nearly as strong as the latter wood. It requires to bend white oak 6,950 lbs., chestnut, 7,720 pounds, and locust, 10,920 lbs. In each case, this unit of strength is the average of several experiments, and is the weight required to bend a post one inch square and one foot long. There is reason to presume that the strength for red cedar is below 10,000, but let it be assumed at this. Upon this data, a post of red cedar, 3½×5½ inches, and 9 feet long, will require 29,113 lbs. to bend it from a straight line, and something more to complete the fracture. Each post in the building supported about 200 feet superficial of the floor; therefore the 29,113 lbs. is equal to about 140 lbs. upon every foot of the floor.

It has been shown above that if the barley was 5 feet deep, there was a weight of 175 lbs. upon each foot of the floor. This, together with some 25 lbs. for weight of floor timbers, &c., was quite sufficient to break a post of the size stated. From this computation, and the fact that a broken post was found in the ruins, we may safely conclude that the want of size in the posts was the cause of the failure. The posts should have been at least six inches diameter, and perfectly straight at that.

R. G. HATFIELD, Architect.

New York, December, 1857.

Patent Jobs—Commencement of Lobby Operations.

We see that the Chaffee patent is again before Congress, on a petition presented by Mr. Pugh, of Ohio, for its further extension. This may be regarded as the inauguratory operation of the lobby for the session, and the precursor of a host of other jobs of a more or less profitable kind. The presentation of the Chaffee petition is a proof that the Congressional engineers are already at work, and they count upon making a brilliant and profitable campaign of it.

The amount of corruption that will be brought to bear on Congress during the present session will, we believe, be greater than has ever before been known. The results of the Matteson and Gilbert investigation, instead of checking the evil, have given it a greater impulse and extension. The readmission to the floor of the House of the parties expelled for participation in that disgraceful affair has satisfied the lobby men that they have nothing to apprehend from the tone and temper of the present Congress. The profligate bargain by which the spoils connected with the public printing have been portioned out amongst some half dozen political partisans, with the concurrence and assistance of members, is pretty conclusive evidence of the way in which the public interests will be sacrificed. Never before was the lobby so strong, and never were its opportunities for plunder so numerous.

These patent extensions are in themselves an inexhaustible mine of wealth to the lobby speculators, Besides the Chaffee interest, there are some three or four others, such as the McCormick reaper, the Colt's pistol and Hayward india rubber extensions, which are sufficient to make the fortunes of all concerned in them. In addition to these, there are land jobs and other fat pickings, from which trading politicians, starving journalists and idle lawyers can all glean something. Uncle Sam's estate may be compared to an Irish patrimony—it is entailed for the benefit of the hungry and needy.

Under such circumstances, it is of course useless to remonstrate against the injustice of patent monopolies and the perpetuation of the numerous other jobs that are certain to be carried through this session. Corruption is in the ascendant, and the lobby all-powerful. When the country is tired of seeing its most precious interests bartered away by an organized band of blood-suckers who are fattening upon its entrails, it may perhaps think of applying a remedy. In the meanwhile we must be resigned to play the part of Cassandra to an unwilling auditory, and to groan over abuses that we cannot prevent.

[We copy the above from the *New York Herald*, and we rejoice that this independent journal has opened its batteries in good season and with vigor against the system of lobbying at Washington, which has become a disgrace to our country. The patent extension cases are very important, not only to the parties interested, but to the whole country, and we have been surprised to notice the stupid apathy of the leading journals upon this subject. The *Herald* is the only daily journal in New York (we had almost said in the United States) that has fully appreciated these cases, and it has dealt them a powerful blow in times past. We hope it will keep on until not one of these schemes shall stand unexposed to public view.

The Persian Wheel.

This is a contrivance for raising water to some hight above the level of a stream. In the rim of a wheel turned by the stream a number of strong pins are fixed, to which buckets are suspended. As the wheel turns, the buckets on one side go down into the stream, where they are filled, and return full up the other until they reach the top. Here an obstacle is placed in such a position that it overturns the bucket, and the water is poured into a spout or convenient receptacle. It is evident that with this form of wheel the water can only be raised to the hight of the diameter of the wheel, and there is no doubt that it is a very rude contrivance. It is much used in Persia for the irrigation of the land, and very many of them may be seen on the banks of the river Nile.

Polarity.

This is a property possessed by some bodies, which will, when allowed to move freely, arrange themselves in certain determinate directions, or point, as it were, to given poles. Thus, an iron bar acquires polarity by magnetism, and, when suspended from a single point, arranges itself in the direction of the magnetic meridian of the earth. When light is supposed to consist of material particles emitted from the sun, it is necessary to explain certain optical phenomena to assume that the particles are endowed with polarity, which merely signifies that the opposite sides of a particle have different physical properties.

Recent Patented Improvements.

The following inventions have been patented this week, as will be found by referring to our List of Claims on another page:—

SPINNING OAKUM.—A machine for this purpose has been invented by Smith Baldwin, of St. Louis, Mo., which combines the processes of carding and spinning; and the picked oakum, when supplied to it, is converted into a merchantable state, for the use of caulkers, &c., at one continuous operation.

PLATFORM SCALES.—This invention consists in the peculiar manner of connecting the scale beam with the platform, whereby but little motion is allowed the platform; and the weight upon the platform is made to bear equally upon the lever that supports it; it being immaterial on what part of the platform the weight is placed. It is the invention of James Kelly, of Sag Harbor, N. Y., who has assigned it to John Sherry, of the same place.

BUILDING SHIPS.—This improvement consists in preventing the vibrations of the sides of the ship, and the consequent leakage at the keel, by arranging diagonally two rods and braces in opposite directions from the keel to the top side of the ship; said braces and rods bearing against strong knees or shoes, which securely tie the timbers of the keel together. We regard this as a good arrangement, which ought to be adopted in every large steamer. It is the invention of John Reeves, of Brooklyn, N. Y.

LIGHTING LANTERNS.—This invention consists in having a match socket attached to a spring, which is secured to the inner side of the door, and held back to the side of the door by a catch. A corrugated plate is attached to the inner side of the lantern, and the parts are so arranged that the match which is fitted in the socket will, when the socket is liberated from the catch, have its ignitible end forced over the corrugated plate, and the match being then in a line with the wick, lights the lamp. It is the invention of A. C. Richard, of Newtown, Conn.

PERPETUAL LIME KILN.—This invention provides a perpetual kiln, wherein lime and coal, or fuel, may be mixed or burned together perfectly, in the same kiln, without the necessity of using side furnaces or grates; and the lime, when burned and discharged, is purer, and freer from carbon, ashes, or other impurities which usually escape from the coal or fuel, by reason of imperfect combustion during the process of burning in perpetual kilns of ordinary construction. It is the invention of H. R. Fell, of Texas, Md.

IMPROVED SHINGLE MACHINE.—This invention relates to an improvement in that class of shingle machines in which a circular saw is employed for cutting the shingle from the bolts. The improvement consists in the employment of a pendulous frame provided with a proper clamp to hold the bolt, and arranged relatively with a circular saw, and setting device for adjusting the bolt within the frame; the whole being so arranged that the shingles are cut from the bolt with great facility, and adjusted so as to be cut in proper taper form. It is the invention of Robert Law, of Portage City, Wis.

CLEARING SEED PLANTER TUBES.—This invention consists in arranging a shaft set with edged blades behind the cultivator tubes—said blades revolving with the shaft, and in their revolution passing up alongside of the tubes, and carrying with them such grass, weeds, or obstructions as prevent a perfect entrance of the seed into the soil. This is a device much needed by farmers, judging from the fact that considerable inventive ingenuity has been exercised by previous inventors in constructing a device for accomplishing the clearing of cultivator teeth. It is the invention of H. F. Baker, of Centerville, Ind.

PAPER-MAKING MACHINERY.—The object of this improvement is to prevent the breaking or tearing of the paper, as it passes from the upper one of the second press rolls to the dryer. This is attained by the use of a small roll arranged parallel with the press rolls, between the highest part of the upper press roll and doctor, about opposite the line where the paper should leave the upper press roll, on its way to the dryer, so that the web of paper will pass between it and the upper press roll. The slight cohesion of the web to this small roll eases it off the upper press roll and prevents it breaking; and if a slight break should occur in the web, it prevents the edge of the break being carried under the doctor, and thereby increased. This improvement, though simple in its character, is highly important in its results, and is found, by practice, to effect a great increase in the quantity of paper produced in a given time, by saving nearly all the time that is expended when breakages of the web occur. It is the invention of Stephen Rossman, of Stuyvesant, N. Y.

PAINT VEHICLE.—This is a new compound for mixing paints, and consists of four fluid ounces of oil of turpentine, put into a bottle with one-quarter of an ounce of gum mastic, and one-eighth of an ounce of caoutchouc. These are well shaken three or four times a day for three or four days, and then allowed to rest for a short time. One gallon of soft soap, which should be one year old, and of good quality, is next dissolved over a fire in one gallon of distilled rain water. One gallon of linseed oil is boiled and poured into the soft soap and water with frequent stirring, while both are at about blood heat. The gum mastic and caoutchouc solution is then poured from its dregs and added, and after the whole has been well stirred, it is placed over a gentle fire and heated, the heat being increased for about half an hour until it almost reaches the boiling point, but it must not be allowed to boil. The composition is then strained through a coarse cloth, and when cold is ready for use. It makes a paint that is cheaper than common oil paint, and is more durable, owing to the alkali and gums preventing the oil leaving the paint, and being absorbed by the wood. It is also susceptible of a high polish when well dried, and takes varnish well. A. C. Church, of Union City, Mich., is the inventor.