

people from similar disasters; nor could the admirable police of London prevent the awful crush which occurred at the Surrey Music Hall, a short time ago. In this very case, the owners of the Pemberton Mill are reduced from affluence to poverty; and all experience has shown that the dread of social degradation is as powerful a motive as can act upon human nature. If the danger of losing \$300,000 would not stimulate them to make their foundations secure, we do not believe that any inspector would accomplish the job. Experience in building, as well as in other things, has shown that self-interest, where it is brought to bear, is more safely to be trusted than the action of an uninterested and indifferent official.

In large cities, it may be well to have some restrictions in regard to buildings, and it no doubt is; as the close neighborhood of property subjects one owner to damage from the acts of another. But if our State legislatures pass a series of statutes restricting building operations throughout the country, we venture the opinion that such statutes will prove vexatious and annoying, and will do very little, if anything, towards preventing buildings from falling down.

A SUCCESSFUL INVENTOR—A GOOD TRADE.

Messrs. Editors:—I have the pleasure to inform you, that I received my patent papers from Washington on Dec. 31st; and I ought to have informed you before this, with a grateful acknowledgment for the skillful manner in which they have been got-up by you. I have also the pleasure to acquaint you that I have sold one half of my interest for \$10,000. This is my fifth application to the Patent Office. On my first I prepared the papers myself and got a patent; the second and third I lost by employing bungling agents; the two last I obtained through your house; and I am in hopes you will hear from me shortly in the same way, believing it to be the *cheapest, surest and most expeditious* mode of obtaining my rights.

R. S. S.

Athens, Ga., Jan. 7, 1860.

[We are much pleased to hear of the success of our friend, and hope he will still find the field of invention encouraging and profitable. A gentleman called at our office one day last week, and had an assignment made out, granting to the purchaser (a farmer) a right on a seed-planter, for the state of New Jersey, for which \$500 was paid. The next day the farmer called again, and instructed us to prepare an assignment from him to another person, for the same right; the second purchaser paying \$1,000. The farmer thought—and so thought we—that he was doing a pretty good business. On the same day in which one of these transactions was made, a couple of patentees sold, for \$7,500, the right to use an invention in one particular department of business in which it can be employed, reserving for themselves most of the patent and territorial right.

There is scarcely a single day in the week that we do not prepare one or more transfers of patents for valuable considerations. One day last week we prepared five assignments of patents; indeed we can confidently say that we have never known more sales of patented inventions in the same period of time as have occurred during the three months past. The fact is becoming more and more apparent, every day, that inventors are about the most useful class of our citizens. Legislation, as a general thing, has become, now-a-days, if not absolutely unfriendly, certainly indifferent to the progress of the useful arts; and that progress is thus made to depend upon the wits of the ingenious men of this country, who have done more for the material wealth of the nation than any other class.—Eds.

COUNSEL TO INVENTORS.—Inventors and those interested in patents, and desire counsel upon questions relating to Re-issues, Infringements, Interferences or Extensions, are advised to seek the counsel of the Proprietors of the SCIENTIFIC AMERICAN, who, in connection with the Hon. Judge Mason, the late *Commissioner of Patents*, are prepared to thoroughly investigate such matters in the most careful manner. Our facilities for the transaction of all business connected with the Patent Office are unequalled by any other existing agency. We are at all times prepared to receive and examine sketches and descriptions of alleged new inventions, and will advise inventors as to the probable novelty of their devices

STRENGTH OF WROUGHT-IRON BEAMS.

A correspondent in this city makes the inquiry, "At what distance apart would it be prudent and *perfectly safe* to place wrought-iron beams of the annexed "I" section—height 9 inches; top and bottom flanges, each 4 inches wide, and the whole beam throughout one-half inch thick? The spaces between the beams are to be filled with concrete—making the distance from the bottom of beam to top of concrete 13 inches—and the whole to be covered with flooring, in the usual manner. The floor is to be 35 feet wide by 80 feet long; but a girder wall extends the whole length of the room, making the distance between the supports of the beams 17 feet. The room is to be filled with soldiers in motion."

When we received this letter, we thought we could easily refer to tables of calculations on the strength of such beams, by J. Thomson, A. M., of this city, which had been furnished us more than a year ago, and the correctness of which had been verified by a series of experiments. We regret that these tables have been mislaid, but we shall give his formula for such calculations.

Wrought-iron beams are generally put into buildings about four feet apart, as in the "Harpers' Building," in Pearl-street, this city, the floors of which are very strong and firm. The top flange of a beam is principally used to prevent twisting; the lower flange is the main object of strength, and should be formed very accurately, with a clear defined edge and a smooth face. As we understand it, the beam referred to is a single span of 17 feet long, between supports. Its strength to sustain a weight placed at the middle may be calculated by the formula $W = a c^4 h + l$; in which a is the area of the flange in inches, c the co-efficient equal to 60,000 lbs.—the breaking weight of an inch of American iron, h the height or depth of beam and l its length in inches. Thus: $4 \times \frac{1}{2} \times 60,000 \times 36 \div 204 = 21,127$ lbs., or with the load uniformly distributed, it will be 42,254, which is more than 10 tons in the one case and 20 in the other. The weight of the beam should also be subtracted from this. At 4 feet apart there will be 20 beams for the floor, which will support 845,080 lbs. uniformly distributed; or 226 soldiers, with a space of 3 feet between the ranks and 2 feet between each man, their united weight will be 31,650 lbs., at 140 lbs. each. Marching at the rate of 3 miles per hour, the momentum on the floor will be 145,590 lbs. per second, a load which such beams can very well support did it not beget a dangerous vibratory motion which accumulates the tensile strain. The strength of the beams given, however, is nearly six times greater than the momentum of 226 soldiers marching at the rate of 3 miles per hour on the floor. To this subject we expect to advert in our next number, and present other calculations and formula.

CHANGES IN GUTTA-PERCHA.

Messrs. Editors:—I noticed some time since in your paper some remarks upon the changes taking place in gutta-percha after exposure to the action of salt water. I have frequently noticed such changes in surgical splints made of this material, after a few months use. I have now in my possession portions of a splint which I applied in a case of hip-joint disease, which became so brittle as to break upon a very slight force being applied to it. I will send you pieces of this should you desire it.

R. U. P.

Nahant, Mass., Jan. 16, 1860.

AMERICAN AND ENGLISH LOCOMOTIVES.

The Americans have enough of which to be really proud, and do not need to resort to ignorant and vulgar, if not dishonest, boasting to make out a case. Such a course only reacts upon them, to their own damage, in the end. Russians, Austrians, Egyptians, Chilians, and other foreigners, are becoming sufficiently enlightened to detect and despise such shuffling.—*London Engineer*.

[Without debate, the best answer which can be furnished to the above, is to state the fact that the Chilian Railroad Company has ordered two more locomotives from Rogers & Co., of Paterson, N. J., which are to be similar to the two whose alleged superior performances over the English engines have given so much delightful cause for our London cotemporary to grunt and growl.—Eds.

We have just received another interesting letter from our regular correspondent, E. M. Richards, which we shall publish in our next.

TO MAKE A POWDER WHICH INFLAMES ON EXPOSURE TO AIR.—To the substance possessing this property is given the name of *Homborg's pyrophorus*: it is prepared in the following manner:—Equal parts of alum and coarse brown sugar are to be mixed together and dried over the fire in an iron ladle, being diligently stirred all the while with an iron rod. The mixture melts, becomes thick, swells up, and runs into small dry lumps. These are coarsely powdered in a mortar, and again roasted till the operator is well assured that the mass contains not the least moisture, when it looks like a blackish powder of charcoal. This must be put, while hot, into a common phial, previously luted on the inside, by being washed with a weak solution of borax, made as thick as cream by the addition of pipe-clay. The phial, when charged, must have a narrow glass tube, six inches long and open at both ends, luted into its neck, and it should be only three-fourths filled. When ready, it is to be placed in a crucible, or deep iron pan, and covered with sand; and the crucible is to be put into a fire and heated to redness; a thick smoke will rise from the tube for a quarter of an hour, and be succeeded by a sulphurous vapor, which must be inflamed. When this flame disappears, the operation is completed; the tube must then be closed by a plug of soft clay, and the crucible must be removed from the fire. As soon as the phial becomes cool enough to be handled, the contents of it must be hastily transferred into a dry and warm stout glass phial, which must be secured by a ground glass stopper. Experiment:—Throw a little of this powder upon a flat dry surface, in a short time it will burst into flame. Rationale:—The sulphuret of potassium derived from the alum attracts moisture, or (perhaps) a little potassium formed in the process attracts oxygen from the air, and generates sufficient heat to kindle the carbonaceous matter mingled with it.

USE OF SNOW IN COOKERY.—A correspondent of the *Boston Cultivator* says:—"Put corn meal into a good-sized wooden or other bowl, with sugar and salt to the taste; then add twice or three times its bulk of snow, and stir it together with a spoon. When well mixed, it appears like so much dry meal or snow. Fry a little on a hot griddle; if it cooks too dry to turn well, add more snow; if too wet to be light, add more meal, when just right, fry on the griddle in convenient-sized cakes, and they will be as light as can be desired. I claim to have first suggested, to the best of my knowledge and belief, the above sure test for arriving at the right proportions, namely, trying a little on a hot griddle, and adding corn meal or snow, as the case may require."

CALIFORNIA MINES.—The *Hydraulic Press* states that great operations in fluming are still being carried on in the golden country. Water is being conducted from great distances in tunnels to places where there is plenty of gold, but which have hitherto been unworkable, on account of the absence of water for washing. In some places the miners had struck against the high tariff charged for water by the proprietors of tunnels; a reduction in the price had been the result, and great activity was expected to prevail this year among all the mining companies.

THERE has recently been presented to the Museum of the Medical College, Mobile, a beautiful specimen of legatta or lace-wood tree. The peculiarity of it is in the fibrous nature of the bark, which is about an eighth of an inch thick. From this bark has been dissected more than 20 coats of apparently real crape or lace, most of them large enough to serve as a small handkerchief. It can be washed and ironed like ordinary muslin. The tree is a native of the West Indies, and is very rare.

CHEMISTRY OF CARBON.—Professor B. Silliman, Jr., of Yale College, delivered a lecture on the above topic, accompanied with experiments, at the Cooper Institute, on the evening of the 19th inst. The whole pleasure of listening to it was destroyed by a host of noisy boys from the public schools, who were admitted free.

A paper has been published by Mr. David Chadwick, of Salford, England, on the rate of wages current in the manufacturing districts during the past twenty years. It is remarkable that, while the hours of labor have been reduced from 69 to 60 weekly, the rate of wages has increased 20 per cent on an average.