

ber of pieces, for the holes are more likely to be irregular. The excess to be allowed depends very much upon the quality of the workmanship in the construction. If the holes are carefully drilled the excess to be allowed may be much less than when the holes are punched.

In addition to the shearing strength of the rivets, some strength may be calculated upon from the friction that is produced by the riveting and cooling of the rivets; this additional strength can only be calculated upon as an addition, when it is quite certain that the rivet holes are completely filled by the rivets.

Experiments show that a three-quarter inch rivet properly riveted in three plates or bars, the center one having a slotted hole, will take five tons to overcome the friction of the heads of the rivet, and make the center plate slip between the other two, and the friction given by a $\frac{7}{8}$ -inch rivet will not be overcome with less than seven tons. This extra force from friction is no addition to the shearing strength of the rivets, unless the rivet holes are well filled up. There is no doubt this friction adds much to the rigidity of built wrought-iron girders, and has something to do with the deflection being no more than it all the joints were welded. Good riveting will bring all the plates into close contact, and besides adding to the stiffness of the work by friction, it prevents anything more than a superficial coating of oxide between the faces riveted together.

No doubt machine riveting is the best for giving the greatest friction, and filling the rivet holes most perfectly; and it certainly injures the rivets less than the succession of blows given by hand riveting. In hand riveting many of the blows are given when the rivet is comparatively cold, and have, therefore, a tendency to destroy the quality of the iron in the head; and, again, hand blows cannot force the metal into the body of the rivet hole in any way to be compared to machine riveting. A machine riveted boiler is generally tighter under pressure than a hand riveted boiler, showing the plates are in closer contact, and better able to resist corrosion by being riveted with machinery.—*Mechanics' Magazine.*

ALEXANDRE VATTÉMARE.

At the meeting of the Farmers' Club, held on the 26th of April, the President, N. C. Ely, Esq., made a formal announcement of the death of Alexandre Vattémare, an honorary member of the American Institute, and formerly a frequent attendant of the meetings of the Farmers' Club. The announcement was responded to by—

Dr. David Holton:—Mr. President, I have met with Monsieur Vattémare, as associated in labor with the late Josiah Holbrook. Forty years ago Mr. Holbrook commenced in Boston his labor of organizing a system of exchanging minerals and other specimens of natural history between different schools. The pupils of each district collected specimens prevalent in their district, and the duplicates of these were exchanged for the duplicates of other districts, and thus large cabinets were cheaply and easily formed.

Monsieur Vattémare, at that time a distinguished ventriloquist, happened to meet Mr. Holbrook in this city, and he conceived that the system of exchanges which Mr. Holbrook had successfully established between districts, towns, counties, and States, might be extended to nations, kingdoms, and empires. To this great labor Monsieur Vattémare devoted the remaining years of his life.

On the Fourth of July, 1855, I was in Paris, and witnessed the opening of the hall dedicated to the reception of the books from the United States in the exchanges organized by Monsieur Vattémare. The rooms were quite spacious, and were piled with the best American works, a present from the publishers. The Emperor had directed alcoves to be set apart for them in the Hotel de Ville, where they might be accessible to those desirous of consulting them. A discourse was pronounced by Mr. Guizot, highly complimentary to American literature and to the labors of Monsieur Vattémare.

At that time it was my lot to announce to Monsieur Vattémare the death of Mr. Holbrook, his fellow laborer. Mr. Holbrook was gathering mineralogical specimens with his hammer and basket, near Lynchburgh, in Virginia, when he fell down the mountain, and his body was found in the river at its base.

In making the exchanges organized by Mr. Holbrook, a small cabinet of minerals was forwarded to each member of the New York Legislature; and this was a year or two before the vote inaugurating a geological survey of the State. Perhaps the possession of these curious specimens may have had some influence on that vote, which has resulted in so much honor to this State among the men of science throughout the world.

Mr. Robinson:—It was the propelling power that carried the measure through. There is no doubt of it.

Patent Machinery for punching Plates.

M. H. Lishman, of Stockton-on-Tees, England, obtained a patent on the 14th of August, 1863, for a machine which is thus described:—

"In punching holes in metal plates for ships boilers and other purposes, it has hitherto been usual to mark on the plates by hand all the spots where holes are to be punched. In punching plates for ships, a great difficulty also exists, from their curved shape necessitating the punching of the holes in the various plates at different distances apart. Now, this invention consists in punching holes in manner and by the machinery hereafter described. Upon standards in front of the machine, the patentee fits a table free to travel to and fro, upon which the plate to be punched is laid; the plate must previously be marked at the two spots between which holes are to be punched, for instance, for the holes for the rivets which secure a plate to the ribs of a ship. Above the plate, and bolted to or forming part of the punching machine, is a bed-plate having fixed thereto a frame or apparatus by which the space between the two marked spots is divided, as hereafter described, into as many equal distances as there are holes to be punched. This frame or apparatus is composed of two longitudinal bars, free to move upon, as fixed centres, near one end thereof. The shorter arms of these longitudinal bars are connected by a slotted transverse bar placed at a given distance, say 3 inches more or less, from the fixed centres, the longer arms are divided into spaces of 3 inches or each equal to the given distance just mentioned, and at each division there are holes for securing another slotted movable transverse bar or a wire. The longitudinal bars are drawn out of a straight link or into a position where they form an angle with the line of holes to be punched, when it is necessary to reduce the distance between the holes. When the punching machine is set in motion, it punches a hole in the plate where marked; the table is then made to travel by suitable mechanism, until the hole comes underneath a pin, which drops in the hole, throws the mechanism out of gear, and stops the table, when the punch descends to punch another hole, after which the pin again rises, the same operations are repeated until all the holes are punched, the pin always falling into the hole last punched. Instead of fitting the dividing or regulating apparatus, above described, to a punching machine, it may, slightly modified, be employed simply for marking the spots where holes are to be punched, and the punching may then be performed by any ordinary method."

The Owners of a Boiler convicted of Manslaughter.

The Birmingham correspondent of the London *Engineer* writes:—

"The inquest on the bodies of the twelve men and boys killed by the explosion of a boiler at the Hall-End Iron-works (near West Bromwich) of Messrs. Thomas and W. E. Johnson, has resulted in a verdict of manslaughter, as well against those gentlemen as against their engine-tender, William Bagnall. The coroner (Mr. Hooper) in sending the case to the jury, said that the scientific evidence went to show that the explosion had taken place from over-pressure, and not from want of water; and the other evidence seemed to point to the fact that, at the time when the explosion took place, William Bagnall was sober, although he had been drunk on the previous day. It was his duty to tell them that, if they believed that the defective state of the boiler was brought under the notice of Thomas Johnson and W. E. Johnson, and that they had taken no practical notice of the information, it would be their painful duty to return a verdict of manslaughter against those persons; but if they were not clearly satisfied, they must give them the benefit of the doubt. The coroner concluded by remarking on the high character of the scientific evidence adduced.

After the jury had deliberated for about two hours and a quarter, the public and parties interested were readmitted into the court, when the coroner said that the jury, having carefully considered the evidence before them, returned a verdict of manslaughter against Thomas Johnson, sen., the proprietor of the Hall-End Works, and his son, William Edmund Johnson; and also against the chief engineer, William Bagnall, *alias* Bagley. That was the verdict of seventeen out of the nineteen jurors as regarded Messrs. Johnson, and the whole of them as respected Bagnall, the engineer. As regarded the verdict, he himself had arrived at the same conclusion, and he believed it to be a strictly honest, just, and impartial decision. The Messrs. Johnson and William Bagnall were admitted to bail on two sureties of £100 and themselves in £200. The inquiry lasted until half-past one o'clock."

Genius and Cooking.

A "cook and housekeeper," named Katy Liddle, of No. 7 Comelybank, Edinburgh, has lately filed the following provisional specification in the Patent Office. The Commissioners of Patents have, however, refused provisional protection. Katy says:—"I get a tinsmith or other competent person to make for me, of any suitable material, an egg or saucepan constructed with a second bottom placed on a framing inside, two or three inches above the bottom of the pan, in which second bottom are made one or more holes, according to the size of the pan desired, to receive the bottom of as many small tea-cups placed in the holes made large enough to allow the cups to be immersed in the boiling water up to the middle of the cup. I place this pan on the fire, with water sufficient to cover the upper bottom, and let it boil; I have ready the number of eggs required to be cooked, with a small tea-cup for each egg. This tea-cup I dip in boiling water but without leaving any or very little of the boiling water in it, and I then break the egg in the usual way and place it in the tea-cup, and I do the same with all the eggs I have to cook. The tea-cups with the eggs in them are then placed in the pan in the holes made for them in the second bottom, as above mentioned. I carefully watch to see the egg done to the precise degree of doing it according to the taste of my master, which generally takes not quite so much time as does the ordinary method of boiling an egg in the shell. My master thinks this a very superior method of cooking an egg. He says that it very much improves the flavor as compared with the ordinary method of boiling an egg in the shell; it is also so nice and clean-looking, and you can also by it always and at once detect an unsound or imperfect egg. As compared with the usual method of poaching an egg, every one admits that my method is a decided improvement. My master is at pains to show it off to any friend or friends who may be visiting him, whether it be at breakfast, or at dinner, or at supper, by having an egg cooked for each friend after the manner I have described above. He likewise says that it makes the egg so light and easy of digestion that he thinks a man might with ease eat half-a-dozen at a meal without any injurious consequences."

Great Coal-oil Case.

Our English exchanges contain full reports of the important case of *Young vs. Fernie*, which involves the originality of James Young's patent for distilling paraffine or kerosene oils from Boghead and other coals. A large amount of evidence has been taken on both sides of the case, and numbers of chemists and experts have testified—some on the side of Young and others on that of his opponent. What renders this case important is that some of the most widely known chemists express the conviction that Young's invention was really novel, while others, equally eminent, declare it to have no novelty whatever, and that his process had been used many years before his patent was granted. The decision of the court in this case will be regarded with much interest, for business operations of great magnitude are involved in the result. The diversity of the scientific witnesses affords a commentary by no means pleasing, and suggests the unpleasant reflection that individual opinions frequently override what science teaches as fact, and the followers of science often ignore the instructions which they should have thoroughly digested and appropriated, and descend to expressions of opinion outside their sphere.