

tion he testified, positively, that he had found prussic acid actually present in the stomach of the deceased; but on being cross-questioned and required to give the details of such finding, he admitted that he did not actually extract any of the prussic acid at all; but what he did was to mix a solution of potash, sulphate of iron, and muriatic acid with some of the juices distilled from the stomach of the deceased; these solutions, he said, when mixed with anything containing prussic acid, give a blue color; and as he obtained this color, he was satisfied that prussic acid was present. "All I did," he swears, "was to satisfy myself that a blue color resulted, and that satisfied me that prussic acid was there." He then made a vapor test and got a red color, which confirmed his previous test, he thought; finally admitting that he obtained only the merest trace of color in both tests. The nitrate of silver test, which is admitted by intelligent chemists to be the best test of all for prussic acid, was not used by Aiken.

It was shown for the defence, by the testimony of Professor John J. Reese, LL.D., of the University of Pennsylvania, that the saliva, which would naturally flow into the stomach of the deceased, was capable of producing the same results that Aiken had alleged that he found, and it further appeared that the colors had probably been introduced into the liquids by Aiken himself, by careless manipulation, and did not result from the presence of prussic acid. Dr. Reese further showed that in a chemical analysis, in such a case, it is the duty of the chemist to be so thorough, so complete, so exhaustive, as to leave no test untried. He further showed that Aiken had completely failed in this, and pointed out his errors in the processes of distillation, in which all the recognized tests for the presence of prussic acid had been omitted. The most overwhelming medical evidence was also presented for the defence, showing that the prosecuting witnesses were not properly informed as to the symptoms produced by poisons upon the human system. Finally it was conclusively proven that the symptoms exhibited by the deceased were those occasioned by natural causes, namely, the contraction of the kidneys, resulting in the injection of uric acid into the blood, which produced serous apoplexy or congestion of the brain—of which the patient died. The evidence for the prosecution was completely broken down, and the prisoner was acquitted by the jury, and is now free.

The Chief Justice remarked that he considered the evidence against the Doctor so feeble that, had it been presented to him on the hearing for binding over to answer the charge, he could not see how he could have done so, further remarking that he "believed that it was God's providence which alone had saved the Court and former jury from committing a great wrong."

The Doctor has renewed his application for the probate of the will, and it is to be hoped he will receive the fifty thousand dollars bequeathed to him. It will be a poor recompense for the terrible ordeal through which he has passed, for the three long years of imprisonment that he has suffered, and for the loss of his business, reputation and property.

Some of our cotemporaries, we observe, in commenting upon the evidence in this singular case, express the opinion that scientific knowledge is, after all, of little practical value; for it appears that experts are always to be found who are ready to contradict each other in testifying upon a given statement of facts. But this, we think, is an erroneous deduction. An intelligent cross-examination will invariably demonstrate whether the expert is really a man of knowledge and science, or only an ignorant pretender. If the latter, his contradictions will have no weight, will perplex no intelligent mind. The importance and value of thorough scientific training, and its utility in the detection of professional fraud, ignorance, and humbuggery, has, in our opinion, seldom been more strikingly exhibited than on this remarkable trial.

#### THE FAIR OF THE AMERICAN INSTITUTE.

The same delay in forwarding and arranging goods for exhibition, which has rendered the first two weeks of all previous Fairs of the American Institute periods of disorder and confusion, seems to have been the case in the exhibition of this year. In spite of the increased demand for space and the consequent crowding that must later ensue, exhibitors manifest the same inexcusable tardiness, so that we scarcely hope to see the Fair well under way, with all its departments complete, much before the time allowed for its duration shall have half expired. Although we miss several articles and processes of manufacture that formed prominent points of interest in the exhibition of last year, others have filled their places; so that, in general popularity, there is every reason for the present exposition to equal if not excel its predecessors. The interior of the building, late the Empire Skating Rink but now the property of the American Institute, has been renovated and redecored. No additions to its already large area of floor space have been made, although the mode of arranging the articles in the separate departments is somewhat altered. The general decorations consist of the time-honored red, white and blue draperies, national flags, etc., and the scenic effort of doubtful excellence on the large arch at the further end of the hall. The roof of the building has been painted in appropriate colors, which is a decided improvement over the bare woodwork of former times. The usual Matthews soda water fountain occupies a central position in the hall, and is surmounted by a colossal female figure. The latter, we hope to see speedily removed. In our opinion it has no artistic merit; it is rough and apparently unfinished, while its false or rather want of proportions show a lack of knowledge of anatomy on the part of the modeler which the immense size of the statue renders still more glaring. While

it is possible to obtain in this country the works of such sculptors as Powers, Palmer and scores of others of equal or less note, there is no necessity for forcing into prominence any such caricature on the plastic art. Illumination at night is effected by means of the new oxyhydrogen gas which, carried through the building, gives an admirable light.

In recording our notes jotted down during several visits to the exhibition, we shall, according to our usual practice, begin with the department of machinery, mentioning whatever it contains of novelty and interest, and then proceed through the other divisions in regular succession. Professor R. H. Thurston, of the Stevens Institute, Hoboken, N. J., the author of the excellent series of letters ended in this number of our journal, is the chairman of the Committee of Managers in charge of the machinery. He is ably seconded in the executive portion of his duties by Mr. R. H. Buel, the superintendent of the department, through whose efforts the arrangement of this part of the Fair has been conducted with unusual vigor. Of

#### STEAM BOILERS.

but three are in position. The small Root safety boiler, on the right hand side of the entrance to the boiler room, is the one used in the previous exhibition. Facing it, is a larger boiler of the same pattern, of 200 horse power. A Phleger non-explosive boiler is also in place, supplying steam. In this generator, there is a constant circulation due to the position of the water tubes, some of which are under the fire, while the internal arrangements are such that dry steam is always afforded. The

#### STEAM ENGINES

are not so numerous as they were last year. An admirably built 80 horse power Wright horizontal engine occupies the most prominent place and supplies the power to other machinery by means of two 3 inch triangular belts. The latter form a new and effective mode of transmitting power, and are claimed to possess many points of superiority over the flat belt. The best oak tanned leather is used, made, for the above mentioned size of belt, of 5 ply with long laps. For belts of smaller dimensions, 3 or 4 ply leather is substituted. The pair referred to, as used at the Fair, are claimed to equal in every respect the 20 inch single belt of last year. On the opposite side of the passage way from the Wright machine is a 50 horse power horizontal engine, from the Newburgh Steam Engine Works of Messrs. Whitehill, Smith & Co., of Newburgh, N. Y., which is fitted with an adjustable cut-off worked by eccentrics and a Shive's governor, which will be described hereafter.

The Yale Iron Works exhibit a 10 horse power vertical engine which, if we may judge from its noiseless and equable motion, is excellently constructed. The Erie City Iron Works present a 15 horse power horizontal engine, remarkable for its compactness of form. The steam and water pressure engine of Messrs. King & Mulock, of Middletown, N. Y., is a recent invention of very simple construction, having but a single valve. As its name indicates, it can be run by either water or steam pressure, and, it is claimed, at a very low cost. The well known Baxter engine, manufactured by the Colt Arms Company, of Hartford, Conn., is displayed in its various sizes. It attracts a curious crowd, and is the recipient of well merited praise from all quarters. Other excellent portable engines are those from the Ames Iron Works. The larger sizes are especially adapted for use in saw mills. Two machines are exhibited of ten and three horse power respectively.

#### PROFESSOR R. H. THURSTON'S LETTERS.

The last of the interesting series of letters written by Professor Thurston for the SCIENTIFIC AMERICAN, during his recent western tour, will be found in another column. We much regret the necessity which brings this correspondence to a close, for it has been full of interest to our readers, furnishing them with the latest information concerning the improved processes now in vogue in metallurgy, as practiced at the leading establishments, with observations relating to the situation of the mineral supplies upon which many of the metallurgic industries of our country depend. Our correspondent has arrived at his home in Hoboken, N. J., and resumed his accustomed duties as Professor of Mechanical Engineering in the Stevens Institute.

#### PATENT OFFICE ITEMS.

Assistant Commissioner of Patents J. M. Thacher, after several weeks' absence, has returned to his post, and will administer the duties of the Commissioner while the latter is away in the West, whither he has gone in the interest of the Government.

Competitive examinations which have recently taken place at the Patent Office have resulted in the following appointments and promotions: Major Z. F. Wilber, lately first assistant examiner in-chief of the class of Mills, Glass, and Clay, has been promoted to be principal examiner in the same class, to fill the vacancy made by the resignation of T. C. Folger; F. L. Freeman, W. Osgood, L. N. E. Cooke, and J. B. Darnall are appointed second class clerks in the examining corps.

Professor H. H. Bates, examiner, has taken charge of the class of Civil Engineering.

#### CAR COUPLING DANGERS.

The suggestions heretofore made by us on this subject have called forth a variety of communications from correspondents, some of which we shall publish. One of these, signed "Brakeman," will be found in our present number. It is the production of a brakeman now working on the Erie railway, and is a model of excellence. The clear intelligent manner in which the subject is discussed is very creditable to the writer. Communications of this kind, from practical men, we highly value.

#### Business and Personal.

The Charge for Insertion under this heads One Dollar a Line. If the Notices exceed Four Lines, One Dollar and a Half per Line will be charged.

The paper that meets the eye of manufacturers throughout the United States—Boston Bulletin, \$4 00 a year. Advertisements 17c. a line.

I want a partner with capital in Bolt Machinery, also some parties to make machines with good facilities, fully developed. John R. Abbe, Providence, R. I.

Pipe Cutters, equal to Stanwood's, for cutting off iron or brass pipe. Price,  $\frac{1}{2}$  to 1, \$2.50. Apply to G. Abbott, 31 Devonshire Street, Boston, Mass.

Wood turning Lathes, cheap. Wm. Scott, Binghamton, N. Y.

Wanted—A Power Pump to raise water 45 feet into a Tank to supply a 25 H.P. Locomotive Boiler. Send Circular and Price List to D. B. Cade, Jr., Danburg, Wilkes County, Georgia.

Bar Mill Roller Wanted—In an old established mill of first rate reputation. A first class roller in every respect, steady and attentive, and competent to any rolling of Bars and Bands. Steady work and healthy, pleasant locality. Address L. W., care of Box #70, N. Y. City.

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Large lot of Machinery for Sale. See adv. of Geo. Place & Co.

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Wm. Burghart, 125 Grand St., Paterson, N. J., wants to find parties who will manufacture a new and valuable invention.

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Models and Patterns of all kinds made in the best manner at lowest prices. Geo. B. Kilbon, 35 Market St., Springfield, Mass.

Whitcher's Pat. Rotary Engine is the simplest, cheapest. On exhibit at P. Fields & Son, North Point Foundry & Mac. Wks., Jer. Cit., N. J.

Ashcroft's Original Steam Gauge, best and cheapest in the market. Address E. H. Ashcroft, Sudbury St., Boston, Mass.

Diamond Carbon, of all sizes and shapes, furnished for drilling rock, sawing stone, and turning emery wheels or other hard substances also Glazier's Diamonds, by John Dickinson, 64 Nassau St., New York.

Engineering and Scientific Books. Catalogues mailed free. E. & F. N. Spon, 446 Broome Street, New York.

Steel Measuring Tapes, manufactured and sold by W. H. Payne, Greenpoint, N. Y. Send for circular.

Heydrick's Traction Engine and Steam Plow, capable of ascending grades of 1 foot in 3 with perfect ease. The Patent Right for the Southern States for sale. Address W. H. H. Heydrick, Chestnut Hill, Phila.

Tested Machinery Oils—Kelley's Patent Sperm Oil, \$1 gallon; Engine Oil, 75 cts.; Filtered Rock Lubricating Oil, 75 cts. Send for certificates. 116 Maiden Lane, New York.

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The Berryman Steam Trap excels all others. The best is always the cheapest. Address L. B. Davis & Co., Hartford, Conn.

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Kelley's Chemical Metallic Paints, \$1, \$1.50, \$2 per gallon, mixed ready for use. Send for cards of colors, &c., 116 Maiden Lane, N. Y.

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For Steam Fire Engines, address R. J. Gould, Newark, N. J.

Old Furniture Factory for Sale. A. B., care Jones Scale Works, Binghamton, N. Y.

Kelley's Pat. Petroleum Linseed Oil, 50c. gal., 116 Maiden Lane.

Brick and Mortar Elevator and Distributor—Patent for Sale. See description in Sci. AMERICAN, July 20, 1872. T. Shanks, Lombard and Sharp Streets, Baltimore, Md.

Brown's Coalquarry & Contractors' Apparatus for hoisting and conveying material by iron cable. W. D. Andrews & Bro., 414 Water St., N. Y.

Ashcroft's Self-Testing Steam Gauge can be tested without removing it from its position.

Peck's Patent Drop Press. Milo Peck & Co., New Haven, Ct.

Williamson's Road Steamer and Steam Plow, with Rubber Tires. Address D. D. Williamson, 32 Broadway, N. Y., or Box 1209.

Belting as is Belting—Best Philadelphia Oak Tanned. C. W. Arny, 301 and 303 Cherry Street, Philadelphia, Pa.

The Berryman Heater and Regulator for Steam Boilers—No one using Steam Boilers can afford to be without them. I. B. Davis & Co.

Steel Castings to pattern, strong and tough. Can be forged and tempered. Address Collins & Co., 212 Water St., New York.

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