On page 276 will be found an illustration of one of these engines mounted on wheels for farmers' use.

The patent for this invention was issued August 3, 1858; and the claim is for a "hollow continuous bed-plate (without regard to exterior form), the interior of which may or may not be used as a heater." Persons desiring further information in relation to this invention will please address the inventors and manufacturers, H. & F. Blandy, at Zanesville, Ohio.

POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

[Reported expressly for the Scientific American.]

On Thursday evening, the 12th inst., the usual weekly meeting of the Polytechnic Association was held at its room in the Cooper Institute, this city; the president, C. Mason, in the chair.

MISCELLANEOUS BUSINESS.

Mono Lake.—Mr. Bruce gave some interesting facts (lately received in letters from his son) about Mono lake, Cal. The lake is about six miles long, and has no visible outlet. The water flows from the circumference to the center, where it seems to descend into some subterranean passage. A person wading in the water and troubled with corns, will be relieved, for the water will soften them so that they can easily be eradicated. The leather of boots and shoes will soon lose its strength and will appear like brown paper. The water is quite alkaline, so that people in the neighborhood wash their clothes in the lake, and are able to dispense with soap. About the lake there is no vegetation, and in it no fish. But a certain kind of fly thrives about the lake, and the nymphæ of this fly have their existence in the water, and are in this season so abundant that the whole lake is covered, and appears like a huge cauldron of indian meal gruel. Thousands of tuns of the larvæ might easily be gathered every year. The Indians about the lake make the larvæ a chief article of food, collecting it and storing it up for winter use. From the larvæ also may be extracted 75 per cent of oil, which is suitable for burning.

The subject was briefly discussed by the president, Dr. Stevens, Professor Hedrick and Mr. Seely, and the statements of Mr. Bruce confirmed. Doubts, however, were expressed of a subterranean outlet, several members preferring to believe that the water evaporated as fast as it flowed in. Specimens of the dried larvæ, which had been received in a letter were passed round and examined. The form of the body was not well enough preserved to be examined by the naked eye; the taste was salt, alkaline and fishy.

Re-election of Professor Mason.—The Committee of Arts and Sciences of the Institute, announced that they had chosen Professor Mason to be president of the club, for the coming year. The choice was approved by a vote of the club.

The president then announced the regular subject:—"Fire-escapes, Ventilation and Iron Buildings."

DISCUSSION ON FIRE-ESCAPES.

Mr. Dibben—The fashion of building is now quite different from that of our fathers. Our buildings are higher, with more wood, and frailer than is desirable. Tenant houses always have narrow staircases, and tower above their neighbors 40 or 50 feet. For this new state of things, we require new apparatus for protection against fire. Hooks and ladders are good enough for buildings two or three stories high, but they are of little service when our six or eight story buildings are on fire. The demand for contrivances for saving property has created an excess of the ordinary fire apparatuses. They get in each other's way, and the streets are often blocked-up with them. We need other contrivances and a different system. The London fire-escape is much talked of, but it will not answer for New York. It is altogether too bulky. In London they build differently. We need for fire-escapes, apparatus that can be carried and managed by a single man, who can operate it without being disturbed or incommoding others, and every engine company might easily carry appliances which could be instantly put in service. The leading ropes of engines should be available when a rope is needed at a fire.

The President—No single apparatus can be adjustable to all emergencies. When the City Hotel was burning, and it was supposed all the occupants had escaped, a man was seen in one of the attic windows. A rope was dexterously thrown up from the street, was caught, fastened to the window, and by it the man was saved.

Mr. Whittmore—At a fire in San Francisco, it was found that the ladders would not reach the upper stories. Two ladders were then so placed that their upper ends met, and on these as a base another ladder was raised which reached the top of the building. By this means several lives were saved.

DISCUSSION ON VENTILATION.

The President—When we had fire-places there was little said about ventilation, and we show our regard for the old fashion by still keeping the mantles, but unwisely in a pecuniary point of view, for we pay for mantles, under which a fire is never made, enough to procure the very best apparatus for warming.

Professor Hedrick—No system of warming and ventilation will suit all circumstances. What is fit for winter is useless for summer; contrivances for churches and hotels, would be quite unsuited for private dwellings. Stoves are very good when properly used, but they enable us to suffocate ourselves; with the fire-place suffocation is impossible.

Dr. Young—Flues should be built in walls on every every side, and ventilators arranged in many places.

Professor Hedrick would place the ventilators at the bottom, and the hot-air registers at the top.

Mr. Baker advocated ventilating flues traversed by steam pipes, which by the warmth would establish a current.

Mr. Reid—The Romans heated their floors, laid with tiles, so that the heated air rose from every part and secured equal warmth and circuiation.

Mr. Brown elucidated the whole subject by drawings on the blackboard, showing the advantages and disadvantages of the different systems now in use. He advocated the plan of admitting, at the bottom of a room, air heated to about 160°, but never beyond, and opening ventilating flues also at the bottom. He had tested his system with very satisfactory results. He found that a school building, containing 1,500 children, during all the changes of winter, could be uniformly heated and thoroughly ventilated.

Mr. Godwin believed that *power* would in some cases be required to secure thorough ventilation.

The same subjects were ordered for the next meeting.

AMERICAN NAVAL ARCHITECTURE.

[Reported expressly for the Scientific American.]

THE STEAMER S. R. SPAULDING.

This steamer was constructed by Messrs. Harlan, Hollingsworth & Co., of Wilmington, Del., for the Merchants' and Miners' Transportation Company, to ply between the ports of Boston and Baltimore; and she was recently employed to convey the New England delegation to the convention at Charleston, S. C.

As this steamer is securely built, and has, upon her first trip, far exceeded the anticipations of those interested in her erection, we need not apologize to the readers of the SCIENTIFIC AMERICAN for giving minute details of the construction of her hull and machinery, which are as follows:—Length on deck, from fore-part of stem to after-part of stern post, above the spar deck, 214 feet; breadth of beam, at midship section, above the main wales (molded), 33 feet 3 inches; depth of hold, 15 feet 9 inches; depth of hold to spar deck, 24 feet; draft of water at load line, 12 feet; dip of wheel at load line, 7 feet 9 inches; area of immersed section at above draft, 335 square feet; tunnage, 1,092 tuns. Her frame is of wrought iron plates 7-16ths and 13-16ths of an inch in thickness, and securely fastened with rivets $\frac{7}{8}$, $\frac{3}{4}$ and $\frac{5}{8}$ of an inch in diameter every 3, $2\frac{1}{2}$ and 2 inches. Distance of frames apart at centers, 16 and 18 inches. The floors are shaped I (vertical); depth, 20 inches, and thickness of same, 9-16ths of an inch. The shape of keel is U, and it is 13-16ths of an inch in thickness. There are 12 keelsons fore-and-aft, each 20 inches in hight by $\frac{1}{2}$ of an inch and 9-16ths thick.

The *S. R. Spaulding* is fitted with one vertical beam condensing engine; diameter of cylinder, 56 inches; length of stroke of piston, 11 feet 3 inches; diameter of paddle wheels, 31 feet; material of same, iron; number of blades, 26; width of same, 7 feet 8 inches.

This steamer has one return tubular boiler, located in hold; length, 17 feet; width, 16 feet 6 inches, and is 13 feet in hight; the number of furnaces is 4; length of fire bars, 7 feet 8 inches; number of arches, 4; diameter of same, $22\frac{1}{2}$ inches; diameter of tubes, 4 inches. The hight of the smoke pipe is 56 feet above grate surface; diameter of same, 5 feet 6 inches; area of heating surface, 3,225 square feet. The boiler has water bottom, and no blowers to furnaces. All the woodwork around the boiler is protected from communicating fire by iron, felt and tin. The maximum pressure of steam is 25 lbs., cut off at $\frac{1}{2}$ stroke; revolutions at above pressure, 20. Her bunkers are of iron, her water-ways of wood, and she possesses 3 anchors, one smoke pipe, one independent (extra size) steam fire and bilge pump, one bilge injection, and bottom valves or cocks to all openings in her bottom.

Her rig is that of a brigantine. In addition to the above features, she has three water-tight athwartship bulkheads, and is, in every respect, a seaworthy and staunch vessel.

WHAT OUGHT TO BE KNOWN.

How much solid water there is among the flues of boilers as ordinarly set under ordinary firing.

How much water there is in the legs of fire-boxes under the same circumstances.

How much water goes over into the cylinder in case of two domes, one dome, the perforated pipe, and various standard amounts of steam and separating room.

How much average pressure there is in the cylinder before the point of cut-off at quarter-stroke with the link-motion and narrow port.

What shape and size of smoke-arch for a given flue-area and cylinder will allow the largest blast-pipe.

How much combustible gas there is in the smoke-arch under ordinary working, with the various kinds of "smoke-burning engines."

What is the proper counter-balance for the wheels of the various classes of engines, to be ascertained by suspending one of each class by ropes, and working it then and there.

The greatest weight on a given area of journal that will allow a film of oil to remain between it and the box.

How much it costs to stop and start a 25-tun engine and four cars filled.

How much extra fuel it requires to heat through each sixteenth-inch of scale on fire-boxes and tubes.

Whether the pressure on slide-valves is decreased when they are in rapid motion, *i. e.*, whether any film of steam between them and the seats counteracts the pressure above.

What is the relative friction and wear of an ordinarily turned-up and emery-finished iron journal, and a burnished journal of hardened steel under given loads.

This is merely a sample of a few of the problems in railway practice of which a solution is rather important to economy. And if railroad companies would club together and answer them by experiment—all of which is easy and simple—we venture to say it would lead to a saving of a hundred times the cost of the experiments, and ten times the cost of the necessary changes which the experiments would suggest.—*American Railway Review.*

FIRE-ESCAPES—A SUGGESTION.

MESSRS. EDITORS:—I have read several articles in your paper, treating on "Fire-escapes."

I venture to offer for your consideration a suggestion which I have been making for the last fifteen years, but which, although well received, has never had any practical attention. It is this:—Let a law be passed, requiring, in all buildings, on every floor, immediately between the floor and the window, a square opening in the wall, of some 12 by 16 inches, in which will fit a wire ladder, folded, so that a person has only to throw it out of the window, when it will unfold and roll to the ground; one end being fast to the wall inside, the other end can be held, if necessary, some distance from the wall, so that the parties can readily descend or a fireman ascend, pipe in hand. The opening can be covered with a close door, so that this box for the ladder will not be a disfigurement. When it shall be known that every floor in every house will have these ladders, people will, without hesitation, go into and up every house with impunity.

I do not know if I have made myself perfectly understood. If I have, I believe the mode suggested will be found the simplest and most effective of fire-escapes.

W. H. W.

Philadelphia, Pa., April 23, 1860.