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THE BLANDY PORTABLE STEAM ENGINE.

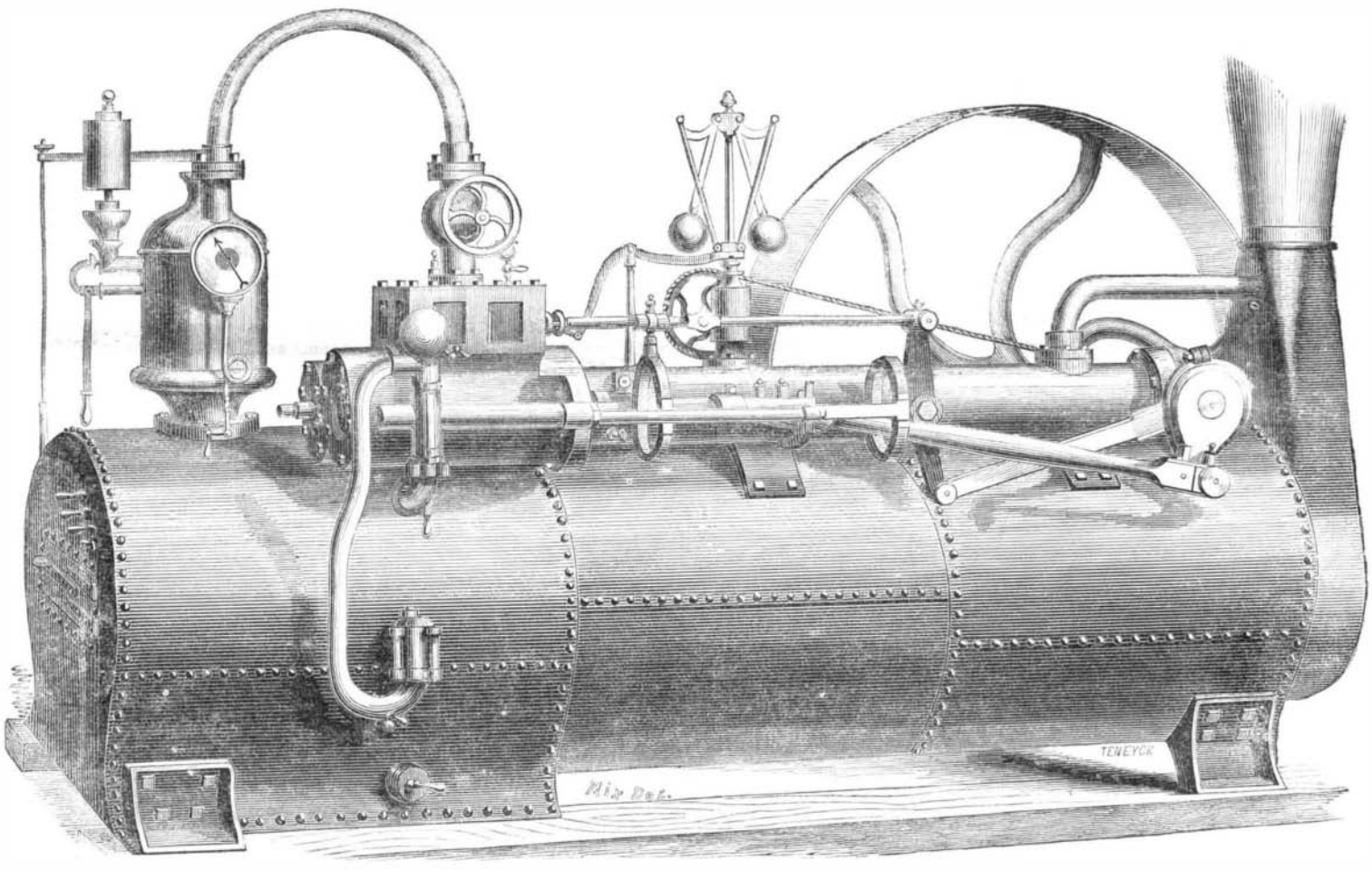
The aggregate horse-power of small steam engines demanded by a community is much greater than that of large ones. This is one manifestation of a pretty general law, which is shown in the greater amount of *local* than of *through* business of railroads—in the excess of the aggregate of small properties over the sum of the great fortunes, and in numerous other ways. When we couple these facts with the transcendent importance of the steam engine, we are prepared to realize the immense extent of the manufacture of portable steam engines, and are not surprised at the statement that the success of the firm whose engine we here illustrate is surpassed only by that of the sewing machine manufacturers.

The leading peculiarity of this engine consists in the bedplate, *which, for a 20-horse power engine*, weighs 320 lbs. only, and is strictly a cast iron pipe, the form combining the greatest strength with the least weight of metal, and having, on one side, seats for its own attachment to its permanent seats on the boiler, the separate faces of which are planed and united by bolts; on another side, seats and faces for the attachment of *all the working parts of a steam engine!* One end of the pipe bedplate is closed by one of the plumber blocks of the main shaft, the other by a cover with projecting nozzle, through which the supply water is conveyed into the interior of the bedplate, where it is heated by the exhaust or escaping steam, conveyed through its own separate pipe, *through the interior of the bedplate*, on its way to the smoke-stack, where it is used to fan the fire! It will thus be seen that the bedplate is really a very curious and useful affair; not an inch of useless or unoccupied surface, inside or out; not a pound of metal employed not necessary to its integrity as a common pipe. The bedplate effectually and perfectly isolates the working parts from the boiler, and fixes their relations to each other so perfectly that they are absolutely unaffected by the variations of the boiler in passing from cold to steam at any safe pressure. The engine is so erected that, in taking down the whole of the separate parts, or any single part, or the bedplate carrying the whole engine from the boiler, everything must go back to its own proper place, and cannot be put in any other, as no "dutchmen," or liners are employed; and all without disturbing a bolt passing through the boiler sheets—the surfaces being planed. Permanent pins and studs are used in attaching the separate parts to the bedplate. Notwithstanding the interior of the bedplate is used as a heater, and the stream of cold water constantly passing into it serves to preserve a lower and equal temperature, still it is not necessarily used as a heater. The water may be introduced directly into the boiler. There is on the boiler a cold water lifting and forcing pump, worked by a band from the main shaft, and, by clutch coupling, thrown into or out of gear instantly.

The boiler of the Blandy Steam Engine, like the bedplate, is peculiar; of symmetrical proportions, nearly cylindrical in outline, with ample furnace inside, entirely surrounded by water space, and large open grate surface; the larger sizes receiving common cord wood, and all sizes burning wood, coal and coke equally well.

Though so compact, the engine has all the separate parts ever attached to any high pressure engine—globe throttle, governor, steam gage, whistle, heater, &c.; and all so skillfully and artistically combined that no motion of the boiler ever disturbs the relations between it and the separate parts of the engine. For sawmill, mechanical, manufacturing and printing-office purposes, the boiler is furnished with cast iron feet; for planters' and farmers' use, it is mounted on wheels, with locomotive smoke-stack, spark deflector, wire gauze, &c., to make it safe among the combustibles where its services are performed. But, however excellent, theoretically, any new discovery may appear, its true value is only determined by the unerring test of experience. The Blandy Portable Steam Engine has fully sustained itself in practical operation, and has achieved the most brilliant results in sawing lumber—the hardest possible work for any engine. Besides, it obtained the first premium at the Ohio State Fairs for 1857 and 1858; and the first regular premium for a farm engine, and an extra, special and only premium for a sawmill engine (silver medal and $20) for 1859.

The Blandy Portable Steam Engine affords another illustration of the tendency to simplicity in all progress in the mechanic arts, and is, we think one of the most compact, simple and efficient portable engines ever yet offered to the mechanic, manufacturer, planter and farmer, and quite unsettles the hitherto-acknowledged superiority of the common stationary engine, up to the limit of portability; and time and further experience is needed to define this limit.



THE BLANDY IMPROVED STATIONARY STEAM ENGINE.

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.