



An Experiment with a Steam Engine.

MESSRS. EDITORS:—I was called upon a few days since by Mr. G. B. McDonald, constructing engineer of the Louisville rolling mill, to witness an experiment on one of its principal engines—an account of which may prove both useful and instructive to many of your readers.

In this trial the throttle valve alone was used (the governor valve was thrown full open). After setting the throttle so as to give about the ordinary piston travel per minute it so remained through the experiment. The engine when cutting off at half-stroke made 28 revolutions per minute; the change was then made to full stroke by simply changing the cam hooks, when the running speed fell off until only 17 revolutions per minute were obtained in the same time. These tests were repeated three several times during half an hour, with precisely the same results. The boiler pressure by the gage was 125 lbs. The engine was merely driving the unloaded machinery—shafting, gearing, &c.—which equals about fifty tons.

Mr. McDonald stated that the engine in question was in first-rate order, as it had been running but a few days since it was thoroughly overhauled by the maker. It has a 26-inch cylinder by 5½ feet stroke, with puppet valves, levers and lifters worked by eccentrics. The fly-wheel, 18 feet in diameter, is on the counter-shaft, driven by a 16-foot spur wheel on the engine shaft, and made about 2½ revolutions to 1 of the engine.

Does not the above test show the practical difference between wire-drawing, as it is termed, and expanding steam?

In my practical tests of stationary engines, using slide valves and steam chests, I long since discovered there was a proper or proportional size for the capacity of the steam chest relative to the size of the steam cylinder and point of cutting off. My experiments showed that a point could be reached where the supply preserved with the chest would approximate very closely to that of the boiler, while using the common governor and valve. It is easy to perceive, if the chest was too small, that the quantity would fall short; if too large, the amount of pressure would not be reached. Beside, large chests or castings, to fill between the governor valve and piston (when under the control of a governor), cause more fluctuation of speed than small ones, and especially so where the amount of fly-wheel is insufficient, which is too generally the case in the West.

N. COPE.

Louisville, Ky., April 23, 1864.

[We should like to see cards from the engine in question—they would tell the whole story. As our correspondent adds—in another portion of his acceptable letter—the principle, or rather the reason, for the defect is not new, and has been suggested many times before. Engines in general—ordinary stationary engines—follow a great deal further than they should; more steam enters the cylinder than is required to do the work, and the result is not only a waste of fuel but a loss of useful effect in the engine itself. Such engines labor heavily and act as if afflicted with the asthma. Five-eighths of the stroke is far enough for any engine to follow. Very many engines whose ports remain open to the end of the stroke, would be greatly benefited by adding lap, if the valve is a slide, and shifting the eccentric to cut off sooner, or altering the toes and eccentric to make the valves drop sooner if they are poppets.—Eds.]

A Valuable Testimonial.

MESSRS. MUNN & Co.—*Gentlemen*:—For a number of years past I have been constantly experimenting in machinery, and since the commencement of the rebellion, in gunnery, shot, shell, &c. During my short career as an inventor I believe I have employed "Munn & Co." in all the business connected with the Patent Office excepting one job. During the three past years six patents have been secured for me in this country and one in England and one in France. You will accept my most grateful acknowledgments for the prompt manner and untiring energy always

exhibited [in your efforts in all my cases before the Patent Office. Allow me, through you, to thank your very able and gentlemanly assistants at Washington for their numerous kindnesses to me.

I have sold out my interest to the "American Projectile Co.," No. 48 Pine street, who will continue the business as usual. The parties are men of worth and influence, and will no doubt continue to employ your services. Should life and health be continued to me, I hope to be remembered as among those who are engaged in some of the great enterprises for the development of our national industry.

Yours, very respectfully,

W. STAFFORD.

New York, May 3, 1864.

[Mr. Stafford is well known to the readers of our journal as the inventor of the "Stafford Projectile."—Eds.]

Destruction of an Iron Propeller in a Coppered Ship.

MESSRS. EDITORS:—At the last meeting of the Institute of Technology, in this city, a gentleman, well known as one of our greatest pioneers in all that relates to shipping, presented some fragments of a cast-iron propeller, which was attached to a coppered ship, which was remarkably deteriorated. To use the gentleman's own words:—"It had the consistence of graphite, and could be shaved off with a pocket-knife to a depth of ¼ of an inch from the surface." Several reasons were given for this rapid deterioration (the screw having been in the water but a few months), but the right one perhaps was not hit upon. It is well known that a piece of iron in a salt of copper will precipitate all the copper in a metallic state, and a corresponding equivalent of iron will take its place in the solution, forming thus a salt of iron. Now might not this reaction have taken place in the case of this propeller?

Sea water contains soluble sulphates. The coppering of the ship was probably dissolved in the form of a sulphate, and the iron of the screw being brought into contact with this solution, the copper was precipitated and the iron was dissolved, the crust on the casting which was found to be so soft, was then composed of the oxide of iron [Fe₂O₃] probably, together with the carbon of the cast-iron which was left after the iron had been dissolved; and this carbon, which is in fact graphite or black-lead, mixed with the oxide of iron, was the substance forming the crust, which could be so easily cut with the knife. If this reason should be the right one it would be quite out of the question, practically, to use cast-iron propellers on coppered ships unless they could be covered with some pigment which would preclude the possibility of contact between the iron and the salt of copper supposed to be in solution in the water.

F. W. E.

Boston, Mass., May 2, 1864.

[This is doubtless the correct explanation. When two metals in contact are corroded, the action is confined wholly to the electro-positive metal.—Eds.]

Fan for Hospitals Wanted.

MESSRS. EDITORS:—I would suggest to the inventors of the United States to contrive a fan of some kind that can be affixed to hospital beds, and which will fan for ten or fifteen minutes without stopping. No one can tell the benefit of such a contrivance or the satisfaction it would give to those who have to lie on hospital beds in the heat of summer.

Baltimore, Md., April 22, 1864.

[A good suggestion; to which we will add that the fan should draw the air out of the room, effecting a gentle circulation. Merely disturbing the air by a fan shaken back and forth is a waste of the power employed.—Eds.]

Large American Planing Machine.

MESSRS. EDITORS:—Having read an account of a large English planing machine on page 266, current volume of the SCIENTIFIC AMERICAN, I think it only just to make mention of a planing machine of American manufacture built by Messrs. Poole & Hunt, and now in operation at their works at Woodberry, near Baltimore, Md. It will plane in its present unfinished condition 12 feet square by 20 feet long, but when completed its length will be increased to 45 feet. It is now fitted up with three tool boxes, two on the

cross-slide and one on the side, but provision has been made for a fourth one should it be deemed necessary.

J. JONSON.

Woodberry, Md., May 3, 1864.

Indignation vs. Goodyear's Patent.

MESSRS. EDITORS:—In common with many others, I beg leave to express my thanks to you for your fidelity to the people, in reference to your course on the Goodyear Patent, and on numerous other occasions. I can hardly believe that the present Congress will consent to be bribed by mercenary capitalists. It is none the less true, however, that the "love of money is the root of all evil;" still less do I believe that the people will tamely submit to be betrayed by their own representatives. Should this monopoly be extended, many a politician's career is ended forever. Such a popular demonstration will be made by an outraged people as will cause to tingle both the ears of every Congressional culprit. Meanwhile—I would suggest that every man interested in the right cause address his immediate representative in Congress, to use his influence to have the "yeas" and "nays" called upon the final vote. To this action on the part of their public agent, the people have a sacred right, and I trust that it may have a useful result. I cannot, however, but repeat my belief that our present Congress is incapable of the moral baseness of sacrificing their constituents to monied mercenaries.

O.

Maine, April 29, 1864.

Unseemly Extravagance.

The lavish expenditure and love of display which is becoming so prevalent among a portion of our people has called forth many remonstrances; and there are voices—not crying in the wilderness, but strong in their utterances, among men that cannot let the folly pass unrebuked. Nor should they. We reproduce herewith an article upon this subject which recently appeared in the *Evening Post*:—

"A man builds a marble stable on the rear of his lot, at a cost of eighty thousand dollars, and fits up a private theatre over it. Another pays eight thousand dollars for a pair of horses to drive on the road for his pleasure; and many give from fifteen hundred to three thousand dollars for the same object. Another provides a dinner for a dozen friends—rejecting the old superstition of the unlucky thirteenth—and this simple dinner costs one thousand dollars. A children's party is given, in an up-town house, where every child is clad entirely in dresses imported from Paris. An American citizen purchases a house for over one hundred thousand dollars, and tears it down, to rebuild upon its site one yet more costly. These are signs of the times—are they not evidences of a state of things unhealthful, feverish, threatening to the honest simplicity of our political life; and threatening not less evil to the ideas and the principles of which that life has hitherto been a fair exponent? What business have Americans, at any time, with such vain show, such useless magnificence? But, especially, how can they justify it to themselves in this time of war? Some men have gained great fortunes during the last two or three years; but that does not excuse their extravagance. Is there nothing worthier than personal adornment in which to invest their means? Are there no enterprises open to these men of fortune which would benefit the country and their fellows as well as themselves? One man spends two hundred thousand dollars upon a dwelling-house; but he might build with this sum a long row of decent cottages, to rent to people in moderate circumstances; he might enable fifty or a hundred families of workingmen to live cleanly and respectably in New York, and thus make himself a public benefactor—and that without sinking his money where he can never recover it. Or, instead of dressing a few children in silks and jewels, and robbing them of the freshness and charm of youth by these vanities, why not spend the money in sending the homeless children of the city to comfortable farm-houses in the West, where they will be trained to industry and virtuous conduct, and grow up good citizens? The sum wasted on a dozen children at a party would probably suffice to send a hundred to the West, and make honest citizens of them. In England, during the French war, useful enterprises of all kinds were originated, and prospered. There was then, as with

us now, an inflated currency; great fortunes were made by speculative ventures, as here now. No doubt, too, there was extravagance; but there arose, at the same time, a spirit favorable to useful enterprises of many kinds—such as we wish could obtain amongst us. We have far better opportunities for such use of capital; we have mines, new manufactures, waste lands, to be developed and brought into profitable use; we have comparatively a new country to our back, in which the prudent capitalist can see a thousand opportunities to increase his store, and, at the same time, benefit his countrymen. The citizen, therefore, who wastes his gains upon ostentatious houses, extravagant furniture, dress, or food, commits a crime against his country. And especially is extravagance culpable in New York, where, though but half the island is built upon, there is scarcely a place fit for an honest workingman to bring up his family in, or where they are not exposed to the corrupting influences of squalor and vice."

Facts about Meats.

Every wife and mother owes it to herself, her husband, and her children, as well as to society at large, to prevent waste in every department of the household, whether provisions are cheap or dear, whether the husband is rich or poor; for waste is a crime against humanity, an insult to the bounteous Hand which "giveth us all things richly to enjoy." On the other hand, a true economy is one of the wisest, the best, and ennobling of domestic virtues. A hundred careful experiments were made in England in reference to roasting and boiling meats, in order to ascertain the respective losses:—

Roasted chickens lost 15 per ct.; beef ribs and sirloins, 19 per ct.; geese, 19 per ct.; boiled mutton legs, 10 per ct.; boiled beef, 15 per ct.; boiled shoulder mutton, 28 per ct.; turkeys, 20 per ct.; mutton legs and shoulders, 24 per ct.; ducks, 27 per cent

Boiling beef saves more than four per cent over roasting. If a leg of mutton is boiled it loses ten per cent; if roasted, twenty-five per cent! The fatter meat is, the greater the loss; it should be moderately fat to make it tender; but there is an unprofitable fatness. Eleven pounds of roast rib-pieces loses two pounds, and the bones one pound, so that of the eleven pounds, only seven pounds come to the table. Hence if roast rib-pieces cost in New York, in April, 1864, twenty cents a pound at the butcher's stall, it is more than thirty-one cents a pound on the dinner-table.

It is philosophically true that one pound of clear roast beef is more concentrated than one pound of boiled beef, has less matter in it, and hence may contain more nourishment; but the more concentrated food is, the more unwholesome it is, not only because it requires a greater digestive power to convert it into pure blood, but the sense of sufficiency at meals is induced to a considerable extent by the bulk of what is taken, and if we eat concentrated food until there is bulk enough to remove the feeling of hunger, there is so much nutriment in it that nature can't extract it all in a perfect manner; hence there is not only too much nutriment for the wants of the system, but all of it is imperfectly prepared, and we really get less strength and less pure blood out of it, than if much less had been eaten, or it had been taken in a more bulky, or, if you please, in a more watery condition. This is the reason why dyspeptics and others eat a great deal, but they do not get strong. But if there is too much bulk, there is not enough nutriment, although a great deal is taken into the stomach. Porter and beer, for example, fill up the stomach, and seem to make persons fleshy, but there is but little nutriment and great bulk; but great beer-drinkers are never strong, they are puffy. —Hall's Journal of Health.

A PLAN for picking pockets has been invented by the Rebel prisoners confined at Wheeling, Va. When a new prisoner arrives some one of the initiated starts the cry, "fresh fish," which is understood to convey the knowledge of the arrival. When the new prisoner is ushered in he is immediately seized by the occupants of the room, placed in a basket, and thrown up. They continue to toss the new comer in this manner until his pocket-book falls out, when he is released and the pocket-book is confiscated.

Anti-fouling Composition for Iron Ships.

The *Circassian* is in the dry dock at the Charleston Navy Yard, receiving another application of Mr. Davis's *anti-animalcule* composition, which has been previously used with such success on her bottom. The Navy Department having been informed of the effective character of this preparation have approved of it, and no doubt, within a few months every iron vessel in the navy will have it applied. It will be one of the most servicable things yet introduced into the navy, and by it the great defect of iron vessels—their liability to foul bottoms—will be entirely remedied.

The invention is considered one of great importance and a very desirable acquisition. By it, our monitors and iron-clads will be in a better sea-going condition than ever before. When the *Circassian* was hauled into dry-dock, and her sides exposed to view, she was pronounced the cleanest ship ever before placed in the dock after a cruise. Her bottom was as clean as the day she was launched. The English and French Consuls, Capt. Moodie of the *Asia*, and a number of our principal ship-owners have visited the *Circassian*, and expressed themselves in the most favorable manner regarding the *anti-animalcule* composition.

[If this article is all that it is stated to be, it is invaluable. European chemists and inventors have labored in vain up to this time to produce a practical non-fouling coating for iron ships.—Eds.]

Increasing the Illuminating Power of Gas.

The editor of the *Sanitary Reporter* (England), in an article on testing gas, says:—"The following are distinct modes of increasing the power of an argand burner consuming ordinary coal-gas; they have all been long known to the writer:—1st. Contracting the central opening to about .45 to .5 of an inch diameter. 2d. By a perforated disk round the burner, and resting on the gallery which supports the burner. 3d. By interposing a thin piece of paper or metal to contract the passage of air through the central opening. 4th. By placing a little contracted cap on the top of the chimney. Now, every one of these contrivances will considerably increase the power of the argand burner. Moreover, all these contrivances act on the simple principle of diminishing the velocity of the current of atmospheric air, and thus allowing the minute particles of carbon, which the gas contains, to be longer suspended in the flame."

Water Meters in Philadelphia.

All large consumers of water in Philadelphia, are to be charged hereafter by the gallon. Mr. Birkinbine, the Chief Engineer, has issued a circular announcing that water meters will be introduced at the expense of the consumers, and bills collected quarterly at the following rates: From one thousand to ten thousand gallons per day, two cents per hundred gallons. For from ten thousand to twenty thousand gallons per day, one and a half cents per one hundred gallons. For from twenty thousand gallons per day and upward, one cent per hundred gallons.

PURE COFFEE.—The editor of the *Baltimore American* visited the Commissary Department of one of the large military hospitals a few days since, and noticed several barrels of dried coffee grounds, the purpose whereof excited curiosity. The polite Commissary informed him that they received twelve dollars a barrel for the grounds. But "what is it purchased for," he asked. "Well," said the Commissary, hesitatingly, "it is re-aromatized by the transforming hand of modern chemistry, and put up in pound papers, which are decorated with attractive labels and high sounding names."

EXTENSION OF THE STEEL MANUFACTURE.—The Whipple File Manufacturing Company, at Ballard Vale, Mass., have erected during the last year, a building 200 by 77 feet, for the manufacture of their own steel, and they claim to make a better article than they have ever been able to purchase. They will soon be producing 30 tons per week. Their files are cut by machinery.

IN the evidence in regard to a bridge case a few days since, an engineer testified that a measured march of men was the severest test of a bridge, and that the trotting of a horse produced double the vibrations of a twelve or fourteen-ton locomotive.



- J. W. W., of N. Y.—We know of no method of sighting a gun with perfect accuracy except by actual trial in shooting it. The back-sight is generally made to slip so that it can be adjusted by fring.
- J. S. B., of Ala.—An illustration of Giffard's injector was published on page 260, Vol. III, new series of the *SCIENTIFIC AMERICAN*. A steam pipe from the upper part of the boiler terminates in a conical end opposite a similar end of a pipe leading into the bottom of the boiler, a short space separating the two pipes. The feed water fills this space, and when the steam comes in contact with the water it is condensed, forming a vacuum, into which the steam flows with such velocity that its momentum not only carries itself into the boiler, but also a portion of water.
- W. C., of N. Y.—If any one allows you to work a low pressure steam engine for manufacturing purposes from the exhaust steam of another engine close by, for \$10 a year, we advise you to keep your own counsel and say nothing about it. There is no work devoted to super-heated steam that we know of. If you read the *SCIENTIFIC AMERICAN* carefully, you will find all the latest intelligence respecting compound steam engines.
- W. S. S., of R. I.—We have no receipts for pickling cucumbers that we can recommend at present. Your request is slightly out of our line.
- H. B. W., of Conn.—Twisted drills are made at South Bridgewater, Mass., and Newark, N. J., but we do not know the name of the maker in either place.
- A. B. M., of Mich.—We know nothing about an instrument for "graining;" you should address some wholesale paint dealers on the subject. Messrs. Reynolds, Devoe & Pratt, 100 Fulton street, can probably tell you.
- Reader, of Mass.—E. V. Haughwout & Co., of this city, are manufacturers of china ware, and can give you the information you ask for.
- A. L. L., of U. S. A.—Prof. Henry first ascertained that electricity could be passed through wires more than three miles in length. He made the important discovery that the resistance of long wires might be overcome by increasing the intensity of the current, that is by increasing the number of cups or pairs in the battery.
- U. C., of Ohio.—There is some defect in your Leyden jar that you do not point out.

Money Received.

At the Scientific American Office, on account of Patent Office business, from Wednesday, May 4, 1864, to Wednesday, May 10, 1864:—
 W. & S., of N. Y., \$25; T. & W., of N. Y., \$25; S. W. K., of Vt., \$45; J. P. E., of N. Y., \$16; J. S., of N. Y., \$16; J. S., of N. Y., \$42; H. H., of Ill., \$45; J. F., of Conn., \$20; F. J. N., of Maine, \$20; A. R. A., of England, \$16; S. & K., of Prussia, \$20; A. H. B., of N. Y., \$41; J. B. R., of N. Y., \$20; H. B. W., of N. Y., \$24; P. B. P., of N. Y., \$16; S. D. E., of Pa., \$20; I. T. G., of Iowa, \$20; P. H., of N. Y., \$41; R. D., of N. Y., \$16; H. A. A., of N. Y., \$41; H. C., of N. Y., \$16; P. C., of N. Y., \$20; J. W., of Mass., \$46; F. M. M., of Ind., \$20; E. W., of Mich., \$45; J. P. W., of Mass., \$54; T. P., of N. Y., \$65; M. B., of Ky., \$20; G. S. & H. C., of N. Y., \$20; W. D. M., of N. Y., \$36; J. Van D., of N. Y., \$20; M. C., of R. I., \$10; E. St. J., of N. Y., \$45; F. A. J., of Prussia, \$20; T. R., of N. Y., \$40; O. E. W., of Pa., \$20; J. B. W., of N. J., \$20; J. W. S., of Col. Ter., \$16; N. S. W., of Conn., \$20; S. R. B., of Wis., \$70; M. N., of N. Y., \$20; H. M., of N. Y., \$16; M. S., of Kansas, \$20; J. McP., of N. Y., \$45; J. O. S., of N. Y., \$45; L. G. K., of Mass., \$30; J. T., of Wis., \$16; F. J. G., of N. Y., \$18; S. R. H., of Mich., \$25; L. D. C., of Mich., \$21; W. S. N., of Conn., \$25; I. W. B., of Mich., \$16; D. H. H., of Ohio, \$15; J. A. D., of Ill., \$25; F. L. T., of Wis., \$11; S. M., of England, \$16; P. & T., of Pa., \$26; J. M. G., of Ill., \$25; F. C. L., of Iowa, \$15; T. & F., of Mass., \$15; P. P. P., of Mass., \$20; A. & S., of N. Y., \$25; D. L., of Vt., \$15; W. F., of Mass., \$16; McI. & R., of Col. Ter., \$100; H. J. M., of Ohio, \$25; A. K. Jr., of N. Y., \$16; J. G., of R. I., \$16; S. & P., of Ill., \$17; L. S. M., of N. Y., \$25; J. & J. N. P., of Mass., \$16; F. & B., of Ill., \$21; S. L. O., of Conn., \$30; R. W. J., of N. Y., \$56; L. G., of Cal., \$15; W. F., of Cal., \$20; T. D., of N. Y., \$25; P. C. R., of Mass., \$25; R. W. J., of N. Y., \$25; W. G. R., of Mo., \$19; J. McK., of Ohio, \$25; J. P., of Canada, \$20; J. M. A., of Mass., \$25; W. D. B., of Mich., \$25; G. W. J., of Cal., \$20; A. D., of La., \$41; C. M., of N. Y., \$16; C. M. M., of N. J., \$29; D. & B., of N. T., \$15; J. P., of Ill., \$16; G. F. B., of D. C., \$16; J. A. N., of Mass., \$16; W. D., of Cal., \$25; J. M. H., of Oregon, \$45; W. P. W., of N. Y., \$16; F. J. R., of Ill., \$26; E. K., of N. Y., \$25; W. B., of Iowa, \$25; H. H. II., of Iowa, \$25; J. C. P., of Ill., \$25; J. L. R., of Ohio, \$25; W. H. R., of Ky., \$28; J. F. L., of Ill., \$15; W. B. T., of Mass., \$16; W. C., of Cal., \$20; O. P. F., of N. Y., \$16; J. P. E., of N. Y., \$25.

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it and if they have not received an acknowledgment by mail, and their initials are not to be found in this list, they will please notify us immediately, stating the amount and how it was sent, whether by mail or express.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office, from Wednesday, May 4, 1864, to Wednesday, May 11, 1864:—
 S. & W., of N. Y.; A. H. B., of N. Y.; F. J. G., of N. Y.; C. M. M., of N. J.; L. S. M., of N. Y.; T. D., of N. Y.; J. M. G., of Ill.; S. L., of Mo.; H. J. M., of Ohio; G. & P., of Cal.; A. J., of Md.; E. C., of Iowa; J. L. R., of Ohio; T. & W., of N. Y.; P. H., of N. Y.; R. W. J., of N. Y.; W. D. B., of Mich.; J. C., of Mass.; J. M. A., of Mass.; L. G. K., of Mass.; J. McK., of Ohio; P. J. R., of Mass.; W. A. J., of Cal.; J. C. P., of Ill.; F. J. R., of Ill.; E. B., of Conn.; J. S., of N. Y.; H. A. A., of N. Y.; W. D., of Cal.; P. & T., of Pa.; S. L. O., of Conn.; L. D. C., of Mich.; W. S. N., of Conn.; S. R. H., of Mich.; W. & F., of Pa.; A. & S., of N. Y.; W. B., of Iowa; W. H. R., of Ky.; J. P. E., of N. Y.