

Fusible Plug for Boilers.

Almost every body knows that the pamphlets which have been sent out from the Patent Office, from time immemorial (nearly), containing instructions to inventors commence the form of "specification" with, "I, Sebastian Cabot, have invented an improved mode of preventing boilers from bursting, by providing the upper part of a steam boiler with an aperture to be closed by a fusible plug or disk of alloy, to fuse at a given degree of heat, to allow the steam to escape," &c. Well, a few weeks ago, a not well informed correspondent published a communication in the "Eastern Mail," Waterville, Me., recommending this same thing, and the paper came to us marked "please insert this." Instead of publishing a newly vamped invention, we merely, in a note, a few weeks ago, mentioned that "the fusible plug was old, that boilers had exploded with them, and that the Reports of Mr. Burke would give all the desired information on the subject." Not satisfied with this, the Editor of the "Mail" takes up the cudgel for his correspondent, in the Mail of the 18th April, and indulges in a very immoderate warmth of language on the subject. Hear what he says,—

"In all the philosophical principles developed, thus far, by scientific committees of investigation, we see nothing that should destroy a reasonable confidence in the 'fusible plug.' Indeed the singularity of the objections brought against it, can only tend, in any enlightened mind, to confirm this confidence. Like all other discoveries, its simplicity is fatal to its success. To 'wash in Jordan' was proved a wise remedy thousands of years ago, and yet its virtues are but just beginning to be appreciated. This simplicity has even led the editor of the Scientific American into what appears to us a very singular decision."

There is not an engineer on the Hudson, Ohio, or Mississippi rivers, but is acquainted with the fusible plug, and many boilers now use them. In referring to Mr. Burke's Report, we always like to point to sources of correct information, and as we know that implicit dependence cannot be placed in the fusible plug, we merely mentioned the fact. Leaving out all that we personally know about it, let us quote undisputed authority, viz., John Bourne, C. E. He says, in his splendid work on the Steam Engine, "plugs of fusible metal were at one time much in repute as a precaution against explosion, the metal being so compounded that it melted with the heat of high pressure steam, but the device, though ingenious, has not been found of any utility in practice." Aye, practice is the thing. Well, as if to have practice on the side of the Editor of the "Mail," he seizes Mr. Burke's report and reads—

"The government of France, over twenty-five years ago, passed a law prohibiting the use of cast iron boiler heads, after some destructive explosions from this cause. It also passed a law compelling all high pressure boilers to have their strength tested by hydrostatic pressure every three months, to ascertain if they were in any way defective, and also passed a law compelling all high pressure steamboats to use plates of fusible alloy on the top of their boilers, which would fuse at a certain temperature and prevent an explosion, which had frequently happened previous to these acts, and many lives lost; but since these laws were enforced we have scarcely heard of an explosion in that country. Now the fusible alloy, used by Mr. Evans in his guard, is precisely the same as that used by the French government but the arrangement in his invention is far superior and more simple than that of the French, and our government might have been using the fusible plate previous to Mr. Evans's improvement. What a misfortune our government did not follow the example of France twenty years ago, &c."

Gloating over this extract, he attempts to prove that we asserted what was not true, but the Report states that "two or three explosions had taken place in steamboats using 'Evan's Guard,' which is stated to be superior and more simple than the French fusible plate. Again he says, "If the testing of the boiler operates as a security in France, the test

and inspection required by law would give the same security here. What then, but the identical 'fusible plug' has done all this? And if it has accomplished so much in France, what stands in the way of the same result in this country? Where does the Scientific American find authority for the assertion that "many boilers with such plugs have exploded?"

Yes, sir, the test and security required by French law would give the same security here, but unfortunately we have neither, so then, the fusible plug has not given all the security for life in France, for if it did, how very foolish it is to be at the expense of regularly testing and inspecting their boilers. Now we have never said a word against using the fusible plug, only not to place all dependence on it. Careful engineers, a rigid system of inspection, severe and certain punishment for neglect and recklessness would, without the fusible plug, make explosions as rare in our country as in England, where there are a hundred steam engines for one in France.

Sugar and its Uses.

The French people are great eaters of sugar, always carrying some of it about with them in their pockets. M. Chessat reports that sugar, when used as the exclusive or principal article of diet, produces quite opposite effects in persons according to the difference in their systems; for, while it fattens some, it creates bile which induces a diarrhoea and a wasting of the solids in other persons. The celebrated Bolivar had, by fatigue and privations, so injured the tone of his stomach, that he was unable at times to take any other food than sugar, which, in his case, was easy of digestion.—His personal friends assure us that in some of his last campaigns he lived for weeks together upon sugar alone as a solid, with pure water as a liquid; but, probably, in nine hundred and ninety-nine cases out of a thousand, this diet would soon have brought the person adopting it to his grave; for, on those whose digestion is feeble, a larger or exclusive allowance of sugar adds to their grievance, because the excess of nutriment not being generally absorbed by their weakened system, becomes converted to bile, and causes great debility and wasting of the body. In seventeen experiments made on dogs, M. Chessat observed that, when the sugar diet fattened them there was a general tendency to constipation meanwhile; and, on the contrary, when it produced an excess of bile in other dogs, their bowels were relaxed. Why English children suffer in their digestion after eating largely of sugar-lumps, confits, &c., is chiefly owing, however, to those delicacies being composed of the refuse of starch works, mixed with plaster of Paris, pipe clay, and chalk, and having, indeed, as little sugar as suffice to give them a palatable sweetness; and they are often colored with gamboge, and sometimes with red lead, verdigris, and other mineral poisons.

Everywhere the beast of the field, the reptiles, the fish and insects, are found to have a great liking for sugar and honey. Mr. Martin says he has tamed the most savage and vicious horses with sugar, and has seen the most ferocious animals domesticated by being partly fed upon it. The tamers of lions and tigers owe their power over them, chiefly to a judicious use of sugar and other sorts of sweets and also of lavender water, and various other perfumes, of which feline animals are remarkably fond. In the sugar season, in the West Indies, the horses, mules, and cattle, soon acquire a plumpness and strength by partaking of the leavings of the sugar canes, after the manufacturer has done with them. In Cochinchina, the elephants, buffaloes, and horses, are all fattened with sugar. We learn from the "Memoirs of Dr. Edw. Cartwright," (1843,) that the ingenious man used to fatten sheep on sugar.

In our country there is more sugar used than in Britain and many of the nations of Europe, and although it is generally admitted to form good food, yet it is not prudent to use too much of it, for it is not, singly, a good supporter of life. In the northern States, and especially in those districts where considerable maple sugar is made, a great deal of it is eaten by young people, not as food, but to gratify

a passion for it. This is wrong. It is very easy to form a habit of desire for any thing sweet, sour or bitter, from sugar to opium and tobacco, but if these things are not necessary, they must be the reverse. One thing we know, and that is, maple sugar is very destructive to teeth—ten times more than crab-apple vinegar, in fact all sugar is severe on teeth, and it may be that the cause of early decay in teeth, so common throughout our country, and which is a subject of surprise to Europeans, is owing to the great amount of sugar eaten in the shape of maple sugar, cakes and candies.

Percussion and Re-Action Water Wheels.

MESSRS. EDITORS:—The article of R. C. M., in Vol. 5, No. 27, Sci. Am., requires as brief a notice as possible from me, the only agent of Zebulon Parker in Illinois, and as such agent the person meant by Mr. R. C. M., when he says, "We have a specimen of these wheels in this vicinity, made and put in operation under the superintendance of Mr. Parker's agent." If Mr. R. C. M., had confined himself to the text at the head of his article and given to the public some light upon the subject of re-action water wheels, in contradistinction to the article of J. S., in No. 17, Sci. Am., I should have been content to let the world have all his wisdom without notice or comment. But his object was not, as he professes, to enlighten the public mind, but to gratify personal jealousy. Now, so far as the article refers to the "specimens of such wheel" on Black River, it is distorted, inconsistent and wholly subservient to wrong motives. It is not true that any wheel or wheels have been constructed and put in operation under the superintendance of "Parker's Agent"—it is not true that any wheel or wheels have been constructed, such as described by Mr. R. C. M., on Rock River, under "9 feet head, 284 inches area of issue and gate corresponding; nor is it true that any such wheel has been constructed on any other stream in Illinois, and the only wheel that has been constructed of the character referred to on Rock River is on a head of 4½ feet, the issues and gate 450 inches area, and it ground 15 bushels per hour instead of six (as R. C. M. informs the public,) and the discharge of water from these wheels may be easily calculated by Parker's tables, which millwrights, like R. C. M., "condemn for not understanding them," and who do not wish to try to understand them.

I will now leave the readers of your valuable journal, who have read the article of R. C. M., to form their own conclusions in the matter. J. S., I have no doubt, is fully competent to relieve R. C. M. of all ignorance on the subject of the principle of combining percussion with re-action in the same wheel, which "has not failed to obtain favor in high places."

Yours, truly,

E. C. A. C.

Illinois, April 24, 1850.

Plank Roads in Alabama.

There are now being constructed in Alabama a chain of Plank Roads from the Tennessee River to Mobile Bay, a distance of about 330 miles, running nearly from one extremity of the State to the other, north and south, through its heart and centre, via Montgomery and Wetumpka. When these roads are finished (which will be within two years) a person can leave Nashville, via Nashville and Chattanooga Railroad to the Tennessee River, thence by Plank Road to Montgomery and Mobile,—arriving in New Orleans in 56 hours. The plank road from Montgomery to Mobile Bay (called the South Plank Road) will be finished in 15 months, when this road is in operation, it will shorten the journey to New Orleans two whole days. It will be a great accommodation to the public and promises a rich harvest to the proprietors.

Fulton.

A gentleman, now an honored representative of one of the Congressional Districts of New Jersey, visited Robert Fulton when he was in Paris. The man whose genius has made a new era in civilization occupied a small and obscure room. The embodiment of the expansive power of steam was confined within narrow limits. Like Diogenes in his tub, Fulton was almost lodged in the circumfer-

ence of a cylinder. On the wall of his habitation was sketched coarsely, but distinctly, the plan of a steamboat. "There," said Fulton, as he pointed it out to his visitor, "there is the image of what will yet traverse the river and the ocean." And wherever he went this image of the future he carried with him. If he did not sketch it on the wall it was written in his mind. He saw it as he walked along; he thought of it; he dreamed of it; and, at last, he acted it. The taper of his lone room illumined the world.

Lumber Trade in Maine.

The Penobscot is free from ice on one day, its vessels like birds are seen moving on its waters the next. The Bangor Whig has the following upon the quantity of lumber likely to find its way to market:

"The quantity cut on the East Branch, above and below the Telos, this season, is about forty millions. On the West Branch, as estimated by the West Branch Log Driving Company, about thirty-one millions. On the Mattawamkeag, about thirty million; and on the Passadumkeag, about ten million. The old logs now on hand, cut on the Mattawamkeag last season, amount to about thirty million; add to this from ten to fifteen million cut in other places, and then deduct ten million which will not get in, (as small a quantity as has ever been known to lie back,) and we have, new and old, in round numbers, about one hundred and fifty millions, for his year's stock.—There is, in boards, about eight millions, a portion of which are outs, (scotts and fours).—This is less than the amount surveyed last season,—while year before last, the survey amounted to about two hundred and sixty million. Taking into consideration the quantity, compared with other years, and the barrenness of the markets in Massachusetts, Connecticut and Rhode Island, there is no doubt that the prices of lumber this season will be well sustained."

Lifting Heavy Persons.

One of the most extraordinary pages in Sir David Brewster's Letters on Natural Magic, is the experiment in which a heavy man is raised with the greatest facility, when he is lifted up the instant that his own lungs, and those of the persons who raise him, are inflated with air. Thus, the heaviest person in the party lies down upon two chairs, his legs being supported by the one, and his back by the other. Four persons, one at each leg, and at each shoulder, then try to raise him—the person to be raised giving two signals, by clapping his hands. At the first signal, he himself and the four lifters begin to draw a long full breath, and when the inhalation is completed, or the lungs filled, the second signal is given for raising the person from the chair.—To his own surprise, and that of his bearers, he rises with the greatest facility, as if he were no heavier than a feather! Sir David Brewster states that he has seen this inexplicable experiment performed more than once.

Effects of Proportion.

It is singular says Count Stolberg, in his travels, that both the outside and the inside of St. Peter's Church, at Rome, although at the first aspect they fill the heart with a sublime sense of majesty, do not appear so vast as they are in reality. Some critics affirm that this is a defect in the structure, others maintain that the gradual development of this grandeur, though it does not immediately convey to the eye an idea of its extraordinary magnitude, is but a consequence of its perfect symmetry, and I believe that these last are in the right. You must frequently have remarked that beautiful human figures, as well male as female, appear less than those of equal size, that are not so well formed. I have often made the same observation on trees. The finest oak I ever saw did not appear to me so tall or so large as others around it which were less beautiful, and which, in fact, were less in size.

Rail-car axles are proved by English experience to become crystalline only at a point just adjoining the wheel; the rest of the axle maintaining its fibrous structure unchanged by the action of rotation and percussion.