

More Useful Information respecting Steam Boilers.

Notwithstanding all that has been said on this subject, it seems to excite continual interest, because it is a question which concerns so many persons. While a fatal disease rages in the community, excitement remains unabated, and as long as boiler explosions occur they will excite interest. The subject is of such vast consequence in our country that officers are appointed by government to carry out laws for the safety of human life; and in England, a most powerful voluntary association has been formed for the same purpose. We recently gave a condensed summary of the Report for 1856, of our American Inspectors, and we will now present a like review of the Association in England.

Its headquarters is in Manchester, England, where it originated. Its members subscribe a certain sum annually, and employ competent Inspectors to examine and report on the condition of their boilers. At the close of 1856, this Association had under its care 1,456 boilers, and had made 2,246 visits of inspection in the course of the year. No explosion has occurred to any of these boilers, but 143 of them have been found in a dangerous state from corrosion of the plates, inoperative and inefficient safety valves, defective gauges, and deficiency of water. Corrosion of plates is attributed, in one case, to the use of water containing acid, such as that obtained from stagnant pools containing decaying vegetable matter. The remedy suggested for this, when no other kind of water can be obtained, is some potash or soda, put from time to time into the boiler. Dampness from leaks also causes corrosion in the seating of boilers.

Circulation.—On this head the Report of Inspector Longridge contains much original and useful information. It says:—

"From a careful investigation of the subject I have been led to the conclusion that, in the majority of cases, leakage and fracture of the plates at the underside of a boiler originate from imperfect circulation of the water. In no boiler that I have yet seen have any means been adopted to promote circulation, and we find that, whatever be the construction of boiler, failures of this kind occur to a greater or less extent where the pressure is considerable. In multi-tubular boilers, where the greatest heat exists in the upper rows of tubes, the water at the bottom remains comparatively cool and undisturbed, and, as is well known, these boilers are especially liable to leakage. In flued boilers, with furnaces in the flues, it is no uncommon occurrence to find one of the seams on the underside, about the middle of the boiler, fractured between the rivet holes throughout a considerable portion of the semi-circumference. In first raising steam from hot water, it is well known that the steam may be up and the temperature in the upper part of the boiler very considerable, while at the underside the water and the plates remain quite cool, which could not be the case with good circulation. Cylindrical boilers, with external furnaces, are affected from the same cause, though somewhat in a different manner."

Many boilers were found to be fractured for want of proper circulation. The mode of remedying these evils which he suggests, is to "fix in the boiler sheets of iron to separate the ascending and descending currents; or where this cannot be arranged for want of space, to convey a large pipe, communicating with the upper part of the water, underneath or within the boiler, with several branch pipes to supply water for the ascending current. The advantage to be derived from attention to circulation would not be confined to the durability of the boiler, but would also greatly contribute to an increased evaporation of water, and I know of no point connected with the construction of boilers more deserving the attention of the engineers."

This is a point which, within a few years, has attracted considerable attention in this country, and inventions have been brought forward in which the circulation of the water was a principal, in fact the only peculiar feature. But it has been pretty generally concluded inexpedient to insert plates or partitions for the express purpose, as all such additions, by forming nuclei for scale and in-

crustation, may do far more harm than good. But our boiler makers have modified their proportions materially to this end, and in the tubular boiler, for example, place their tubes at a considerably greater distance apart, so that greater opportunity is afforded for a free descent of water in an open space at the sides of the shell, to rise mingled with steam through the spaces in the middle. One principal object attained by the peculiar construction of the Martin patent marine boiler, now almost universally employed on all our new steamships, whether merchant or naval, is the active circulation of the water, but the efficiency of the heat in raising steam, and the durability of the parts is found to be quite sensibly increased.

Low Water and Heated Flues.—There was one peculiar case which occurred with a cylindrical boiler. It connected with two others, having the fires in the flues, and had been placed considerably higher than the latter on account of convenience in firing, and on the occasion referred to it appears that, owing to the valve in the feed pipe not having been perfectly tight, the water had escaped into the other boilers, till an equality of level was established, leaving the flue of the higher boiler partially uncovered. The fireman, on finding the water too low, opened the feed-valve to admit more, when almost instantaneously, the flue collapsed with a loud report. On examining this boiler a few days after, there was a distinct line, showing that the upper part of the flue had been uncovered by water, but there was no appearance of its having been red hot. The temperature, however, had been sufficient to surcharge the steam, which the moment before the accident did not exceed 8 lbs. pressure.

To provide against this danger, Mr. Longridge recommends "every boiler to be provided with efficient fusible plugs or safety valves connected with floats, either of which should be arranged to come into operation and allow the escape of steam before the water could reach a dangerous level. Where, however, a boiler is already in danger from this cause, the best course to be pursued is to draw or damp the fire, and then leave the boiler to cool, carefully avoiding any measures which might cause agitation of the water, such as starting the engine or opening any of the valves."

The Kind of Boilers.—The majority of the boilers employed in the Manchester District are of the Cornish or flued construction, and because they are stronger than the old wagon boilers, and can carry high pressure, they have superseded them, but they are not so strong as plain cylindrical boilers; they are preferred because of their superior economy in generating steam.

"The weakest points in these boilers," the Report says, "as is well known, are the flues, which, in case of deficiency of water, are very liable to collapse. It has not been satisfactorily ascertained what pressure such flues are capable of sustaining, but by some late experiments it has been proved that the strength of cylindrical vessels subjected to external pressure is in the inverse proportion to their length, a fact which seems hitherto to have been unknown, or at any rate disregarded. It seems, on this account, advisable in high pressure boilers of this construction, to strengthen the internal flues, if of considerable length, by external rings of T, or angle iron."

This is a point to which we wish to direct the attention of our boiler makers and engineers, because it is one respecting which all are somewhat in the dark.

"The cylindrical boilers without internal flues, though well adapted to high pressure, do not contrast favorably with flued boilers, in economy of fuel. The multiflued boilers are much approved of by many, but multitubular boilers are the most economical, though hitherto the necessity of frequent repairs has brought them into disrepute. One objection frequently urged against this description of boiler is the difficulty of removing incrustation from the tubes. In regard to the evaporating power of boilers our present knowledge is very imperfect. The true tests of the merits of a boiler is the weight of water evaporated per pound of coal under a given pressure and

in a given time, which can be ascertained by means of an accurate water meter."

This Report contains some very useful information relating to different kinds of engines, and the use of steam at different pressures. In our next number we will take up and discuss this part of it.

Writing Paper.—The Best Colors.

Those who are in the habit of writing during evening hours, under artificial light, are aware of the fact that the eyes often suffer from looking upon the white paper. A partial remedy for this evil is the use of light blue colored paper, which is manufactured in great abundance. All our artificial light—that of oil, gas, candles, and any common hydro-carbon—has a yellow tinge, which color excites the retina more than any other in the spectrum. As blue and yellow form a green color when combined—the most agreeable to the eye under bright lights—the benefit of light blue paper to write upon during night hours becomes apparent. The yellow rays of the artificial light strike upon the light blue paper, and mingling with the blue, reflect light green rays to the eyes. All paper, therefore, for writing upon under artificial light, should be of a very light blue color.

The writing paper to be employed by those who have inflamed and tender eyes under bright sunlight, instead of being colored blue, as we have seen recommended in some medical works, should be of a light green color, because the sun's rays are pure white, and such paper will reflect light green rays to the eye from the white solar rays falling upon it. Under no condition, however, should those who have strong and healthy eyes use any kind of paper but white. If writing in a room under bright sunlight they can tone the intensity of the rays with a white screen or other shade, and thus admit subdued white light. There are many persons, however, to whom light green paper would be of great benefit, and as very little writing paper of this color is manufactured—white and blue being the common kinds—we would suggest to our paper makers, the manufacture of more light green paper. It should take the place of that dirty yellow colored paper so commonly used in the manufacture of envelopes, &c. Common thick, but well glazed smooth wrapping paper colored green might be economically employed by many persons. All that is required to produce this kind of paper is to mix some blue coloring agent with a proper yellow coloring agent.

The common extract of indigo sold by dealers in chemicals, and a yellow fustic liquor, will color paper a good light green. These two coloring agents, in proper proportions, may be mixed with the paper pulp in the "engine." To insure the action of the indigo, one ounce of the acetate of lead dissolved in warm water should be added when cold, to 1 lb. of indigo, and the solution allowed to stand two or three hours before it is used.

We have no doubt but the foregoing suggestions, if carried out, will be the means of doing much good to a great number of persons.

Stamping Patented Articles.

Although we have on two former occasions, presented our views respecting the meaning of the patent law, as it relates to the date on patented articles, we still receive communications in which information on the subject is requested. We suppose that most of these letters come from new subscribers who have not had and cannot have the opportunity of reading the articles referred to. In view of these facts, and some others of a peculiar character, relating to this question, we deem it necessary to bring it again before our readers.

One of the letters to which we have alluded reads as follows:—"Is it absolutely necessary that the date of a patent—both month and year—and also the word *patent*, should be stamped on every article, however small? Or will it answer the claims of the law to mark thus the packages containing these articles? Some articles are so small that it is very inconvenient and almost impossible to stamp them separately." It is indeed very difficult to mark the date of a patent on many articles, on account of their minuteness, but it is not

only necessary, to stamp or mark the month, year, and word *patent* on every article for which a patent has been granted, but the *day* also. The law relating to this point came into effect on the 29th August, 1842. It says (section 6): "*And be it further enacted*, That all patentees and assignees of patents hereafter granted, are hereby required to stamp, engrave, or cause to be stamped or engraved, on each article vended or offered for sale, the date of the patent; and if any person, patentee, or assignee, shall neglect to do so, he or she shall be liable to the same penalty, to be disposed of as specified in the fifth section of the same act." The penalty for non-compliance with the law is one hundred dollars, with costs, to be recovered by action in any Circuit Court of the United States.

Now, what is the meaning of the term *date*? Evidently the *day* on which an instrument is signed. We have no other meaning for the word as it relates to patents, because it refers to the day, the month, and year on which the patent is signed.

In the month of May, last year, a suit was brought against a manufacturer in this city, for selling patent pen-holders which were merely stamped with the year (1850) on which the patent for them was issued. The ruling of the Court in that case was, that each patented article required to be stamped or engraved with the date of the patent—day, month, and year; but the plaintiffs failed to make out a case as to the articles offered for sale.

For want of a correct understanding of this law, or on account of the smallness of the articles patented and the difficulty of stamping them, hundreds of patentees have not complied with the letter of the law, although they have, in our opinion, with its spirit and object. The object of the law is to prevent persons from deceiving the public.

In every community there are always some human jackals and hounds, and we understand that there are a number of such who prowl about this city, endeavoring to find out patented articles on which the date is not sufficiently stamped, for the purpose of levying "black-mail" upon the unsuspecting patentees, assignees, or persons offering them for sale. When they see a patented article which has not the *day* of the patent's issue stamped upon it, an accomplice endeavors to have it offered to him for sale. When sufficient testimony to this effect is secured, notice is given of a suit to be commenced against the party offending, and a tremendous bill of liabilities—one hundred dollars for each article is something of a scarecrow—and costs, is presented to the mind. The law being so apparently pointed against the party offering the article for sale, it is generally concluded to pay a bonus—throw a bite into the hounds' jaws to stop their barking. We would treat every attempt to levy "black mail" in this manner with contempt. While we rejoice to see those who stamp the word "patent" on unpatented articles offered for sale, fined and punished for their plain attempt to deceive the public, we have very different feelings towards an honest but mistaken patentee who has not fully complied with the letter of the law.

We advise all patentees to stamp or engrave their names together with the *exact date* of the patent on each article offered for sale, to prevent the possibility of being annoyed, but, at the same time, from a thorough examination of the statute, we are of opinion that every person who brings a suit of this kind against another, is bound, according to section 5 of the Act referred to, to prove "intent to deceive the public" on the part of the defendant. Resting on this foundation, every honest patentee will find full security in the law, and he may snap his fingers at every "black-mail" jackal that growls at him.

The Dudley Observatory.

The Albany papers state that this institution will be in working order some time this spring. The amount expended thus far for the Observatory is about \$75,000. The permanent fund for the support of the institution exceeds \$75,000 more. A calculating machine ordered to be constructed in Sweden is expected to arrive this month.