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EXPLOSIONS OF STEAM BOILERS.

In Manchester, England, there exists an association of engineers who carefully survey every disaster of this kind upon its occurrence, and report the prominent features which, in their opinion, were the cause of the accident. They not only do this, but they also inspect the boilers of all persons who are members of the society, from time to time, as they deem necessary, so that every reasonable chance of explosion may be anticipated, and the proper means taken to prevent it. The results of this organization are forcibly shown by the report; out of 36 boilers which exploded in 1863, but one of them was under the charge of the association, and this was an exceptional case; all the others ran their chance, as we may say, and suffered accordingly.

By a tabular statement given in the London *Engineer* we find that the principal cause of explosion with most boilers was corrosion—chiefly external. The report also mentions that damp, or "sweat," as it is sometimes termed, formed between the walls in which the boilers were set, and thus caused the injury spoken of.

Careful and deliberate synopses of the several disasters enabled the members of the inspecting committee to arrive at the conclusion that one-sixth of the explosions which occurred could be traced directly to this external corrosion. From this it appears, that however important it may be to examine the interior of the boiler, it is also of vital importance to investigate the outside, especially those parts which are either in immediate contact with the setting walls, or else so covered by them as to prevent thorough ventilation.

A very general opinion prevails that explosions arise either from shortness of water, tampering with the safety-valve, or excessive pressure. An examination of the table alluded to does not warrant this assumption, for out of thirty-six explosions only two were from excessive pressure, four from scarcity of water, and but one of the cases of over-pressure was caused by carelessness, the other being an inadvertency.

"The consideration that has been given in the preceding remarks to the thirty-six explosions that occurred during the year 1863, and of which the circumstances were ascertained, clearly shows, that, however complicated the subject of steam boiler explosions has been made to appear, and however numerous and ingenious the theories may be that are propounded from time to time by way of explanation, yet on a close inspection of the simple facts in each case, the whole question with regard to those under consideration admits of a very clear solution; and

that the occurrence of all the explosions, with the exception only of that of a locomotive boiler, may be attributed to one or the other of two causes, viz.—either to the defective construction of the boiler in the first instance, or to the defective treatment it received in the second, that treatment in some cases extending over a term of years, till it reduced the boiler to an unsafe state, and in others producing immediate explosion by a reckless tampering with the safety-valve, neglecting the water supply, or by other careless mismanagement. It is important that this view should be clearly brought before steam users, since the subject has too frequently been enveloped in mystery, and where mystery begins the adoption of vigorous measures for prevention is sure to end. The public have been sadly misinstructed upon this subject. It is true that they are duly informed, by means of the newspapers, of the frequent occurrence of boiler explosions, as well as of the loss of life and damage to property resulting therefrom; but on carefully looking through all the reports that were currently circulated throughout the past year, as to the causes of these explosions, it may safely be stated, that, as a rule, they were incorrect, and only tended to mislead, so that the opportunity was lost of making the facts of one explosion serve as a guide to the prevention of the recurrence of others.

"Many other illustrations might be given, but these will suffice to show the mistaken views too often entertained and promulgated with regard to the cause of boiler explosions, while it will be seen, that with such evidence and such reports, there is but little prospect of any progress being made, and therefore that this association will render important assistance to the cause of the prevention of steam boiler explosions, by circulating correct information of all the circumstances connected with their occurrence."

Why shall we not have some such association as that in this country? We have in this city alone hundreds of steam boilers, some of which are never properly inspected, and the vast number of accidents occurring from the use of steam render it imperative that some action should be taken immediately. Who will move first in this matter?

THE NEW CALL, AND BREECH-LOADERS.

The President has issued a call for 200,000 more men for our armies; and if the complement is not previously filled by enlistment, a draft is to be made on the 15th of April next. By the letter of Colonel Wilder, published on page 170 of our current volume, it was shown that long experience in practical warfare has fully demonstrated that one regiment armed with good breech-loading rifles is equal to at least three regiments armed with muzzle-loaders. By the reports from our great armory at Springfield we learn that a large portion of the force is still employed in the manufacture of muzzle-loading small-arms.

The experiences of this great war are rapidly teaching lessons in all departments of the military art. If the heads of the War Department decided a few years ago against the use of breech-loaders by infantry, the results of the large experiments in practical warfare which have since been made, and which have changed the opinions of so many of our officers, demand, at least, a new examination of the subject. And, considering the enormous effort and expense required to send a single regiment to the field, this examination cannot be too promptly made.

A REMONSTRANCE AGAINST THE EXTENSION OF THE GOODYEAR PATENT.

We notice that our hint to those who are opposed to the extension of the Goodyear patent—to get up remonstrances against it and send them on to Congress—is being acted upon. Senator Sumner has presented a remonstrance from manufacturers in Lowell, and others are in circulation for signatures. We have before us the petition of Thomas J. Mayall, of Boston, who has devoted a great deal of time to making improvements in the manufacture of india-rubber. In a letter addressed to us and referring to our discussion of the subject, Mr. Mayall says:—"I have read, with much satisfaction, your articles in the last two numbers of the *SCIENTIFIC AMERICAN*, upon the application for the extension of the Goodyear patent. I do not know that I can now add anything

to the lucid manner in which you have presented the injustice which would be worked upon a class of the community who, to say the least, have been and still are of vital importance, in a pecuniary point of view, to the licensees under that patent—I mean the inventors—that class of the great public whose contributions to the welfare and pride of our country are more worthy of protection than the 'soulless corporations,' who oblige them to sell their brains for a 'mess of pottage.' I enclose to you my 'remonstrance,' and bid you 'God speed' in your righteous undertaking."

The "remonstrance" to which Mr. Mayall refers is addressed to Congress in the following words:—

That he has read the petition of Charles Goodyear, Jr., executor of Charles Goodyear, deceased, for the extension of Letters Patent granted to Charles Goodyear, deceased, for the invention of vulcanized india-rubber.

That he believes he can prove, to the satisfaction of your honorable body, that said Charles Goodyear and his legal representatives have been amply rewarded for his said invention, and that the public has been sufficiently taxed for the same.

That the extension prayed for would be an act of injustice to this remonstrant for the following reasons, among others:—

Your remonstrant has made many and valuable inventions in the manufacture of india-rubber, for some of which he has procured Letters Patent, and for others of which he has applied and intends to apply for Letters Patent.

That, by reason of the monopoly enjoyed by licensees of Charles Goodyear, your remonstrant has been compelled to sell to them many of his inventions for merely a nominal consideration, and so has been deprived of all benefit thereof, while said licensees have made large sums of money therefrom.

That, if the monopoly of said Goodyear and his licensees is longer continued, your remonstrant will be deprived of all benefit from the remainder of his inventions aforesaid during said continuance.

That, as your remonstrant is informed and offers to prove, the very parties for whose benefit the continuance of this monopoly is now sought, are the same parties who, by reason of their position, have derived great benefits from the inventions of your remonstrant, whilst, at the same time, they compelled your remonstrant to part with them for a nominal consideration.

Your remonstrant will prove the foregoing averments when, and as, your honorable body shall direct, and for the above reasons, he earnestly remonstrates against the passage of the act prayed for.

The above remonstrance presents the question very simply and squarely to every inventor. No matter whether they are studying out india-rubber inventions or are engaged in other departments, the great underlying principle is the same. The question is, shall one inventor and his heavy manufacturing monopolists so control the legislation of the country as to prevent all other inventors from making and using their own improvements, and shall the people continue to be taxed to support such a scheme? We cannot believe that Congress will ever sanction such an outrageous system.

THE MONITOR TURRETS.

In the field of abstract science speculation is pardonable; but in dealing with matters of fact we cannot rely upon the opinions of a select few, however oracular their utterances may be. The London *Mechanics' Magazine*, of February 26th, contains a comparison between "Captain Coles' and Captain Ericsson's Turrets," with several engravings intended to illustrate the principal features of each. We have watched the progress of Coles' cupola-ships and cupolas, and have read much of the advantages of the inclined sides of the Coles' cupolas and their power of deflecting shot. Our London cotemporary now presents to its readers something quite different from those of which we have read so many glowing descriptions. It now appears that Captain Coles has adopted the American "turret"—a structure perfectly cylindrical, of nearly the same internal dimensions, height, and diameter, as those of the monitors, but sunken below decks for one-half of its height. The inclined sides have vanished with the old name; the name and form have both disappeared. Our "cousins" have adopted the Ericsson turret (they even call it "turret") and now deride us for preferring it to their clumsy adaptation of Ericsson's ideas, which are set forth in Coles' plans. We consider their course most wise and a high compliment to the skill of Capt. Ericsson.

We cannot, however, pass unnoticed the erroneous comparisons which the *Mechanics' Magazine* institutes between the English and American mode of building and applying the turrets. Our cotemporary has evidently been grossly imposed upon by the draughtsmen in delineating the monitor turrets, and