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Improvements in Rail Roads in Virginia--Governor's Message.

Governor Floyd, of Virginia, has sent a message to the General Assembly, recommending them to build a rail road to connect the depot of the Fredericksburgh and Petersburgh Rail Road, to test fairly an invention of James S. French, Esq., of Elizabeth City, Va., whereby he proposes to ascend much higher inclines than the greatest now overcome, and likewise prevent the cars from being thrown off the track, by any ordinary accident.

As we do not know exactly, the full nature of this invention—the means proposed to accomplish these desired objects, we cannot say anything about it. We will, therefore, briefly review the Message of the Governor, as there are some points in it worthy of attention, and upon which we believe we can throw some light.

He says: "Railroads have failed in many instances to realize the anticipations of their projectors," (as subjects of investmentfor capital,) "owing to the increased weight which has been given to the locomotive since its first introduction. This weight is still increasing, and from a little over three tons in 1829, in England, it has now reached 40 tons; and on many of the our northern roads, 30 tons, and on our southern roads, 15 to 20 tons." (The rapid destruction of heavy rails, he attributes to the weight of the locomotive.) "The locomotive of 1829, with enlarged wheels, and two or more driving wheels, with a great addition of size and weight, is the locomotive of to-day. They draw no greater loads in proportion to their steam power, nor have they added anything to their adhesion or fulcrum for progressive motion, but sprinkling sand upon the rails and by various devices, heaping weight upon the engines; nor up to the present time, have any means been devised for keeping the engine and cars from being thrown off the track."

Here, we differ in opinion from Governor Floyd. By the above, the idea is conveyed, that it is customary to sprinkle sand on the rails to make the wheels adhere to them. This is never done except when the rails are wet, (to start,) or grease has been sprinkled on them, and this is seldom done. It is true that the weight of the engine is employed to give greater adhesion to the driving wheels, and this is a peculiar feature in the system; but surely the increased weight of locomotives is a great improvement, if not, our railways have been improving backwards. It is well known that with the increase of weight in our locomotives and the increase of weight in the rails, so in proportion have our railroads become profitable. This is true of the whole line in this State, from Albany to Buffalo. Many plans too, have been devised, to spread over or throw the weight at pleasure upon and off the driving wheels, so as to throw great paying weight upon the driving wheels when ascending inclines, and then spread it upon the other wheels when running on levels. Dr. Lewis, of this city, invented a plan to do this more than three years ago, as illustrated in No. 25, Vol. 1, Scientific American. The same invention also provides a very ingenious plan for preventing the cars from running off the track. We have also seen many other plans for accomplishing this same thing. The question with Gov. Floyd is this: "Can the weight of the locomotive be safely reduced and the engine still retain its capacity for usefulness? He believes it can, and so do we; but will all its useful effects be maintained? We say yes, when light trains are not drawn: but we say no, when heavy trains are to be drawn. This accords with the past experience of the railway system.

A locomotive weighing only 9 tons, named the "Fairfield," on the Bristol and Exeter R. Road, Eng., has carried 50 passengers at the rate of 24 miles per hour, 32 on the level; and it ascended a gradient of 35 feet to the mile, and 3½ miles long. Gov. Floyd says, that there is only one ton in the six, of adhesion in the locomotive, and at that rate, there would be only 1½ tons in this 9 ton locomotive. It could not then by any common possible means, have drawn 50 passengers, whose united weight would be no less than 3 tons. How ihen did it draw its load at all? and how did it ascend the incline of 35 feet to the mile?—We will answer. The weight of the passengers was used as an adhesive power; the very thing which Gov. Floyd says is wanted, so as "not to depend upon the weight of the engine." He is, therefore, positively correct in his theory; but it has been carried out into practice already. But it can only be useful for light trains. This was the opinion expressed by R. Stevenson, C. E., (and there is no man more capableof judging,) at a late meeting of the Institution of Civil Engineers. We, however, like the recommendation of Governor Floyd—there is nothing like experiment for testing the value of an invention. We have no doubt but there are many excellent inventions slumbering in neglect, because the inventors of them have not the means to bring them into favorable notice; and the invention of Mr. French, may be of very great value and importance.

Explosions of Steam Boilers.

We believe we are not saying too much, when we assert that no subject, from first to last, has engaged so much attention and has been the object of so much investigation as that of "Steam Boiler Explosions." It has often engaged the attention of Congress, and Report after Reporton the subject have been issued by the Commissioners of Patents. Juries without number have sat to determine the cause and report on the same, but all these things—reports, decisions, investigations and what not—have been nothing but mere shams, so far as it relates to the good accomplished by them. It may sound well to hear of philanthropy contributing its thousands for the benefit of those whose friends have been sent in a moment to eternity. This is right—but will this bring the dead to life, will it animate the ashes of the urn, or will it prevent such catastrophies occurring again. We answer, no. The only way to prevent such accidents, is the *certain* fear of punishment to those who are the principal causes of them; and who are those? Generally the proprietors, or those who have the supreme command. Cupidity is at the root of all the evils. Every body knows that the bursting of a boiler is caused by the pressure within being greater than the binding force without—the steam becoming the Sampson, the boiler the binding *withs*.

The late explosion in this city, whereby 63 persons were killed, has been the subject of investigation by a jury, of which Mr. James Renwick was foreman. The witnesses examined were men of scientific attainments, and the majority of them of great practical experience. Looking at the names of those witnesses, we would expect that if any testimony would be of the least benefit to guide us to a correct conclusion respecting the cause of said explosion, it would be the testimony of those men. But what do we find? Very contradictory opinions indeed: one, a practical boiler maker, believed that the boiler could stand a pressure of 100 pounds to the inch; while another believed that it could only stand the pressure of 40 lbs. (We cannot go over the evidence, because it is very long.) We had hoped that the jury would have given some reasons for the verdict which they rendered, but none were given. The following is the verdict:—

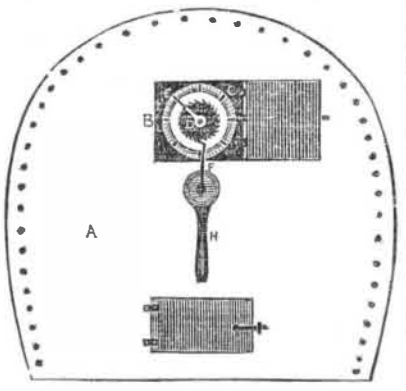
First—That Messrs. A. B. Taylor & Co., were the direct cause of the recent explosion in Hague street.

Second—That Messrs. Walker & Milligan were the indirect cause of the recent explosion in Hague street.

Third—That Messrs. Pease & Murphy are deeply reprehensible in selling the boiler, knowing its imperfections, and after it had lain in the open air for more than one year.

From the evidence submitted we are of opinion that verdict first was all thatwas required. By an examination of the boiler, a few days before the explosion, Mr. Birbeck told Mr. Ford, in the presence of Mr. Taylor, the proprietor, that it was not safe to carry any more than 40 or 50 pounds pressure of steam. After this what do we find? The steam increased to 100 lbs. pressure. They wished to get 60 per cent. more out of the boiler to the danger of life and limb, than the boiler was capable of performing. Oh, cupidity, what sins thou must answer for! What would be done to the man who would wantonly or selfishly load a twelve pounder with grape and fire it through one of our crowded streets? He would be consigned to the scaffold or State Prison for life. Look, then, at the act of increasing a pressure of 60 pounds on that boiler. It amounts to the astonishing presssure of 4 tons 640 pounds on the square foot. What terrible effects such a pressure is capable of producing, when, like a maddened giant, it bursts from its weak fetters. The cause of the explosion was a too great pressure of steam, and the dreadful effects produced were the result of quantity also—in other words, the pressure was high and the water was low. The boiler might have burst with the pressure while it had plenty of water, but the effects would not have been so disastrous. Two hundred cubic feet of steam, at the same pressure. is just double the effective power of one hundred, and would produce double the amount oflabor under control, and double the amount of damage by an explosion. It is true, that as the steam had room to expand, its effective pressure would decrease, but then we have its destructive velocity,—as Mr. Paul Stillman expressed himself, "a tornado let loose."

What are the remedies for the evils of explosions? We answer. A plentiful supply of water in the boiler, and a pressure commensurate with its strength. Mr. Dunham and other witnesses stated that careful engineers and good guage cocks were the best safeguards. No one can doubt this. We believe however that a "tell-tale" attached to the guage cock, and shut up from the fireman, would be a good thing. Various plans could effect this object. Here is one:



A is the boiler. B a view of the box, (to be locked up); C is a dial; D a ratchet wheel on a spindle, which has a pointer, E, on it, turning and pointing to the dial. F is a ratchet attached to the upper part of the guage cock, handle, H. By turning the handle to test the boiler, say every 15 min., one tooth of the wheel would be moved round, and a wheel of 40 teeth would answer for 10 hours. The box should be examined every hour by the Superintendent whether it is the Chief Engineer or some other person. It may be said, that "it would be easy to turn the wheel round four times at once, if it had been neglected before. The man who forgets his duty once, would not be likely to remember how many times he had neglected it; and for a certainty, it would lead to regular habits of examination—and "habit is second nature." It would be easy to place a vertical spindle in combination with theratchet wheel, and it might extend up to a room above the boilers, and be carried by bevel gearing, either into the Engineer's or Superintendant's room; and then the little dial would faithfully report the duty performed below.—Every mechanic will understand how this may be accomplished.

Steam boilers should be kept in a place apart from the main building or factories, and above all, we recommend prompt punishment for all who may be the direct cause of such accidents. Let the *fear* of the law be the beginning of wisdom.

The questions now to be asked, are: Will this investigation lead to the adoption of effective measures for the prevention of the like evils? Will this catastrophe lead to no definite results, whereby the lives of innocent working people and the travelling public will be more safe? Will cupidity and recklessness still be allowed to hold up their brazen fronts and offer Pilate's mock oblation? There is too much false philanthropy in our midst. Justice must reign as well as generosity—they must go hand in hand, or there can be no safety.—By two recent explosions, the one in N. Orleans and the other we now speak of, no less than 300 of our fellow beings have suddenly been deprived of life. In Rome, he who saved the lifeof a citizen was rewarded with a great public honor, but the lives of our citizens seem to be held at a low valuation. If this is not so, why do the guilty go unpunished?

An engineer would rather work an engine at a low, than a high pressure; but he has not his choice in such matters—he must make the engine do the work, and the value of many engineers is estimated by their recklessness. The laboring force of an engine is not in its piston-rod, crank, or shaft; it is the steam that is the power. How often have we heard men say; "what an astonishing amount of work we get out of that little engine. We only bought it for ten-horse power, and it works up to fourteen; it makes things hum like a top." They do not seem to know that the boiler is the magazine of power, and that with their increase of power, they are risking the lives of the innocent.

Cheap Postage.

We are gratified to perceive that strong efforts are being made here and in other parts of the country, to effect a still farther reduction in the rates of postage. This subject is confined to no section or class, it is universal,—a point that seems to be overlooked by the wise savans congregated at Washington. The Cheap Postage Association, in this city, passed a resolution to the effect:

"That as one of the original and fundamental objects of the Association is to effect a postal reform, by which pre-paid letters, under half an ounce, shall be carried for TWO CENTS to all distances in the United States, it be recommended to the friends of cheap postage throughout the Union, to petition Congress to establish this rate."

It is certainly important to petition Congress, if any further reduction is desirable, as it cannot be accomplished in any other way, and we hope to see the people moving strongly in the matter from all quarters. We can learn a profitable lesson on this subject from Great Britain.

The Iron and Zinc of New Jersey.

In New Jersey there is an abundance of the red oxide of Zinc, combined with Franklinite, This latter is an iron ore resembling small black peas. It is peculiarly an American ore. For a long time this ore, and the Zinc, lay silent and useless; but now good metal is made out of both. The Zinc is superior to the zinc of commerce, and the Iron is equal to the very best iron known in commerce. The iron is of a strength equal to 77,000 lbs. per square inch, and the zinc equal to 10,000 lbs. We believe that the best Swedish iron is only of the strength of 72,064 lbs., and the best English is only 61,000.

Receipts for Washing.

We have received quite a number of receipts from friends respecting different ways to shorten the process of washing. We are very much obliged to them for the interest they take in casting their gifts into the treasury of science. This is a subject with which we are intimately acquainted, chemically, and no doubt many who have but lately adopted some new improvement are not aware that the said improvement has been long applied in public works—such as bleach works.

We are daily receiving long tedious letters from subscribers which require more time to read than we can devote to them, without trespassing upon time which is valuable to us. In all such cases we are obliged to put them on file, and take them up in regular order, and we have to request in future that subscribers writing long letters will bear with a little delay, recollecting that no letter from a subscriber, which is post-paid, escapes attention either through our columns or by mail.