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Safety Plates for Steam Boilers-

A patent was granted to Henry Waterman of the city of Williamsburgh, N. Y., on the 28th of last December, for an improvement in steam boilers, so as to render them safe from dangerous explosions. The claim for this patent will be found on page 134, this volume of the Scientific American. On Wednesday, last week, the 2nd inst., we witnessed an experiment with a large cylinder boiler, to test the merits of this invention. The experiment was made at Messrs. Waterman's Block Factory, near Peck Slip Ferry, Williamsburgh. Mr. Curtis, Inspector of Boilers, in this city, and several other scientific gentlemen, were present. The improvement consists in having a top plate of the boiler perforated with a number of holes opening into a small chamber inside of a dome. The top plate of the small chamber, is called the "safety plate," and is made of thin brass capable of standing a certain defined pressure according to its thickness and area, of at least six or seven times less than the iron boiler plate. This safety plate is grooved and screwed down by a ring on the perforated top plate of the boiler, leaving a small chamber between the two. The steam from the boiler passes through the holes spoken of, and presses against the brass or safety plate, which, when the steam rises to the defined pressure, said plate, is torn, open, (brass and copper do not fly to pieces like iron plate), the steam escapes up the dome, and thus the boiler is relieved of its excess of pressure, and all danger of its flying to pieces obviated. The object in having the boiler plate perforated, is to prevent the water from being thrown out of the boiler with the steam, when the safety-plate is torn by the pressure; also to offer a considerable resistance to the escaping steam, so that a too large volume may not jump at once from rest, and by its great and suddenly applied dynamic force tear away the top plate of the boiler. When the safety plate, therefore, is torn open, the boiler is at once relieved of its excess of pressure, but in such a manner that the water is retained inside, and the confined steam allowed to escape without danger to the boiler, or any person who may be around it. The experimental brass plate on the boiler, which we saw, was in thickness 0.25 wire gauge, and 19 inches in diameter. We were told that it would be torn open at 60 lbs. pressure; and at that exact point, while looking on the steam gauge, the plate was suddenly torn open, but not off; and the indicated pressure suddenly fell from 60 to 40 lbs.; and gradually to 10 lbs. A boiler should never be allowed to carry over one-third of the pressure it is capable of standing, therefore if a boiler is capable of standing 300 lbs. pressure it should only be loaded with 100 lbs., which will be the strength of its safety plate; others are made for boilers, varying from 20 lbs., and upwards, thus insuring a certain and safe relief when the defined pressure point is reached.

When the water in a boiler falls below the water line, and covers the flues in a very thin sheet, steam is generated with great rapidity, and we have often seen a very sudden rise in the gauges, from 60 to 80 lbs., a safety valve in such cases presents an inefficient opening for such a sudden generation of steam; this safety plate appears to answer a better purpose, by being torn open before the flues are uncovered.

There can be no doubt but it is more economical to generate steam under a high pressure, and then expand it for working an engine, than to generate it under a low pressure. A means to insure safety and work high pressure steam, will enable our ocean steamships to save much fuel. This object appears to us to be obtained by Mr. Waterman's improvement, which has been tested a number of times with uniform success.

Burning Fluids--Newell's Wire Gauze Lamp.

On page 160, we presented some extracts from an article taken from the Haverhill "Gazette," Mass., on the subject of Burning Fluids and Newell's Lamp. The article stated that holes were made in the lid of said lamp at the suggestion of Dr. Jackson, of Boston. Mr.

Newell has written us a letter asserting that this is not true, and Dr. Jackson himself has also called upon us, and stated that he never made such a suggestion. The statement, then, in the Haverhill "Gazette" is not reliable. Before we made any remarks on the article referred to, we examined the list of patent claims to discover whether—as was therein alleged—Isaac Jennings, of New York City, had invented a Wire Gauze Lamp to prevent explosions, in 1836; we could not discover then, as we stated, and have not since, any claim set up for using wire gauze in a lamp like that of Mr. Newell's. We have discontinued the use of the common burning fluids in houses where there are servants or children. The most ingenious lamps and feeders may be employed, but careless and timorous persons will sometimes spill the fluid, and we have seen more than one explosion caused by such means, independent of lamp or vessel containing the fluid. There is no fluid, however, so clean and beautiful for artificial illumination, as that of a mixture of alcohol and turpentine distilled together. We have been informed by a friend in Boston, that no turmeric colored fluids were sold there, but a mixture of alcoholic solutions and resins. This gentleman uses a hydro-carbon fluid, mixed with diluted alcohol, which affords an enduring and beautiful light, although containing 20 per cent. of water, which lessens its dangerous qualities, but which, at the same time, detracts from its illuminating powers. If sold, however, at a price, in proportion to its cost; such a fluid is preferable to a more concentrated one. This gentleman, who is a distinguished chemist, has submitted Newell's Lamp to several severe tests, and although strongly prejudiced against the use of burning fluid, he says the said lamp under no condition failed to prevent an explosion.

Clipper Ships--American and English.

In an article in the Scientific American a short time ago, we said, in answer to some hasty remarks made by the "Niagara Mail," "whenever it is shown that a British clipper ship has beaten any American one in a fair race—day by day—we will give the winning ship full credit for the same, and not feel the least chop fallen." We also called upon those who boasted of the superiority of the British clippers, to show their courage and confidence by taking up the Boston challenge.

The "London Expositor" has made some comments upon our remarks, which are very temperate, although it is mistaken in supposing there is any acidity in our dispute with the "Niagara Mail."

The "Expositor" asserts that the American clipper ships were beaten last year by the Aberdeen built clippers. If so, we give them full credit for having done so well, but the accounts received by us are as follows:—"Aberdeen ship Chrysolite, 106 days from Canton to Liverpool; American ship Challenge, 105 days from Canton to Deal; British ship Stormaway, 109 days from Canton to Deal; American ship Surprise, 106 days from Canton to Deal. From Shanghai to Deal, American ship Nightingale, 110 days; British ship Challenge, from same place to Liverpool, 113 days. It appears to us that the races are in favor of the American ships. The Chrysolite appears to be as fast a clipper as any of ours, and the Aberdonians deserve great credit for the fine ships which they build; they are manfully upholding any credit that England has for fast sailing ships. The "Expositor" alludes to the recent voyages of the Marco Polo, a clipper ship built in New Brunswick, N. A., and says, "it ran from Liverpool to Australia in 60 days; we do not know if any ship built in an American port has ever equalled her speed; in her run home she repeatedly made 300 miles in 24 hours." The Marco Polo has done well, we wish not to ruffle a feather of the plume which her builders deserve; at the same time let us observe she is an American built ship, not a Yankee one to be sure, but a provincial one. Our next door neighbors cannot live so near us and not catch the true spirit. The clipper ship "Flying Cloud," built in Boston, by D. Mackay, however, has run 336 miles in 24 hours, thus beating the Marco Polo. We do not wish to be speaking of these things like jockeys about the conflicts on the "turf," we believe that the

spirit of emulation in building fast ships, is a noble one; it tends to advance one of the noblest—if not the noblest—of architectural arts, therefore we say the *prudence* of the British merchants spoken of by the "Expositor" in respect to betting, although we commend them for their principles, shows that they do not feel the keen spirit of national rivalry in this contest, or else they have no confidence in their own ships. These must be the causes for not accepting the Boston challenge, for London merchants are not more moral than our Boston friends. We must take this occasion to say that in principle we are opposed to all betting—these conflicts for an honorable superiority should all be *for love*, as a son of the Emerald Isle would say. We will still consider the American clipper ships as the victors on the ocean race course; and must do so until we have particular evidence to the contrary.

City Railroads.

The subject of City Railroads is becoming one of such absorbing and universal interest that we cannot well allow the present occasion to pass by without a few remarks. A fresh impetus has been likewise lately given by the counter movement of the Legislature, rendering nugatory the attempts of the Corporation to foist upon us an unjust and corrupt scheme of their own concocting, by which nobody would have been benefitted but themselves and their patrons. Plans of a similar description we will never uphold, and therefore we are rejoiced to see that a superior and more honest party has stepped in to prevent a gross injustice; the Legislature, by their interference, have proved themselves worthy of their station, and of the confidence reposed in their integrity by the people of New York. It is not, however, upon the Broadway Railroad that we wish merely to comment, nor to confine our remarks simply to a single scheme, but to the subject of City Railroads in general. This, as yet a comparatively new field of enterprise, is daily becoming of paramount importance, and the railroad appears soon destined to be as ordinary a system of conveyance through our streets as along the highways. The demand for this almost indispensable accommodation is becoming general in large cities, and is not confined to ourselves, although New York is more favorably built for their formation than many other places, the width and straightness of the streets allowing of city railroads at a very little comparative expense. In London, the huge capital of England, the same outcry is being raised for railroad accommodation, and although, from the position of the business part, called "the city," which is placed centrally, there is not so urgent a necessity for railroads as with us, yet it is probable that railroads connecting the different parts of that metropolis, will eventually be made. Different schemes have been proposed for this purpose, as the narrowness of the streets, and the numerous buildings crowded in the rear, forming courts and alleys, present a formidable obstacle. Any railroad in that city must, therefore, be carried over the houses or else be tunneled underground, and it is proposed in the London "Artizan" to effect this object by the first-named method. This however, is not altogether an original plan for two short lines of railway, the Greenwich and Blackwall are built in this manner, and are carried over the streets and houses—in the case of the Greenwich Railway by brick arches, and of the Blackwall railway partly by cast-iron columns and girders. This latter plan is proposed in the "Artizan," with the additional improvement that a street underneath should be built by the railroad company, which could be lighted both from the sides and the top, for which purpose a large part of the railway surface could be flagged with thick glass. How far such a plan would succeed we are not prepared to say, but we see nothing impracticable in the method, and we suggest something of the kind to our city railroad projectors. If objections are raised to railroads in crowded thoroughfares like Broadway, it would be easy to form a viaduct, either quite level or with a sufficient incline, as might appear desirable. In the case of the two railroads alluded to, the stations forming the termini in London are above the tops of the highest houses, and a si-

milar plan could be adopted here, the passengers, goods, &c., could be lowered by a movable platform to the level of the street if a proper incline could not be obtained from want of space. The viaduct railroad might be more expensive than one made on the ground, but it possesses many advantages for a crowded thoroughfare like Broadway, it would not interfere with the ordinary traffic, and the locomotive could be employed the whole distance, thus saving the cost of horses and drivers, which amounts to a large item in the expenses of the New Haven, Harlem, and Hudson River Railroads.

Ventilation of the Crystal Palace.

In all the specifications that we have seen of the adopted New York Crystal Palace, no arrangements have been made for proper ventilation. This is a most important oversight and should at once be provided for. The London Crystal Palace, in a climate averaging 20 degrees below our summer temperature, was oftentimes far from comfortable. The heat of the atmosphere of the New York Crystal Palace, under our blazing summer sun, will be like that of an oven—it will really be a "hot-house." Such a mass of glass as will enter into its composition, will so concentrate the solar heat as to make the atmosphere of the interior totally unfit for human beings to breathe. This can be remedied if measures are taken in season for proper ventilation. These measures must be undertaken on a grand scale to insure success.

Ventilation of Ferry Boats.

Some of the new ferry boats running between our city and Brooklyn, are well ventilated; the old boats are defective in this essential particular; and the Williamsburgh boats, when the cabins are crowded, are no better than the Black Hole of Calcutta. Pure air is as essential to health as pure water: no person would drink out of the gutter; but who is so dainty respecting the atmosphere, of which he must drink continually? Some of the boat cabins for gentlemen (wrongly named) are converted into smoke houses, totally unfit for decent men or beasts.

The Extension of Patents.

A careful watch must be kept upon Congress, to see that no extension of patents are carried through by a *coup d'état*.

So writes a correspondent to us about the Woodworth Patent. We have no tears of any such result as long as the present Chairman, Mr. Cartter, is at the head of the Committee on Patents in the House of Representatives. No harm, however, comes of being watchful.

Iron Interest of New York.

The "Rondout Examiner" directs our attention to the importance of new improvements in the manufacture of iron, to reduce the cost of both pig and wrought-iron. The "Examiner" has called attention to an experimental college for experiments to accomplish such desirable results. The plan is a good one—but, at the same time, we want to see large iron works established and conducted with spirit and enterprise with the present knowledge we now possess. It is our humble opinion that iron can be made cheaper here at any time, in some districts at least, than it can be made either in England or Scotland. We have coal and iron lying beside one another, and the price of manual labor in making a ton of iron is not so much as some pretend. More men of capital should enter into the business and conduct it upon a large scale.

We have been informed that M. G. Farmer, of Boston, whose name is so intimately associated with the Municipal Telegraph Alarm, has invented an improvement on Grove's Battery, of such a nature as will reduce the cost of working it about 50 per cent. We do not know in what the improvement consists, but give the statement for what it is worth: if it is as represented, the value of it to the community is incalculable.

Sears C. Walker, so distinguished for his researches in practical astronomy, is no more; he died in Cincinnati on the 30th ult. His health was impaired for a long time by severe mental exertion in scientific studies and researches. We have lost one of the ablest men of science in our country.