

but the fatal defect of the guards still remains. This itself can be remedied by hips or sponsons, but as the vessels with these attachments and their present engines would not steam more than three miles an hour, they would be of doubtful utility in a sea-going point of view.

It is urged by a daily paper that the *Monitors*, while being conveyed from point to point on the coast, should have all their hatches battened down and caulked, and every air-hole and crevice rendered water-tight. "Then," says this oracle, "they would not sink." The writer is evidently under the impression that the turret performs the office of a funnel through which the water was shipped, that occasioned the disaster; but if we may be allowed, we will say that if the *Monitor* had possessed the buoyancy which a sea-going vessel ought to have, all the water in the Atlantic Ocean could not harm her. That the *Passaic* and *Montauk* went through to their destination we have ample proof, but the former was at one time in great peril; if we may believe the reports received, the *State of Georgia* was obliged to go about on her course and run before the wind with the battery; the water in the fire-room of the *Passaic* was at that time three inches deep.

There is a responsibility resting on some one in this matter. We have no disposition to criticize any of the *Monitor's* officers; that they acquitted themselves well and nobly under the trying circumstances to which they were exposed is fully apparent; but upon whom should fall the burthen of ordering a little vessel, such as was the *Monitor*, around the most dangerous part of the coast in mid-winter?

PROFESSOR JAMES RENWICK.

On the evening of the 12th inst., Professor James Renwick, L.L.D.—one of our most distinguished citizens—was "gathered to his fathers," at the age of 71 years. He was a graduate of Columbia College, in this city, in which institution he was professor of chemistry and physics for several years. He was favorably and extensively known for his attainments in science, especially mechanics, and was the author of several publications of a scientific character, such as a "Treatise on the Steam Engine," "Practical Application of Mechanics," "Outlines of Natural Philosophy," "Outlines of Geology," &c. He was also the author of several biographies of distinguished American mechanics, such as that of Robert Fulton and David Rittenhouse. As a writer upon such subjects he was distinguished for perspicuity and brevity. In the survey of the north-eastern boundary between Maine and New Brunswick, upon which the Ashburton Treaty was based, he was one of the commissioners. He was generally regarded as a father of those mechanic institutions in our country which have for their objects the advancement of the practical sciences, and the rational elevation of our mechanics. In all mechanical experiments he took a deep interest, and up to a very recent period was an active member of all such associations in this city. No man was more highly esteemed in New York for unostentatious demeanor combined with such extensive acquisitions in solid knowledge.

STEAM ON CITY RAILROADS.

Any one who has ever watched a heavily loaded city passenger car, drawn by reeking and straining horses, cannot but pity the brutes, and wish that some other means could be adopted as a motive power. We have a remedy at hand; why then should we not use it? The introduction of steam, to do the work of human muscles in quenching fires, has been so rapid, and the good results derived are so apparent, that the number of hand-engines are decreasing every day; those who would multiply them evince only an opposition to progress and natural reform, which happily does not prevent the adoption of the new agent. We think that if any of the railroad companies were to introduce dummy engines in the place of horses, they would soon find many advantages arising from their use. In the first place, although the prime cost is more than horse-power, they are not so expensive to keep in repair, and to feed with coal as horses are to feed with oats or hay. They can be more easily managed, take less room in the track, and in short their advantages more than compensate for their demerits.

These demerits are said to be a liability to frighten horses by their uncouth appearance. This idea is a wholly visionary one. The engines can be all enclosed in the car, and if horses do not now shy at these, they certainly will not hereafter, provided steam be employed. The Broadway railroad is progressing; let this company be the first to introduce steam and they will certainly be benefited by it.

EXPLOSIONS OF STEAM BOILERS.

Upon no other subject are philosophers, engineers and men of science generally, so much exercised and so much at variance as in their theories respecting the causes of steam boiler explosions. No sooner does some new opinion appear, or some new agent is asserted as the dangerous element, than a boiler explodes under circumstances which set the savans' opinions aside, and force them to go to work at investigating the subject over again. Boilers have burst under every possible circumstance and in every condition—while the engines which they have driven were at work and while they were quiescent—with low steam and high steam—with water and without water, and under mysterious circumstances apparently the most impenetrable. Yet the world is just as much in the dark as ever. Formerly it was a generally received opinion—that the contact of comparatively cold water with an overheated plate, generated an excessive amount of vapor of an especially dangerous character, the expansive force of which no form of boiler nor any diameter of safety valve could operate against effectually. So generally was this opinion received, that all explosions were at one time attributed to it, and the engineer who was so fortunate as to survive his disaster, was universally discredited when he asserted that there was plenty of water at the time of the accident.

But lo! certain inquisitive men—and it is to them that science owes all her discoveries—quietly take a boiler, heat it to redness, and then inject water in quantities. So far from blowing it up, the vapor only discharges itself through the safety valve with a mighty roar!

This theory, as a universal and general source of danger, has gone to the clouds with the puffs of steam that destroyed its value. Perhaps the latest cause assigned as the mischievous force which destroys steam boilers by explosion is that of electricity. We find an account of an apparatus once used to ascertain the presence of this agent, and the manner of its generation in steam, in a philosophical work:—

"The apparatus was a common high pressure steam boiler, about three feet long and twenty inches in diameter, mounted on insulating pillars, and strong enough for a pressure of 200 pounds to the inch. The steam was suffered to escape by jets of a peculiar form, on the side of a box into which it was admitted by a cock. Faraday, in investigating the electricity of steam, found that dry steam gave no excitement, and that the electricity resulted from the friction of vesicles of water against the sides of the orifice. Hence the box contained a little water, over which the steam escaped, and was partially condensed. The jet had an interrupted passage to produce friction, and its nozzle was lined with dry box or partridge wood. The vapor escaped against a plate covered with metallic points, to collect the electricity, and ending in a brass ball insulated from the earth. The boiler was negative, and positive electricity was collected at the ball, provided the water was pure and free from grease. Turpentine, and other volatile essences reverse the polarity, while grease or steam from acid or saline water destroys all excitement. If the nozzle of the jet ends in ivory or metal, there is also no excitement. A boiler, such as is described, will develop in a given time as much electricity as four plate machines forty inches in diameter, making sixty turns a minute—a truly surprising result."

Thus it appears from high authority that electricity can only be obtained in steam under extraordinary circumstances. Certain features in the detective apparatus must be rigidly conformed to, otherwise it fails to appear. And what is sufficient to utterly nullify any value this theory may have had, is the fact that the presence of grease or steam from salt water prevents the electrical fluid from mani-

festing itself. As steam boilers are rarely, if ever, free from oil in small quantities, it will be seen that there need be but little danger apprehended from boiler explosions, through electricity.

THE EXERTIONS OF OUR FRIENDS.

When we announced a few weeks since that we should be compelled by the unprecedented rise in printing paper, to increase our subscription price \$1 per year and two cents per copy, we did it reluctantly, but felt that it was unavoidable. At the same time we called upon our friends to aid us by putting their shoulders to the wheel and using their influence among their acquaintance in behalf of the *SCIENTIFIC AMERICAN*. They have, we are happy to say, responded nobly, we are daily receiving large accessions to our subscription list, accompanied by letters full of complimentary allusions to our progress and the efforts we are making to not only keep up the standard of the paper as the only journal of its class in the country, but to carry it far beyond any distinction it has as yet achieved. The following letter was received from Mr. G. M. Holmes, of Gardiner, Maine, who accompanied it with a list of twenty new subscribers:—

MESSRS. EDITORS:—After much trouble I have succeeded in procuring a list of twenty names for the *SCIENTIFIC AMERICAN* for the ensuing year. With the same amount of labor, at any other time, I could have got at least forty names, but most of our mechanics have gone to the war, which makes the labor of forming clubs harder than ever before.

Allow me to thank you for myself and the club from this place, for the excellent matter with which the *SCIENTIFIC AMERICAN* has been filled for the past year. We think that your endeavors to improve the paper have been eminently successful; not that it was not always "first-rate," but that for the past year it has been better than ever.

Herewith I enclose the list with the amount of subscription. GEO. M. HOLMES.

Gardiner, Maine, Jan. 1, 1862.

All we can say, in answer to Mr. Holmes's complimenting, is that we will endeavor to make the present volume more interesting than any previous one.

To a great number who have sent us lists of subscribers we are under obligation, and to the following persons we would render our special acknowledgment:—From Mr. F. Marston, of Houghton, Mich., we have received a list of 33 names; from the American Watch Company, Waltham, Mass., 24; Mr. H. N. Hemingway, of Des Moines, Iowa, 23; Mr. C. F. Hill, of Hamilton, Ohio, 23; Mr. S. Chadwick, of Wilkins, Pa., 23; Mr. E. Miller, Meriden, Conn., 22; Mr. S. Durivage, of Oswego, N. Y., 21; and from Messrs. T. Lyman, Sandusky, Ohio, and G. M. Holmes, Gardiner, Maine, 20 subscribers each. This last is, as the reader will discover, from the writer of the letter above quoted.

The press too have vied with each other in seeing which of them could say the most complimentary things. A recent number of *The Marietta*, published in Marietta, Ohio, contains the following paragraph of praise:—

The *SCIENTIFIC AMERICAN* for last week, the closing number of the volume, contains, beside much other valuable matter, an illustrated article explaining the methods by which the *Great Eastern* was repaired. To engineers and hydraulic mechanics, if not to every curious and intelligent reader, this number of the *SCIENTIFIC AMERICAN* alone is worth the subscription price.

The *Indianapolis Daily Journal* thus praises us:—

The *SCIENTIFIC AMERICAN* has issued its prospectus for 1863, which will make the 8th volume of the new series. This publication has established itself as an authority in science and mechanics so firmly, that no man who desires to be "posted" in the progress of either can afford to be in ignorance of its opinions. It is conducted with great ability and judgment, is always ready with a well considered opinion for any topic of importance, yet is not dogmatic and overbearing, as papers devoted exclusively to some special subject are apt to be within their peculiar dominion; it is not too learned to despise entertainment, and its pages contain as much interesting miscellany, relating however to arts, inventions and discoveries, as any paper we know of, and it is illustrated profusely and admirably. So far as we know, Europe has no publication of the same class that compares with it in variety, excellence, and soundness of matter, or beauty of illustrations.

Really, gentlemen, if this kind of thing is to be continued, we shall be greatly embarrassed. We hope our readers will allow us this little corner to ourselves this week, and pardon the egotism which has prompted us to quote the good sayings of our friends.

Thus far the ice crop has been a complete failure this winter.

The annual clip of wool in California for 1862 was 5,600,000 pounds.