Scientific American

NEW YORK, FEBRUARY 8, 1851.

Our Ocean Steamships.

We know of no question which engages more attention, at the present moment, than the one we have now selected to make a few remarks upon. And it is no wonder that it excites so much attention, for the interests, the skill, and the honor of America, are at stake; and every morning, from lip to lip, and ear to ear, is heard the watchword and reply, "is there any news of the Atlantic?"

It is now thirteen years since regular steam navigation was established between Britain and America. For the successful establishment of this great blessing,—and who can deny that it is one—we are indebted to foreigners. But, although this is true—and we are always happy to give honor to whom honor is due—it was with no wish to injure the business of those who laid the foundation of Atlantic Steam Navigation, that American companies engaged in the undertaking of establishing two lines of Atlantic steamships, —no, it was from a firm conviction of the imperative requirement of raising up a marine steam navy. The United States is the second mercantile nation of the world, and when we found that some other nations, with not a one-hundredth the interests at stake that we had, possessed respecatble steam fleets, it was surely no more than the dictates of sound national policy that urged us to commence ocean steamers—yea, we may say, it was urgent national necessity; for marine navigation requires great experience, involves great expense, and these conditions cannot well be met in our country, without combining like the Royal Mail Line, the national with the mercantile interests—the mail with the cotton bale. Three years ago America sent out her first Atlantic steamship, the Washington, which was succeeded at considerable intervals by the Hermann, and the United States. These vessels formed a line between New York, England, and the Free City of Bremen, on the continent of Europe. In 1850 a new line of American steamships was established to run between New York and Liverpool, to carry the national mail and share the advantages which had been exclusively enjoyed by our enterprising rivals for eleven years. It was quite natural that the heart's desire of our people should go out in good wishes for the prosperity of our ocean steamships, and the natural questions are, "have they been successful? Do they equal those of Great Britain?" We do not believe they have, and will give a few reasons why they have not.

Beforethe last war with Britain broke out, Prof. Gregory, of Edinburgh, in company with a few friends said. in answer to a boast about the superiority of the British navy, after it had swept the seas of every French fleet, "the Americans have built some long frigates lately, if we have a war with them, they will give an account of themselvse." During the war, they did give an account of themselves. In the construction of ships and sailing vessels, America has for forty years stood at the head of all other nations, and has, in competition, successfully snatched the trade out of the hands of our naval fatherlanders. A great drawback on improvemts in the construction of British ships, was bad tonnage laws. In the construction of steamships, the British have all along stood unrivalled. We had no ocean steamships until within a few years, the British had no river steamboats—all their steamboats were built to stand the ocean tempests, because they had all to go out to sea, owing to the shortness of the rivers of England. When our first line of ocean steamships was established, owing to a well merited confidence in our sailing vessels, the general expressed opinion was, that we would beat our rivals. We failed to do so, and many among us had to eat our own words. We have a wrong notion of Uncle John Bull's go-a-head propensities—his desire to go through creation is just as strong as that of any of his American descendants. His locomotive goes faster than any other in the world; and if we have been in advance in the building of sailing vessels, the greatest rivalry and attention has been paid in Great Britain, for twenty years, to the building of fast sailing steamships.

When the Collins' American Mail Line was established, last year, great expectations were formed, and superior results anticipated. We saw the Atlantic depart on her first voyage, and could not help greeting her departure with cheers, and wishing her "God speed." Other ships of the same line, succeeded her, and made very succesful passages, in point of time, during the past summer and autumn, but during the past stormy months of this winter, they have not done so well. It is too common a practice for our people and our editors generally are very much to blame, in cheering rather too loud, at any partial success, and are too ready to turn round and scold at any partial want of success. This is not right; sympathy should be extended in many cases, instead of blame. It would indeed have been a most wonderful thing to us, something almost miraculous, if we could have so soon rivalled the Cunard steamships in all things, but not in some things. And to throw some light on this subject let us revert to some facts in connexion with them which but few of our people seem to be aware of.

All the Cunard steamships have been built and completed from stem to stern on the river Clyde, in Scotland. The principal stockholders are Glasgow merchants. The builders of the hulls of them, are Messrs. Steel & Caird, of Greenock, (with the exception of the Europa) and the engineer, Mr. Robert Napier, of Glasgow. The river Clyde has always been famous for building swift sailing vessels, and we have been informed that Henry Eckford, so well known as a most scientific ship builder in this city, served his apprenticeship in the very yard where these ships have been built. These nautical architects, have been acquainted with the building of steamships from the very origin of the art, and the builder of the Europa—the finest hull of them all—was John Wood, the gentleman who built the hull of Henry Bell's first steamboat—the first successful one in Europe. Here, then, practical experience—an accumulation of facts respecting the faults and merits of different forms of steam vessels have been in the possession of these men, and is it wonderful that they should be able to challenge superiority?

Robert Napier has been engaged as a builder of marine engines for thirty years, and he has built more marine engines in one year than all our companies put together have built in all their lives. He is a practical engineer, too, as well as a scientific one. He is a self-made man, and possesses inventive faculties of a high order, and has an abundance of wealth at command, and has far better means, such as tools, &c., for constructing marine engines, than can possibly be expected of any of our engineering shops. The very successful passage of the Pacific, and some of the Atlantic's, led some of the London newspaper critics —especially the "Nautical Standard," to run down the Clyde-built steamers; and a correspondent of the London Mechanics' Magazine, in an article which was copied in the Franklin Journal of last month, takes the ground that Collin's American steamers are superior to the Cunard line, because they have tubular boilers. The way whereby the British are to attain the mastery, according to his dictum, is to adopt oscillating engines in preference to the side lever kind. A correspondent of the "N. Y. Herald," alluding to the Baltic and Arctic running short of coal on their recent voyages, throws all the blame on the inexperience of the firemen. He signs himself "Engineer," and he says that those connected with the Cunard vessel, have said "*Give us your vessels and we will beat you one day*;" and they might have added, "*and save ten tons of coal.*" Another letter in the Tribune of last Tuesday, makes out the Asia to be superior to the Baltic in speed, according to her power, all owing to having a larger paddle surface according to her tonnage. Here are contradictory opinions—not one of which is worthy of confidence, because there is an absence of facts for premises. Tubular boilers for steamships were tried and laid aside by Robert Napier long ago. There is much truth about inexperienced firemen, but who are their bosses? the engineers. Oscilating engines, in opposition to the London author, have been tried and decided against, and when the proper size of paddle surface for the tonnage of a vessel is demonstrated then we shall have a fact to base a theory upon. At the present moment, we want, more than ever, the influence, the sympathy, the support and encouragement of all our people for our ocean marine. Let this be liberal, reasonable, and prompt, and experience will do all the rest for our success and future progress.

Rationale of the Composition of Water.

When we look into the constitution of bodies, we find them made up of particles—some all of one kind, others of many kinds. Taking water to illustrate this point, its elements can be separated by the voltaic battery. By electrolysis we are able to divide the water into two gaseous unequal parts. One of the gases is highly inflammable, very light, and is named hydrogen; the other is heavier, will not burn itself, but will cause other bodies to burn with a great heat, and to emit, generally, a bright flame: this gas is called oxygen. Oxygen and hydrogen, then, are the two constitutional elements of water. By means of a galvanic battery, these elements of water can be separated, and the proportion of each estimated. In every case these proportions are definite, and consist of 1 volume of oxygen and 2 of hydrogen, (volume means bulk, a very different thing from weight). Both of these gases have a gravitating power. Oxygen is allowed to be the most abundant of all elements. It has neither color, taste, nor smell, and it combines with all elements in many proportions: 100 cubic inches of oxygen weigh 34.6094 grains. Oxygen may be produced by heating the scales of iron which are found in blacksmiths' shops, in a gun barrel.

Hydrogen may be produced in various ways —by taking some tin and placing it in a bottle containing sulphuric acid and water, the result will be the decomposition of water, and the hydrogen will be given off. The specific gravity of the hydrogen—100 cubic inches—is only 2.1318 grains. Hydrogen is the lightest of all gases, and is, therefore, the best for inflating balloons, but it is expensive, hence light coal gas is in general used as a cheap substitute.

Hydrogen and oxygen combine to form water by a power named chemical affinity. This power is quite different from the law of gravity; it means that two separate elementary bodies unite together by a law, whereby each parts with some of its properties, and produce a new mass, having different qualities from the two bodies, separate. Soap is made of oil and an alkali. The compound is very different in quality from the two bodies when separate.

In every case, when hydrogen and oxygen are placed in a vessel, in the respective volumes, mentioned above, they can be instantly changed from a gaseous state, into water, by flame, the electric spark, or a piece of platina. Water can thus be resolved into its original elements, and its original elements made to combine and form water. Every chemist can do this, just like pouring one cup of water into another, and then pouring it back again. No man has yet been able to resolve pure hydrogen into water—it cannot be done. The assertion that has been put before the public, that water could all be resolved into hydrogen, should, therefore, not be received without the demonstrative proof of resolving the hydrogen into water. Oxygen and hydrogen, when they unite to form water, create an explosion, when the electric spark is passed through them. There must be a sudden great expansion, and a sudden great contraction—for this reason. The mere contraction or condensation of the gases to form water, would only cause an outward pressure of near 15 lbs. on the square inch, (the real pressure of the atmosphere on a vacuum vessel), but the effect produced by the explosion of these gases, when they unite to form water, is far greater than that which can be due to the pressure of 15 lbs. on the square inch. Those persons who would try the effect of resolving water into its elements, and resolving the same into water, must be very cautious about what they are doing. To show how much water is expanded when in its original elements, one cubic inch of it is extended to 662 cubic inches of oxygen and 1,325 of hydrogen, or a total of 1,987—hence we perceive that, to form water, there is a condensation of original elements from nearly 2,000 in bulk to 1.

Railroads of the United States.

The first railroad built in the United States was the Quincy railroad, in Massachusetts, which was three miles long, and was used to draw granite from the quarries. The first railroad that employed steam power was the Mohawk and Hudson, between Albany and Schenectady. This road was comp'eted in 1833; it was built to cut off the tedious canal passage round by the Cohoes. The first locomotive used, we think, was an English one named "John Bull," which was imported for that purpose. That road is now greatly changed from its first route; it had an incline, with a stationary engine, for one mile; it is now continuous for the locomotive, and economy is the result. The number of miles of railroad constructed in our country since 1827, when there were only three miles in operation, is enough to excite both surprise and gratification in every American heart. In twenty-three years we have advanced from three miles of railroad (and that without steam power) to 7,677 miles. In 1840 there were 2,380 miles in operation, and in the latter part of 1850 there were the number of miles already stated in operation. No less than 3,297 were originated and put in operation during the last ten years. The nature of our country is most favorable for railroad enterprise. Although we have many mountains, yet we have so many vast and extensive plains, that our railroads are easily and cheaply constructed, in comparison with what they are in England, where every mile of railroad has cost nearly five times as much as ours. The abundance and cheapness of timber in our country, is another economic advantage, and a very important one in our favor. The first railroads built in our country were very poor in comparison with those which are now being, and which have recently been built. All the old roads, too, have been remodelled and renovated. Heavy rails, level and firm tracks, are now known to be the grand economisers of power, convenience, regularity, and expense. When we consider the position which our country occupies on the globe, in relation to Europe on the east, and Asia on the west, we cannot help looking forward to the time when the United States, by her railroads, steamships, and telegraph lines, will be the half-way-house between Western Europe, China, and Oceanica. In a very few years we shall have a line of telegraph to the Pacific, thus linking the Atlantic on the east, with the Great Ocean on the west, by lightning, for news, and at a period not far remote from the completion of the telegraphline, we will have a railroad for passengers and freight. We knew something about the benefits of railroads and canals now, but we can scarcely anticipate the greater benefits that are yet to ensue from them to all classes. A time will yet come, we believe, when railroad tracks, (for short distances between populous cities) will be constructed of double the width of the common gauge, and huge cars and engines will transport thousands of people at once, as securely and comfortably as if sitting in their houses, from place to place, at a very small cost. After distant places of our country have been linked together, then attention will be keenly directed to local improvements—this will be the result as certainly as the sun shines.

We return our sincere thanks to A. C. Dodge, A. P. Butler, Thos. H. Benton and I. P. Walker, of the Senate, for valuable books and congressional favors, and to J. C. Dickey and Robt. Toombs, of the House, for similar favors.

Instructions have been given at Washington for the St. Lawrence to depart upon her voyage on the eighth day of this month, Saturday next.

☞ Reported expressly for the Scientific American, from the Patent Office Records. Patentees will find it for their interest to have their inventions illustrated in the Scientific American, as it has by far a larger circulation than anyother journal of its class in America, and is the only source to which the public are accustomed to refer for the latest improvements. No charge is made except for the execution of the engravings, which belong to the patentee after publication.

LIST OF PATENT CLAIMS
Issued from the United States Patent Office.
FOR THE WEEK ENDING JANUARY 29, 1851.

To Elisha Smith, of Albany, N. Y., for improvement in Stoves.

I claim the combination of a transparent water vessel, with covered or other transparent openings, in the top of a stove plate, and a mirror placed upon a stove top, as herein represented and described.

To F. N. Still, of New York, N. Y., for improvements in metal or second patterns for castings.

I claim preparing second patterns by moulding metal patterns in two part moulds, and then separating the two parts of the mould, the pattern being left in the sand, to cast a plate fitted to the metal pattern so moulding, as specified, so that the pattern can be attached to the plate, and the two be used in moulding, to produce castings, substantially as described.

To M. L. Knapp, of Painesville, Ohio, for improvement in Abdominal Supporters.

I claim the construction of hip springs, with split or divided ends, forming elongations of the same strip of steel, the front springs having slots and pivot holes, the backs springs having two or more graduating pivot holes, to be used in combination with the adjusting screws, as herein substantially as set forth.

To James Hanley, of New York, N. Y., for improvement in Swivel-ribbed Key.

I claim making the making the exposed ends of keys in such a manner, that they may revolve freely upon the other parts of the key, substantially in the manner and for the purposes described.

To Wm. Fields, Jr., of Providence, R. I., for improvement in the Hydraulic Ram.

I claim the hinge valve opening upwardly and inwardly, at or near the upper end of the inclined plane or drive pipe of the hydraulic ram, said valve being placed in a box made of brass, or any other suitable materials, which valve, by closing on the re-action of the water in the drive pipe prevents the said re-action from distributing the water in the spring or reservoir. The box of said valve is bolted to the drive-pipe, and said valve may be a hinge valve, or any other suitable valve.

To Alfred Hathaway, of Boston, Mass., for improvement in Pens for Ruling Paper.

Whatever may be the number of thicknesses of which the back bar and pens are composed, my improvement, and what I claim, consists in not only making the upper one larger than the others, but in making it the marking part, and soldering the next one below it, to it, as specified. Such improved mode of making the pen or pens, I claim as my invention, and whether the plates of metal placed upon one another be of different metals, or of different thicknesses of metal, as described.

And I also claim the improvement in the construction of the back bar, the same consisting in making it with a slit or opening, between any two pens, and extending nearly or quite up to the vertex of the angle or bend of the bar, as specified, the same producing the advantage above mentioned.

And when the pen is composed of more than two thicknesses of metal, I claim the improvement by which one single soldering of the upper and lower parts together, suffices to bind or keep all the parts together or in place, the said improvement consisting in making the lowest thickness of metal longer than any of the others, except the first, or upper, and marking one, as described.

And I also claim the method of making the pens and back bar, as shown, when the same are composed of two different thicknesses of metal, or of two plates of different metals, the said improvement consisting in making the lower plate to enclose or lap over the one or others above it, and thus make the back bar of one more thickness of metal, than the pens are composed of.

And I also claim to make the different thicknesses of the pen of different metals, as specified.

DESIGNS.

To Conrad Harris & P. W. Zoiner, of Cincinnati, Ohio, for Design for Stoves.

For the Scientific American.
Mechanical Principles.

Messrs. Editors—I perceive that "Maclaurin," under his article in last week's paper, states that, "according to my reasoning a feather and a ball would fall with equal velocity," but he neglected to state that, according to his own reasoning, a feather of 10 ounces would fall with a greater velocity than a ball of lead 5 ounces: I say that two bodies of the same specific gravity, one large and the other small, will fall with equal velocity.

W. A. Black.

Philadelphia, Jan. 25, 1851.

[We will answer friend Black, and save Maclaurin the trouble of replying (if he would reply), as we don't like to occupy but little room with such a plain question. Maclaurin is right, for two reasons—1st, his reasoning did not go to prove that a feather of 10 ounces would fall faster than a ball of lead 5 ounces, but the reverse. 2nd—Mr. Black's premise that "two bodies of the same specific gravity, the one large and the other small, will fall with equal velocity," is an error, as Maclaurin has shown, in alluding to a piece of gold, which will fall with great rapidity if made into a ball, but if the same weight of the ball be beaten out into gold leaf it will be borne upon the breeze. This is plain, surely. Take a piece of iron weighing one pound, make it into a ball, and then take a pound of sheet iron and make it into a box of one cubic foot, and then let them drop at the same moment from Trinity Church steeple, would they both fall to the ground with the same velocity? No. The articles of Maclaurin are strictly philosophical in every point. If Mr. Black reads them over from No. 1, carefully, he will be convinced of the correctness of the premises there laid down. It is the resisting medium of the air which makes the difference in the velocity of bodies according to their form and bulk, whether of the same or different specific gravities.—Ed.

For the Scientific American.
The Moisture of Rooms.

This is a subject in which all are concerned, particularly during the cold months of a northern climate, and perhaps attention has not been sufficiently drawn to a matter which must, in no small degree, affect the health of those delicate in constitution, and, if properly regulated, contribute to the comfort of all.

How delightful is the soft balmy air of a southern latitude! Its genial feeling conveys the delicious sensation of bathing in the atmosphere; and how strongly contrasted to the harsher air of a colder region. What makes the difference? Let us inquire into this question. If we chemically analyze the atmosphere of the zephyrs of the tropics, we find the air of precisely the same proportions in its constituent gases as the keen piercing winds of the boreal latitudes.

Then, it is not any variation in this respect which constitutes the difference; neither is it in the temperature, for, if so, then the warm air of our dwellings should rival the soothing atmospheres of Florida and Cuba, and consumptives would have but to remain in-doors during the inclement months, to derive all the advantages of climate, for which those regions are famed. There must be, then, some other causes than those above alluded to for the difference in question.

It is mainly, perhaps entirely, caused by the great difference in the amount of moisture in the two cases, supposing both to have the same temperature.

Cold air, even if saturated with watery vapor, when warmed up by admission to the lungs, becames of necessity very drying in its effects; for the quantity of moisture which the atmosphere is capable of absorbing and holding in solution being strictly dependent on its temperature, the same air which is loaded with aqueous particles at a low temperature becomes proportionably very dry at one more elevated. Thus the air of a room twenty feet in extent, by fifteen broad and twelve high, should have about one half gallon more of water dissolved in it at 80°, than at 32°, to keep it at the same relative state of moisture. Hence that additional quantity should be evaporated to preserve it in the same hygrometric state. But the atmosphere of a chamber is continually being renewed to supply that carried up the flue of the chimney by the action of the fire, and this must be provided for by the continual evaporation of a quantity of water necessary to be evaporated to preserve it in a salutary condition. The knowledge of this amount can be obtained only by experiment—by evaporating water until a hygroscope shall show the proper quantity required

The small vessels of water placed on the tops of stoves are insufficient; the quantity of vapor furnished by them is, in general, entirely inadequate—so small indeed that it is carried off by ventilation, nearly or quite, as rapidly as formed, and the hygroscope scarcely takes notice of the insignificant remainder; unless, indeed, the room be of contracted dimensions with the lungs of several persons exhaling a moist effluvia. This species of moisture, however, is contaminated with effete animal matter to a prejudicial extent, and should be avoided.

I have found the following arrangement efficient for the end proposed:—A tin box, two feet long and six inches deep, is suspended by hooks to the upper part of the fire-place, so high as not to intercept the heat of the grate, and having at each end a wrought-iron tube one and a half inches in diameter and eighteen inches long, soldered to its bottom, and extending down along the sides of the interior of the grate, some six inches into the burning coals; a handful of nails is put into each tube to prevent the noise of the ebullition. The tubes are the boilers, and the tin box the reservoir, holding about one and a half gallons of water; the box has a top, with a tin tube projecting six inches above, surmounted by a small funnel to fill the reservoir with, as well as to prevent the steam formed—which escapes through it—from being drawn into the flue of the chimney and lost.

I find by the hygroscope, described in a previous number of the Scientific American, that it requires the reservoir to be filled morning and evening; thus, in my chamber, of the dimensions above stated, three gallons of water are evaporated in twenty-four hours, and all this does not render the air as moist as that we breathe in summer, having the same temperature.

It may be observed that our rooms are very dry when no moisture is deposited on the cold panes of glass of the exposed windows, when the outside air is below freezing. It shows that the interior air would not be saturated with aqueous vapor, even if cooled down to that temperature, and hence, as previously explained, must be very drying in its effects.

A moderate degree of dryness is perhaps advantageous, in some cases, for the vigorous health of the system, but an excess should, if possible, be avoided. If a just medium cannot be obtained, the excess of moisture is probably the safer side, for sailors live constantly in the enjoyment of robust health, breathing continually an atmosphere overloaded with watery vapor.

At the proper season—in summer—I may again refer to the subject of the moisture of rooms in relation to the injurious effects of a cold dampness.

Franklin.

New York, January, 1851.

More than 6,500 persons met at Malone Franklin County, N. Y., a few days since, to consider the project of constructing a bridge over Lake Champlain.

TO CORRESPONDENTS.

"J. G. E., of N. C."—The patent of Mr. Hotchkiss expired on the 19th ult. We do not know whether the wheel, shaft, and crank are cast in one piece or not; his residence is Windsor, Broome Co., N. Y. Rose claims the conical flume "and making the buckets flare out from the back." It was patented in 1839. We are not able to give you the practical knowledge desired about the mulley.

"L. D., of N. Y."—It is best to have it recorded, for we suppose from your letter that the bargain is embraced in the assignment. We do not know of another such case, but it is best to be on the safe side, although the courts in Massachusetts have decided that such agreements come under the common law.

"J. H. R., of Ohio.—We do not know any such machine, except Stirling's Hot-Air Engine, described in Vol. 3, Sci. Am.

"G. B. A., of Philadelphia."—We do not know what kind of condenser yours is, but condensers for the same purpose have been tried before. Hall's condenser is well known. All have been failures, we believe.

"F. A. W., of Mich."—We have received yours of the 4th, and will give it attention.

"R. W., of Berl."—We saw a model three years ago, which was constructed nearly upon the principle embraced in your diagram. We do not believe that it will answer a good purpose. The great majority of accidents are caused by obstructions, very few by the curvatures.

"M. H., of Pa."—You have asked us a question which is very difficult to answer. The modifications of surveying instruments are very numerous, in fact are legion. We will give you our advice:—take it to a philosophical instrument maker, and if you find that its merits will cause it to be extensively used, then get it patented.

"J. W. A., of Md."—We believe that your stone facing hammer is patentable, and should be secured.

"J. B. L., of Waterloo."—Consult a physician at once; strong poultices of linseed meal should be applied in the mean time. We know of no better application.

"J. Y., of Pa."—As we understand it you could not get a patent on your gate; if we had a model we could judge better.

"C. E. K., of Pa."—We are sorry to say that we do not know of an artificial hand that would be of any benefit for your friend.

"H. K., of Mass."—We have never heard of the balls you speak of being used for incrustations. We think the composition patentable.

"R. L. L., of N. C."—There are various kinds of chain belts; we will try and get the information for you.

"G. H. S., of Pa."—We do not know the price of the transit instrument. They are made by J. W. Young, of Phila.

"J. W. R., of Ind."—The question embraced in your letter relates to one of economy. It would take some experiments to prove whether it is not more economical to have the diminished exhaust openings than to use steam direct from the power. In any case, the steam is the power, and if you take it from the boiler, it is lost in that respect. We do not know of a like arrangement to yours having ever been used before, and as something new we believe it to be patentable.

"Observus, of ——."—We would have published your article only it came too late for last week's number, and the debate for this week would be over before it could appear. Your views accord very nearly with ours on the subject. We have received a great many articles on the Patent Law Reform.

"W. L. N., of Ohio."—We have received so many articles on the subject of the Patent Laws, that we find it impossible to give yours an insertion.

"N. B., of R. I."—We do not know of a single work on submarine operations.

"M. W. H., of Ind."—Dealing in patent rights is a business in which we never engage. The procuring of patents is our legitimate business, but buying and selling, or disposing of patent rights on consignment, is out of our latitude. The $5 which you sent was the requisite amount for the engravings.