A NEW LIGHTNING ROD

A correspondent in Albion, N. Y., communicates a somewhat novel plan for a lightning conductor. He says: "We are in this part of the country using quite extensively, thin strips of sheet copper, nailed to the building, as lightning rods. The plan is to use a thin copper tube, about ¾ of an inch in diameter, along and above the chimney, which at the ridge of the roof is flattened, and riveted to two thin strips of copper about an inch wide each, and these are occasionally nailed along the roof and down the side of the building, and let into the earth a few feet." This conductor if properly put up would surely be efficient. But our correspondent omits to give particulars of perhaps the most important thing to be considered in the erection of a lightning rod, namely, the connection with the ground. He says, "the strips are let into the earth a few feet." Electricity is very particular about the road it travels; it does not hesitate an instant to turn aside if an obstruction is offered to its course; if the way is not perfectly clear to get into the earth, it may prefer to dart into the house and set it on fire. Dry earth is almost a non-conductor, and a rod might as well lie along the ground a few feet, and take the chances as to be buried in dry earth. It is almost a common occurrence for the ground to be plowed up and even wetted in spots around a lightning rod, a fact which shows that those who put up rods, are either ignorant or neglectful of their duty. In a city, lightning rods should invariably be put in metallic communication with the gas or water mains, and in the country with a stream or well of water. If this rule were followed we should not hear of half the number of cases in which buildings having rods are injured by lightning.

Whether a lightning rod be of iron or copper, or square round or flat, or whether the conducting power resides on the surface or through the mass are questions of very little practical consequence beyond the effect they may have on the cost of construction. We have never seen a rod or heard of one being used, which was too small or too poor a conductor to carry of all the electricity which its point would receive. Lightning leaves a rod to go into a house only when its continuity is imperfect, or as is more likely to happen, when it cannot discharge itself into the earth.

NEW PLANET DISCOVERED.

OBSERVATORY, Washington, Sept. 17, 1860.

SIR: A planet was discovered here last Saturday night, by Mr. Ferguson, at 9h. 19m. 38. 6s. in 23h. 4m. 38. 5s. of A. R., and 3° 22m. 53. 8s. South declination. It was first seen by him the night previous, but the observations were not conclusive as to its true character. This is the fifty-ninth in the family of asteroids, and the third discovered by this indefatigable assistant.

It remains to be seen whether we have been anticipated in this discovery. If we have not, and unless you direct otherwise, I propose to name this new star from the Indian mythology of this continent.

Respectfully,

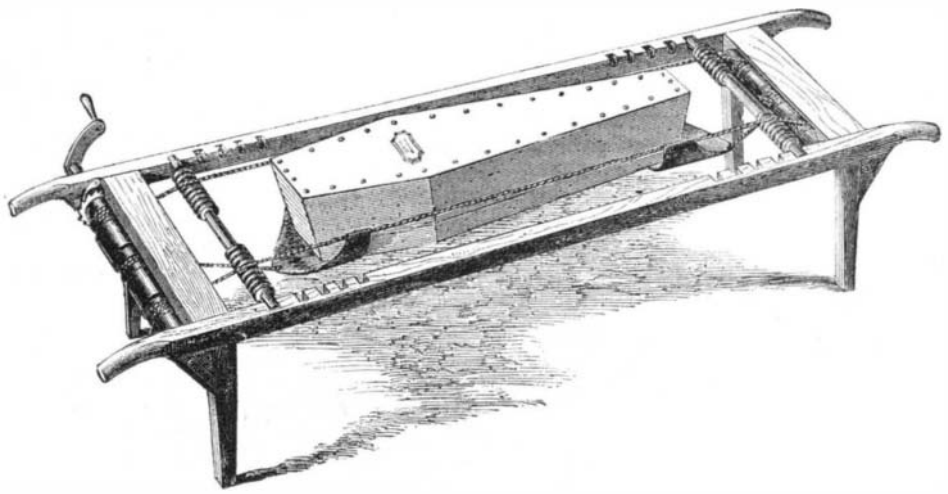
M. F. MAURY, Superintendent.

HON. ISAAC TOUCEY, Secretary of the Navy.

PATENT BIER AND MODE OF LOWERING COFFINS.

The life of this age, most assuredly, moves on patent inventions. The infant is wrapped in linen which has been woven upon a patent loom, from yarn spun upon a patent frame, and he draws his first drop of nourishment from his mother's breast through a patent nipple shield. The girl fondles a patent doll, the boy whirls a patent top or plays with a ball which is made under one of the most valuable patents of the age. In later life we put on a patent French yoke shirt, which, with the rest of our clothes, is sewed on a patent machine, with a patent thread, by a patent needle, which comes enveloped in a patent wrapper, and our very boots are made of patent leather. We rise in the morning from a patent eliptic spring bed, undo the patent fastenings of our windows, roll up our patent curtains, open the patent lock of our doors, which was constructed by patented machinery, and go down to our coffee, which is made in a patent "Old Dominion" pot. We write with one of Morton's pens, which we dip into patent ink in a patent stand. Thus, surrounded by patents, we pass our life, which is filled with gorgeous dreams of making a splendid fortune by some patent invention of our own, till at last we are placed in a patent burial case, and lowered from a patent bier into our final place of rest.

For this ultimate disposition of us all the patent bier here illustrated has been invented, and we have never described an invention which was more certain to be needed by every member of the community. The method of its use will be readily understood by examining the engraving. The cords, being adjusted to the width, and the supports which slide on them to the length of the coffin, are wound up tight, and the pawl put down on the ratchet wheel to keep them secure. The coffin is taken from the hearse and placed on the bier, each end resting on one of the support. The bier being carried to the grave and placed directly over it, the undertaker throws back the pawl, and, unwinding the cords, the coffin reaches the bottom. By unwinding a little more, the supports are drawn from under the ends of the coffin; the middle cord, being three or four inches shorter than the other, begins to wind up as soon as the coffin reaches the bottom, while the outside rope is still unwinding. The whole being then wound up, the bier is ready for another interment.



SCARLETT'S BIER AND MODE OF LOWERING COFFINS.

The patent for this invention was granted to the inventor, William Scarlett, and further information in relation to it may be obtained by addressing him at Aurora, Ill.

THE EMPTY BIER.

BY HANNAH GOULD.

"Thou empty bier that standest here,
Alone by the churchyard gate,
Say, whose the door thou'lt pause before
Thy burden next to wait?"

The bier replied, "My range is wide,
And my hours of rest but few;
But to One alone can the ways be known,
That I must hence pursue.

"I first may seek her form, whose cheek
Is fresh in its maiden bloom,
On me to lie with a rayless eye,
At the threshold of the tomb.

"The youth who last sped by so fast,
With the nerve and the glow of health,
He next may find, that close behind,
Death followed him by stealth.

"Or she, who smiled when the lovely child,
She was lately leading near,
With wonder stopped, and his lilies dropped,
To gaze at the sable bier;

"That mother may be called to lay
That beauteous boy on me,
In his morning hour, like the dewy flower,
He lost, and as suddenly.

"Her own pale clay, to bear away,
It next may be my lot,
She may close her eyes on her infant ties,
And her prattler be forgot.

"And as I call in time for all,
From the babe to the silver haired,
Thy glance at me, perchance may be,
A hint to be prepared."

HOW TO MAKE CLOTH AND PAPER INCOMBUSTIBLE.

Cloth and paper cannot be made to burn unless oxygen is present, and in the presence of oxygen there will be no burning unless there be a considerable heat to begin it; the combined presence of the three things, combustible, oxygen, and heat is essential. A plan, therefore, of rendering a combustible, fireproof, must provide for the removal from it, of either oxygen or heat, or both; the cloth or paper must be enveloped in a varnish which is of itself incombustible, and at the same time impermeable to oxygen and heat. If we had such a varnish, and it did not injure the pliability and other good qualities of the cloth and paper, the problem would be completely solved, and if the art could be practiced cheap enough, the occupation of the washerwoman would be gone, for we should send our dirty linen to the blacksmith, who would throw it on his fire, and when it became brilliantly white (hot), would take it off and hang it up to cool.

But we have no such varnish and the materials for its composition are quite beyond the present possibilities of chemistry. Our attempts at fire-proofing will be only distant approaches to the perfect plan.

There is no organic substance that does not burn, or is not destroyed by heat. Water, from the fact that it is a product of combustion will not burn, but it has not the other properties desirable; it does not dry up and leave and elastic covering. Thus far then, only mineral substances have been used for fire-proofing; and among these alum has been the greatest favorite. A piece of cloth or paper dipped in a solution of alum, and then dried, is tolerably safe from fire, the whole surface being covered with matter which will not burn. Alum also, has the property of taking up a large quantity of water still appearing dry, and it cannot be heated much above 212° before all the water has evaporated.

Soluble glass (silicate of soda) has often been proposed as a fire protector and especially for wood. Being glass when the water has evaporated, one would suppose it would be altogether too brittle for fabrics which must be flexible. Mr. F. A. Able, of Woolwich, England, however, has made a little advance on the old plans by proposing to impregnate tissues with a metallic silicate. The particulars of his process are as follows:

"I take," he says, "a solution of lead, of zinc, or, practically speaking, of any other metallic base capable of forming, by its action upon a soluble silicate, a double silicate, insoluble in water. For this purpose I prefer the use of a basic acetate of lead, prepared as is well-known, by boiling sugar of lead and litharge with water and although I have found that solutions of various strengths will answer the purpose, yet that which I prefer is prepared by boiling together, according to the following proportions—25 pounds of sugar of lead, 15 pounds of litharge, and 40 gallons of water, for about half an hour, allowing it to stand for about a couple of hours; the decanted clear solution forms a liquor well adapted to my said purpose. When I want to use the liquor so prepared, and which, in the present instance, is a solution of basic acetate of lead, I take such a quantity of it, as will be at least sufficient to cover completely the fabric or material which I intend to render uninflammable, or else the said fabric or material may in many cases be simply passed through the said liquid, raised to nearly the boiling point, the object being simply to saturate or impregnate it thoroughly with the said liquor. This having been done, the fabric or material so saturated or impregnated with the said liquor is to be removed and spread out for about 12 hours to the contact of the air. This hanging or spreading out of the fabric or material to the air, may be dispensed with, but I prefer to do so, the subsequent operation, now to be described yielding then, a better result. The material or

fabric, after having been subjected to the first operation, just described, should now be immersed for a period of from one to two hours, or thereabouts, in a hot and moderately strong solution of an alkaline silicate, by preference in silicate of soda. The material or fabric should then be withdrawn from the said bath of alkaline silicate, allowed to drain, washed thoroughly in soft water, and dried, when it will be found to have acquired the properties claimed for it."

AMERICAN NAVAL ARCHITECTURE.

THE STEAMER "NEW BRUNSWICK."

This steamer was constructed by John Englis, foot of Tenth street, East river, New York city. She was built under the direction of Mr. John B. Coyle, of Portland, for the International Steamship Company, and is to ply from St. Johns, New Brunswick, to Portland, Maine, stopping at Calais and other intermediate places, and connecting with the Grand Trunk Railway.

She is very substantially built, adapted to the roughest sea weather, and admirably calculated for the rough and rocky coast along which she is intended to run.

The minute details of her construction are as follows: Length on deck, from fore-part of stem to after-part of stern-post, above the spar-deck, 224 feet; breadth of beam at midship section, above the main wales (molded), 30 feet 8 inches; depth of hold, 12 feet; depth of hold to spar-deck, 12 feet 3 inches; draft of water at load-line, 6 feet 6 inches; area of immersed section, at this draft, 180 square feet; tunnage, 815 tuns.

Her hull is of white oak, chestnut, &c., and square fastened with copper, treenails, spikes, &c. The floors are molded 14 inches, and sided 6 inches. The distance of frames apart at centers is 24 inches, and they are not filled in solid; but iron straps, diagonal and doublo laid, 4 by ½ inches securely fastens them; wrought iron straps, 6 by ¾ inches, connect all the top timbers.

The *New Brunswick* is fitted with one vertical beam condensing engine; diameter of cylinder, 48 inches; length of stroke of piston, 11 feet; diameter of water-wheels, over boards, 31 feet; length of wheel blades, 7 feet; depth of same, 1 foot 10 inches; number of blades, 27, and they are constructed of iron.

She is also supplied with one return flue boiler, whose length is 26 feet 3 inches; breadth (front), 13 feet; hight of same, exclusive of steam chimney, 11 feet 7 inches; location, on deck; number of furnaces, 2; breadth, 5 feet 9½ inches; length of grate-bars, 7 feet six inches; number of flues above, 6; number of flues below, 10; internal diameter of flues above, 1 foot 5 inches; internal diameter of those below, two of 22½ inches, four of 15 inches, and four of 17 inches; length of flues above, 18 feet 6½ inches; length of same below, 13 feet 2 inches. The diameter of smoke-pipe is 4 feet 4 inches; the boiler has no water bottom, and uses a blower to furnaces. The engine is fitted with H. Winter's patent expansive gear, and a variable cut-off.

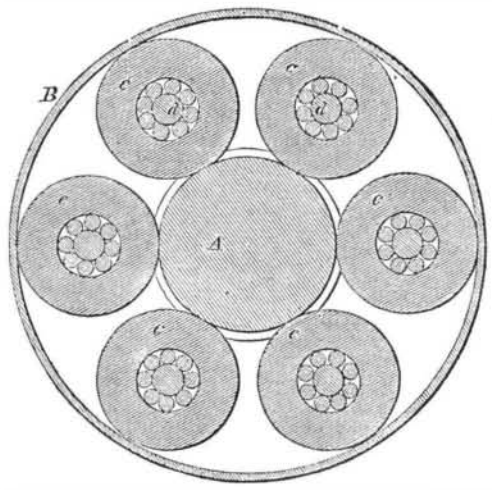
Her rig is that of a schooner. She has water-wheel guards fore and aft, and is well coppered. The bunkers are of wood, and she possesses one independent steam fire and bilge pump, one bilge injection, and the ordinary bottom valves to all openings in her bottom. The water-wheel guards are fitted with sponsons under them; the forecastle of this vessel is inclosed, and her promenade deck, saloon cabin, and state-rooms are very commodious and handsomely finished. The machinery of this steamer was constructed by the Morgan Iron Works, foot of Ninth street, East river, New York city.

The company owning this vessel is a new organization. They will furnish the only means of communication between the places above mentioned, excepting a weary line of stages at present traveling over hills and through woods a great portion of the distance. In addition to the travel which will naturally be created in the British colonies and the United States by the establishment of these facilities, it is confidently expected that considerable European travel will be secured by the line. Canadian passengers will undoubtedly find it a convenient route to Montreal by way of the White Mountains, whilst others can be left at Portland, within reach of all points of the United States, by railroad connections. The company have secured other steamers, which they soon expect to place on the same route.

PRATT'S IMPROVEMENT IN ANTI-FRICTION JOURNALS.

Friction is the greatest evil encountered in the working of mechanism. It not only consumes a large portion of the power, but it slowly and surely destroys the machine, involving all that vast amount of labor which is expended in the renewal of worn out parts. Could this power be arrested in its destructive work, a machine once made would last through all generations, forever. Though this consummation is not to be anticipated, the labors of thousands of active intellects directed to the task, are constantly diminishing the evil, and friction is being constantly reduced by new mechanical devices. The friction of journals, from the immense number of these in use, has been deemed of special importance, and many plans have been proposed and tried for lessening its amount. One of the most obvious of these is the interposition of rollers between the axle and the journal-box, so as to avoid the rubbing of surfaces altogether; a rolling friction only being encountered. A history of all of these plans would occupy too much of our space; suffice it to say, that in all of them some defect in detail has rendered them impracticable. We here illustrate a device, invented by William S. Pratt, of Williamsburgh, N. Y., which, so far as we can judge from its mechanical arrangement, and from a few weeks trial on one of our city railroads, seems to be the last link in the series of inventions necessary to make the friction *roller* journal a practicable device.

The annexed cut represents a cross section of the axle and journal-box, A being the axle, B the box, and C C C C C the friction rollers interposed; the axle being secured rigidly to the wheels, and the journal-box to the carriage. The rollers are made hollow and have the axles. *d d*, passing through them, which axles enter at their ends into two disks which are carried around the principal axle, A, by the rolling of the rollers, C C. In order to prevent the wear of the axles, *d d*, these are surrounded by sets of friction rollers as shown.



Friction balls are interposed between the ends of the axles and the external disks, while outside of these disks, between them and the stationary cap of the journal box, is a second set of balls, to relieve the axle of the friction upon its ends resulting from curves and inequalities of the road. The surfaces coming in contact should of course be made of cast steel or chilled cast iron, and a leather washer placed around the axle to exclude the dirt. No oil or other lubricating material is required.

We have seen one of these boxes which, it was stated, had run 1,000 miles, and it was not possible to perceive that it had experienced any wear whatever.

The patent for this invention was granted on May 8, 1860, and further information in relation to the matter, may be obtained by addressing W. J. Demorest, 473 Broadway, this city.

FRICTION ONCE MORE.

MESSRS. EDITORS:—On page 115 present volume of the SCIENTIFIC AMERICAN, I see an article from J. W. Sprague, under the caption of "Friction—The Philosophy of Small Axles," in which I, in common with a large number of practical mechanics, think the subject is not properly discussed, and therefore ask a place in your columns for a few remarks.

Friction as developed by motion is, I think, divisable into two elements; the first a raising of weight, the second a breaking of atoms. We have an illustration wherever there is friction, the protruding atoms of one surface enter the corresponding depressions of the other. This lock of the surfaces can only be destroyed by one of two methods; the first a lessening of their proximity, which must be by lifting the movable one; the other a breaking of the interlocked atoms.

The first of these elements is always present, as is proved by the peculiar motion of the moving body. The presence of the second is shown by the wearing away of the exposed surfaces.

If it were true that all resistance to motion offered by these locked surfaces is overcome by lifting the incumbent weight, which x will represent, then friction would be in a direct proportion to the time occupied in moving, and independent of the distance moved, for the aggregate length of the little falls will be dependant on the time which they occupy. If it were true that all this resistance is overcome by the breaking of particles or atoms, then the friction would be in a direct proportion to the amount of surface passed over, and independent of the time occupied. But since neither the one or the other of these suppositions is true, the friction is neither in a direct proportion to the space passed over, or the time occupied, but in some kind of a proportion to them both—considering all the time the incumbent weight equal to x. When the incumbent weight is changed, the proportion between the amount of resistance overcome by lifting and the amount overcome by breaking will be changed. Quality of metal, nature of lubricating material, velocity, and perhaps other circumstances, all tend to change this proportion. There being so many varying circumstances it would be difficult and perhaps impossible to give a formula for the calculation of the proportions in which these two elements, viz.: attraction of gravitation and cohesive attraction, are united in particular cases of friction.

EDWIN CRAIG.

Camden, Ohio, Aug. 21, 1860.

[Sound, common-sense remarks, that go right to the pith of the matter. Our correspondent will observe, however, that his classification relates only to the modes in which friction is overcome—in one case by breaking off the protruding particles, and in the other by raising the moving body over them. In whatever mode overcome, Morin's experiments, as well as those of other investigators, have settled these three laws of friction:—

1st. Friction is proportional to the pressure.

2d. That it is independent of the extent of the surfaces of contact.

3d. That it is independent of the velocity of motion.

The friction is independent of the velocity, but is proportional to the distance through which one rubbing surface passes over the other. Now, as the distance round a large axle is greater than round a small one, the amount of friction *at each* revolution is in direct proportion to the circumference of the axle.—EDS.

DRAUGHTING LESSONS, GRATIS.—Two large and wealthy associations in this city, will, this winter, give lessons, without charge, to applicants of all ages above fourteen in both architectural and mechanical drawing. The Cooper Institute lesson will be given in the upper story of the splendid building known by that name, and the Mechanics' Society School in the Mechanics' Library premises, 472 Broadway. This is the second winter in both institutions, and the instruction, last season, by the best teachers in the city, was availed of by several hundred persons, including journeymen mechanics and foremen. The example is worthy of imitation by wealthy societies in other cities.

THE FRENCH MEASURES INTRODUCING THEMSELVES.—Nearly all of our microscopists, in their communications to Silliman's *Journal* and other kindred works, use the millimeter as their measure, and in Cooke's "Chemical Physics," and other standard works, the meter and killogramme, as well as the degrees of the centigrade thermometer, are employed without translation. We are beginning to think seriously of adopting this course in the SCIENTIFIC AMERICAN. The people are running ahead of our legislators in making this great reform in our weights and measures.