Correspondence.

Fixing Pencil Marks.

To the Editor of the Scientific American:

In your issue of February 7, 1885, page 9, question 86, J. B. P. writes to know what will fasten pencil markings, thereby preventing rubbing or blurring. You gave him a remedy; please allow me to give him another and (I think) more simple.

Immerse paper containing the markings to be preserved in a bath of clear water, then flow or immerse in milk a moment; hang up to dry. Having often had recourse to this method, in preserving pencil and crayon drawings, I will warrant it a sure *cure.*

J. C. PELTIER.

Fort Wayne, Ind.

An Intermittent Air Well.

To the Editor of the Scientific American:

About four miles north from town, on the prairie, lives a farmer who, a few years ago, dug a well near his house, 110 feet deep, and curbed it up with plank. Last winter the family was alarmed at a terrible roaring, which was discovered to proceed from the well, and they were fearful that it might be premonitory of an earthquake. The roaring and puffing from the well continued for several days; then quieted down, followed again by the same phenomena. This alternate action and reaction has occurred ever since. The blowing generally commences just after the lull of a powerful wind from the south and southeast.

Looking down, one can see the water below bubbling and foaming in great agitation. When the well is closed over, the air presses through the crevices with a force sufficient, if utilized, to propel light machinery. There is no apparent odor to the air, nor is it any way deleterious to the lungs.

J. O. BARRETT.

Brown's Valley, Minn., Feb. 7, 1885.

Novel Mode of Extinguishing a Fire.

To the Editor of the Scientific American:

We had what seemed to us rather a novel mode of extinguishing a fire. On Sunday morning, Feb. 16, the sexton of the Congregational church built a fire in the furnace, and left it to heat up the church. On his return to ring the bell for services, he discovered the audience and furnace room densely filled with smoke; he at once rang the alarm. A crowd soon collected, but, in the absence of any apparatus for extinguishing fire, all hopes were given up of saving the building, as the fire was under the floor between the joists.

Dr. N. G. O. Coad went to his store and procured two or three buckets full of common soda and a bucket full of sulphuric acid; water was then poured on the soda, and the acid emptied in a tub full of water. The windows were then opened, in order to lift the smoke from the room. The material thus prepared was emptied into the register of furnace; the experiment was a success, as the fire was extinguished instantly. The floor was then partly torn up to make sure, when it was found that a large number of the joists were entirely burned through. The church was saved, and the entire business portion of the village, as the wind was blowing a gale; and nothing but frame buildings, mercury down 20° below zero, and a scarcity of water, presented rather a gloomy aspect to the citizens.

B. T.

Pattersonville, Iowa, March 17, 1885.

Lead Gaskets.

To the Editor of the Scientific American:

We would like to know whether any of your readers have observed weakening of their boilers from the use of *lead* gaskets around man-holes or hand-holes.

We have an upright tubular boiler, 3' × 6'. At the bottom, on opposite sides, are two hand-holes, about 6" × 9". For about two years past these have been calked by gaskets made of sheet lead.

Last November we were alarmed by a stream of hot water, shot from a small hole about four inches from the edge of the hand-hole. As we had a good pressure of steam, and were in the midst of our work, we tried to plug the hole with a pine plug, tapering from three-fourths inch to a point. The hammer drove the plug entirely through the sheet, though the hole had been a very minute one.

We then had a patch put round the hand-hole. The metal round the hole was found to be entirely converted into oxide of iron for a distance of four to five inches from the edge of the hole in all directions. This oxidized ring was limited by a sharp line, and immediately outside of this line the iron was perfectly sound.

To-day we find the other hand-hole in precisely the same condition, being surrounded by a ring of oxide extending about five inches from all round the hole and bounded by a sharp line of sound iron, showing that the action begins at the hole and extends slowly outward. We believe it to be caused entirely by the galvanic action of the lead gaskets, and now believe such gaskets to be a source of danger.

VAN BIBBER & CO.

Cincinnati, Feb. 20, 1885.

[Iron is thermo-electrically negative to lead, the hot water completing the battery element. Lead should never be used as boiler gaskets.—ED.]

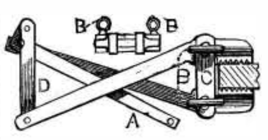
THE RUDDER OF THE ALASKA.

We publish the following additional contributions upon this subject:

To the Editor of the Scientific American:

Having noticed that you invite correspondence on the Alaska rudder problem, I send you my ideas on the subject.

A heavy pair of tongs might have been made, having steel jaws with teeth cut in and hardened—the levers long and heavy; and if there was no suitable screw and nut on board to draw them together, a lever and strap like A and D might have been applied at the end of the levers, and as the lever, A, was brought down to the jaws, it would force them together sufficient to sink the teeth into the iron rudder. As seen in the sketch, the lever, A, has the most power where it is most needed. The device could be made fast to the chain by the eyes, B B, to be lowered and operated. This device would take some time to make, but it could surely have been made and applied sooner than they got assistance from the other ship.



E. R. LANGFORD.

Tombstone, Arizona, March 18.

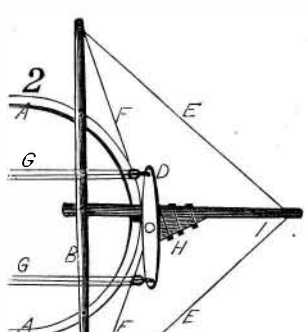
To the Editor of the Scientific American:

I give you to-day a very simple and, I believe, effective plan for a jury rudder. The materials of which it is composed ought to be within the reach of all steamers that go to the open seas. The only possible objection to it lies in the resting of the apparatus on the chock and on the guys and collar to which they shackle. But, *pro contra*, the whole thing being of wood, and most of it under water, the strain on these parts will not be great, and it is probable that it might be necessary to load the jury rudder or to brace it, so that it could not rise. If the parts, B B, are made of boiler iron, all chances of the rudder's lifting will be nullified.

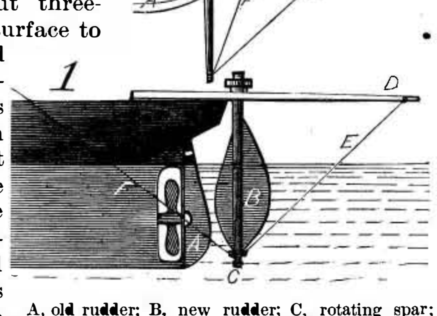
The following is a detailed description of rudder. The unbroken part of the rudder, A, is to be let alone.

The important part of the new rudder is the spar, C, Fig. 1. The head of this stout spar is supposed to turn and rest freely on a stout chock, H, Fig. 2, the turning power being a heavy yoke, D, and tackles, G.

A A, round of stern at rail; B, spar for guys to hold C; C, spar to hold new rudder; D, yoke to which steering tackles go; E, guys; F, guys to hold the heel of C; G, tackles to steer by; H, a stout chock fastened to C; I, bumpkin spar guyed to B.



The actual rudder consists of two stout pieces of timber, B B, strongly bolted to the spar, C, about three-fifths of the surface to be abaft C and two-fifths forward of it; this is similar in shape to what was termed the "equipoise rudder," as applied to several United States ships and to iron yacht Edith. It will readily be seen by those who have had experience of the "equipoise rudder" (which is a misnomer) that very small power will be necessary to work this rudder, provided, always, that the chock, H, be made so as to support C; and while the ship is going ahead the heel of this spar must be so arranged as to give a firm hold to the guys, E and F, and at the same time permit of free revolving, as in a step or pintle.



A, old rudder; B, new rudder; C, rotating spar; D, bumpkin spar; E F, guys to hold new rudder; B B may be of metal, or so loaded as not to be lifted.

As we cannot get down to the heel to secure it, that important function must depend on the guys, E F, Fig. 1, and the guys, F, Fig. 2. All the guys (as well as the spar, D) must be *very rigid*, and are supposed to be of steel wire.

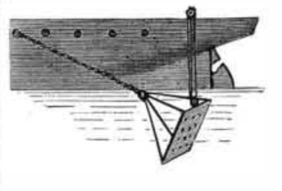
If the weight of the spar, C, did not rest on the chock, H, and on the guys that go to the heel, a very small power would hold the jury rudder, provided the ship always moved ahead; but as the principal surface is abaft the center, it follows that the yoke, D, the chock, H, and the tackle, G, must be very strong to hold on in stern-way. The spar, D, Fig. 1, need not be over 35 or 40 feet long; the coop spar, B, Fig. 2, 50 to 55 feet, and it may be in two pieces; and the spar, C, which I call the rudder stock, may be 24 or 26 feet. Any steamer running on the Atlantic would be furnished, in the shape of yards or topmasts, and trysail booms, with spars such as I have described. *If not, she ought to go to Davy Jones' locker.*

R. B. FORBES.

Milton, Mass., March 24, 1885.

To the Editor of Scientific American:

In regard to the discussion now being carried on in your paper about "How to steer a vessel that has lost the use of her rudder," I would suggest the following simple plan: To a rectangular plate of boiler iron attach rods at each corner, all connecting with a ring. Make a chain or hawser fast to this ring, and lead it through a chock about 80 feet from the stern of the vessel. Attach a tackle to the drag, as shown in the diagram. This tackle will serve both to steady the drag and to lift it out of the water when necessary. The rods could be so arranged that the drag would have a tendency to shoot downward and out from the side of the vessel. By loosening a drag on whichever side it became necessary, the vessel could be after a time worked into some port.



C. A. M.

Ithaca, N. Y.

The New Commissioner.

A Democratic Patent Office Commissioner has been appointed to the place of Mr. B. Butterworth. We are anxious to see how the new man, Mr. Martin Van Buren Montgomery, of Michigan, meets the responsibilities of his important office, under the changed political conditions. Mr. Butterworth gave satisfaction, on the whole, but the general control and management of the department has been the subject of much complaint on the part of inventors and patent attorneys for many years. It is possible that the Democrats will find many abuses deserving correction, and it is to be hoped that they will make the necessary reforms; but they will best assist inventors and advance the manufacturing interests of the country by increasing the staff of the Patent Office and giving it a larger building. At present it is disgracefully undermanned and shamefully housed.

There are about 550 employes, when the number should be at least 1,000, who could all be paid out of the earnings of the Office; and the lack of accommodation may be inferred from the simple fact that the electrical division, with its 6,000 patents and a rapidly growing work, occupies two dismal, small, damp rooms on the ground floor, under which there is no cellar. It is high time that some of the 20,000 cases on hand should be disposed of, and that part of the accumulated $2,000,000 of surplus and of the $200,000 now turned over to the general treasury annually should be devoted to its proper employ. The fact that the whole laboratory of the Office is not worth $500, and that the apparatus in the electrical division consists of only ten cells of Bunsen battery, a small hand dynamo, and two old galvanometers, is enough to arouse any one to fierce indignation.—*The Electric World.*

The Toxic Effect of Insect Powder.

Regarding the method of action of this powder upon its victims, the fact should be kept in mind that the lungs or breathing apparatus of the insect are very different to those of the vertebrate animal. Instead of lungs, as we have, set apart in one portion of the frame, for the definite object of supplying oxygen to the blood after the latter has become in need of it, the insect has a central tube, connected with the air by a row of orifices on each side of its body, from which smaller channels radiate to every part of its circulation. The animal lung demands two systems, as it were, of circulation—the arterial and the venous. The insect has but a single circulation, and the whole of its blood is being constantly and fully brought into contact with fresh supplies of air. Hence the instant and powerful effect of any toxic substance with which the air may be impregnated. Thus an insect may be almost instantly killed by the vapor of chloroform, or ether, or prussic acid. These facts are powerful arguments for the theory that it is the volatile constituents of insect powder which are fatal, and not the actual contact, necessarily, of its particles.

THE following statistics will show what a wonderful fishing center the town of Gloucester, Mass., is. The amount of fish landed at this port during the month of October, 1884, was as follows: Codfish from George's Bank, 2,870,000 pounds; halibut from George's Bank, 13,200 pounds; fish caught on the Cape shore, Nova Scotia, 580,000 pounds; codfish from Grand Banks, 1,370,000; salt halibut from Grand Banks, 9,800 pounds; fresh halibut caught on the Banks, 724,700 pounds; haddock from the Banks, 45,000 pounds; pollock caught in nets, 1,994,000 pounds; codfish caught in nets, 68,000 pounds; and 7 sword fish, weighing 2,218 pounds.