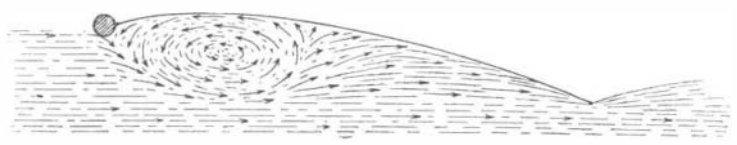
Correspondence.

WIND VORTEX IN SAILS.

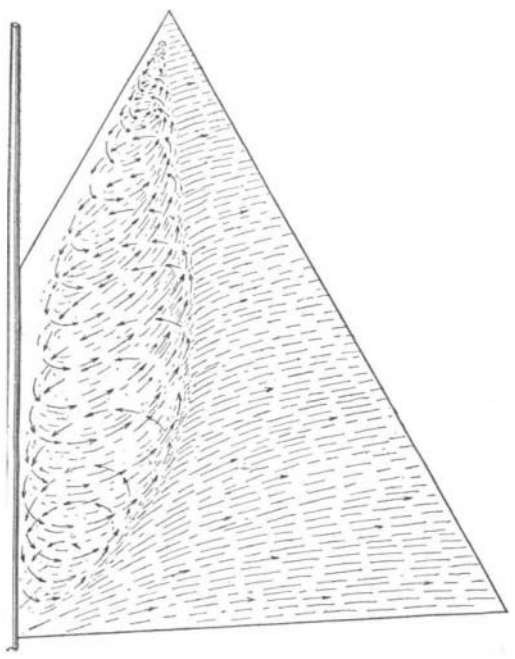
To the Editor of the SCIENTIFIC AMERICAN:

In connection with the theory advanced under the head, "Action of Wind on Sails," in a recent number, I desire to call your attention to the inclosed diagrams, illustrating a fact which I observed while sailing an iceboat in a snowstorm. No. 1 shows the



No. 1.

wind's circular motion caused by a bellying sail; like flowing water by a depression in the shore line, its course is reversed, and as air in a rotary motion attains greater velocity, it is plain to see its effect in forcing a boat to windward. No. 2 shows the vertical column of whirling air and the advantage this pattern of sail has for gathering a large volume. The working area of sails is materially increased, without detriment to pointing, by the use of a flexible boom, yielding laterally nearly in conformity with their curve; by this means the base will be broadened and exert itself over a larger portion of the sail. I have used flexible booms for both jib and mainsail for a number of years.



No. 2.

Advantages derived from gathering the vortex near the mast consist in a flatter leech, largely overcoming the tendency to backfill, less strain on the sheet, and consequently less lateral resistance on the rudder blade, points which I think many of your sailor readers will appreciate. S. D. TUCKER.

Troy, October 23, 1899.

Eyesight of School Children.

To the Editor of the SCIENTIFIC AMERICAN:

I wish to thank you for bringing the subject, "The Defective Eyesight of School Children," before the public, and I hope it may be persistently agitated till the importance of it is fully understood and appreciated by the parents and educators of the land. In addition to what has been so admirably said, I am convinced from my own observation and from the testimony of others that one great cause is requiring so much to be learned from the blackboard, reading lessons, mathematics, etc., with defective light. Children sitting near or distant, often in an oblique position, the angle of vision imperfect, often a glare of light which almost obscures, there is a constant strain upon the eye in the endeavor to see distinctly. Even little tots five years old required to copy from the board their reading lessons when they do not know their letters, and number work not knowing one figure from another. I have been a scholar and a teacher. I know of no better way for children than to read holding the book and thereby enabling them to adapt their vision as required. It is a question whether so much writing is best for older children. Exercises of various kinds, mathematical work, examination papers, etc., all requiring close and earnest work on paper, which is very trying for the eyes. A mother of boys and girls, a woman of education, a graduate from Mount Holyoke Seminary, remarked: "It seems to be, with teachers and superintendents, an era of experimenting, but it is very hard on the children." A close observer has said he feared the day was coming when we would be a nation of blind people unless preventive and radical measures were adopted. MRS. M. B. SMITH.

A Possible Explanation of Boiler Explosions.

To the Editor of the SCIENTIFIC AMERICAN:

The American journal, The Locomotive, informs us monthly of the great number of boiler explosions in the United States, numbering at an average each month about thirty, and the directly killed also about thirty, and the wounded are more or less. But the real cause of the explosion is not often discovered. It is not improbable that in many cases a cause existed which was not considered dangerous by the fireman, as, for instance, a case mentioned by the Metallarbeiter of September 27, 1899:

"It is a known fact that glass water gages may indicate a much higher water level than in reality exists. Each defect in steam tightness of the steam pipes leading to the top cock of the glass water gage, or a defect in tightness of said top cock, causes less pressure on the water in the glass gage. Consequently the water rises higher and higher in the glass in proportion to the defect in tightness of the steam pipe or cock. By a defect in a steam pipe leading to the top cock of a glass water gage was caused a difference of five inches in the water level of the glass gage and that in the boiler."

C. Remschel stated in the Technisch Zeitung that a magnetic water level indicator gave alarm of low water while the glass water gage showed four inches above middle water height. Everything was found in good order except a defect in tightness or soundness of a steam pipe leading to the top cock of the glass gage. The boiler after being fed with water till the alarm whistle was silenced, showed then the said differences in the water level. After remedying the defect in the steam pipe, the water level in the glass water gage fell six inches.

Likely such kind of defects as just mentioned caused many boiler explosions, since boilers are often intrusted to men lacking technical knowledge. And if in case of a terrible explosion the fireman escapes being killed and declares truthfully that the glass water-gage indicated sufficient water in the boiler, still the water may have been far too low, the boiler flues not covered with water—the danger of explosion not in the least visible to the fireman.

To bring such facts to general knowledge may not be amiss. L. OTTO P. MEYER, Ex-American Consul.

Dresden, October 31, 1899.

Coming Eclipse of the Sun.

To the Editor of the SCIENTIFIC AMERICAN:

In the delightfully clear paper on the coming eclipse of the sun (see SCIENTIFIC AMERICAN, October 21, 1899, page 267), Professor Lumsden says that at the commencement of the total eclipse, "we lay down the position of planets, comets, if any, and of bright stars." A' against particular stars or planets would show which were visible.

Now all this takes time, and time is of supreme importance. Before the eclipse we know the position of the sun and of the planets and stars around. Why should not observers have maps ready of the stellar part of the sky in question? And record the effect of the eclipse on the map? Surely this would lessen the labor of observation while leaving the attention freer to follow the particular phenomena.

F. C. CONSTABLE.

Burward, Sussex, England.

Accused of Fraud.

O. J. Bailey, publisher of The World's Progress, and proprietor of the American Patent Agency, at Cincinnati, O., has been on trial on a charge of using the mails to deceive and victimize patentees and dealers in patents.

In stating the case for the government the prosecuting attorney said that Mr. Bailey had been in the patent agency business in that city for twenty-three years, and that it was intended to show that his custom had been to write to persons as soon as their patents were announced in The Patent Gazette, offering to sell their inventions on commission, throwing out alluring suggestions as to values, all of which ended in demands upon the patent holders for $23 cash down in order, ostensibly, to advertise the patents.

This advertising was through The World's Progress, Inventors' Manual, and other publications printed by Mr. Bailey. The World's Progress circulation was given as 50.000 copies per issue, when, the government claimed, the actual number printed was never over 2,500; and similarly with the other publications, 6,000 circulars were promised when from 100 to 200 only were printed.

The whole arrangement, the government claimed, was simply to interest inventors by delusive hopes, get their $23 cash, and then be rid of them in the best way possible. One way for interesting the inventors was to write, telling them that, owing to the certain and manifest great value of their inventions, the patent agency was ready to reduce its regular commission for selling from 15 per cent to 10 per cent.

Witnesses from different parts of the country were called to prove the charges.—The Fourth Estate.

Expense of Target Practice.

A single big gun of the many now being put in place for the protection of the sea coasts costs a large sum. Some interesting figures on this subject have just been submitted to Gen. Wilson, and will be by him transmitted to Congress.

A 12-inch breech-loading rifle, with its disappearing carriage, costs $141,000; a 10-inch, $99,250; and an 8-inch, $72,000. The figures show that modern high powered guns cost immense sums of money, and the cost of firing them is proportionately as great. The report of experts who have inspected these guns and the devices for securing an accurate aim show that there is an immense saving effected by possessing modern range and position-finding devices.

"The demoralizing effect of a hit as compared to a miss," said one of these reports, "cannot be reduced to a money value, but it costs big money to shoot a big gun and then miss the mark. Take for instance the 12-inch gun. To miss the mark is simply to throw away $561.70. With the 10-inch gun the loss is $322.40, and with the 8-inch rifle it is $164.65."

A SIMPLE DEVICE FOR TIGHTENING FENCE-WIRES.

In order to provide a means for taking up the slack of a loose fence-wire, Mr. William H. Mason, of Leesburg, Ohio, has devised a simple ratchet whereby the wire or cable can be restored to its former tautness.

The device comprises mainly a front ratchet-wheel and a rear ratchet-wheel, the two being riveted together and rigidly connected by a hub on the rear

VIEW OF RATCHET SHOWING WIRE WOUND ON.

ratchet-wheel which hub fits into a corresponding recess in the front ratchet-wheel. From the inner faces of the wheels teeth extend inwardly, the tooth of one wheel being opposite a cut-out portion in the other wheel. The teeth have inclined backs and slanting front edges.

The wire is placed in a diametrical slot in the rear wheel, and the device is turned by means of a wrench applied to the squared hub of the front ratchet-wheel.

SIDE VIEW, SHOWING MANNER OF FASTENING THE WIRE.

The wire readily slips over the inclined backs of the teeth, and is wound up on the intermediate hub of the rear ratchet-wheel. When the desired tension has been secured, the wrench is removed and the wire snaps against the forwardly-slanting edges of diametrically-opposite teeth, and is thereby held firmly in position. The wire may also be slackened if desired.

It is necessary only to slip the slot over the wire and to turn the device to secure the desired tension; for the wire, after having been sufficiently stretched, automatically springs against the teeth to lock the ratchet-wheels in place.

Vanilla Poisoning.

A certain fearful interest attaches to accounts of poisoning by substances in common use, and the interest becomes almost painful when we learn how difficult it is to provide against its occurrence. Vanilla is a case in point. Fortunately, thanks apparently more to luck than anything else, cases of poisoning from this cause are rare. Nineteen persons, one of whom subsequently died, suffered severely, Wassermann tells us, from the effects of eating some vanilla "cream." This was composed of milk, eggs, sugar, and flavored with vanillin (the commercial article prepared from coniferin). The dish had been cooked in the evening and allowed to stand, uncovered, in the dining room till noon next day. Investigation showed that the eggs and sugar were good, that the milk alone was harmless and that the vanillin was pure. The fact that the cook and landlady, who had merely tasted the dish, had also become seriously ill, suggested the idea that the poisonous agent might have undergone further development after being swallowed—that is, that it was bacterial. Wassermann boiled three flasks containing respectively plain milk, milk flavored with vanillin, and a solution of vanillin in water, then let them stand eighteen hours at a temperature of 37° C. (98·6° F.) Some of the contents of each flask were injected into mice. The milk flavored with vanillin was poisonous, the other two harmless.—British Medical Journal.