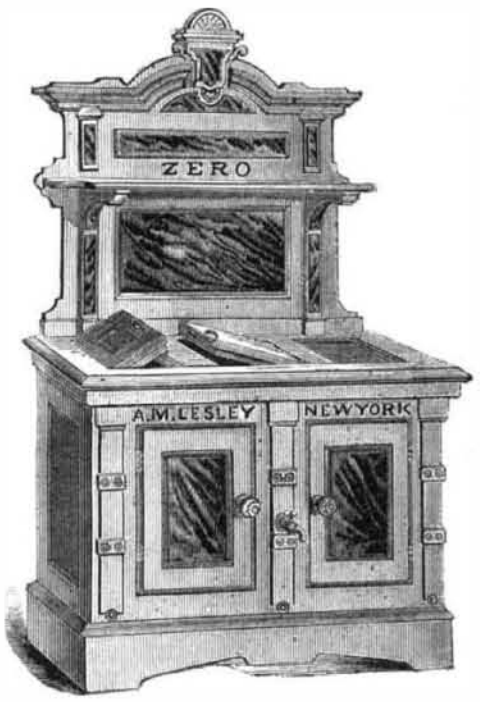
SIDEBOARD REFRIGERATORS.

The season for refrigerators being at hand, persons about to purchase will be interested in knowing what is new in this line. The last improvement we have seen is in the form of a sideboard, as shown in our engraving, made by Mr. Alex. M. Lesley, No. 226 West 23d street, New York city.



As all the refrigerators thus far brought out are only adapted to the kitchen or the hall, the handsomest of them having no claim to any beauty, and much less deserving to be called ornamental, it was for a long time the desire of many housewives to have a refrigerator that would not disgrace a dining room. To Mr Lesley belongs the credit of having brought out such a refrigerator, in the exterior form of a sideboard, and therefore called the "Sideboard Refrigerator." It is constructed in the most tasteful style, of solid wood—oak and black walnut—and, as the engraving sufficiently shows, is a decidedly ornamental piece of furniture, well adapted for even the most stylish dining room.

It is scarcely necessary to sum up the advantages of having the refrigerator in the dining room instead of in the kitchen. 1st. It is less under the control of the servants, which may be of some importance, especially when wines and delicacies are preserved in it. 2d. It is out of the heat of the kitchen. 3d. It is not exposed to the unavoidable flavors of the kitchen, which may affect certain delicate articles of food. 4th. If a refrigerator diffuses some coolness around it, especially on being opened, it is better that the dining room should have the benefit of it than the kitchen.

In regard to the interior arrangement of these elegant sideboard refrigerators, they are the same as those of Mr. Lesley previously described by us, and this arrangement has been proved very satisfactory in all respects. The water proceeding from the melting of the ice is stored in a separate tank, and can be drawn off for drinking purposes, while the water of condensation, always tainted with the odors of the meats and fruits preserved, is drawn off by a separate channel. This elegant appliance costs about double one of the plain kitchen or so called Zero refrigerators, which has been described in these columns.

Prize offered by the King of the Belgians.

A recent *Landon Gazette* contains a translation of documents which have been received at the Foreign Office respecting the $5,000 prize which the King of the Belgians proposes to award annually for the best work on a subject of national interest. His Majesty explains his design in a letter to M Delcour, the Minister of the Interior, who, in conjunction with the king himself, is to choose the jury of seven members—namely, three Belgians and four foreigners—the president to be a Belgian. The first award is to be made in 1878 for the best work on the national history of Belgium; the second in 1879, for the best work on architecture; the third in 1880, for the best work on the development of the commercial relations of Belgium; and the fourth in 1881, for the best scheme of harbor improvements on low and sandy coasts like those of Belgium. The first three competitions will be limited to Belgian subjects, but the fourth will be open to foreigners. In each succeeding four years, there will be three restricted and one open competitions. At King Leopold's wish, regulations have been drawn up and published by the Minister of the Interior.

The New Twenty Cent Coin.

Dr. Linderman, director of the mint, has selected the design for the new twenty cent silver piece. The obverse will bear a sitting figure of Liberty with the word "Liberty" inscribed on the shield, the whole surrounded by thirteen stars. Beneath the figure is the date. On the reverse is an eagle with the words "Twenty cents." The edge of the coin will be perfectly smooth in order to distinguish it from the twenty-five cent piece.

A Boiling Lake.

Mr. J. Sturge favors *Iron* with the following: "A discovery of some interest has been made in the Island of Dominica, West Indies. Drs. Freeland and Nicholls, Captain Gardner, and Mr. Watt, exploring the steep and forest-covered mountain behind the town of Rosseau, came upon a boiling lake about 3,500 feet above the sea level, and two miles in circumference. When the wind cleared away, for a moment, the clouds of sulphurous steam with which the lake was covered, a mound of water was seen, ten feet higher than the general level, and caused by ebullition. The margin of the lake consisted of beds of sulphur, and its overflowing found exit by a waterfall of great hight."

ARRANGEMENT OF GALVANIC BATTERIES.

The arrangement of the elements into batteries varies according to the purpose they have to serve. A maximum magnetic effect may be obtained from a given number of elements, if they be so arranged that the resistance in the battery is equal to the resistance in the closing wire. A given number of elements can be combined in very different manners. For instance, eight elements can be arranged in four different ways, as shown in Figs. 1, 2, 3, and 4. Which one of these combinations should be selected, in a given case, depends upon the resistance to conduction of the circuit. That combination must be taken, the resistance of which is nearest to that of the given circuit.

In Fig. 1, the elements are connected, one after another, into a battery containing eight successive pairs of plates, and the current has to pass in succession through each of the eight elements.

Fig. 1.

Fig. 2.

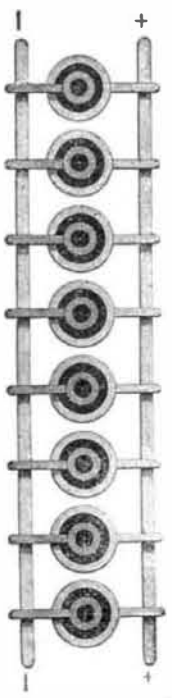


Fig. 2 represents the reverse, all the zinc cylinders being connected together to form one zinc pole, and all the copper cylinders connected together to form one copper pole, the whole forming a single element of eightfold surface. In this case, the elements are connected side by side for the production of the largest quantity of current through a circuit of the least resistance. In the former case, the elements were connected for the purpose of producing the greatest quantity of current through a circuit of the most resistance.

Between these two cases, there are the two others, represented by Figs. 3 and 4. In Fig. 3, the four elements, 1, 2, 3, and 4, one after another, are connected as one battery, as are also the elements 5, 6, 7, and 8. The corresponding poles of both batteries are connected with each other, and hence this battery represents a voltaic pile of four pairs of plates, of which each has double the surface of the pair of plates shown in Fig. 1.

Fig. 3.

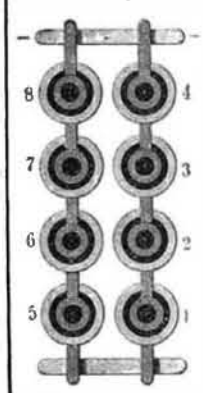


Fig. 4.

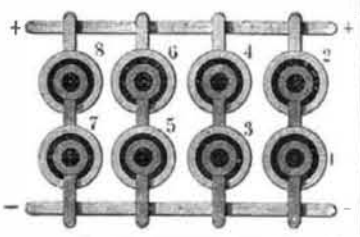
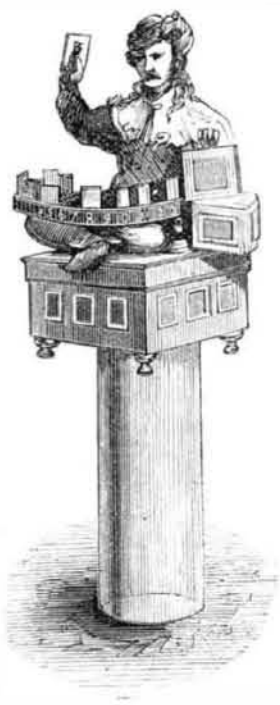


Fig. 4 represents the connections in which each two elements, 1, 2—3, 4—5, 6—7, 8, form a battery of two pairs of plates, whose surface is four times as large as in the pairs of plates shown in Fig. 1. Supposing the resistance of an element to be 4 ohms, the resistance of battery shown in Fig. 1 would be 32 ohms; in Fig. 3, 8 ohms; in Fig. 4, 2 ohms, and in Fig. 2, 0·5 of an ohm. Considering the different combination of the 8 elements represented, it is seen that, as the pile is shortened, it becomes broad in the same proportion; and hence, by making the pile one half as long and twice as broad, the resistance is reduced to one fourth of its former amount.

Now, in determining which combination of the above elements would be the most suitable for any given circuit, reference must be had to the resistance of the circuit; and if the greatest magnetic effect was desired upon each, the resistance of the closing wire, including the electromagnet, must exactly equal the resistance of the battery.

PSYCHO EXPOSED.

An exhibition is now being held in the Egyptian Hall, London, England, of which an automaton, called Psycho, until recently, formed a part. The figure performed many curious tricks, solving mathematical problems, and playing cards with great skill and accuracy.



Psycho is an oriental personage, sitting on a box some three feet square and eighteen inches high, while he himself is about twenty inches in hight, placed on a glass cylinder to show that there is no connection with the stage under the table. The movements were, of course, caused and governed by a secret force, but the method of communication with the figure defied detection for a long time. Mr. Maskelyne, the inventor, allowed any one to inspect the figure. One night a military gentleman, among others, sent up his card for that purpose. He examined the glass pedestal and other parts, but could see nothing of any mechanical contrivance. Subsequently, however, the mystery was solved by Mr. W. H Coffin. son of Dr. G. W. Coffin, an American dentist in London, Mr. Maskelyne being unwilling to submit his figure to the test proposed. The solution is that Psycho is worked by the condensation and diminution of the column of air in the glass cylinder on the top of which he sits. Beneath the carpet at the bottom of the cylinder is a perforated plate of zinc, connected with the operator behind the scenes, who, at his will, may increase or decrease the column of air, the figure moving one way or another in accordance with the pressure put upon it. The conjuror was at first disposed to deny the explanation, but Mr. Coffin told the audience that it could easily be tested by Mr. Maskelyne allowing him to put a newspaper between the figure and the cylinder. This the conjuror declined to do, and then followed great applause, when it became recognized that Psycho, as a mystery, had passed away.

London Fires.

The actual number of fires in London in 1833, as returned, was 458. The population then was 1,710,059. This gives one fire to every 3,734 persons. Last year the fires were 1,573, in a population of 3,400,701. or at the rate of one fire to every 2,162 persons. The population of London in 1874 was not quite double that of 1833, but the fires last year were more than three times as numerous as at the earlier date. Had the fires simply increased in the ratio as the population, the number last year would have been 911 instead of 1,573. The actual excess, therefore, is fully 72 per cent. A further investigation of data shows that this disproportionate growth of the London fires is a persistent phenomenon during a considerable series of years.

Reverting to the simple question of fires, apart from the success achieved in extinguishing them, there is a remaakable fact pervading the statistics—namely, that fires have a tendency to outstrip the population.

The frequency of fires in London far exceeds anything known in ordinary country towns. Moreover, we have the statistics of London itself, showing that, when it had half its present population, it had less than one third its present number of fires. The conclusion which appears warranted is this—that a population distributed over a number of separate towns is less liable to outbreaks of fire than the same population brought together within the compass of one town. In order to explain this social phenomenon, we may allude to the greater density of population in large towns as compared with small ones, though, on the other hand, this very density would seem to afford means of protection by rendering it less likely for a fire to pass beyond the incipient stage without being detected. On the whole, we are warranted in concluding that there are circumstances connected with the furnishing of houses, the storage of goods in warehouses and elsewhere, and the general hurry and pressure of metropolitan life, which involve contingencies more favorable to the occurrence of fires than are likely to be found in many country towns. The fact that fires increase more rapidly than the population creates a danger in large and growing communities lest the arrangements for extinguishing fire should not keep pace with the real necessity There is also the circumstance that large cities have large buildings, so that fires in such localities are likely to be not only numerous but extensive. Examples of this kind are not wanting in London, and the peril is increased by the enormous hight to which buildings are carried where the ground is costly.—*The Engineer.*

ELECTRIC "armored" cables are to be experimented with on board the torpedo school ship Vernon at Portsmouth, England, in connection with torpedoes laid down for harbor defense. Should these invulnerable cables prove a success as a means of connecting torpedoes with the shore, the value of these machines for defensive purposes will be considerably increased.