

## THE MOTHER OF EXHIBITIONS.

(Continued from page 419.)

this festival of amity. In all parts of England itself the exhibition aroused intense enthusiasm as long as it remained open. One reads, for example, of an old Cornish woman who had trudged on foot three hundred miles from her native county to see the wonderful palace of glass. The feeling of London showed itself at a ball given in the Guildhall, when the passage of the Queen and the Prince Consort through the city was made the occasion of the most jubilant demonstrations of loyalty, even on the return journey, though it was as late as one o'clock in the morning.

On October 15 the Prince Consort declared the exhibition closed, and the awards were published. The fair had been divided into four great departments—raw materials, machinery, manufactures, and fine arts—and these were subdivided into thirty classes. One-half the space had been allotted to England and the colonies, and one-half to foreign countries. There were 17,000 exhibitors, of whom 2,918 received prize medals and 170 council medals. The estimated value of the articles exhibited, exclusive of the Kohinoor diamond, was \$8,909,645. During the 144 days during which the exhibition was open, there was a total of 6,170,000 visitors. The largest number entering in one day was 109,760 (on October 8), and the largest number present at one time was 93,000 (at 2 o'clock on October 7). Haydn's "Dictionary of Dates" is responsible for the statement that the latter is the largest number of persons recorded in history to have ever been present at one time in one room, though larger crowds have assembled simultaneously in the various buildings of other exhibitions and in the open air.

Long before the final accounts came to be made up, it was evident that there would be no tax upon the guarantors. The amount paid for admission was \$2,525,535. After all expenses had been met, this left a surplus of \$1,066,525. There was much discussion as to what should be done with it, for such a result was so unexpected that no provision had been made for it in the original scheme. Some advocated that it should be spent upon a winter garden; but others, notably the Prince Consort, thought it would be an anti-climax to connect with a mere place of amusement the memory of an exhibition which had been a landmark in the history of industrial art. The wiser counsel prevailed, and the money went to form the nucleus of what was afterward known as the South Kensington Museum, an institution which has been not only a permanent collection of valuable exhibits, but a center of artistic and scientific education throughout the British Isles.

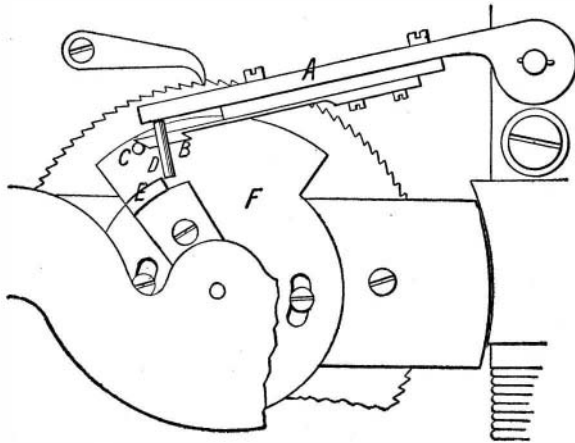
And what was to happen to the actual building? Some who had at first vehemently opposed the desecration of Hyde Park by any such monstrosity, were now eager that it should remain forever where it was. This plan, however, was not generally thought to be expedient. On December 1 the building was surrendered to the contractors, who sold the materials for \$350,000 to a company which proceeded to re-erect it on the top of a hill in the suburb of Sydenham. The services of Paxton, who had received the well-deserved distinction of knighthood, were brought again into requisition, but this time the work was carried out in more leisurely fashion, for it was not until June 10, 1854, that the transplanted building was opened on its new site. From that time until the present the "Crystal Palace," as it came to be called, has been well known to every Londoner and every visitor from the country. It has been especially noted for its musical festivals, and has many times recalled the memories of its original function by affording a home for exhibitions, generally of some special scope, as bicycle shows, chrysanthemum shows, etc. A notable occasion was a service held on the fast day for the Indian Mutiny, when Mr. Spurgeon preached to a congregation of 23,000 people.

In cost, size, and number of visitors the exhibition of 1851, though spoken of at the time as "the Great Exhibition," appears small in comparison with such an enterprise as the St. Louis Fair. But no successes of later undertakings in the same line can rob the promoters of the Hyde Park project of the distinction that belongs to the pioneer. On the other hand, the very expansion of the international exhibition movement is itself the greatest possible tribute to the wisdom and courage of those who made the strange idea familiar. And, as Mr. Justin McCarthy has put it in his account of the event in the "History of Our Own Times," although later exhibitions have been far superior, "the impression which the Hyde Park Exhibition made upon the ordinary mind was like that of the boy's first visit to the play—an impression never to be equaled, no matter by what far superior charm of spectacle it may in after years again and again be followed."

The largest producer of sulphur is Sicily; its deposits occur in Miocene limestone, with unaltered beds of gypsum below, and it exported in 1903 475,508 tons, of which nearly one-third was for the United States.

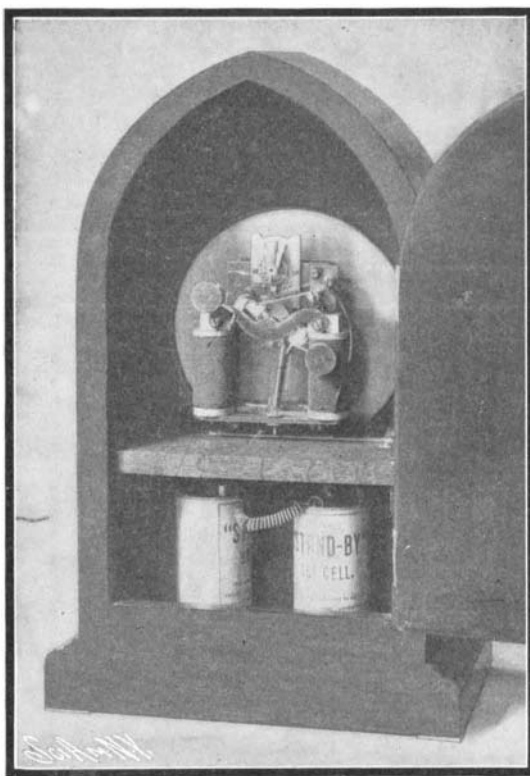
## AN ELECTRICALLY-OPERATED CLOCK.

It is the usual practice in clocks driven or wound by electricity to arrange the pendulum to make the electric contact at regular intervals; but heretofore great difficulty has been found in keeping the contact points bright and clean, owing to excessive sparking on breaking the circuit. The clock which we illustrate herewith is so designed as to entirely overcome this defect, and, furthermore, is so constructed as to reduce friction of the parts to a minimum—a prime requisite in all electric clocks. As a result of embodying these two features in this movement, but little current is required to operate it, two small dry cells being amply sufficient to keep the clock running for three years without renewal. The improved electric clock comprises an electro-magnet, between the poles of which



POSITIVE CONTACT FOR ELECTRIC CLOCK.

an armature is pivoted to swing. A pawl attached to this armature engages a ratchet wheel connected with the gear train of the clock, and a spiral spring attached to the armature near one end serves to draw it slowly out of line with the magnet poles, thus operating the clock movement. The latter may be regulated either by a balance wheel or a pendulum escapement, as desired. Electric contact is made at the end of every six minutes, the current serving to energize the magnet and draw the armature back to horizontal position against the tension of the spiral spring. The contact is made by means of a very efficient arrangement which is shown in our detail view. One terminal, E, consists of a metal segment which is carried on a plate, F, secured to the armature. The other terminal, D, consists of a pin which is secured to a swinging arm, A. Fastened to this arm, but insulated therefrom, is a flat spring provided at its free end with a



CLOCK WOUND EVERY SIX MINUTES BY ELECTRICITY.

head or cam, B, adapted to engage a pin, C, on the plate, F. The ends of the cam, B, are beveled, as illustrated, so that when the armature moves away from the poles, the cam will ride over the pin, C, lifting the contact pin, D, out of engagement with the segment, E. When the pin, C, passes the inner end of the cam, the pin, D, will drop onto the segment, B, completing the circuit through the magnet coils and causing the armature to swing back, and the cam then riding under the pin, C, will press the terminal, D, down against the segment, E, insuring a perfect contact. During the fraction of a second which is taken up by the armature in swinging to horizontal position, the clock movement is actuated by a second spring, not shown in our illustration, which is put under tension by the movement of the armature. The striking mechanism of

the clock is actuated by another spring which is wound up by the movement of the clock hands. The form of the main spring, that which acts on the armature, is quite novel in construction. Due to its spiral form it does not lose its elasticity as rapidly as the usual type of clock spring, particularly since its extension is very slight compared to its length. By means of a thumb-screw adjustment at its lower end, its tension may be very accurately regulated. Mr. Max Moeller, of 73 Palmaille, Altona, Elbe, Germany, owns the patents on this improved electric clock.

## The Scientific American in the Schools.

It is pleasing to know that the SCIENTIFIC AMERICAN is widely read in schools. We have recently been favored with a circular issued by the Superintendent of the Whitinsville, Mass., schools, which says: "A friend of the schools has been gratified at finding the names of so many pupils on the honor roll for the past year. He most thoroughly believes that one of the best lessons to be learned in the schools is that of punctuality and regularity; after the habit of honesty and truthfulness in word and deed, and earnestness and thoroughness in doing, no habit of greater value can be formed in youth than that of fulfilling our duty at the appointed time. In recognition of your faithful attention to this duty of regular attendance, a year's subscription to your choice of one of the periodicals named on the inclosed card will be sent you if you will mark, sign, and return the card." One of these circulars was sent to every pupil on the honor roll. It is gratifying to note that ten of the pupils selected the SCIENTIFIC AMERICAN in place of papers which deal with lighter subjects. The SCIENTIFIC AMERICAN should find its way into every schoolroom.

## The Current Supplement.

Two striking pictures with a brief article on the Craig-Goch Dam, Birmingham, England, open the current SUPPLEMENT, No. 1482. Rear Admiral John Lowe presents a solution of the problem of the screw propeller which will doubtless be of interest to naval engineers. "Oil from Livers of the Cod and Related Species" is the title of a treatise by Charles H. Stevenson, whose articles on the fish industry of this country will doubtless be remembered by readers of the SUPPLEMENT. The English correspondent of the SCIENTIFIC AMERICAN describes in a very exhaustive manner the method by which the Duddell oscillograph records alternating-current wave-forms. The recent architectural discoveries at Pompeii are made the subject of an interesting account. To those who are not familiar with the fine instincts of animals, an article entitled "How Animals Detect Poison" will give a vast amount of information. Dr. R. V. Wagner describes an X-ray tube with adjustable focus. The usual engineering notes, electrical notes and trade suggestions from United States consuls are also to be found in the SUPPLEMENT.

## Engineering Notes.

Another step in the direction of technical education has been made in the city of Dresden in the establishment of a school for locomotive driver apprentices. The initiative was taken by the Locomotive Drivers' Association of Saxony, which succeeded in interesting the members of the Dresden city council in the scheme, as well as the directors of the technical school and the administration of the Royal State Railroads. The purpose of the new school, which is managed in connection with the Dresden Technical School, is to better equip men who are to become locomotive drivers. The school is for apprentices between 25 and 30 years of age who are employed in the Dresden car shops. Among the subjects taught are German, arithmetic, graphics, and the mechanism of locomotives. For the present the course has been fixed for one year. The lectures and class-room work will be held on three evenings during the week and on Sunday mornings.

An important alteration has been made in the armament of the six armored cruisers of the improved County class, now in course of construction for the British Admiralty. Heavier guns than those originally designed are to be supplied, the alteration representing an increased outlay of \$1,000,000 for the six vessels. The original armament for each of these vessels comprised fourteen 6-inch guns; but when Mr. Watts succeeded to the office of Chief Constructor of the Navy, two 7.5-inch guns were substituted for four of the 6-inch guns. In this last revision four more of the 6-inch guns are to be dispensed with, and in their place two 7.5-inch weapons are to be installed. Thus four 7.5-inch and six 6-inch guns will be carried. The 7.5-inch guns will be mounted as follows: One placed forward in a turret, and another aft. The other two will be in casemates, firing ahead or on the broadside. Thus three 7.5-inch weapons will fire ahead, and as many on the broadside. By this change the battery will be considerably strengthened and improved, for the 7.5-inch gun fires a 200-pound shell, as against the 6-inch gun's 100-pound shell, and will perforate a much greater thickness of armor.