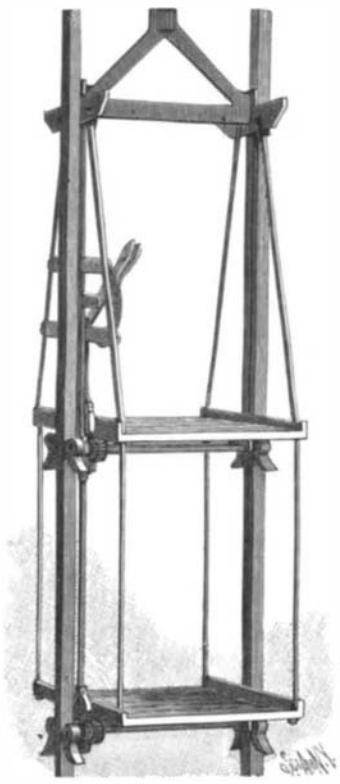
A CONTROLLING APPARATUS FOR MINE ELEVATORS.

Letters patent have been secured by John J. Cook and Walter W. Wishon, of Butte, Mont., for a controlling device which is particularly adapted to mine elevators, and which is operated by means of a hand-lever.

Below each deck of the car two shafts are mounted, the ends of which carry dogs having toothed cam-surfaces, designed to grip the guide-rails between which



A CONTROLLING APPARATUS FOR MINE ELEVATORS.

the car moves. Near one end of each shaft a pinion is fixed. The pinions are located opposite each other and mesh with racks extending vertically between them. The racks are connected by links to move in unison and are operated by a hand-lever provided with a latch-spring pressed into engagement with an apertured quadrant. The lever and its latch can be thrown to any desired position, so as to engage and disengage the dogs and the guide-rack.

The device is simple in its construction and efficient in its operation.

The Pollock Life Saving Competition.

It will be remembered that Anthony Pollock, a patent attorney of Washington, D. C., and his wife, were among those lost on the ill-fated steamship "Bourgogne," and that the Pollock heirs decided to offer a memorial prize of $20,000 for the best life-saving device in case of disaster at sea, and we have already given the various rules formulated, governing the competition. A committee of naval experts was appointed to take charge of the devices and select those which were considered worthy of being forwarded to the Paris Exposition. One hundred and twelve life-saving devices were received from all parts of the United States, and out of this number, the committee has selected ten which will be sent to Paris and placed on exhibition. Among the competitors whose devices have been selected is Chief Constructor Philip Hichborn, United States Navy, who sends his life buoy; Assistant Naval Constructor Francis T. Bowles, United States Navy, who presents an electric closing, water-tight, bulkhead-door; John A. Aniello, New Orleans, a life-boat; J. C. Angevine, Los Angeles, Cal., life jacket; N. H. Borgfeldt, Brooklyn, N. Y., steel belt to prevent the upsetting of life boats; W. J. Kennedy, New York City, boat, hoisting, lowering and detaching apparatus which was specially commended by the committee as the best device for getting boats clear of the ship when lowered with passengers; Arthur W. McGray, Boston, Mass., presented a design for a ship; W. McKinnon, a device for swinging out life boats; Robert Nevill, Washington D. C., the eophone sound condenser; C. F. Sultemeyer, Chicago, life boat. It is announced that persons whose devices have not been selected can send them to Paris at their own expense and they will be placed on exhibition. It is gratifying to note that several of the successful exhibitors secured their patent protection through the Scientific American Patent Agency.

It has been decided that the Scottish Geographical Society shall send a party to work in Antarctic fields. Researches will then be in progress on all sides of the Polar area

A SIMPLE FORM OF WIRE-HANGER.

In the accompanying illustration we present a new form of wire-hanger for suspending overhead trolley-wires or other wires and cables. The chief object of the construction is to hold the wire firmly without bending the hanger, and so to arrange the device that it can be moved along a wire whenever it may be desired. The hanger constitutes the subject of an invention patented by James W. L. Jaques, of Salt Lake City, Utah.

The hanger consists of a casing open at its top and ends, but closed at its bottom to receive the wire. Clamping blocks, serrated in order to grip the wire tightly and provided with inclined slots to receive the clamping-bolts passing through the sides of the casing, are designed to slide in opposite directions within the casing in order to engage with their upwardly and inwardly sloping adjacent ends the correspondingly formed surfaces of a central wedge-block. Through the sides of the casing and through the vertical slot in the wedge-block a bolt passes.

The casing is first slipped over the wire and the wedge-block placed in position with its bolt passing through the vertical slot and casing. The slidable clamping-blocks are then placed in position on either side of the wedge-block, with their bolts likewise loosely passing through the casing and inclined slots. By drawing upwardly on the central wedge-block, or downwardly on the wire, it is evident that the wedge-block will move the clamping-blocks outwardly, causing the upper inclined walls of the slots to engage the bolts. When the wire is tightly gripped between the serrated clamping-blocks and the bottom of the casing, the bolts are tightened so as to hold the parts permanently in position.

It may sometimes be necessary electrically to connect the adjacent ends of two wires with a hanger. The clamping-blocks are, therefore, provided with openings to receive the upwardly-turned ends of the wires.

THE COMING ECLIPSE.

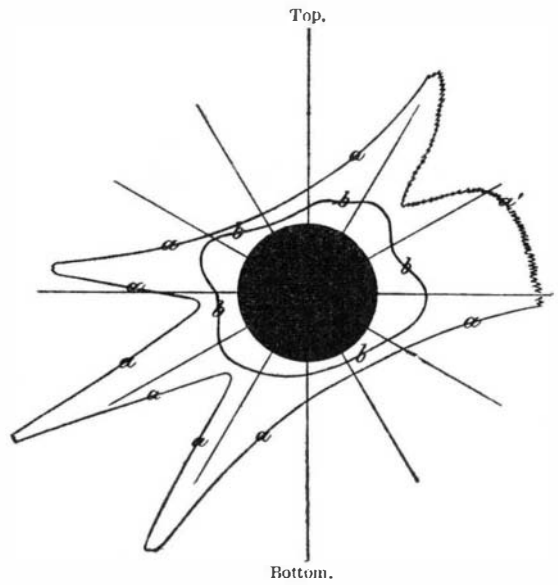
The total eclipse of the sun on May 28, instead of passing over the sparsely settled regions of the world, will cross the States of Louisiana, Mississippi, Alabama, Georgia, South Carolina, and North Carolina, and will even touch Virginia. The track of totality begins on the Pacific Ocean just west of Mexico, enters the United States near New Orleans, and passes in a northeasterly direction until it reaches the sea at Norfolk and Cape Henry. Its path then crosses the Atlantic Ocean and touches Portugal, Algiers and North Africa, and will terminate near the northern end of the Red Sea. The eclipse will last 1 minute and 12 seconds near New Orleans, and 1 minute and 40 seconds near Norfolk. It is probable that large numbers of people will take the railroads to points where the eclipse can be seen. A number of experimental stations will be established by the government along the path of the eclipse. The necessary apparatus is now being gathered and arranged, and men specially adapted for the work are being engaged and are trained. Congress has allowed $5,000 to the Naval Observatory and $4,000

A SIMPLE FORM OF WIRE-HANGER.

to the Smithsonian Institution for this purpose. The Naval Observatory will send out two expeditions. They will probably be located in North Carolina and Georgia, 200 miles apart. The Weather Bureau is collecting data of the weather conditions in past years in the month of May for the localities along the line of totality. So far they show there is less chance of cloudiness in Central Georgia and Eastern Alabama and this is, therefore, the best region for locating the eclipse stations. The stations will be occupied two or three weeks before the eclipse, and the part which each man will take will be thoroughly rehearsed. It is very imperative to make no mistakes during the minute and a half when observations can be made.

The Smithsonian Institution officers will be under Prof. S. P. Langley, those of Princeton University under Prof. Young, those of the University of Pennsylvania under Prof. Stone, and the Yerkes Observatory will conduct the expedition with Prof. Hale at its head. Nearly every college and scientific institution in the country will be represented, and probably 100 expeditions will observe the eclipse in the path of totality in addition to large numbers of scientific amateurs, who will make extended observations. Prof. Brown, of the Naval Observatory, considers that there will probably be thousands of these unattached amateurs. It should not be forgotten that one of the finest sets of photographs of the eclipse in India, in 1896, was taken by an amateur with a home-made camera. The expeditions sent out by the Naval Observatory will consist of only five or six observers. The same observatory has issued a little pamphlet containing a map of the path of the eclipse showing the various towns, railroads, streams and elevations, and it contains suggestions for observing the eclipse.

Doubtless many of our readers will be interested in knowing how to make amateur observations. Preliminary preparations should be carefully made where it is intended to sketch the corona with the naked eye. Those who expect to make a sketch of the corona unaided, will have to confine their attention to sketching outlines or to some other particular feature, otherwise they will result in hasty and inaccurate work. Co-operation of groups from two to five sketchers is strongly commended. A sheet of paper of convenient size, of say 9×12 inches, should have drawn upon it a black disk, 1¼ inches in diameter, to represent the moon, with straight lines radiating at an angle of 30 degrees, as shown in our diagram. The positions of the various parts of the corona, as seen projected against the sky are best referred to a vertical line obtained by mounting a plumb line so it is seen over the moon's center. The diagram upon which the drawing is to be made it is to be placed upon any convenient support so that the lines marked "Top," "Bottom" shall be in the plane of the plumb-line, the top part corresponding to the top string. The diagram also shows the outline method of sketching in the forms of the inner and outer corona, where the principal stress is laid upon the inaccuracy of the position and form. It is a reproduction of a drawing made by E. J. Stone in 1874. *a*, *a*, *a*, shows the outer corona, the part *a'* indicating a faint and undefined boundary, *b*, *b*, *b*, shows the inner corona. This sketch forms no part of the diagram to be used in the coming eclipse, but is placed on the diagram



OUTLINE METHOD OF SKETCHING IN THE FORMS OF THE INNER AND OUTER CORONA.

PATH OF THE TOTAL ECLIPSE OF THE SUN, MAY 28, 1900.

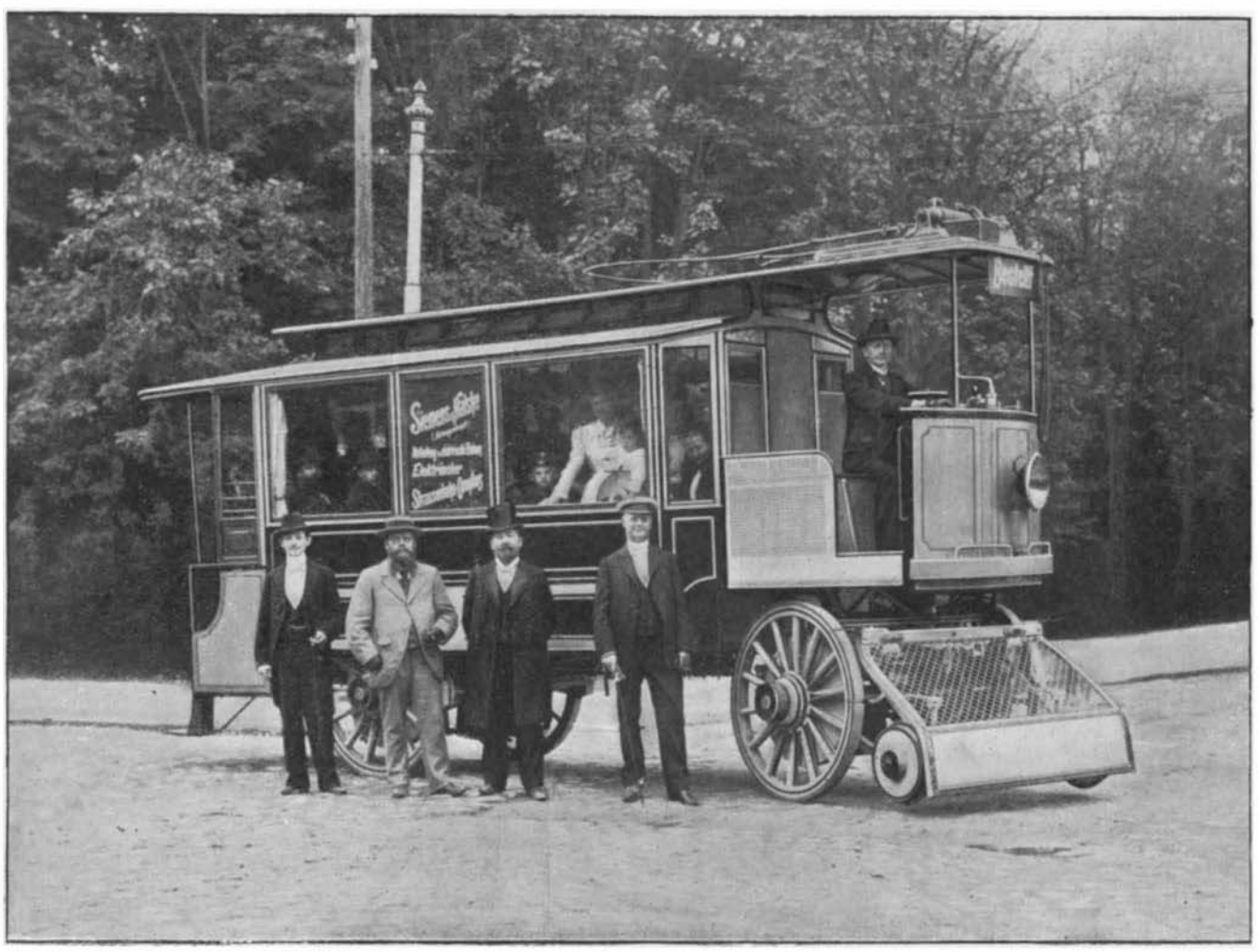
only as an illustration of the method. The dimensions of the various parts of the eclipse can be made with accuracy by estimating them in terms of the moon's diameter as a convenient unit. The party should practice together beforehand, each sketching only his proper quadrant from a corona drawing suspended at the angular height of the sun. The time of exposure of drawing should be slightly less than the known duration of the eclipse. White chalk on purplish blue paper gives admirable results. On eclipse day the sketchers should avoid fatiguing their eyes by too much observation of the preceding partial eclipse and should rest the eyes for the last five minutes before absolute totality.

Photographs of the corona are of great scientific value, and may be obtained with instruments of moderate dimensions. Almost any good rectilinear lens may be used. One with an aperture of 2⅛ inches and of a focal length of 32½ inches proved very satisfactory in the Indian eclipse expedition of 1898. For plates of ordinary sensitiveness exposures of one or two seconds are ample. It is better to use a plate of normal sensitiveness instead of an extra rapid one, and to lengthen the exposure in proportion, because a slower plate is easier to handle and permits of a more restricted and prolonged development and is less liable to accidental fogging. Photographs taken with amateur instruments are, of course, not as valuable as those taken with instruments provided with a driving clock or other device for keeping the image stationary on the plate. In focusing, the instrument should be pointed at a well-defined object distant say from one-quarter of a mile to a mile, and the object brought to a short focus for center plate. The image of the sun is really a small object and occupies but a comparatively small part of the center of the field. The focal length of the camera in inches will give roughly the diameter of the sun's image in hundredths of an inch. Negatives should not be retouched.

While a proper telescope is desirable, small spy-glasses and opera glasses may be used. For the first and last contact shade glasses are necessary. The usual and most objectionable color for a shade is red, either a neutral tint or green should be used, and deep blue is also recommended. Instruments specially intended for observing the sun are always provided with arrangements for getting rid of the excessive light and heat without diminishing the aperture, and often without using shades. Special care must be taken that the temperature of the tube is the same as that of the outside air. The first contact is a slight indentation in the sun's limb, and it usually attains some size before the observer, unless he is specially trained, sees it. The internal contacts, or beginning and end of totality, are phenomena of such a definite character that the instant of their occurrence can be noted within a small fraction of a second. For a minute or two before the predicted time of second contact the sun's thin and now fast-waning crescent should be carefully watched through a neutral or green shade glass. Presently the crescent will become a mere thread of light, which will rapidly shorten and suddenly disappear. The approach of the third contact will be heralded by the rapid brightening of the chromosphere at the point of the moon's limb, where the sun is about to reappear, and two or three seconds later a sudden burst of light will announce the contact itself, and with it the termination of totality. The observation of the fourth contact is a simple matter. The segment cut out of the sun by the retreating limb of the moon is carefully watched as it becomes less and less, and the instant of its final disappearance is noted as the fourth contact. Very precise directions are given by the Naval Observatory authorities for amateur telescopic observing parties, and are sent by them on request.

In our chart the shadow path is crossed at more or less uniform intervals by straight dotted lines which terminate in the north and south limits of totality. Each of these lines is approximately the locus of all points for which the middle of total eclipse occurs at the moment of Greenwich mean time indicated thereon. The adopted interval is five minutes. The longer dotted lines include points for each. Either the beginning or ending of partial eclipse will occur at the moment indicated.

SIEMENS AND HALSKE OMNIBUS DRIVEN BY OVERHEAD CURRENT.



THE SIEMENS AND HALSKE OMNIBUS DRIVEN BY ACCUMULATOR.

A COMBINED AUTOMOBILE AND TRAMWAY OMNIBUS.

A vehicle of a very novel form, designed by the well-known German firm of Siemens and Halske, has been used with considerable success in the city of Berlin. The vehicle is an electrically-driven omnibus which differs from other electromobiles in so far as it derives its power both from accumulators and from two overhead trolley wires, so that it can travel in streets without tracks as well as upon the rails of a tramway.

The omnibus, since it can be used with or without tracks, is admirably adapted to connect all parts of the city with one another. For it can travel, not only in those streets too narrow to permit the laying of tracks, but also in the restricted avenues in which the laying of rails is prohibited.

When the omnibus runs upon the tracks of an electric line, it takes the current necessary to actuate its motors and to charge its accumulators from the feed-wire above; but when it travels in rail-less streets, the conducting loop and its carrier are lowered, and the current from the accumulators is used.

The vehicle possesses the advantages over electric automobiles hitherto constructed of employing lighter accumulators and using a smaller amount of current when running on tracks, owing to the slight resistance. Moreover a high speed is attained,