TO THE NORTH POLE BY BALLOON.

An expedition has now been organized to make the trip to the North Pole by means of a balloon. The chief of this adventurous aerial trip is M. Andrée, an engineer of the Patent Office of Sweden and a very able aeronaut, who has made a large number of remarkable ascents in Scandinavia, in one of which he crossed the Baltic in a small balloon. The expense, which will be about $36,000, has been defrayed by means of a public subscription headed by the King of Sweden, who has subscribed $8,000. The balloon will contain 6,000 cubic meters of gas, and is being constructed at Paris under the immediate direction of M. Andrée. The ascent will take place in the month of July, 1896, from one of the northwestern islands of the archipelago of Spitzbergen. M. Andrée has had a building constructed in Sweden to shelter the balloon during its inflation, as it may be a number of days before the wind will blow in the direction of the pole. M. Andrée will be accompanied by M. Nils Ekholm, the astronomer, who is now attached as physician to the Central Meteorological Bureau of Stockholm. The balloon will be constructed of double silk and the cordage will be very heavy, so as to resist the action produced by the heat of the sun on the balloon. M. Andrée has devised a very ingenious contrivance for directing the balloon. The efficiency of this device has been tested by a trip which he took on the 14th of last July. It is composed of a rudder sail secured to the apex of the balloon and to the car by a rope, so that it can move freely, and a guide rope which can be adjusted to different positions for 180 degrees of the circumference of the ring which is secured to the car.

Fig. 1.—M. ANDREE, THE AERONAUT.

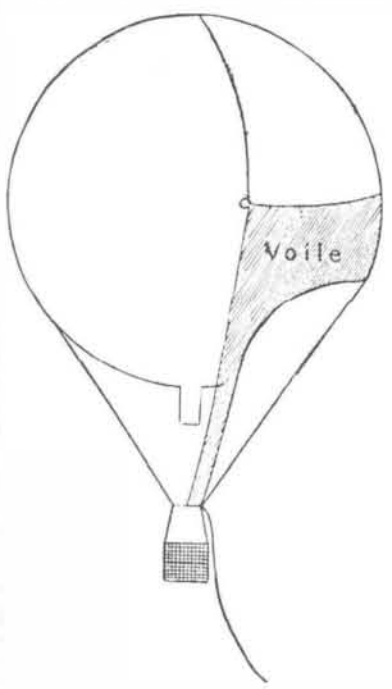


Fig. 2.—BALLOON WITH RUDDER SAIL.

The guiding is assisted by means of this guide rope, which is allowed to drag on the ground or in the water. The eyelets shown in Fig. 3 are intended to receive the hook of this guide rope. When the hook is attached to the central eyelet the balloon will move in the line of the wind, but by adjusting the guide rope to the other eyelets motion in other directions is obtained. The change is made with the aid of a differential pulley, as shown in our engraving. The aeronaut with this rudder sail, shown in Fig. 4, and the guide rope can change the direction of the balloon at will. In the season which M. Andrée has chosen the weather is usually fine in the Arctic regions, and there appears to be no good reason why the expedition should not be of great scientific value, even if the pole is not reached. The most favored of Arctic explorers rarely make more than four or five miles a day, so that the speed which can be obtained with a balloon will tend to do away with the great trouble which has heretofore blocked all the explorers—the shortness of the season.

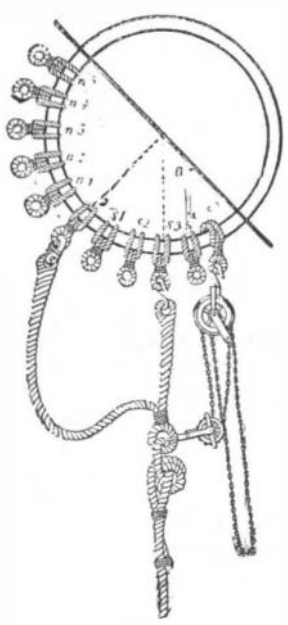


Fig. 3.—GUIDE ROPE ATTACHMENT.

A great deal of practical value has been accomplished by all the explorers, Kane, Franklin, Rodgers, Hall, De Long, Peary and others; but if success can be attained, incalculably greater benefits to science may be anticipated as the crown of such success. For our engravings and the foregoing particulars we are indebted to L'Illustration.

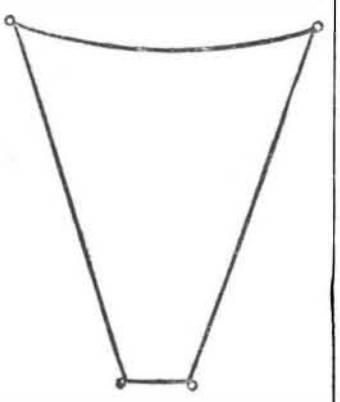


Fig. 4.—RUDDER SAIL.

Electric Traction Motors for Steam Railway Trains.

Within a few days past specially designed motors have been employed to haul, for a short distance, the regular trains of the Baltimore & Ohio Railroad. The service consists in hauling the trains through the great $8,000,000 tunnel, 7,430 feet long, under the business part of the city of Baltimore. The motors weigh 95 tons each, are 14 feet 3 inches long, and are of standard gage. They have two trucks and eight wheels, each 62 inches in diameter, and flexibly supported on each truck are two six-pole gearless motors, one for each axle. It is said that these motors are guaranteed to pull 1,200 tons at a speed of 30 miles an hour, and that, in a test, one of them was coupled to a six-wheel New York Central locomotive and pulled it up and down the track at will, although the best attainable pull was made by the steam locomotive against the motor.

This is but one more illustration of the manner in which the employment of electricity is being extended. We last week noticed some interesting trials of electric motors designed for regular service on the Nantasket Beach road, near Boston. The ease with which very high speeds could be obtained in hauling full passenger trains was amply demonstrated. Subsequent trials were made on the same road in the haulage of heavy freight trains and with equally satisfactory results.

That the electric motor may yet displace steam locomotives in the regular railway service of the country seems now a reasonable possibility, and one, too, in regard to which the principal question is that of relative cost.

Photographs of Lightning.

We have from time to time published interesting photographs of lightning flashes. The officials of the Weather Bureau are now making photographic experiments which they hope will prove valuable, not only to science, but also from a practical point of view as giving an idea of the necessary protection for houses in the city and country. Alexander McAdie has been engaged in investigating thunder and lightning since 1882. He has made a large number of interesting photographs of lightning, and this summer proposes to carry out an idea which was original with him. He hopes, with the aid of three cameras stationed at different points, to ascertain the actual dimensions and power of lightning flashes. The tip of the Washington monument has been selected as the point on which Mr. McAdie's three cameras are sighted. It is the most exposed object in the District of Columbia, the play of lightning around the tip being very frequent. One of Mr. McAdie's cameras is on the roof of the Weather Bureau, another in one of the committee rooms of the Capitol and a third is at a station back of Fort Myer, across the Potomac River. The distance from the three stations to the monument is accurately known, and Mr. McAdie's object is to get photographs from the three stations simultaneously of flashes of lightning around the Washington monument.

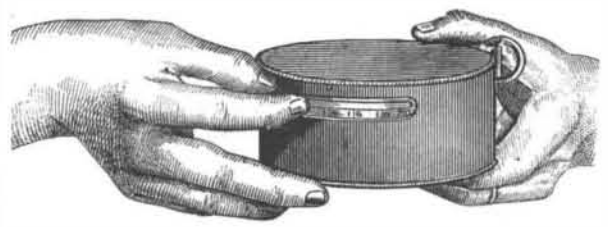
With the three cameras, the flash which is foreshortened from the Weather Bureau station will be visible in its entire length from the station at Fort Myer, or at the Capitol committee room. If Mr. McAdie should succeed in getting a photograph of a lightning flash from the three stations, the bolt itself will be afterward modeled and set up at the Weather Bureau. Computations as to that particular bolt can be made with considerable accuracy and the bolt would be valuable for comparison.

Mr. McAdie has also devised an interesting apparatus for measuring the duration of the flash. Inside of a camera there is a small tin plate with fasteners to receive a sensitized plate. This plate is made to revolve very rapidly. When the flash is photographed on the revolving plate, it will describe a curve making a certain number of revolutions around the center of the plate. As the number of revolutions per second is accurately known, the number of revolutions on the plate will give the exact part of a second the lightning flash has lasted. The results from this contrivance have been very successful. The Weather Bureau will shortly issue a pamphlet on protection from lightning, which was written by Mr. McAdie. It will give some important statistics of actual losses, together with the theory of protection.

There will also be directions for procedure in cases of apparent death from lightning stroke. Statistics show that in five years from 1890 to 1894, 1,120 lives were lost, an average of 224 lives a year. The greater number of accidents occur in the five months from April to September. The report will show that many persons injured by lightning stroke die because of a lack of proper attention. In many cases animation is merely suspended, the shock causing the sudden arrest of the respiratory and heart muscles. The directions are based upon Dr. Augustin H. Goelet's book, "How to Deal with Apparent Death from Electric Shock;" revised and modified for cases of apparent death from lightning by Dr. W. F. R. Phillips, of the Weather Bureau.

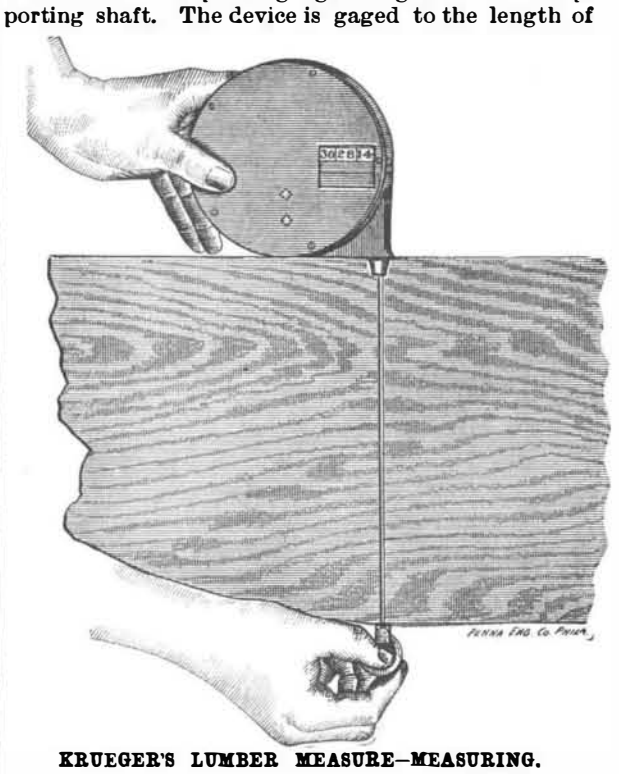
A REGISTERING LUMBER MEASURE.

The device represented in the illustration is an improvement upon an invention described in the SCIENTIFIC AMERICAN of January 12, for which an additional patent has been granted Mr. George Krueger, of Johnstown, Pa. In a suitable casing is arranged a



KRUEGER'S LUMBER MEASURE—SETTING TO LENGTH.

series of graduated gear wheels upon a rotatable shaft, registering devices having gear wheels loosely mounted on their supporting shafts being held in mesh with the graduated gear wheels. There is a clutch mechanism for each registering device to lock the gear wheel to its shaft, and a shifting device to actuate the clutch mechanism and positively connect the gear wheel of the corresponding registering device to its supporting shaft. The device is gaged to the length of



KRUEGER'S LUMBER MEASURE—MEASURING.

the lumber measure, and is not only a register, but calculates the figures in square feet of all areas over which the cable is extended. It is made to measure lengths of boards of twelve, fourteen, sixteen, eighteen, or twenty feet, but the apparatus may be arranged for measuring other lengths.

Kutho Daw.

Prof. Max Muller asks for money to photograph the inscriptions of the Kutho Daw, near Mandalay, in Burmah, before they are destroyed. The Kutho Daw is a collection of over 700 Buddhist temples, each containing a white marble slab on which part of the Tripitaka, the great Buddhist Bible, is engraved; together they give the entire work, which consists of 275,200 stanzas, or 8,808,000 syllables—nearly fifteen times the bulk of our Old Testament. The language is the Pali of the fifth century before Christ, believed to have been spoken by Buddha; the characters are the Burmese letters, and the text was revised by a learned commission. The dampness of the climate is rapidly effacing the inscriptions.

The Notch of Venus.

A cable dispatch received at Harvard Observatory July 2, from Professor Weiss, in Vienna, calls attention to a notch near the south horn of Venus, and asks American observers to note its time of visibility and disappearance.