Airship Anchorages.

By MAJOR O. C. VON VERSCHUER.

THE airship cannot become a practical means of transit until its safety has been assured by an organization as thorough and comprehensive as those of railways and steamship lines. Airship harbors and anchorages are especially necessary. The loss of the stately passenger airship "Deutschland" was due to the lack of suitable anchorages.

The peculiarities of airship traffic will probably develop stations of three classes:

1. Terminal stations, analogous to railway termini

Fig. 1.—Plan of Airship Anchorage

in large cities, and provided with shelters or sheds and every requisite for the preservation, maintenance, equipment and repairing of airships.

2. Way stations at suitable points in the vicinity of small towns and villages.

3. Emergency stations in places well sheltered from the wind, such as valleys surrounded by forests, and situated, if possible, near towns and villages.

Costly shelters will not be required at way stations, for the stops at these stations will usually be short, and even a longer stop, caused by adverse winds or a disabled motor or propeller, will not necessitate the housing of the airship, if the anchorage is provided with appliances which will assure the safety of the vessel even in a violent storm.

An anchorage suitable for a Zeppelin airship can be constructed as follows: The vessel is secured by a stationary anchor, placed at the center of a sheltered level field about 1,000 feet in diameter, and also by a movable anchor in the form of a wheel, rolling in a hollow circular track, about 250 feet in diameter. The stationary anchor is attached to the bow, and the movable anchor to the stern of the airship, which, therefore, automatically keeps it head to the wind.

In order to allow the bottom of the cylindrical hull to be brought very near the ground, two circular trenches, 6 or 7 feet deep, and concentric with the anchor track, are provided for the reception of the two cars, which move along their respective trenches as the airship veers with the wind. On account of the downward pressure of the wind, the bottom of

Fig. 2.—Quadruple Anchor Cable Distended by Steel Springs. Fig. 3.—Movable Anchor and Its Track. Fig. 4.—Airship at Anchor, Showing Protective Apron.

the longitudinal gangway should be about 20 inches above the surface of the grass-grown soil, and should be protected at its after end by leather bags filled with wool or shavings.

Thus anchored, the airship is little liable to injury from head or side winds. The injurious effect of puffs of wind which force themselves between the hull and the ground, and which contributed largely to the disaster that befell the "Zeppelin II." at Limburg, may be prevented by surrounding the lower part of the hull with an apron of sailcloth, with its lower edge stiffened by light metal rods and weighted with sand-bags (Fig. 4).

In order to prevent the rupture of anchor cables

and other damages caused by sudden gusts of wind, it is advisable to employ a group of four cables, stretched over four curved steel springs wrapped with wire (Fig. 2). The elasticity of this contrivance will equalize the tension, diminish the effect of gusts and protect the airship and its connection with the cable from violent shocks.

The cost of constructing an anchorage of this sort would not be out of proportion to the importance of the purpose for which it is designed.—*Umschau*.

Prof. Rosing's "Electric Eye"—A New Apparatus for Television

SEVERAL methods of television, or seeing at a distance with the aid of wires and electric currents, have been announced in the course of the past decade, but none of these methods has come into practical use. The Russian journals now announce that Prof. Rosing, of St. Petersburg, has solved the problem of television. The following description of Rosing's method and apparatus is taken from an article contributed to *Cosmos* by Jacques Boyer, who derives his information from the *Bulletin* of the International Technical Society of St. Petersburg.

The "electric eye," as Prof. Rosing calls his apparatus, is illustrated in the accompanying diagram, of which the right-hand part represents the transmitting station, and the left-hand part the receiving station. In the diagram the stations are shown connected by six line wires, but the number of wires can be reduced to four. At the transmitting station two drums *A* and *B*, covered with plane mirrors, rotate on mutually perpendicular axes in such a manner that every point of the image *M'N'*, which is formed of the object *MN* by the lens *L* and the mirrors, falls successively upon a small aperture *a* in a diaphragm

PROF. ROSING'S "ELECTRIC EYE"; A NEW APPARATUS FOR TELEVISION.

Receiving station at the left—*K*, cathode; *P*, fluorescent screen; *C*, condenser; *●*, diaphragm; *P*, electromagnets. Transmitting station at the right—*A*, *B*, rotating drums carrying mirrors and magnets; *M*, *N*, object; *L*, lens; *M'N'*, image; *A*, diaphragm; *F*, photo-electric globe; *E*, battery; *p*, *p'*, *g*, *g'*, coils.

placed before a glass globe *F*. The interior of the hemisphere opposite the aperture *a* is lined with an alloy of potassium, sodium or rubidium, which is connected with the negative pole of the galvanic battery *E*. The negative charge which the alloy thus acquires is carried away by the negative ions which the alloy emits under the influence of the illumination which it receives from the aperture *a*. In this way a charge, varying in magnitude with the intensity of illumination or the brightness of the point of the image *M'N'*, opposite the aperture *a*, is transmitted to the condenser *C* at the receiving station, through the wires connected respectively with the alloy and with a positive electrode which occupies the center of the globe *F*.

The rotating drums *A* and *B*, which carry the mirrors, also carry magnets which as they pass the coils of wire *p p'* and *g g'*, generate alternating currents, which are transmitted to the receiving station where they energize the electromagnets *s* and *t*.

A pencil of cathode rays, emanating from the cathode of a Crookes tube *K*, traverses the common field of the two electromagnets, the axes of which are mutually perpendicular, and is thus subjected to deviations corresponding to the displacements of the image *M'N'* with respect to the aperture *a* at the transmitting station. The result is that the luminous point produced by the impact of the pencil of cathode rays upon the phosphorescent screen *p* moves in exact correspondence with the relative movement of the aperture *a* over the image *M'N'*.

Before the pencil of cathode rays enters the electromagnetic field it passes successively through a small orifice in a diaphragm (shown in the figure but not lettered), between the plates of the condenser *C*, and through a small orifice in a second diaphragm *o*. The relative positions of the two orifices and the

cathode *K* are such that the rays do not fall on the second orifice *o* unless they are deviated by the electrostatic force exerted by the charged condenser, and that the fraction of the pencil that passes through the orifice *o* is proportional to the deviation, and therefore to the charge. Hence the intensity of the effective pencil and the brightness of the fluorescent spot are proportional to the charge of the condenser, and consequently to the brightness of the point of the image *M'N'* which momentarily illuminates the photoelectric alloy at the transmitting station.

In consequence of these electromagnetic and electrostatic actions exerted upon the cathode rays, every point of the image *M'N'* and the object *MN* is reproduced, with its proper relative brightness, on the fluorescent screen *p* at the receiving station. As the entire operation is repeated forty times per second, the fluorescent screen presents to the eye, in consequence of the persistence of retinal impressions, a motionless picture of the object *MN*. The fluorescent screen, the electromagnetic field, the diaphragms and the condenser are, of course, inclosed in the Crookes tube with the cathode *K*.

Aluminium Copper Alloys

THE British Association of Mechanical Engineers has a committee whose business is research concerning the properties of various alloys, which are now coming so rapidly into use. A recent report deals with alloys of aluminium and copper. Various experiments have shown that such alloys are erratic in behavior, especially under tests for "yield-point" and at high temperatures.

Copper alloyed with 7 per cent of aluminium was shown in some experiments to give disastrous results when employed for stay-bolts in locomotives. On the

contrary, these alloys show good results in other ways. It has been shown that copper alloyed with from 1 to 10 per cent of aluminium becomes practically incorrodible in sea water. But this does not hold for tank water.

Cement-Protected Iron

THE use of cement to protect iron is not a new invention. At Brest the demolition of subaqueous constructions has brought to light iron bars which were thus covered, and which have remained in perfect condition for more than 100 years. At Rochelle a bridge erected in the fifteenth century was found to contain cement-protected iron, and the metal had not suffered from the effects of moisture.

TABLE OF CONTENTS

	PAGE
I. AERONAUTICS.—Airship Anchorages.—By Major O. C. von Verschuer.—2 illustrations.....	334
II. ARCHEOLOGY.—Excavations at Susa.—By Our Paris Correspondent.—4 illustrations.....	379
III. BIOLOGY.—Paris Oe. anographic Institute.—By Our Paris Correspondent.—3 illustrations.....	376
IV. CHRONOLOGY.—Fixing the Day of the Week of Previous Dates	371
V. ELECTRICITY.—Prof. Rosing's "Electric Eye"—A New Apparatus for Television.—1 illustration.....	384
VI. GEOLOGY.—Stalactites.—By George H. Martin, M.A., F.C.S.—2 illustrations.....	379
VII. MINING AND METALLURGY.—The Ultimate Limitation of Mineral Resources, and Its Significance to the Human Race....	375
VIII. MISCELLANEOUS.—The Alteration of Checks.—By William J. Kinsley.—13 illustrations.....	872
IX. NAVAL ARCHITECTURE.—The "Olympic" and the "Titanic."—3 illustrations.....	380
X. RAILROADS.—Steel Cars for Passenger Trains.—6 illustrations....	377
XI. PHYSICS.—Radiant Energy and Matter.—II.....	370