

THE EXPLOSION OF THE BALLOON DEUTSCHLAND.

The Deutschland, a balloon of 9,000 or 10,000 cubic feet capacity, of which we give an exact reproduction, was on view at the trades exhibition held at Berlin in 1896. The experimental ascent which took place the 12th of May of the current year, at 7 o'clock P. M., at the Tempelhof establishment, would have been made last year, if at the time the inventor had been able to procure the funds required. Only recently, however, he found the necessary amount at his disposal.

Dr. Woelfert was furnished with several thousands of cubic feet of gas for his balloon by the Prussian government generators. In the preparation for the ascent he was assisted by officers of the aeronautic department of the German army.

The experiment was to consist of a trip to the town of Rixdorf, in the north-northeast, in spite of an opposing wind. The balloon was to return for descent at Tempelhof, after traveling some four miles in a bird's line. In his fatal ascent Dr. Woelfert was accompanied by the mechanic Herr Knobe, who had also been with him throughout the time of the exhibition.

The balloon was oblong, and the proportion of length to breadth was 2.5. It was fairly stable when suspended in the air, and, though its shape was not graceful, it was carefully constructed. Unfortunately, in order to increase the power of the mechanism, the doctor had brought the car too near the body of the balloon. It was suspended 10 feet below the reservoir. This defect did not pass unnoticed. The Science Illustrée published an article drawing the reader's attention to the dangers of this construction, and sent a copy to the inventor. But the warning seems to have been in vain. The engine had 8 horse power, and, on the whole, resembled those used on autocars. The fuel burnt was benzoline.

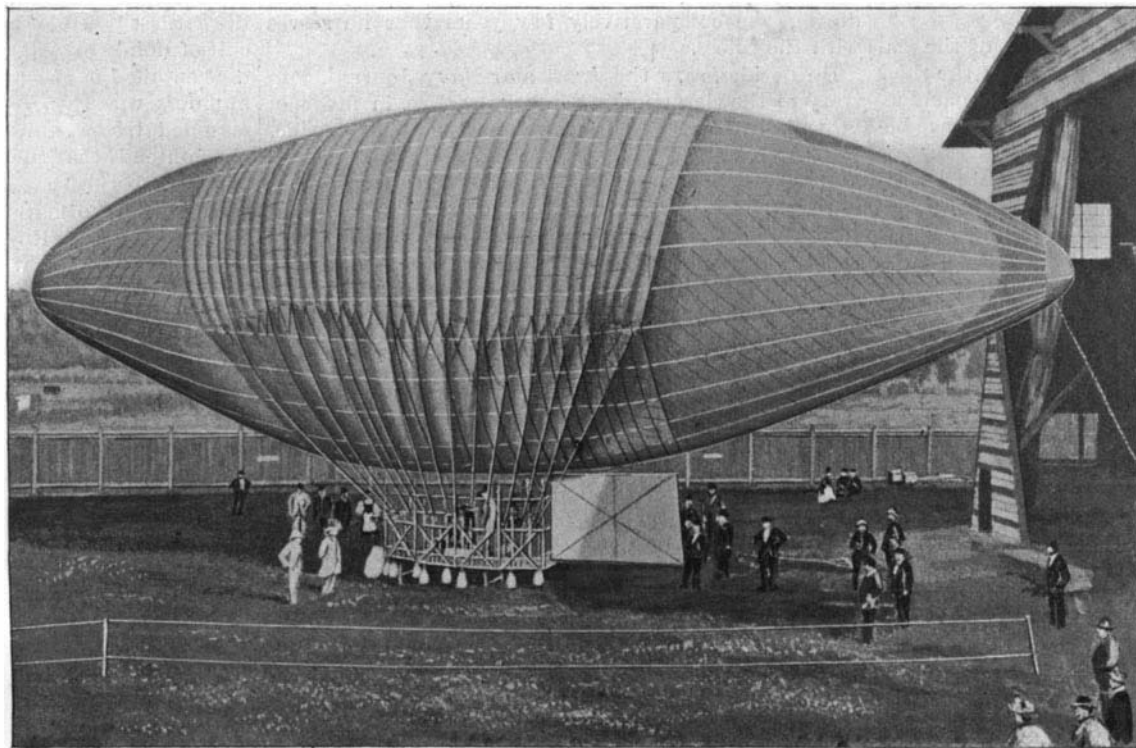
Our second cut shows clearly the details of the construction. The screw propeller was placed in the front, and had two aluminum wings. In the rear was attached a rather large rudder which, to judge from its size, should have been found effective.

According to the Berliner Tageblatt, it appears the balloon took a southerly course, and the machine does not seem to have worked satisfactorily even during the short interval when the screw was seen to be revolving. But scarcely had the attempts at propulsion begun, when a violent explosion shook the air. Basket and balloon were at once wrapped in flames, and the blazing mass was seen falling to earth with ever increasing speed. The rudder also was caught by the flames, got loose, and reached the ground first. For some seconds there seemed to be danger that the aerial furnace should be precipitated on a goods train laden with hay. This additional catastrophe, however, did not take place.

The military aeronauts were the first to pick up the mutilated and charred remains of the unfortunate balloonists, who, but a few minutes ago, had left the solid earth healthy and strong. As the balloon was 2,500 feet above the earth when the explosion took place, and was still in full ascent, there can be no doubt that the gas, escaping from the valve with too great force, reached the furnace and caught fire. The doctor should have made his experiments with the machine only after reaching the zone of equilibrium.

Following so closely the catastrophe of Lilienthal, this new tragedy seems to point to the enthusiasm with which Germany is taking up the problem of the navigable balloon. The principal error on the part of

Dr. Woelfert is the same as that committed by most of the daring men that risk their lives in similar ascents. Their limited means do not give them opportunity to acquire the familiarity required in using with a minimum of risk the delicate contrivances employed. Their impatience and daring are only too well explained when we consider the obstacles they meet at each trial ascent.



THE STEERABLE BALLOON OF DR. WOELFERT.

We can then only sympathize with them for any errors they may commit, and honor them for the courage they show in the advancement of science. And truly of science they are the martyrs. This glorious death they have met in striving for the common weal.

We are indebted for our illustrations of the ill-fated airship and its heroes to Le Monde Illustré.

The Vienna Tramway Line.*

One of the most important of the Viennese tramway lines has been transformed into an electric one. The overhead trolley system has been adopted in spite of the chaos of telegraph and telephone wires above the streets. The line is about six miles long. The work was done by the Union Elektrizitäts Gesellschaft (the company owning the German and Austrian Thomson-Houston patents), under the superintendence of their engineer, Herr C. Pollak, in the short space of two months, although the weather was very bad during the period. [The line was opened on January 27.]

The maximum gradient is 3.8 per cent for a distance of about 150 yards. The rails are partly heavy Phenix rails, weighing 86 pounds per yard, and partly Haar-

700 sq. mm. section, and are also fed at a point in the middle of the line with a cable of 350 sq. mm. section. The trolley wire is fed at three points by independent cables. The first point is 2.6 miles distant from the station, and is fed by a cable of 350 sq. mm. section; the second is 0.9 mile from the station, and the feeder has a section of 140 sq. mm., and the third feeder is of the same section and 1.1 miles long. The feeders are underground, laid directly in the ground, and armored with iron ribbon. Current is delivered from the lighting central station, a special 550 volt shunt dynamo and switchboard being devoted to the tramway circuits.

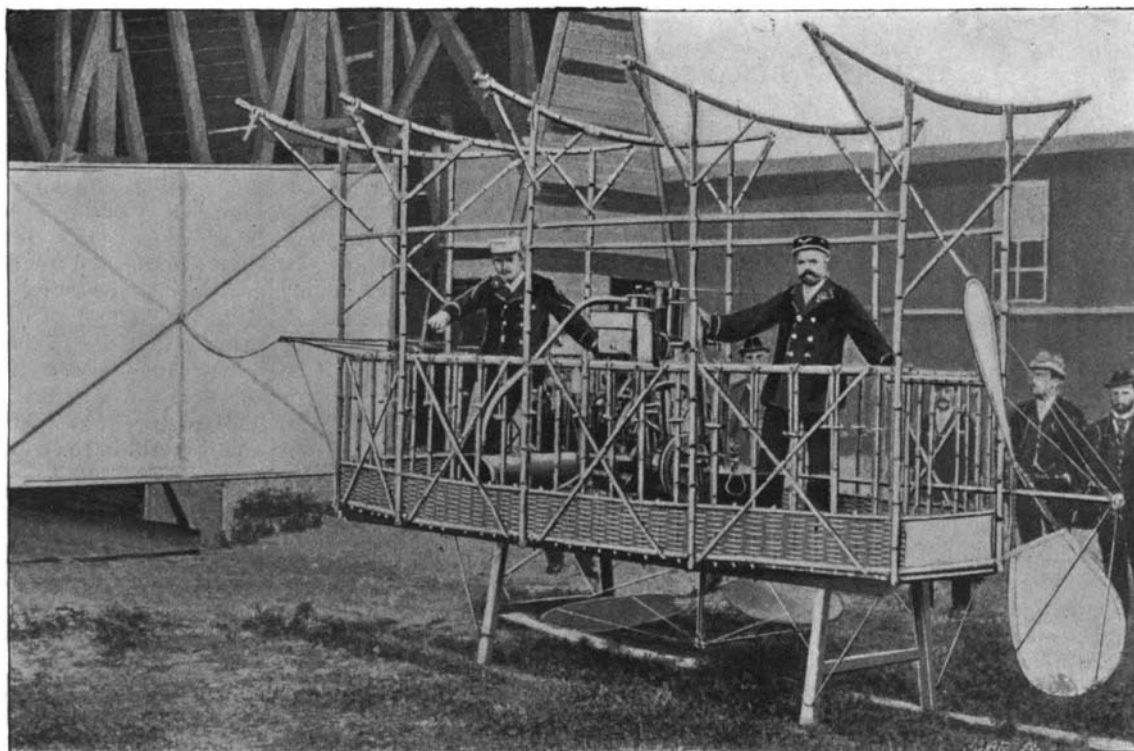
The trolley wire is at a height of about 20 feet above the ground. It is of hard drawn copper wire, 8.25 mm. diameter. It is supported at 643 points, in 312 places by poles and in 331 places by rosettes. In most cases house owners consented to the rosettes being fixed to their houses, so that poles have only been used where it was absolutely necessary. The poles are of steel tube, and are set in cement foundations. The rosettes are ornamental steel castings, inclosing India rubber silencers.

The line and rails are divided into seventeen sections, insulated from one another, which are switched in series under ordinary working conditions. Each section has a Thomson-Houston lightning protector with magnetic spark extinguisher. Almost the whole length of the trolley wire is protected with guard wires.

There is to be a four minute service by means of twenty-five motor cars. In addition there are five cars in reserve. All are of the same type as the Hamburg cars, having a double axle under-frame with a wheel base of 5 feet 8 inches, and a roomy carriage body with twenty seats. The interiors of the carriages are lit by six 16 candle power lamps. The head lamps are also electric, but each car carries a petroleum reflector lantern, to be used in case of emergency. Each car has two 20 horse power Thomson-Houston single reduction motors. In addition to the ordinary brakes, each car is fitted with a short circuiting brake. The car equipment also includes an apparatus for sanding the track, signal and alarm bells, and a tool box. The cars are heated with briquets in the usual manner. Each car can draw an adapted horse tramcar, both being fully loaded, at a speed of nine and one-quarter miles an hour.

Smoke and Storms.

The following interesting results, says the Literary Digest, have been reached by Herr Kasner, of Berlin, from a study of the periodicity of storms in Germany: "During the years 1883-92, storms at Berlin show a maximum frequency on Thursdays and a minimum frequency on Mondays. Observations made, also at Berlin, from 1830 to 1840 and from 1848 to 1891 indicate a maximum on Saturday and a minimum on Sunday, a fact that has also been observed at Aix-la-Chapelle. New researches, covering other cities, and published in Das Wetter, lead Herr Kasner to the conclusion that in general the frequency of storms increases from Monday to Tuesday, and that a minimum occurs on Thursday, or on some day immediately following. In industrial cities that contain large numbers of furnaces there is almost always an increase from Wednesday to Saturday and a diminution from Saturday to Sunday, while in localities where there are no factories the contrary is generally the case. Variations in atmospheric electricity seem to be connected with variations in the quantity of smoke emitted into the air, as Arrhenius and Ekholm have already noted."



THE CAR AND MOTOR

mann twin rails 6 1/8 inches high. The track is of standard gage, and is mostly in the middle of the street. The rails are bonded with Union bonds 107 sq. mm. section, and are cross connected every 110 yards. The rails are connected to the engine room with a cable of

* Abstract of an article in the Zeitschrift für Elektrotechnik, January 1, 1897.—By the Electrician.