



PROPELLER OF ELECTRIC FLYING MACHINE.

ELECTRIC FLYING MACHINE.

The improvements recently made in electric motors have suggested to the eminent French electrician, M. Gaston Tissandier, the idea of employing these machines to propel air balloons. They can be used in connection with M. Planté's secondary couple, which store a large amount of electric energy and weigh relatively little. Such a motor possesses great advantages. There is no danger of firing the volume of hydrogen above, and it has a constant weight, there being no decrease by combustion.

In making his experiments M. Tissandier employed a small oblong balloon ending in conical points. This balloon, which is like that used by M. Giffard, is 3 m. long by 1.30 m. in diameter, and has a volume of about 2,200 liters. Inflated with pure hydrogen it has an ascensional force of 2 kilogrammes.

It is worked by a small electric motor resembling the Siemens dynamo, and weighing 230 grammes. This works a light propeller 40 inches in diameter. This motor is suspended below the balloon, and will propel the balloon for several miles with a

Planté element of 220 grammes, while with a secondary couple weighing 1,300 kilogrammes the duration of its rotation is considerably increased. Under these conditions the armature turns 6.5 times a second, and acts as a propeller, giving the balloon a speed of 1 m. a second during more than 40 minutes. With two secondary elements, a propeller 60 inches in diameter can be used, which will propel the balloon at the rate of 2 m. a second during 10 minutes; and with three elements a speed of 3 m. can be obtained.

These experiments took place in the "Conservatoire des Arts et Métiers," at Paris, in a large hall, where the balloon could move freely, restrained only by a light rope dragging behind it, which served at the same time to guide and to measure its speed.

The working power of the electric motor was measured by the simple method of lifting weights. A secondary element, and afterwards two elements together, were attached to the motor, and it was found that the swiftness of the revolutions varied according to the weight lifted.