

**THE FATAL BALLOON ASCENSION.**

The story of the fatal balloon ascension in France, in which two of the most daring of living aeronauts, Croce-Spinelli and Sivel, lost their lives through suffocation in the highly rarefied air of the upper atmospheric regions, is told in detail by the survivor of the party, M. Gaston Tissandier, in *La Nature*, the journal edited by him. We have already given the main facts of this disastrous affair, but the following in addition thereto will also be found of interest. We extract from the periodical above named the engravings given herewith, one of which represents the aeronauts and their apparatus as disposed in the car of the balloon. Tissandier is shown noting the barometer indications, Croce is seated on the right, and is inhaling oxygen, and Sivel is about cutting loose the bags of ballast. The time chosen is after the balloon had mounted to a height of over 23,000 feet, and a sense of faintness and oppression was already stealing over the occupants of the car. The temperature was about 14° above zero, Fah. Sivel, who had relapsed into a kind of stupor, suddenly awoke, and turning to Tissandier asked the altitude; the balloon had nearly reached 24,000 feet. Then he cut loose the bags of ballast, and this action is the last remembrance which M. Tissandier possesses of the course of events until he awoke and found his companions dead.

The small balloons shown just above the car contained a mixture of air and oxygen (70 per cent of the latter gas) which the aeronauts inhaled until suddenly overcome. The reservoir hanging outside of the car is an aspirator for forcing air through tubes filled with caustic potash, which air was subsequently tested for carbonic acid.

The temperature of the air, as the balloon ascended, was carefully measured, up to the time when the observers succumbed.

At the surface of the earth it was 57° Fah. By the time an altitude of 20,000 feet was reached, about 50 minutes intervening, the mercury had fallen to 32°; the last indication noted, two hours after starting, and when the balloon was 23,680 feet high, showed 13·8° above zero, Fah. During this period the temperature of the gas within the aerostat was constantly noted; this reached 73·4°, when the mercury outside marked but 23°, and remained at that point. This fact accounts for the rapid ascension of the balloon in the upper regions, and its precipitous descent after sinking into the denser atmosphere.

We remarked in our previous article that the registering barometers, which were to be opened by the French Society, and which fortunately remained intact during the fall of the car, would show how high the balloon ascended after the aeronauts became insensible and before it began its downward course. These have been examined, and show that the lowest pressure corresponded to about 10·3 inches of mercury, which indicates a height of a little over 27,500 feet. From this point the balloon began to descend, falling swiftly to 20,500 feet. Here the aeronauts revived, and then cut away the aspirator and threw overboard more ballast, causing the balloon to rise once more to the same high altitude, and insensibility again to supervene. The track of the air ship forms a gigantic M, the ends about 150 miles apart.

In the smaller illustration, Fig. 2, are represented Sivel's sounding balloons, by means of which he recognized the presence of currents of air above or below. A rod, thirty feet long, was projected from the car and held in equilibrium by the upper balloon, which was 19 feet in diameter, and which was filled with gas. This was attached to a rope 3,000 feet long and allowed to ascend that distance above the car. The other small balloon was filled with air, and, being attached to a line of similar length, fell that far below. Mr. Donaldson uses an arrangement similar to this, kites being substituted, however, for the balloons.

**Piracy on a Railroad.**

Presence of mind at the right time averted the possibility of a serious disaster on the Hudson River railroad, recently. Five convicts managed to break away from the working gang at Sing Sing prison, and, reaching the railroad track, suddenly jumped into the cab of a freight engine which, at the time, was slowly dragging a heavily loaded train. Presenting revolvers at the heads of the engineer and fireman, they ordered both men to alight. The engineer, unable to reach any heavy tools to fight the intruders, resorted to strategy.

He noted that the fire was very low; and trusting that the convicts knew nothing of machinery, he seized his pump handle and, as he leaped from the cab, turned it far to the

right, thus admitting a steady stream of water to the boiler. The convicts then uncoupled the locomotive, which, as the steam gage stood at 200 lbs., leaped forward with a jerk.

As soon as the pumps began to operate, the water worked into the cylinders, and, in a few seconds, the head of one blew off, thus, of course, greatly retarding the speed of the machine.

Meanwhile a telegram had been sent to Superintendent Toucey, at the New York office, announcing the capture. Prompt action was necessary, as a locomotive, tearing over the line in utter defiance of time tables and trains ahead, was a dangerous intruder and liable to work considerable damage at stations and crossings. Recollecting that near Tarrytown there is a switch which runs parallel with the main track for a long distance and then abruptly ends in the river, Mr. Toucey, without an instant's hesitation, sent to the Tarrytown station master an order "to open the west switch and throw No. 89 into the river." The astonished official, although hardly crediting his senses, nevertheless prepared to obey the command. He threw open the switch and locked it, and then stood calmly by, watching the cloud of steam up the track get bigger, and waiting for \$20,000 worth of engine to go plunging, with whatever train might be behind it, down to the bottom of the Hudson.

Another explosion occurred, however, which saved the lives of the convicts and the destruction of the engine. The locomotive was within a mile of the switch when the other cylinder head was blown out. The machinery stopped, and the convicts, leaping out, took to the woods. The engineer, who had been running after his locomotive, well knowing that she could not travel very far, soon reached her, and, jumping into the cab, in a few seconds

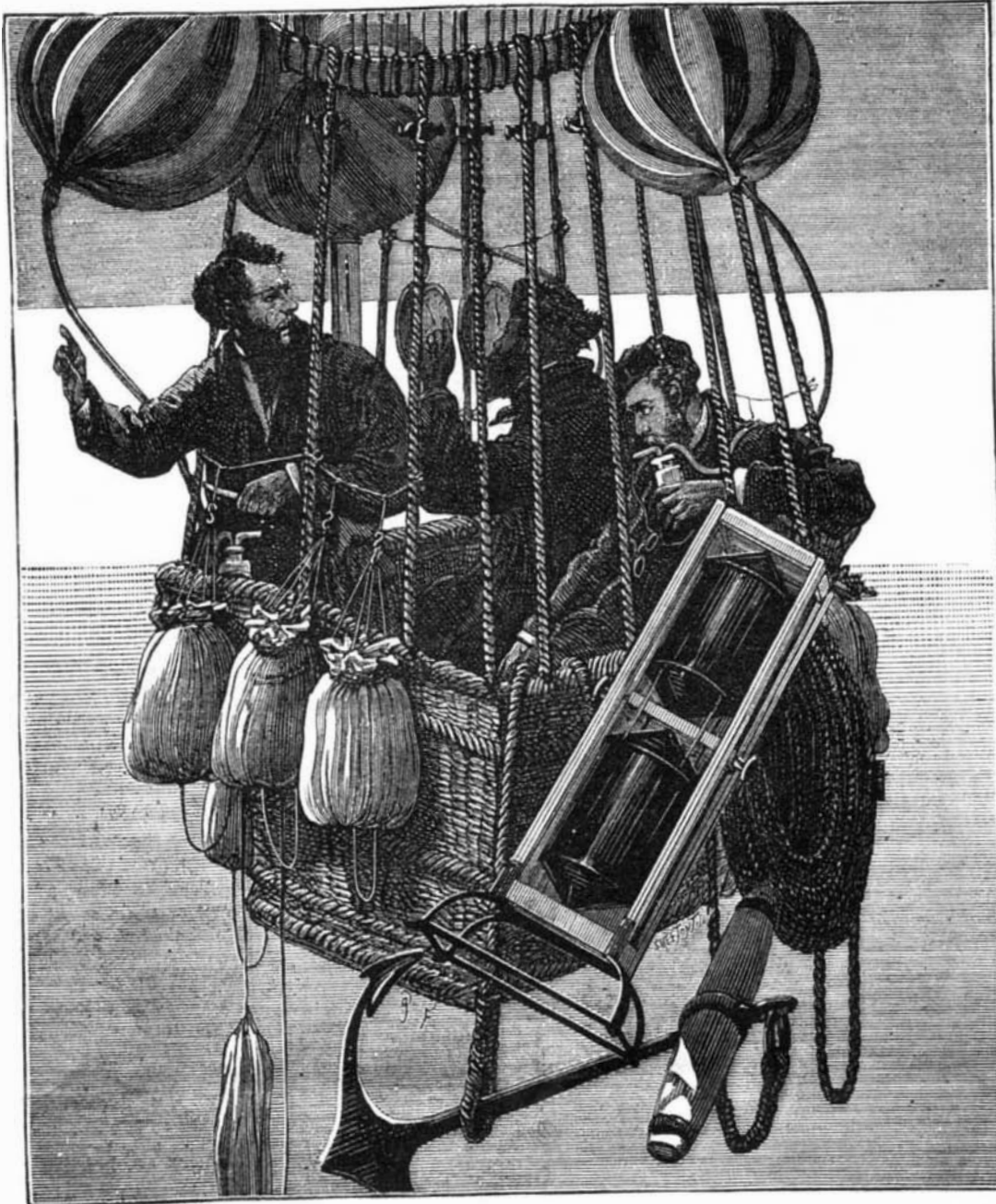


Fig. 1.—THE BALLOON "ZENITH."

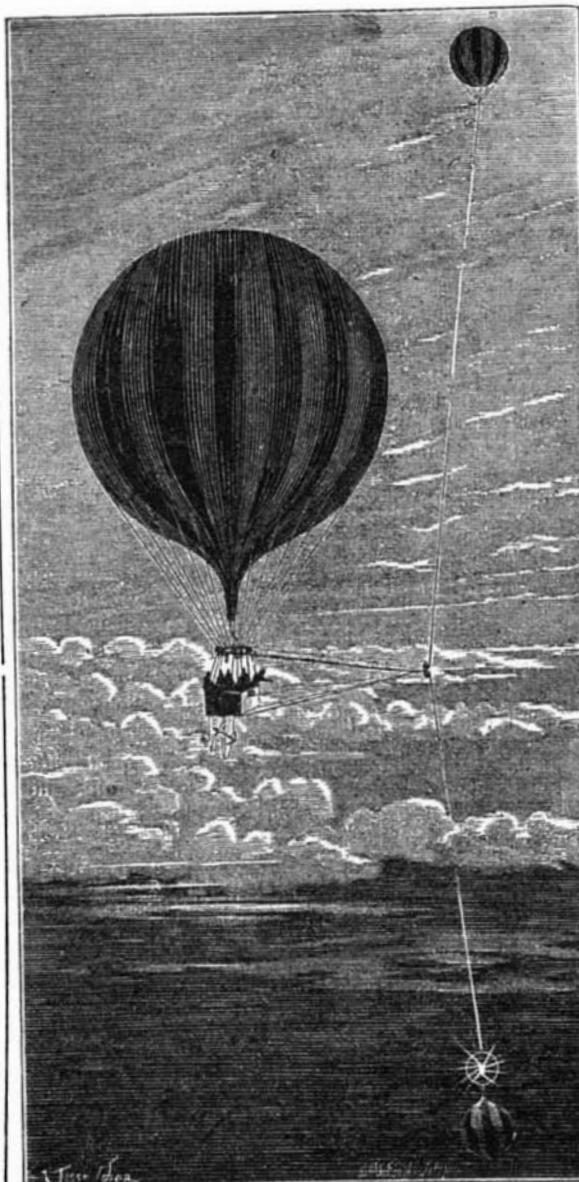


Fig. 2.—SIVEL'S SOUNDING BALLOONS.

had the fire out, and the steam down.

While the prison officials should be held to a strict account for the fact of the escape of the convicts and of their being possessed of arms, the railroad people are entitled to much credit for their part in the affair. And this is equally due to the engineer for his presence of mind, to Superintendent Toucey for his prompt application of an heroic remedy, and to the station master at Tarrytown for his implicit obedience to an order which the majority of men would have hesitated over or have refused to obey without explanation.

**Steam Launches for Yachts.**

A miniature steam launch, only 14 feet long by 4 feet 3 inches beam, has just been built by Messrs. Edwards and Symes, of Cubitt Town, Eng., as a tender to a sailing yacht for use on the fiords of Norway. The boat is to be carried at the ordinary davits, and it has, therefore, been made as light as possible, the total weight, including the machinery, being only 800 lbs. The hull is built entirely of mahogany, and it contains a vertical boiler with engine attached, the arrangement being such that the machinery can be detached from the hull in a few minutes, and hoisted out complete, and the launch then used as an ordinary boat, it being provided with oars and rowlocks. The boiler, which is worked at a pressure of 75 lbs. to 80 lbs. per square inch, is welded up throughout, there being no riveted seams. The boat will carry four persons and a good supply of coal; and during a trial trip made at Greenwich last week, it attained a mean speed of 6½ miles per hour.

**Glycerin as an Illuminating Material.**

M. Schering states that glycerin may be burned in any lamp so long as the flame is kept on a level with the liquid. The latter, on account of its consistence, will not ascend an elevated wick. As the flame, like that of alcohol, is almost colorless, and as the material is especially adapted for absorbing a large proportion of saline substances, M. Schering has recently made experiments in coloring the flame with various bodies, and with satisfactory results. By introducing substances rich in carbon, it appears that the flame may be rendered suitable for illuminating purposes. The low price of glycerin, and its property of not volatilizing at high temperatures, add to its advantages in this direction.

THE new British arctic expedition, which will shortly start for the north pole, is to go up through Smith Sound, on the west coast of Greenland, following the route of the last American expedition—Hall's.