

THE INTERNATIONAL YACHT RACES.

In England the present yachting season has been one of unusual interest, owing to the races which have taken place between the fastest British yachts and the American yacht *Vigilant*. The champion boat on the British side has been the *Britannia*, owned by the Prince of Wales, and in several of the contests the royal vessel has beaten the *Vigilant*. The latter vessel triumphed last year in every race with her British antagonist, the *Valkyrie*, and it was supposed the *Vigilant* could easily outsail the *Britannia*. In almost every race when stiff winds were blowing the *Vigilant* has been the victor; but in light winds the *Britannia* has come in ahead. The races of last year, it will be remembered, were sailed off the port of New York. This year the *Vigilant* went over to England, and it is a curious fact, on one of her races she went victoriously over nearly the same racing ground that the *America* sailed in 1851, when she gained her memorable laurels over the British boats.

Our engraving, which is from the *Yachtsman*, shows the *Britannia* and the *Vigilant* as they appeared at the beginning of the race off Cowes, August 4, 1894, on which occasion the *Vigilant* beat the *Britannia* by 6m. 33s. The prize was a purse of \$500 for a race over the Queen's course.

A TRIAL OF MAXIM'S FLYING MACHINE.

A reporter of the *Pall Mall Budget* recently visited Mr. Hiram Maxim's establishment, near London, and describes what he saw as follows: There was a hissing and a spluttering as some pumps got to work, and then, presently, the port propeller began to revolve with a rapidly increasing whirr-r, and the cry went up to "look out." In a few seconds whirr-r-r-r-r went the starboard propeller also. The platform on which we stood rocked and quivered with the vibration. A hurricane seemed to spring up, laying the hay flat far and wide, and scattering like a whirlwind the shavings in the workshop twenty yards away. Every one grabbed his hat with one hand, and clung for dear life with the other to a rail. Suddenly, when the tornado had reached its height, and the whole machine was shaking and straining at its anchor like a greyhound in the leash, a shrill whistle gave the order to "let go," and the huge structure bounded forward across the meadows with a smooth sailing motion, at a rate increasing up to forty miles an hour.

As the end of the track came in view a look of horror set in. There was nothing apparently but a quick-set hedge to arrest our wild career. A rope was stretched across the path. We crash through it.

Then another; then another, and finally we come to rest in the easiest, gracefulest manner imaginable, within a few feet of what looked like perdition. Then we all laughed. It was a most delicious sensation, wiping out forever such tender memories as switchbacks, toboggans, and the seductive water chute. It was unique, in fact, and unlike anything that the world has

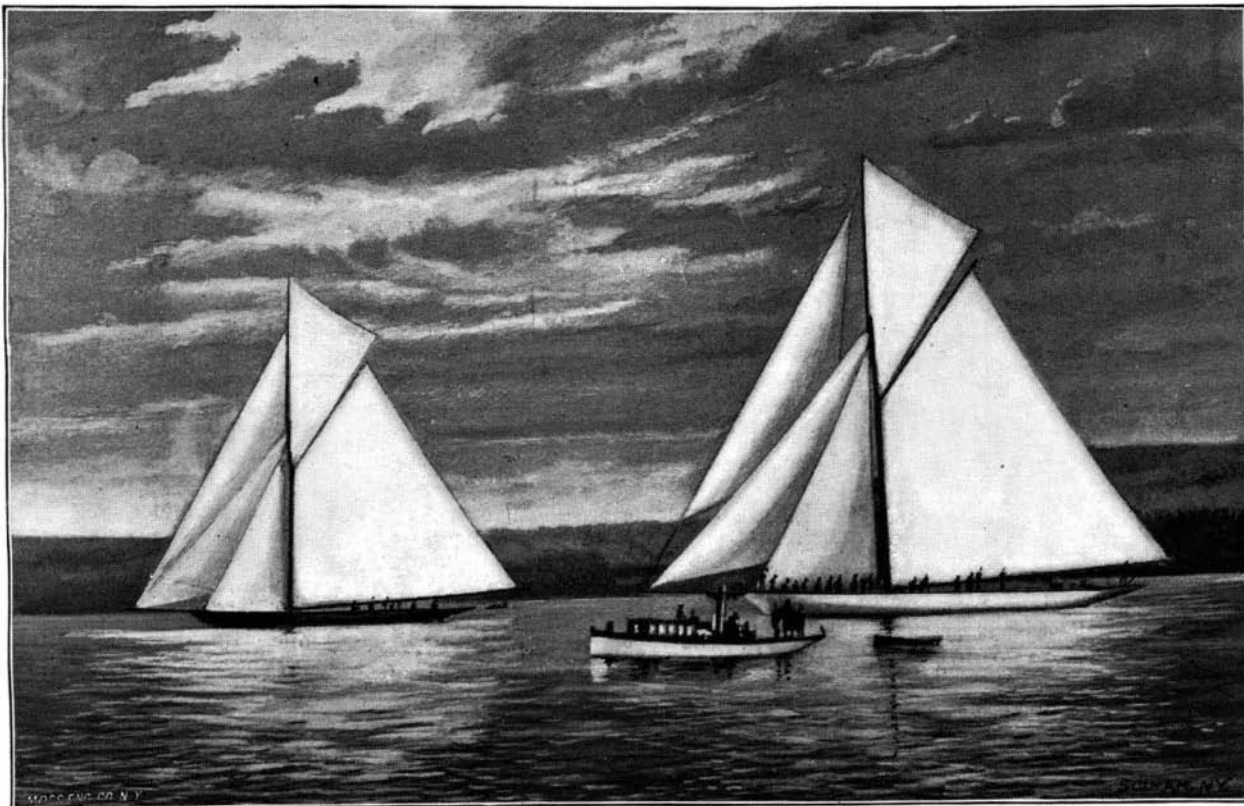
Then the questions began. How was the power generated? What was it all made of? and (most important of all) Would it really fly? To take them in order, the machinery for developing and applying power is one of the most ingenious bits of steam engineering to be seen. It consists of a novel water tube boiler, built of asbestos cloth at the sides, and the thinnest sheet steel on top. The water is contained in about 2,000 bent copper tubes, only three-eighths inch in diameter, heated by over 7,000 gas jets arranged in rows. The fuel is naphtha or gasoline, which is stored in a liquid form and pumped into a vaporizer which transforms it into gas, and supplies it at a high pressure. All manner of cunning dodges are associated with this fuel supply. For instance, there is an exceedingly pretty automatic escapement which controls the fuel pump according to the pressure in the vaporizer; and the inrush of the gas, at a rate of two miles per minute, is utilized to suck in the necessary amount of air as well, both being under the most perfect regulation.

The feed water for the boiler is supplied through rows of pipes no larger than $\frac{1}{8}$ inch in diameter. These are

Britannia.

Vigilant.

THE BRITANNIA AND THE VIGILANT.



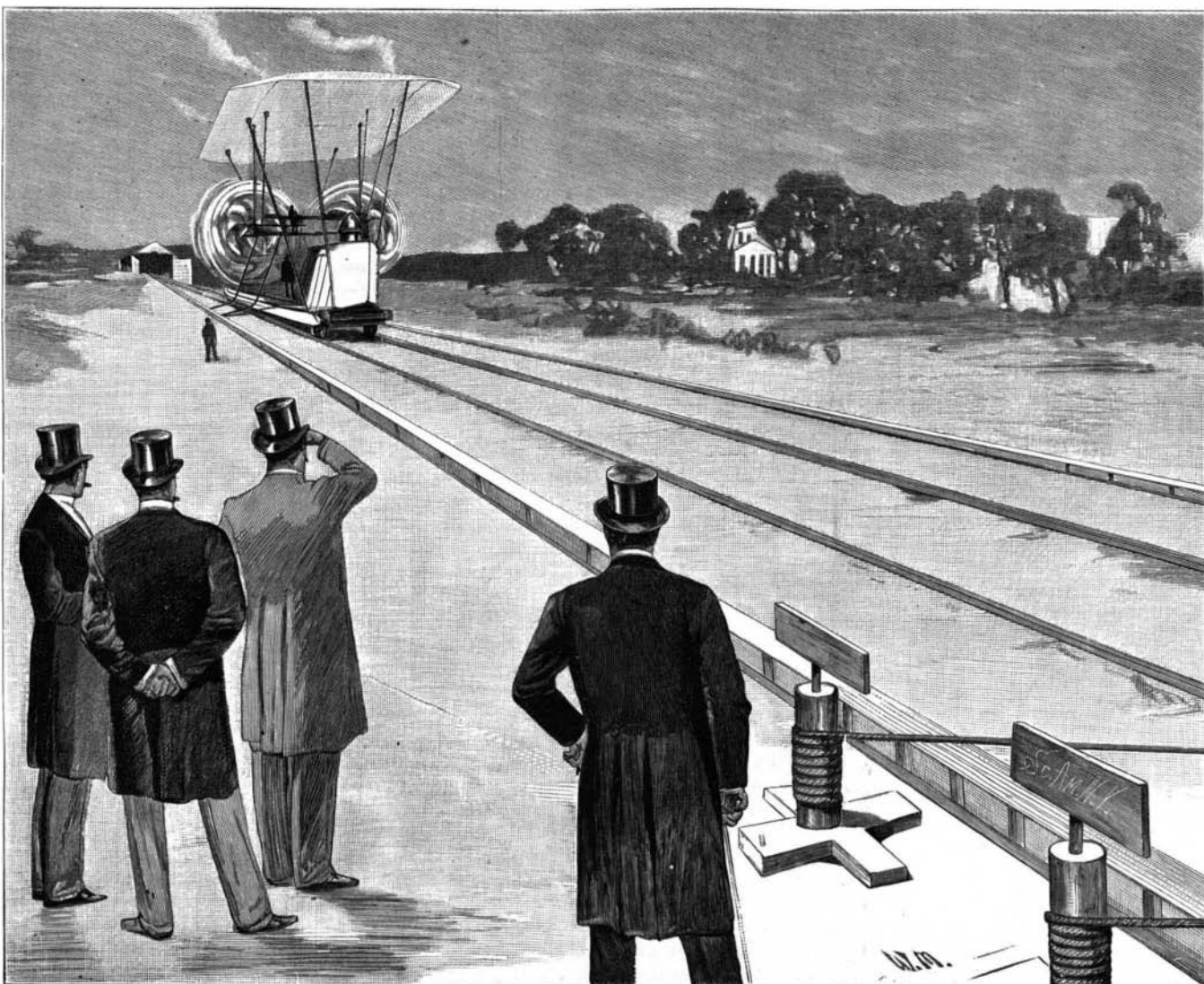
ever seen; for the occurrence just described represents the crude residual impressions of a first trip over the rails on Mr. Hiram Maxim's giant flying machine.

The inventor beamed pleasantly as he noted the effect, for he had a distinguished company on board. There were Lord Kelvin and Lord Rayleigh, Sir Douglas Galton, Professor Vernon Boys, Sir Guilford Molesworth, Earl Russell, Professor Pettigrew, of Edinburgh, and the science representative of the *Pall Mall Budget*. After the first trip there was a unanimous demand for a second, and the huge structure, weighing but some 7,000 pounds in all, was pushed back along the rails on which it runs to the starting point, where steam was got up once more and the performance repeated.

heated by the waste products from the flames with such success that the water is raised to 250 degrees (at which temperature it does not boil, on account of the pressure), and the gas products themselves are so completely robbed of their heat that they do not even blister the Brunswick black on the thin sheet steel covering which represents the top of the boiler. There is a beautiful automatic gauge for registering the amount of feed water passing into the boiler, and another ingenious device by which the pressure of the water itself is made to give the necessary circulation. With this apparatus steam can be got up in the incredibly short space of half a minute. Condensers were used at first, but an unlucky smash about three months ago damaged the apparatus, and now the

steam exhausts into the air in two long wavy jets from the corners of the great aeroplane overhead.

So much for the steam generating appliances, which weigh only 1,000 pounds in all, and are placed in the very front of the machine, the boiler tapering off like the bows of a ship so as not to catch the wind. The engines themselves are an equally remarkable piece of engineering. They are compound two-cylinder engines, poised about eight feet from the floor, and about six feet apart. They are independently governed, and will furnish 150 horse power each, which, considering that their total weight is only 600 pounds, gives the extraordinary efficiency of 2 pounds weight per horse power. This is something which will make engi



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