

WATER VELOCIPEDES.

A recent attempt at applying foot power to the propulsion of a boat was made by the late Crocé-Spinelli, whose experiments were interrupted by the Franco-German war; and the inventor's talents were then devoted to the science of aerostation, in experimenting in which he lost his life. M. Jobert has recently revived the subject, and he exhibited a new river velocipede at the Maritime Exposition held last year in the Palais de l' Industrie, Paris. It was composed of two cigar-shaped floats made of tinned plate, united by a platform of very light wood, which carried the seat of the operator. To the platform the mechanism was also attached; and it consisted of a paddle-wheel, with two cranks on the axles, with straps for the feet. The action is exactly that of a terrestrial velocipede, and therefore requires no further explanation.

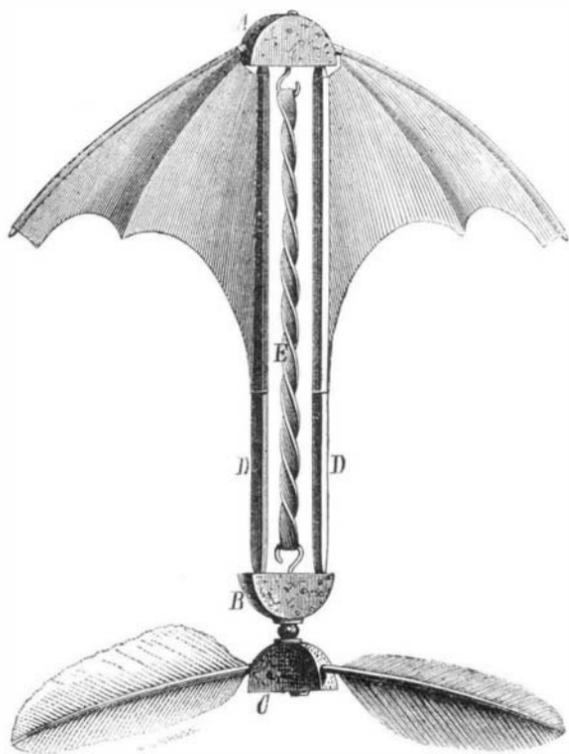
To steer the velocipede, a light rudder is placed in the rear of the apparatus, and it is handled by the cords shown passing round a pulley turned by the handle in the hand of the operator. It will be seen that the operation of the machine is simple and easy, and M. Jobert claims that a very high speed can be obtained.

New French Ironclad.

The new ironclad Trident was lately launched at Toulon, and will be one of the most powerful vessels in the French navy. The Trident, which was commenced in 1870, after the designs of M. Sabatier, the eminent naval engineer, is 320 feet long by 57 feet wide. It is entirely constructed of wood, and its sides, which are about 3 feet thick, carry 9 inch iron plates, each plate weighing about 20 tons. The battery will also be protected with 6 inch iron plates, and the bow is armed with an iron ram 12 feet long, and weighing 30 tons. The total weight of the hull and the iron plates is about 5,500 tons. The armament of the Trident is to consist of nine guns of heavy calibre, and six of medium calibre. The engines, of 4,800 horse power, with a screw 20 feet in diameter, will enable the Trident to steam at a minimum speed of fourteen knots an hour. There are separate engines for the helm, the capstan, and the pumps of the Trident; and she will carry 700 tons of coal and a crew of 689 men.

A TOY FLYING MACHINE.

A very ingenious toy, of French invention, which is a really successful flying machine, is now sold in the toy shops of this city. It is termed the "mechanical bat;" and it imitates the erratic flight of that creature in a very curious and

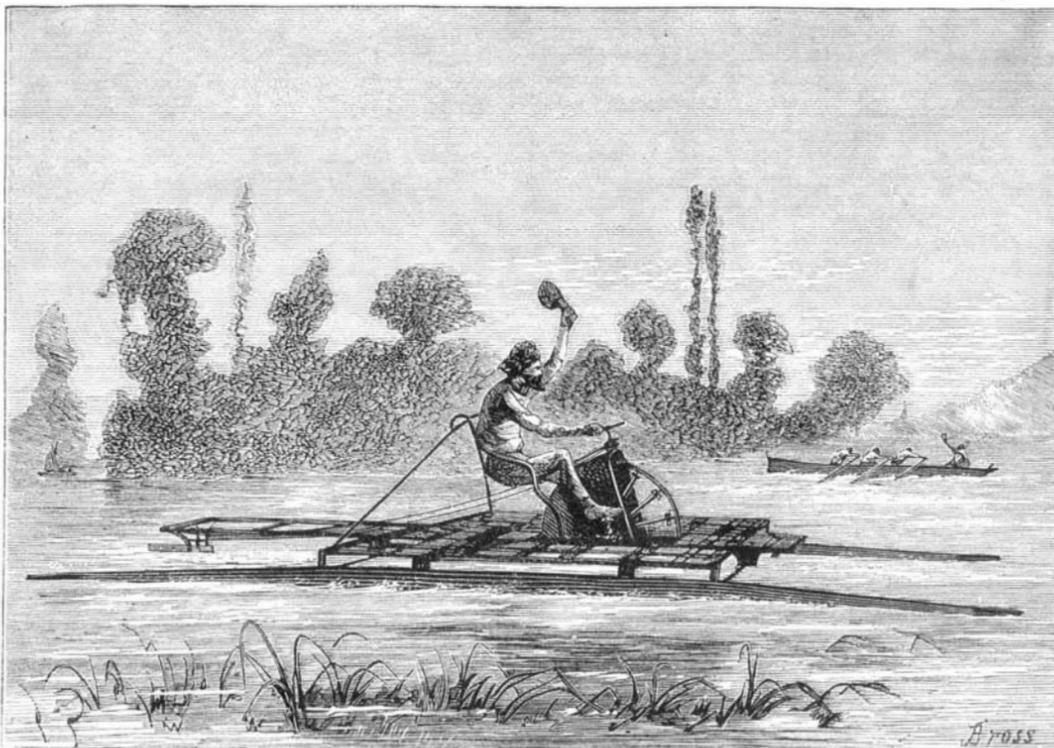


amusing manner. The construction is shown in the annexed engraving. A, B, and C are semicircular pieces of cork. Between A and B are secured two thin wooden rods, D, made of orange or some other light strong wood. From A, extend arms, between which and the adjacent rods, D, are pasted tissue paper wings. In A is rigidly secured a hook. The similar hook in B turns freely therein, but is fastened in another piece of cork, C. Between the rods and from hook to hook is stretched a rubber band, E; and in the cork, C, are inserted two feathers, like the fans of a propeller.

The apparatus is wound up by turning the cork, C, until

a strong twist is thrown in the rubber, E. Then the machine is released, when it will fly for a considerable distance either vertically upward or horizontally, return, and circle about, until the revolution of its propeller ceases, when it sinks to the ground.

The principle of the device embodies both the plans which, it is now generally admitted, must underlie the construction of any successful flying machine—namely, the kite and the screw. The screw drives the machine ahead, and at the same time causes the resistance of the air to furnish the com-

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ponent of force vertically applied, which, acting on the wings, sustains the apparatus against the action of gravity.

The device is one of the most amusing philosophical toys that have come under our notice. It may besides serve a very useful purpose in illustrating some important, though not very clearly understood, mechanical truths. The toy is $8\frac{1}{2}$ inches in length, and 8 inches in breadth from tip to tip of the wings.

An Arizona Bonanza.

The Silver King Mine, located on the western slope of the Pinal ranges, about 30 miles from Florence, is a private mine, and is, therefore, little known to the public, though it is probably one of the richest mines ever discovered on this coast. The proprietors have been steadily working it for the past twelve months, and have shipped, in every month of the present year, one or more parcels of selected ore of the value of \$1,000 to \$2,000 per ton, to the works in Mission street, near Fremont, where it has been ground and subsequently sold by private tender, the owners of the Selby Smelting Works having been considerable purchasers. There is now on the way from the mine to San Francisco 40 tons of ore, which assays from \$1,250 to \$2,500 per ton, and 1 ton of nuggets, which it is estimated will return \$14,000; 27 tons of this ore is on the steamer *en route* from Fort Yuma to San Francisco. There is on the dumps at the mine about 3,000 tons of third class ore, estimated to be worth \$350 per ton. The ore hitherto extracted has been chiefly taken from between the 43 feet level and surface, and in both stopes and drifts the showing of ore is magnificent. Work is now being pushed on in the 100 feet level, where the showing is equal to the best parts of the upper levels. There are about 40 men employed on the mine. The fortunate owners of this splendid property are Messrs. Reay and Mason. The superintendent is Mr. Mason, brother of the owner of that name. The ledge is located for several miles north and south of the Silver King. Within the past month the Silver King South Mining Company, which has about 4,000 feet on the southern extension, have started up work under the superintendence of Mr. M. L. Power; their shaft is now down about 45 feet, and they are in hourly anticipation of cutting the ledge. A new discovery has just been reported from about four miles south of the Silver King, where \$1,000 ore is being extracted from what is believed to be the continuation of the Silver King ledge.

The Duration of Life.

Dr. William Farr, F. R. S., in his letter to the Registrar-General on the mortality in England and Wales during the ten years 1861-70, states that the annual mortality in the city of London was at the rate of 80 per 1,000 in the latter half of the seventeenth century, and 50 in the eighteenth century, against 24 in the present day. This implies that the mean duration of life in London was little more than twelve years in the seventeenth century, was about twenty years in the eighteenth century, whereas it is now about forty years. The mean duration of life depends upon the death rate at various ages, which show the widest range in different parts of the country, dependent upon their sanitary condition.

STORM GLASSES AND THEIR INDICATIONS.

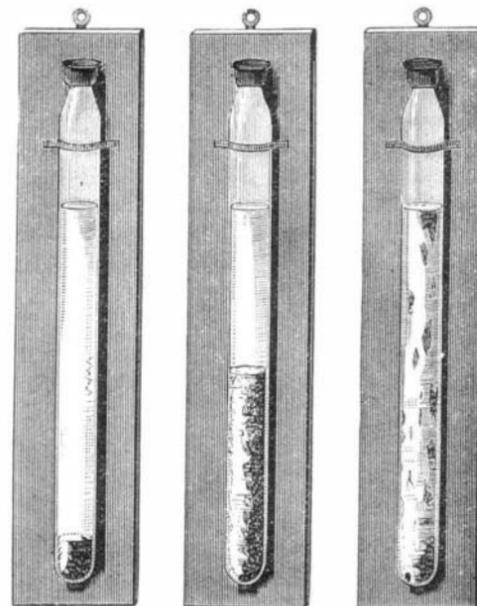
Our readers have doubtless noticed in the stores of opticians a weather indicator, now widely offered for sale at a low price. It consists of a glass test tube, hermetically sealed and fastened to a piece of wood, so that it may be hung up against the wall. A thermometer is often likewise attached to the wood. The tube contains a transparent liquid in which are needle-like, pearly crystals, which vary greatly in appearance, forming sometimes at the bottom, sometimes at the middle, and sometimes at the surface of the fluid, as shown in the annexed engraving. It is said that the alterations of form of the crystals presage atmospheric changes, and announce variations of temperature, tempests, storms, etc.

This instrument was invented nearly a century ago; but whether the inventor was an Italian named Malacredi, who lived in England, or a French lawyer named Le Gaux, is exceedingly doubtful. One or the other of the two is entitled to the credit of the discovery; but neither succeeded in rendering the invention of any practical utility. In 1864 it was revived by Messrs. Negretti and Zambra, and its value was soon after vouched for by Admiral Fitz Roy, R. N. The crystals consist of camphor 2 parts, nitrate of potash (saltpeter) 1 part, and sal ammoniac 1 part, dissolved in pure alcohol and partially precipitated with distilled water.

The instrument must be fixed in the open air, out of the sun, but exposed to diffused light. The mixture then shows changes according to the direction, but

not according to the force, of the wind, which changes Admiral Fitz Roy considered to depend on the electric tension of the atmosphere. If the wind comes from the northward, by examining the mixture with a lens the crystals will be seen to agglomerate and group themselves into leaf-like forms. On the other hand, if the wind is southerly, the crystals vanish; and if the wind is constant for some time, the mixture looks like sugar in solution.

An east wind produces stars more or less numerous; the liquid is somewhat turbid. With a west wind, the liquid is clear, and the crystals well defined. When the solid portions appear at the bottom or top of the liquid, positive electricity in the atmosphere is indicated. A confused mixture shows the coexistence of a north current with a south current in the same locality. Dirty, flocculent masses in a confused mixture, or stars in motion, indicate a strong south wind or gale. When in the tube a soft material, like honey or sugar, seems to be present, a weak south current of air, with negative



electricity, is predicted. These facts were determined by Admiral Fitz Roy by repeated experiment with a delicate galvanometer in measuring the electric tension of the air.

We have had one of the tubes exposed to the air, but concealed from the storms, for several years. It is curious to observe the changes of the crystals; but we have never had much faith in its prognostications of changes in the weather.

Relics of the Spanish Armada.

Two treasure galleons of the celebrated Spanish Armada were, it seems, wrecked on Chesil Beach, Dorsetshire, England, where, after every heavy storm, the Portlanders keep a sharp lookout on the blue clay in West Bay. The recent heavy gales having scoured away the shingle, among other waifs, the *London Times* says, a bar of pure silver, 3 lbs. 2 ozs. in weight, was lately found, which, having been tested, has been valued at \$60.