

TRIAL AT SEA OF A NAVIGATING TRICYCLE.

Mr. Pinkert is the inventor of an aquatic machine of the tricycle nature as figured below. The machine consists of three hollow wheels, air tight, with paddles fixed upon their exteriors. The wheels might be called magnified rubber tires. The wheels are worked by crank pedals after the manner of the bicycle. On this curious contrivance the inventor attempted last month to cross the English Channel, from Cape Grisnez, France, to Folkestone, England. The distance across is only about twenty-five miles; but it is difficult for navigation by small craft. A calm day was chosen, when Mr. Pinkert rolled his queer vehicle down the shore to the water's edge, and then with the assistance of a man to push he worked out through the breakers and headed for old England. It was pretty slow work, but the inventor bravely continued his exertions. After many hours of labor and when half way across the tide turned and Mr. Pinkert became satisfied he would be carried away from land; so he hailed a passing vessel and was taken on board. He will probably make further experiments.

The Manufacturing Industries of India.

In the last twenty years, the number of iron foundries and machine shops has greatly increased in India, and the country is less dependent on Europe for general ironwork; importations of wrought iron and steel are yearly increasing. The following is a list of such structures of iron and steel as are built in India: Coasting and river steamers, launches, barges, steam boilers, bridges, tanks, piers, and jetties, sluice gates, buildings, engines, steam pumps, turbines, sugar-crushing machinery, oil mills, cotton, hay, and other presses, and grinding mills. The United States consul at Bombay says that the railway companies build their own rolling stock, but they import the wheels, axles, tires, and other ironwork; rails also are imported, as are also steel sleepers, which are much in vogue in place of timber. Bolt, chain, and rivet making are not yet known as separate industries. Wire working is a steadily increasing industry, being readily taken up by the natives.

Locks, of fairly good quality, are made in Bombay and Calcutta, but none of the manufacturers appear to possess a key-cutting machine or a good set of machine tools. On account of national and religious customs, brass and copper vessels, for cooking, eating, and drinking, are to be found in every house, and the workers in these metals are more numerous than those in iron. The hollow ware is made of imported sheets hammered into shape; vessels used for cooking are tinned inside; brass hinges are made and much used on account of the destructive effects of the monsoon rains on iron hinges; the whole of the work is done by hand, without the assistance of any stamp or press. Machine tools are made, but in small quantity, most of the tools being imported. Textile machinery is entirely made in England. Agricultural implements are in small demand, on account of the poverty and ignorance of the cultivators.

Cultivation as practiced in Egypt, the grain districts of Southern Europe, and the United States has not yet been begun in India. India possesses only one glass factory conducted on European methods, and this is in Calcutta. There are a few smaller glass factories, but when they do not use broken imported glass, they turn out goods of an inferior quality. Most of the broken glass that reaches the ports of India is sent to China, where it is worked up by the Chinese glassworkers. Good glass-making materials are to be found in India, and a factory for the manufacture of soda water bottles alone would, according to Consul Sommer, find occupation for a large number of operatives. Window glass is now largely used throughout India, where only shutters were used before. It is obtained principally from Belgium. There are five woolen mills in India, two of which are in Bombay.

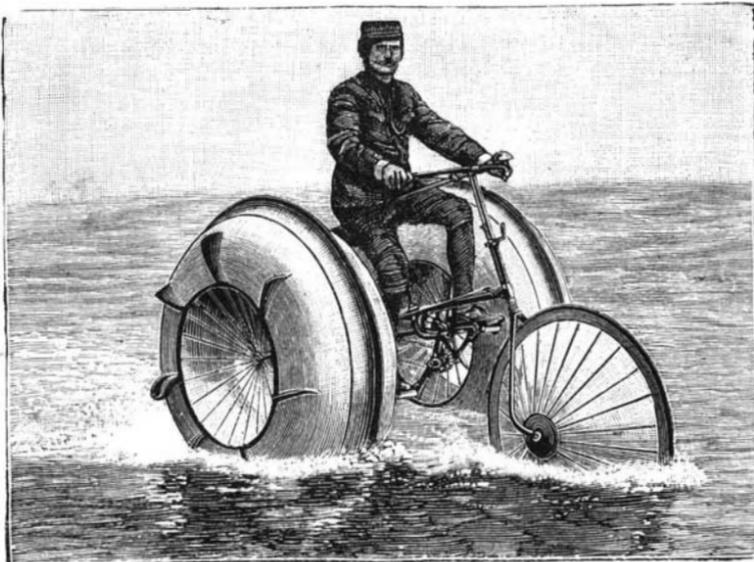
The materials made are blankets, heavy coatings, serges, and

uniform cloths. Both Indian and Australian wools are used, and the future of this industry promises to be a prosperous one. There are nine paper mills in India, four of which are in Bombay. The fibrous materials used for making paper are chiefly rags and munj grass, rice straw, jute, and hemp cuttings, and old jute bags and cloth. The quality of the paper made has improved in recent years, and there is a large and increasing sale of this product. The production of paper in India has increased 118 per cent since 1885, amounting to 11,086 tons in 1891. It is ex-

tion, it revolves long enough for the operation. The tube, which is tapering in form and about four feet long by four inches and a half wide, is split by a piece of string into halves, which, when dried and burned, become the country tiles of India. One layer with edges up and one layer with edges down is what is termed a single tiling. No fastenings are used, there being only one support at the eaves of the roof to prevent them from slipping off. In large towns the European pattern of tile is coming into vogue. The greatest number of European tile factories in India are in Malabar and South Canara, where water carriage along the coast affords a cheap means of transportation. The factories are closed during the rainy season.

The silk industry has not shared the prosperity of the cotton and woolen industry, for while the exports in 1869-70 amounted to 2,594,701 pounds, the exports in 1891-92 were only 1,782,438 pounds. There is a silk mill at Bombay which works only for the Burmese market; and does not venture to compete with the European and Asia Minor goods. Thana, near Bombay, used to have a thriving trade in woven figured silks, which were famous for their qualities of dye and purity, but it has now lost most of its trade, owing to European competition and a growing demand for cheap goods. There are 113 silk factories in India. The first ice factory in India was built at Agra. There have been since thirty-four factories built throughout India. There are large numbers of soda water factories; in 1891, there were 76.

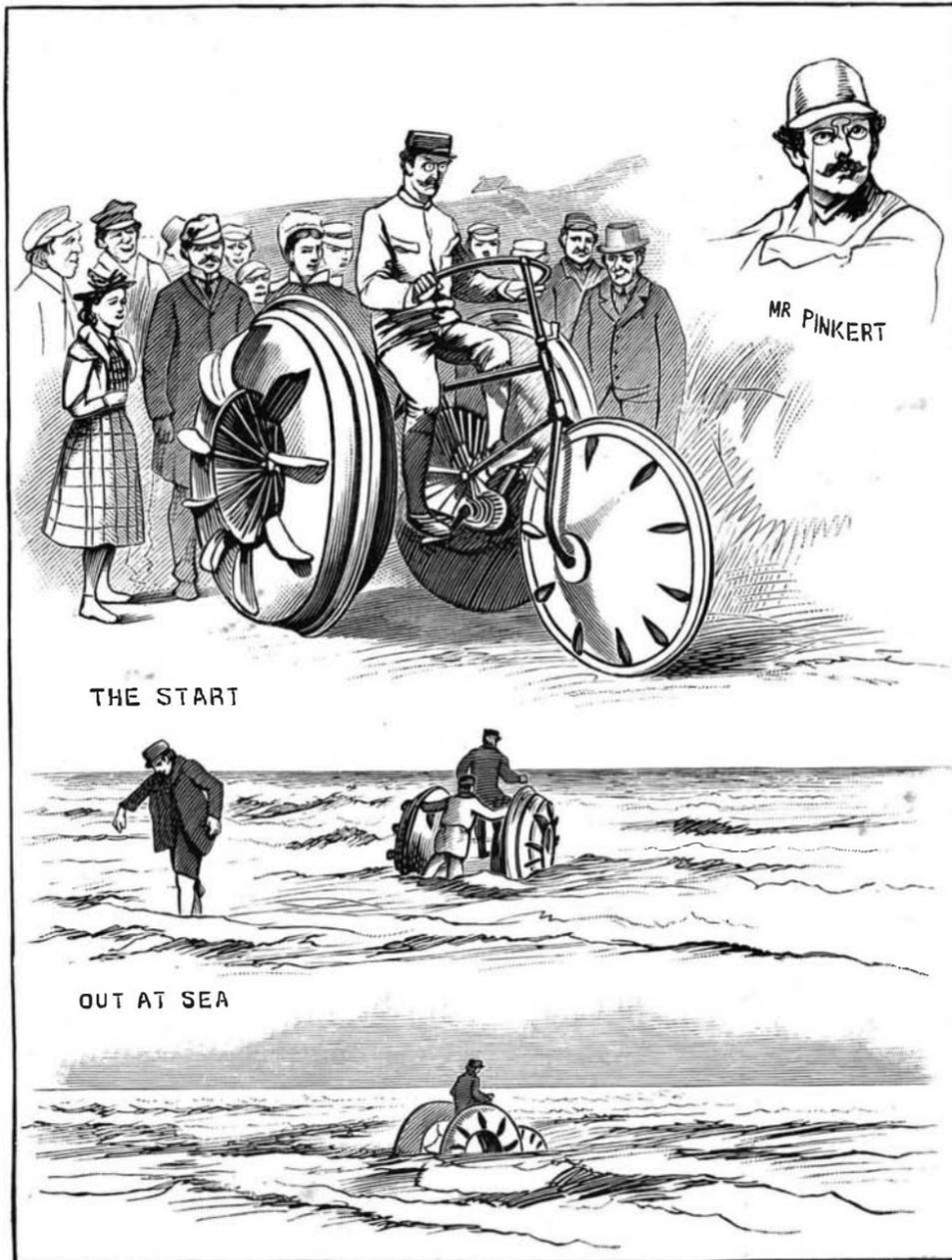
Many of the smaller factories use water from stagnant wells and pools, and some filters are never cleansed, thus giving a bad taste to the soda. Many natives use the carbonic acid to make spurious champagne and other sparkling wines. Oil has been expressed for many centuries by the ghanee, a mortar having a revolving pestle driven by hand or bullock power. The residual cake contains a large quantity of oil, and is used as food for cattle. This mill is still in general use, excepting where Europeans have, a hand in the production, European machinery, of course, giving better results. Until six or seven years ago, vegetable oils were almost exclusively used for every kind of lubrication in India. At first mineral oils made a bad impression, but this was soon removed. Ghee, a clarified butter used by the natives, is adulterated with vegetable oils and animal fats.



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pected that India will in a very few years supply its own paper, the only drawback being the cost of transportation of raw materials from great distances. There were twenty-six mills working jute and one working hemp in India at the end of the year 1891-92. The mills contain 8,695 looms and 174,156 spindles. Their nominal capital is estimated at £1,760,000. In brick and tile making there are few factories having the appliances for making bricks by machinery. The tiles most in use are of native design and manufacture.

A tube of clay is spun by hand on a very simple wheel made of wood and balanced and loaded with clay. It turns on a peg, and having been set in mo-



THE START

OUT AT SEA

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Matter and Motion.

Apart from matter, energy has in reality no existence. We cannot conceive of motion unless something moves, of warmth unless something is heated, or of any of the various states or conditions which are indications of energy unless immediately associated with matter. Hence the co-existence of energy with matter is, to our minds, an inevitable conclusion. But now, let us inquire, can matter for an instance be considered apart from energy? Can any one imagine a body neither hot nor cold, neither in motion nor at rest, and not under the influence of some attraction, some force, or some other form of energy? No! Should such be the case for a space of time inconceivably short, that time would suffice for the rending apart of the universe. Planets would fly asunder; life would be instantly destroyed. The very ether would become, in common with all else, at once disorganized, and the universe, filled once more with impalpable world matter, would recommence, as it did millions of centuries ago, the building up of new systems, new worlds, and new men.

Energy manifests itself to us in various ways. To the physicist, light, heat, chemical action, and all other phenomena included in the category of the physical world are exhibitions of transformation of energy from one form to another. The sum total of energy in this world has never increased nor diminished. Like the matter in the universe, it is and will always be an unchangeable quantity.—Electrical Age.

The English language contains 41 distinct sounds.