inent sense. He is here depicted surrounded by all the signs of the Tonalamatl—from *Tonal*, presiding genius of the day, and *matl*, book, the astrological calendar of this strange people, in which 13 x 20 = 260 days make the astrological year—by the signs which were held to be above all else alone decisive for the things occurring on consecutive days, for their good or bad luck and the tendencies inherent in them—signs which in themselves represent the tonalli, the fitness of the things taking place under their dates and forming the chief instruments in the hands of the seer, the soothsayer, the adviser of the people and the magician.

In this codex, together with the few others known, we have what is left of the records of a religious system or cult developed entirely distinct, and far differently from any of those known to history, pertaining to the most advanced people of the western world, those speaking the Nahuatl tongue, which, sad to relate, through the mistaken zeal of the white conquerors, has come down to us with such paucity of data as to make it doubtful whether ethnological students will ever be able to unravel its mysteries.

The codex contains about 130 figures of gods and goddesses surrounded with symbolic characters and performing various rites. The pictures alone are striking and interesting. How much more so would they be if we could solve their riddle.

### THE TRUFFAULT RACER.

This machine, which, at first glance, seems extremely complicated, shows itself, when the operating mechanism is examined, to be constructed with the greatest simplicity. It can be summed up as follows: A motor, two pulleys, a belt, a lever, a steering arrangement and four wheels—without chains or gears—a single speed, and notwithstanding this, a variation in speed by means of the spark of from 6 to 60 miles an hour.

The frame, 3 feet wide by 6 in length, is constructed of 1¾ inch tubing 0.098 inch in thickness. The two pairs of wheels, which are quite small, are mounted so as not to track. The rear pair are mounted outside the frame in the usual manner and have a tread of 4 feet 3 inches, while the forward pair are set up in regular bicycle forks with a tread of 2 feet 5½ inches.

The seat of the operator is situated behind the rear axle on an extension of the frame and on a level with the same, which is 19½ inches from the ground. The driver therefore sits behind the rear wheels at a distance of 10½ feet from the extreme forward end of the machine, while the steering lever is 7 feet from the axles of the front wheels.

The motor is situated at a point exactly half way between the centers of the front and rear axles. The carbureter and the metal box inclosing the electrical apparatus are on the right side of the frame, between the motor and the seat. The gasoline tank is long and of a special shape, so as to offer the least air resistance possible. It is placed at the rear end of the machine to the left, below the frame. Just under the tank, and protected by it, is the belt.

The Buchet air cooled motor employed has two cylinders of 3.937-inch bore and 5.118-inch stroke. A 6¼-inch belt-pulley mounted on its shaft drives a 13¾-inch belt-pulley on the rear axle.

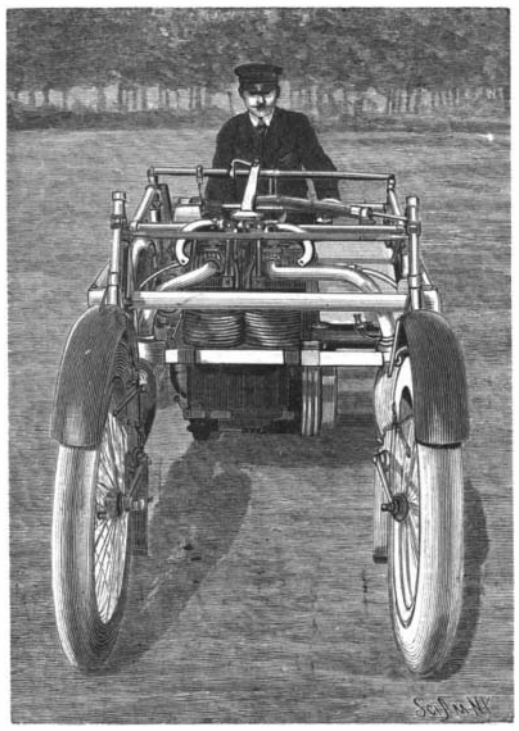
The frame is noteworthy in that it is suspended at the rear end from four jointed arms or brackets, bent at a sharp angle. Each of them terminates at one end in a cap and at the other in a steel pin which enters the tubing and compresses a strong coiled spring.

Steering is accomplished by a lever suitably connected with the front forks by a rod.

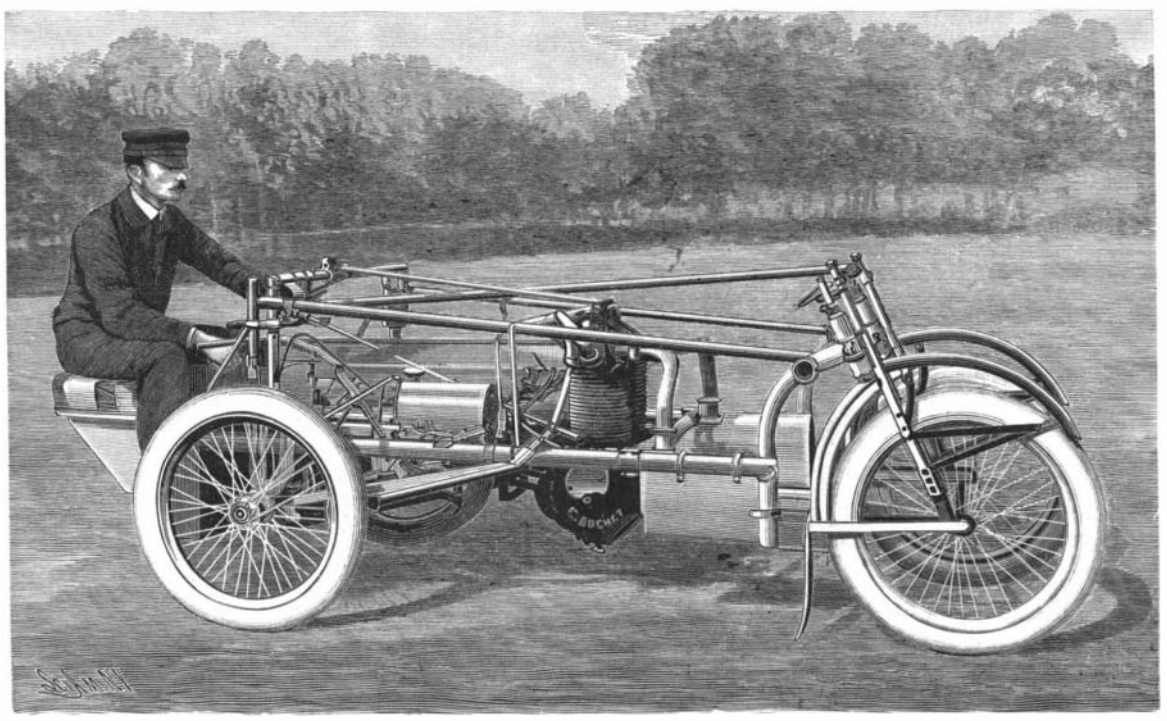
The machine is thrown in or out of gear and the speeds changed by a single lever acting on an idler pulley placed below the belt and tightening or loosening the latter by its pressure. In this way, viz., by the movement of the pulley, change of sparking, and admission of gas, all intermediate speeds between 6 and 60 miles an hour are obtained. The motor makes 166 revolutions per minute when the vehicle is traveling 6 miles an hour; 1,000 revolutions at 37¼ miles an hour, and 1,375 at 51½ miles an hour. The machine was officially tested at Deauville in the 600-mile race, where it attained the last-mentioned speed and won the first place.

It should be noted that the Truffault automobile has no differential. The inventor has dispensed with this by mounting the wheels on the back axles in a special manner, so that they can slip on it when the vehicle is rounding corners.

The machine we illustrate is an experimental model in which the inventor has tried to ease as much as possible the terrible shocks and jars so familiar to all those who have taken long trips in these rapid and light vehicles. It is to be hoped that this experimental type will, with some modifications, soon become an industrial one.—Translated for the Scientific American from La Locomotion.



FRONT END OF TRUFFAULT RACER.



THE TRUFFAULT RACER.

### Japan's Iron Industry.

For some years past the importance of rendering the Japanese government independent of foreign countries for a supply of iron and steel has attracted much attention in that country. In 1890 an attempt by the Naval Department to get a bill through the Diet for the establishment of iron and steel works for naval purposes was a failure. Soon afterward a commission was appointed to consider the matter, and especially to report "on the amount of iron ore obtainable in Japan, the trial manufacture of pig iron and steel, and the organization of the works." The commission sat for about five years, and after a trial manufacture of iron had been made the government resolved to establish works, and early in 1896 submitted a bill to the Diet. They asked for an appropriation of over 4,000,000 yen (over £400,000) extending over four years, to construct works able to produce 60,000 tons of steel, which was about half the amount required at that time. This bill was unanimously passed into law, and Wakamatsu, in the northwest corner of the island of Kiu-shiu, near the open ports of Moji and Shimonoseki, was selected as the site of the works. Experts were dispatched to Europe and the United States to study the great iron and steel works there, and, as a result of their reports, further appropriations, making in all 20,000,000 yen, were applied for and granted, and the Wakamatsu works were formally opened last October.

Mr. Ernest Griffiths, of the British consular service in Japan, has prepared an interesting report on them, which is appended to the annual report from Shimonoseki. Two foreign experts, both Germans, are employed. The works cover about 320 acres, and lie on the eastern side of a large lagoon, ten miles in circumference, which is connected with a pool or basin, a mile in diameter, and this again with the sea by a short and narrow channel. The lagoon is being deepened to 20 feet at ebb tide, and a quay over 2,000 feet long is being built along the front of the works, so that a ship of 3,000 tons displacement will be able to approach the quay wall. The work done up to the end of last year consisted of a channel 6,000 feet long, 240 feet wide, and 14 feet deep, extending from the sea to the pier of the Kiu-shiu Railway Company. The quay and all parts of the works are connected with the main line of this railway, and there are about 20 miles of line about the works. The raw material, consisting of magnetite, hematite and a smaller quantity of zimonite, is all obtained in Japan, except some supplied from Hupeh, in China. Two iron mines and three coal mines have been acquired for the use of the works, all within 20 miles of the latter and connected with them by rail.

It is estimated that when in full working order the establishment will require 250,000 tons of ore per annum, 380,000 tons of coke, and 800,000 tons of coal. It is said that when all the arrangements are complete, ore will be laid down in the works at a total cost of about five yen, or 10s. per ton. A recent official announcement states that the works are designed to supply the steel materials required by the government departments at a price to be arranged yearly in advance. Certain kinds of steel will be supplied to the public, but only in large quantities to Japanese engaged in industry, and at prices lower than the imported articles. In February last the production of pig iron began, and in May Siemens steel was produced at the rate of about 40 tons a day. Toward the end of June two of the five rolling mills were complete, and the production of medium and small rails and plates was started. The head of the works has stated that 90,000 to 100,000 tons of steel can be produced, and that the profits will cover, in a reasonable time, the capital invested in this important and novel industry in Japan. On the other hand, the British consul at Shimonoseki states that it is frequently said in the press that the works do not possess the confidence of the public and are not a success, and that representations have been made for their transfer to private hands at a nominal price.—London Times.

### Big Oil Fleet.

A huge oil fleet will soon be engaged in transporting oil between New York, Philadelphia, Baltimore and Texas, consisting of twenty-five oil steamers having a carrying capacity of nearly 6,000 barrels. Besides this fleet there are also a large number of barges having almost the same carrying capacity. Apparently little Texas oil has found its way to New York, for the reason that it has been difficult to obtain vessels capable of carrying enormous quantities of oil. It is thought that the oil will find a ready market in the eastern ports of the United States. The cost of transportation to New York is estimated at 40 cents per barrel. How easily the oil can be handled is clearly shown by a striking example. The steamship "Roma" recently took on board a cargo in half a day; at her destination she discharged it in thirteen hours. The oil was taken aboard without the aid of stevedores, and was pumped for a distance of a mile from the vessel at her destination.

### An Alaskan Oil Well.

An immense oil "gusher" has been struck at Cotella on the South Alaskan coast. The spouting oil rose nearly 200 feet before it could be capped. It is said that the oil is of good quality and is worth $4 a barrel at the well. About 10 miles of coast line in the Cotella region have been located for oil borings. Some time ago an oil bed was discovered near the same place.