POSTPONEMENT OF THE MOTOCYCLE RACE.

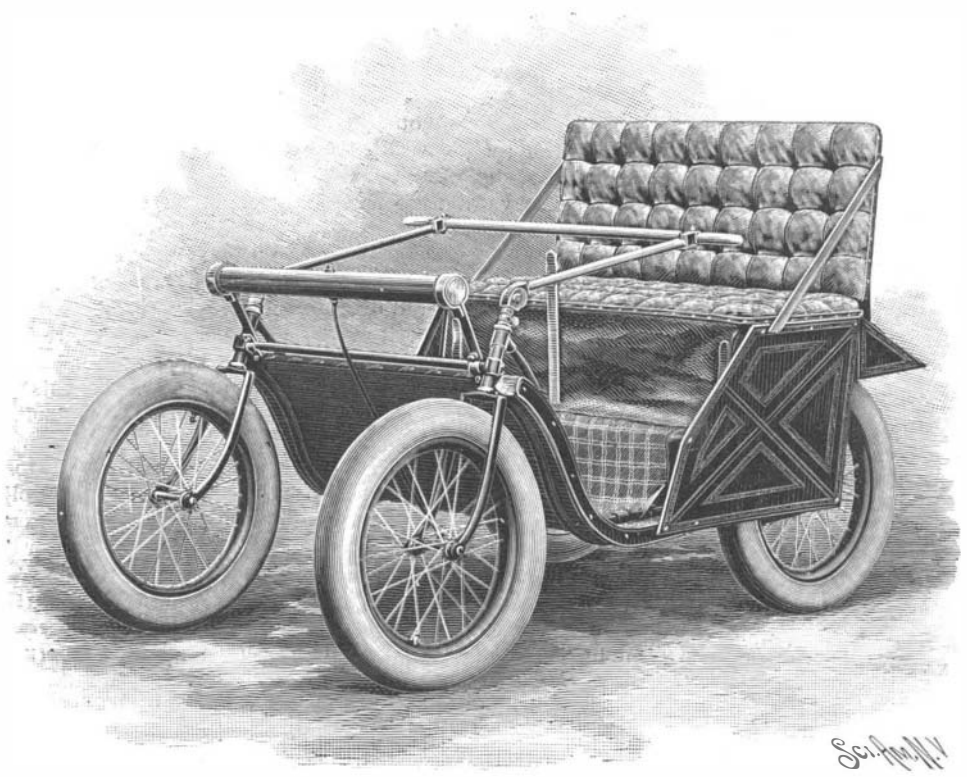
The motocycle contest, which was to have occurred November 2, was postponed on November 1 at a meeting of the judges until Thanksgiving Day, on account of the plea of American manufacturers and inventors that they had not sufficient time to get their new vehicles ready. There was however a race on Nov. 2 over the 92 mile course for a purse of $500. The carriages which ran belonged to the Duryea Motor Wagon Company, Springfield, Mass.; Kane & Pennington Company, Chicago, and the H. Mueller Manufacturing Company, Decatur, Ill.

The Mueller vehicle made the distance in 9 hours 30 minutes; the Kane-Pennington carriages dropped out of the race, and the Duryea machine broke down.

The Duryea carriage is made by the Duryea Motor Wagon Company, of Springfield, Mass. The Duryea wagon weighs about 700 pounds and is built for either two or four persons.

The one shown in the engraving is arranged for two people. It is driven by two three-horse power motors, which use ordinary stove gasoline, so that the expense of running is less than one-half cent a mile.

The wagons have a carrying capacity of eight gallons, so that they will run from 100 to 200 miles. The wagon needs recharging with water each day, and both the gasoline and water can be supplied to the wagon in five minutes. The object of the tank of water is, of course, to prevent the motor from overheating. It runs backward or forward with equal facility, and has four speeds, 5, 10, and 20 miles per hour forward and 3 miles backward. It can be geared to different speeds to suit the roads of any locality and may be run at any speed desired below its limit over roads over which ordinary traffic travels. The wheels of the carriage are 34 and 38 inches in diameter and are equipped with 2½ inch pneumatic tires, and it is easily governed, being steered and speeded by the same lever, being steered by a sidewise motion of the lever and speeded by a vertical motion. It is provided with a powerful brake, and as its motors are wholly independent, one will propel the carriage even if accident affects the other. As an electric spark explodes the charge, the danger of explosion is reduced to a minimum.



THE KANE-PENNINGTON VICTORIA.

Messrs. Thomas Kane & Company, of Chicago, entered four vehicles for the race. These are a four-wheeled victoria with a seating capacity for four persons, a four-wheeled victoria with seating capacity for two persons, a tandem motocycle and a single motocycle. The one shown in our engraving is the victoria for two persons. As will be seen by the engraving, the carriages differ radically from the ordinary type of carriage.

The makers have, in fact, gone back to the early days of Rome, when the low chariots were used by the nobility, as well as in warfare and in the races and public games. The victoria is such a type of vehicle and is constructed low so that one can get easily in and out and there is no liability of overturning. The wheels are so low that the best results are obtained from the motive power for speed and economy in running; 26 inch wheels are used, with heavy steel spokes and 4 inch pneumatic tires. These tires are manufactured by the well known bicycle tire manufacturers, Morgan & Wright, and are non-puncturable. They are also attached mechanically to the rim, so that it is impossible to pull them off, as is the case with a glued tire.

The frame of the victoria is very novel in its construction and combines the greatest strength from the least weight. It is constructed of steel tubing with graceful bends, giving it great strength and beauty of outline. The natural spring from the frame and pneumatic tires gives the engine the same effect as a pivoted compass, rendering no vibration or uneven jar to the vehicle. There is a very ingenious device attached to the rear wheels, so that in turning a corner one wheel travels faster than the other and overcomes the difficulty which has always been experienced in motocycle vehicles. The steering apparatus is very simple and effective, consisting of the wheels being so pivoted on ball bearings that they can be readily turned by the steering handles.

A very unique but effective brake is attached to the side of the vehicle. It consists of a pivoted rod held in place by a coil spring and operated by being thrown as a friction against the ground.

The engine used in these carriages is the Pennington electro-oil engine, consisting simply of a steel tube, a piston and connecting rod, an inlet valve admitting the oil, with an outlet valve allowing the exhaust to escape and a simple electric device for operating the engine. Only about one gallon of water per horse power is required to cool the cylinder. The victoria shown in our engraving has attached to it one two horse power two cylinder engine. It has a maximum speed of twenty miles an hour and can be regulated down as slow as is required. The entire vehicle with machinery weighs less than four hundred pounds. The consumption of the fuel it is claimed does not exceed a gallon of oil per horse power in a fourteen hours run.

THE DURYEA MOTOR WAGON.

Vessel Damaged by a Whale.

Details have reached Plymouth of a strange occurrence at sea in Australian waters. The brigantine Handa Isler arrived at Sydney Harbor on Sept. 1 from New Zealand, presenting the appearance of having been struck by a heavy sea, as she was much damaged amidships. The vessel had made a fair voyage from Mercury Bay, New Zealand, with a cargo of timber up to within ten days of Sydney. At midday on August 24 two large whales were sighted, each being about 60 ft. in length. At first they appeared to be heading across the ship's bows, but they suddenly slewed round and came on toward the ship at a tremendous speed. The first whale struck the ship amidships and, although the vessel is 260 tons register and was laden with nearly a million feet of timber, the concussion was so great that the vessel shook from stem to stern. The second whale, fortunately, did not ram the ship, but dived just before reaching the Handa Isler, and passed under the keel. The brigantine was badly damaged by the collision and the whale must have been terribly injured, as the sea around was speedily dyed with its blood, and the animal did not rise after striking the vessel. The well of the ship was at once sounded, and it was discovered that the water was making at the rate of a foot an hour, which in a vessel so deeply laden was a very serious matter, Sydney being 220 miles distant. Examination showed that there was large dent in the side where the whale's head had butted in the planking and framework. As the water gained on the pumps the deck cargo was jettisoned, but continued pumping enabled the crew to finally get the vessel clear. On the next day, the weather being very favorable, a pad composed of green hides, in which pillows had been sewn, was fastened over the dent in the timbers. The inrush of water was then checked, and the vessel was also enabled to weather the severe gales which followed, and to reach Sydney Harbor in safety.

The Punkah Puller.

There are over 120 patents for punkah pullers, and yet none have come into general use in India. The jerk seems to be the rock upon which most inventors get wrecked, and to obtain this some most extraordinary devices are resorted to. One of the simplest machines is Agabeg's puller. The inventor gets his jerk by the use of a fly wheel on the shaft of the primemover, and regulates the machine to suit the punkah by a sliding weight in the horizontal lever, to which the rope is attached. For a given punkah, once the weight is fixed, it wants no more adjusting. It was worked by a small Robinson hot air engine of 4 inch cylinder, and heated by Vaguer stove. It took about fifteen minutes to get up power and then ran eight hours, or until the oil in the reservoir was exhausted. The machine worked a 7 foot punkah, 24 strokes a minute with a 4 foot stroke. One of the same inventor's machines was worked by electricity with the same excellent result. So long as the coolie is cheaper than the cost of working a machine puller, there is no chance of their ever coming into general use.

IN India every resident must, under penalty of fine, have his name written up at the entrance of his house.

The Weather and Disease.

Poets and writers in all ages have made reference to the effects which changes of the weather produce in the human organism, and the archives of folk-lore would furnish much evidence that these effects have not passed unnoticed by the proletariat. Unfortunately, however, the subject has been adulterated with a great deal of superstition, which has in a great measure tended to retard intelligent inquiry. That the various atmospheric changes should have some effect upon our bodies is easily understood, for we know that alteration in the surface temperature, a change in the blood pressure or in the air pressure of the lungs, may affect the nervous system, and all these changes may be brought about by some peculiarity of the natural phenomena which we call weather. In recent years the subject has attracted attention by those most competent to deal with the matter, and lately a meteorological station has been attached to the laboratories of the public health department at Rome, where lectures are given to students on the application of meteorology to hygiene. At present our knowledge of the way in which the weather acts upon the body is very limited, and must remain so until a larger number of data are collected. An attempt to trace the relation between weather and disease has recently been made by a fellow of the Royal Meteorological Society by bringing together a number of statistics dealing with the phenomena of the weather and some well known diseases, chiefly zymotic, presenting them by a graphic method in a systematic manner. Little attempt has been made to draw conclusions from these statistics, and until they have been digested by many minds perhaps the writer was wise in his omission. There are few people who could not give instances of the influence which the weather has upon them, either mentally or physically, and there are many medical men (who in other directions have no opportunity for original research) who might do some useful work by recording the result of their observations on the subject, and thus add considerably to our knowledge of the role which is played by the weather in the causation or prevention of disease. On some constitutions the seasons have a marked influence. With many the spring, with its bright days and clear air, is felt to be the time of the year when they get the most enjoyment from life; while others, probably of a more sensitive temperament, experience the greatest sum of happiness and health when peaceful autumn wraps the min its serene atmosphere. On the other hand, winter or summer, as the case may be, produces in other temperaments the greatest consummation of healthy vitality. Certain changes in the weather, too, tend to increase or diminish the amount of energy that we put into our daily work, and it has been stated that in a large factory from ten to twenty per cent less work is done on dull days and days of threatening storm. The whole subject is one which, pursued in a proper scientific spirit, should be productive of useful results.—The Lancet, London.

Preparation of Table Sirups.

BY HORACE E. HORTON.

Glucose sirup of the gravity 41° to 42° Baume, mixed with "cane stock" molasses and variously flavored, comes on the market as table sirup.

This sirup has a variety of names: "Honey Dew," "Honey Drips," "Maple Sirup," the wholesale dealer furnishing the name, the factory branding.

The preparation of table sirups is carried on either by the factory producing glucose sirup or by "mixing houses." The glucose manufacturers confine themselves to mixing glucose with "cane stock" from sugar refineries, unflavored, or flavored with vanilla. The mixing houses manufacture table sirups, molasses, honeys, maple sirup.

In describing the process of preparing table sirup at a glucose factory, it will be necessary to briefly sketch the process of glucose manufacture up to the point at which the cane stock is added.

The starch in the form of 20° to 22° Baume liquor is inverted with acids, and the resulting liquor has a density of 15° Baume. This liquor is filter-pressed, and run over bone-black; then boiled in a vacuum pan to the density of 29° Baume, when it is again run over bone-black. The 29° Baume liquor from bone filters is taken into vacuum pan and boiled to 39° Baume, when the pan is "struck" into a tank provided with heating coil and mechanical stirrer.

The glucose is taken in hand at this point by the man in charge of the sirup department.

The stirrer is started and a strong solution of sodium chloride added to disguise the peculiar insipid taste of the glucose. At this point a part or all of the cane stock is added and the stirrer run until the two sirups are well mixed; the mixture is then filter-pressed, using presses clothed with a good quality of Canton flannel. The clear, bright, filtered sirup is taken into a vacuum pan and boiled to a finish. When part of the cane stock is added in the mixing tank the second and last addition is made to liquor in the finishing pan.

When boiled to desired density, 40° to 42° Baume, the pan is struck into a cooler, where it is cooled to 85°, and flavoring, if any, added. From the cooler the table sirup is drawn into basswood or cypress barrels, and branded for the wholesale merchant.

The proportion of glucose sirup to cane stock varies; 95 to 96 per cent glucose sirup, 5 to 6 per cent cane stock, is a mixture which has given satisfaction for the past few years. Previous to this the mixture 70 glucose sirup, 30 cane stock, was prepared, but public taste has increased the percentage of glucose sirup.

A fine grade of table sirup, with a marked flavor of vanilla, is given by the following mixture:

Forty-seven barrels 41° Baume glucose sirup; 3 barrels 40° to 41° Baume cane stock; 1 bucket 20° Baume sodium chloride solution; 1 gallon 2 pints vanilla extract.

For a flavor suggesting vanilla use three-quarters of a gallon vanilla extract.

The finest and smoothest tasting sirups are those made from glucose produced by the oxalic acid process. Glucose by oxalic acid, filtered over a peculiarly prepared bone-black, has no competitor. The taste is smooth and distinctly sweet, in marked contrast with muriatic acid and sulphuric acid glucose. It needs but a slight addition of cane stock and sodium chloride to make it an unrivaled pancake sirup.

The process of manufacture is scrupulously clean and protected from bacteria contamination by strict adherence to antiseptic rules. It is prepared from corn starch by a process which insures a minimum of nitrogenous products in the finished product.

An inferior article of mixing glucose is now offered on the market; an article manufactured with no other idea than cheapness, and of such poor quality that large quantities of sodium bisulphate are necessary to prevent discoloration during the short time intervening between production and consumption. Some table sirups prepared from this glucose have a distinct sulphurous taste.

Table sirups manufactured by mixing houses are prepared by mixing glucose sirup 41° and 42° Baume with varying quantities of open kettle molasses, plantation centrifugal molasses (mill and diffusion), honey or maple sirup.

Open kettle New Orleans molasses rarely, if ever, reaches Northern markets. To secure it in New Orleans is sometimes difficult. The grade known as "prime" sells at 60 to 63 cents on the levee. This is mixed with glucose in varying proportions to please the customer, and the result is pleasing when a large quantity of molasses is used.

Large quantities of plantation centrifugal molasses selling at 7 to 22 cents a gallon and graded, fancy; choice; strict prime, good prime, prime; good fair, fair; good common, common; inferior, give great latitude to the "mixer," and the results are wondrous.

Mixing houses producing sirups proceed as follows:

The glucose in barrels received from glucose manufacturers is placed in a warm room until it will run easily, when the barrels are emptied into an iron tank provided with a heating coil and stirrer. The mixing is done in this or a similar tank.

After adding the molasses, honey, maple sirup, with necessary flavoring extract, the stirrer is run until the mixture is homogeneous, when it is cooled and drawn into barrels. Care should be exercised in running the stirrer, that no air is drawn into the sirup, for great difficulty will be experienced in freeing the sirup from small air bubbles.

I will give a practical example of mixing house work, and at the same time call attention to the use of phosphoric acid in producing bright, clear goods.

A fair grade of molasses is produced by the following mixture:

Glucose	6 parts.
Cane stock	1 "
Black strap	½ "

A homogeneous sirup is prepared from these sirups by using a steam coil and stirrer judiciously; the resulting molasses will, however, have a dull appearance. To brighten this molasses I know of no better way than to use phosphoric acid in the form of a superphosphate. The addition of ½ per cent superphosphate, alone or with milk of lime, and filtering, will give brilliancy to molasses.

The Rumford Chemical Works, of Providence, R. I., have an especially fine superphosphate; L. C. Keever & Company, of New Orleans, have an article known as "Clariphos."

The superphosphate may be prepared by digesting 100 pounds bone dust with 70 pounds sulphuric acid, 60° Baume, for 24 hours; water is then added, well stirred, filtered, and the filtrate evaporated to 16½° Baume, or heavier. The value of the resulting superphosphate solution, in units Ca O, is determined by titrating with calcium hydrate solution.

The proportions and grades of molasses mixed with glucose will be governed by the market price and the idiosyncrasy of the market. A large population in the New England States call for a Porto Rico molasses, the characteristics of which are a "black strap" flavor, with a seeming acidity. Another class of trade have a taste calling for a product represented by the Louisiana product, "sirop de batterie," a product of unrivaled delicacy, enjoyed by the favored few in Louisiana. Western trade demands a product of great viscosity, easily produced by mixing a low converted glucose of high dextrine content.—Louisiana Planter.

The Process of Gold Beating.

The following facts relating to the art of gold beating are taken from the Argosy:

"The gold to be used is alloyed with silver or copper, according to the color desired, and cast in ingots four inches in length, and weighing from ten to seventeen ounces. The second process consists in passing the four inch ingot between polished steam rollers. This reduces the gold to a ribbon twenty-eight yards in length, and $\frac{1}{800}$ part of an inch in thickness. Seven yards of this ribbon are cut into 180 pieces one inch square. These are placed singly between the leaves of a bundle of vellum, technically known as a 'cutch.'

"They are then inclosed in a parchment case and beaten for half an hour with a twenty pound hammer. By this time the gold is extended into squares of three inches. These are removed from the cutch and quartered.

"The next tool used is called a 'showder.' It consists of 720 'gold beaters' skins' four inches square. The gold beaters' skins are bought in packets of 900 leaves, and for each packet the intestines of 500 oxen are required. They are manufactured from the outer membrane of the large intestine by an exceedingly offensive process, as the intestine requires to be subjected to partial putrefaction before it can be separated from the membrane.

"Although the skins have a delicate appearance and are beaten for several hours every day with a ten pound hammer, they generally last about a year, when they are renewed for thirty-five or forty dollars. The 720 pieces of gold are beaten in the showder for an hour and a quarter, till they increase from one and a half to four inches square.

"Another quartering then takes place, and the pieces are then placed between the skins in a tool called a 'mould,' and beaten for a third time. This mould is filled three times, thus producing 2,880 leaves from the 80 pieces. It has been beaten altogether about five hours. The cutch, the showder and the mould, before being filled with gold, are subjected to treatment in hot presses, formed on the principle of a letter press, for the purpose of clearing the tools from damp.

"With an instrument called a 'wagon' the gold is cut to its final size (a square of three and three-eighths inches) and is then lifted into books of tissue paper, the leaves of which have been previously rubbed with red chalk to prevent adhesion. The leaf is now only $\frac{1}{250000}$ of an inch in thickness, and when held up to the light appears to be green. It is calculated that one ounce of gold may be converted into leaf sufficient to gild silver wire about 1,300 miles in length."

The Chicago Drainage Canal.

The report of the board of engineers detailed by the Secretary of War to report upon the probable effect and operation of the Chicago drainage canal upon the lake and harbor levels, and upon the navigation of the great lakes and their connecting waterways, has been made public. There is nothing to show, the report says, that the consent of Congress has been asked for this enterprise, and it is certain that it has not been treated as an interstate or international affair. With this established fact it is impossible to think that supervision of the United States will not extend to the canal in due time. This will become necessary as soon as it becomes a part of the system of navigable waterways. If the new outlet reduces the levels of Lakes Michigan and Huron about 6 inches, that effect will be produced in about two years, it not being a question of many years, as some suppose. The board feels very sure therefore, that: First, the drainage canal is not solely a State affair, but a national one. Second, the tapping of the lakes must affect their levels. If the level of the lakes should be reduced, vessels would have to load accordingly. The trustees of the drainage company now contemplate the abstraction of only 300,000 cubic feet, but after the canal is opened it is assumed that 600,000 cubic feet per minute will be drawn from Lake Michigan. This would lower the level of all the lakes of the system except Lake Superior, and reduce the navigable capacities of all harbors and shallows throughout the system. Under the laws of the United States these changes in capacity cannot be made without federal authority, and to enable the executive officers of the United States to act advisedly in the matter, it is necessary, in the opinion of the board, not only that measurements be taken, but that the money cost of restoring the navigable depths in channels and harbors be carefully estimated. The navigable capacity of all harbors and channels on the great lakes below St. Mary's Falls would be injuriously affected by the proposed canal, and the navigability of the inner harbor of Chicago would be made difficult by the introduction of a current therein.