

while it changes the properties of the product in such a way as to diminish its nutritive qualities. M. Renard's method of only adding a few drops of oxygenized water is much simpler, and quite as efficient as refrigeration, the milk—without being altered in any way—being kept fresh for at least 30 hours after it is taken from the cow.

AN ICE AUTOMOBILE.

BY G. LUXTON.

The development of the steamship, the locomotive and the automobile, and the still later conception of the dirigible airship, would seem to have exhausted the field of novel means of transportation. Yet a machine which is in its basic principle a decided innovation, has been designed and constructed by a Minneapolis man, Charles E. S. Burch, who has experimented for years in practical demonstration of his idea. The machine in question, illustrated in the accompanying engravings, is now resting on the ice of Lake Calhoun, where it has been tested, for, it must be understood, the machine is intended to travel on a frozen surface. The object which the inventor has had in view is the revolutionizing of the means of winter transportation in Alaska, where he is heavily interested in mining properties difficult to develop because of their inaccessibility. At present, in certain parts of Alaska, freight transportation during the winter is accomplished entirely by dog-teams and sleds, and in consequence the charges are from \$100 to \$1,000 a ton. It is the inventor's plan to use in place of dog-teams his "ice locomotive" drawing a train of sleds, and in this way to reduce the expense of freighting to a minimum. It is hoped that the invention will prove a boon to winter commerce in Alaska, and should it succeed will doubtless be received with enthusiasm by the thousands in that frozen country, who in winter are practically shut out from the civilized world.

The ice locomotive is propelled by steam engines, but instead of resting on wheels or runners is supported by four great steel spirals, one at each corner of the body, in the places usually occupied by the wheels or runners of ordinary vehicles. The spirals lie with their vertical axes horizontal, and are of opposite pitch. The edges of the blades are fashioned like skate blades in order that they may grip the ice well. Each of the spirals is directly connected to a separate steam engine and consequently the spirals may be operated independently, this method giving unusual control over the car. It can be driven forward, backward, sideways or at any oblique angle desired, and it can even be made to spin around like a top. The model now at Lake Calhoun is 22 feet long, weighs 4½ tons, has engines of 42 horse-power and steel screws 27 inches in diameter. It is easily seen that the greater the diameter of the spirals the greater will be the ability of the ice locomotive to travel over rough surfaces and to surmount obstacles. Accordingly, a machine which the inventor is having built in Canada, to protect patent rights in that country, will have spirals six feet in height. The ice locomotive is steered by means of two semi-circular steel disks at each end of the body operated by compressed air. The disks work in unison and are weighted in order better to grip the ice. The bottom of the body is made watertight so that in the event of the machine breaking through the ice it will float upon the surface of the water. In that case it would be possible easily to propel the machine, for the spiral method of navigation, as is well known, operates successfully.

The Lake Calhoun machine, which is unfinished and rough in appearance, was constructed to make an estimated speed of 9 miles an hour, but on its trial trip it easily traveled at the rate of 18 miles an hour. Obstacles and rough places were passed with surprising ease. A toboggan slide course of ice and snow several feet above the level of the lake ice was surmounted without difficulty while traveling at full speed. The inventor intends to use alcohol boilers in the machines constructed for practical service in Alaska, thus avoiding the danger of the freezing of the boilers, and furthermore, considerably reducing the size of the latter. He plans to have a condenser to condense the alcoholic steam and use it over and over again. Wood, coal, or oil may be used for fuel under the boilers.

A record feat in shipbuilding on the Great Lakes was marked by the recent launching of the 10,000-ton ore carrier "Jos. G. Butler, Jr.," after a period of only fifty-five days following the laying of the keel.

Accidents Due to the Foreign Chauffeur.—The American Coachman is Said to Be More Cautious.

"American coachmen with a little training make more efficient chauffeurs than the majority of Frenchmen out of employment, who come over here with a smattering knowledge of motors and are employed without question as expert drivers of automobiles." This statement was made recently by a gentleman who has owned automobiles for nearly ten years, is prominent in the affairs of the Automobile Club of America, and has had a wide range of experience in the employment of chauffeurs.

"A majority of the fatal automobile accidents that occur in this country," he continued, "are due entirely to the reckless driving or the absolute ignorance of imported chauffeurs. I have no hesitation in saying that the sad accidents that resulted in the deaths of Mrs. Francis Burton Harrison and Mr. James E. Martin were caused by reckless driving. They probably would not have happened had the drivers been graduated from the ranks of coachmen.

"Bursting tires are usually blamed for fatal accidents, but I know that there is nothing about a tire explosion to force a car off its course before being brought to a stop. This was proved by a series of demonstrations given by S. F. Edge in London with tires purposely deflated. A chauffeur naturally will blame an accident to a tire to screen his own recklessness or ignorance.

"Many foreign chauffeurs are capable drivers. Many

the necessity for perfect lubrication, and, fourth, the danger of fire from gasoline.

"A chauffeur to take care of a car does not need to be a mechanic. If gears are stripped, crank shaft broken or axle bent no chauffeur, however expert, can repair the damage without a machine shop. Therefore it is not necessary to travel with a mechanic, for in case of a serious breakdown the car has to go to a shop anyway.

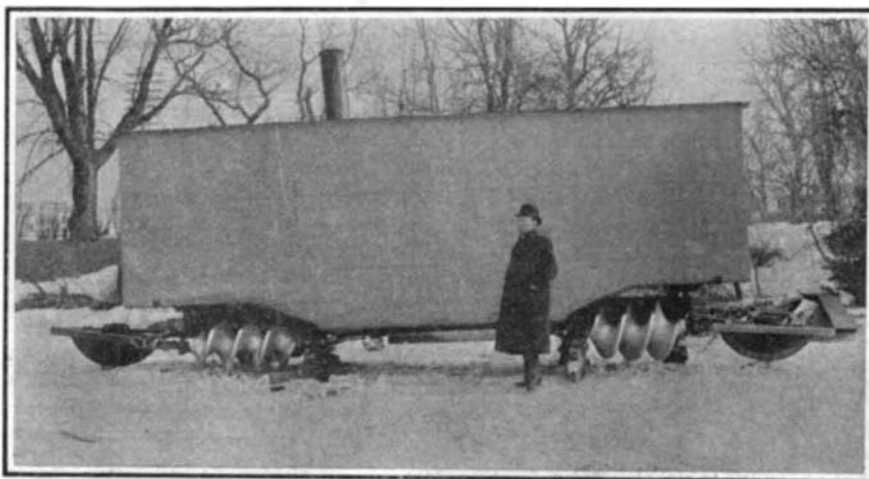
"If proper care were exercised in the selection of chauffeurs fewer lives would be lost in automobiling. Ignorant foreign drivers, who think more of speed than of saving their cars, slam them over rough roads until they become strained. This may not be noticed until weeks afterward, when, because of the strain, a piece of metal snaps and an accident results.

"Examinations for chauffeurs will not remedy the situation to any great extent. A reckless driver might pass a perfect examination. A revocable license would be more effective, for if a chauffeur finds he is liable to lose the chance of earning his living in driving automobiles, he will be more inclined to exercise care. But to my mind the best solution of the problem is the employment of steady-going coachmen as chauffeurs."—N. Y. Herald.

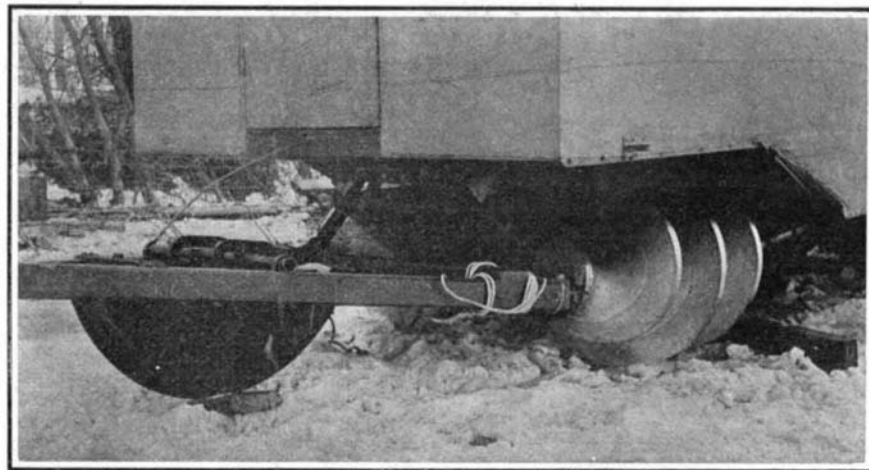
The Coloring Matter of the Blood.

The properties and composition of the coloring matter of the blood have been investigated by Messrs. Piettre and Vila, of Paris. One of the interesting reactions of toxicology is that which enables us to obtain upon the microscope plate the crystals known as *Teichmann's crystals*, and thus according to this classic experiment we find that the coloring principle of the blood is capable of crystallizing. This remarkable property was studied by different experimenters and was soon applied in blood researches in legal medicine. As it is only a question here of a microscopic reaction, we could not find out the composition of the crystals, but later on Nencki by using the powerful resources at his disposal succeeded in preparing about 500 grammes of this matter, by using enormous quantities of glacial acetic acid. The crystallized substance, which represents the total amount of the ferruginous pigment contained in the blood, he designated by the name of *acethemine*. The process which is used in obtaining it is simple, although expensive, and it gives an excellent yield of fine black crystals having a steel-like luster. The crystals have the form of very long rhombs and can reach a length of 0.12 inch. Microscopic examination shows that the *Teichmann* crystals which come from a saline solution, and Nencki's compound which comes from the same solution and in an acetic medium, are identical as to form, spectrum and properties. The authors have also prepared a quantity of the body according to Nencki's method. They find about the same analysis which he gave, namely, carbon 62.58, hydrogen 5.14, nitrogen 8.65, chlorine 5.64, iron 8.66. However, they do not consider that it is a definite chemical compound. They wished to produce the crystals which should be free from chlorine, and succeeded in obtaining such crystals, thus finding that the chlorine is not essential, nor is it constant in other cases. The proportion of iron can also vary. The authors are making further researches as to the nature of this body and state at present that there seems no doubt that the crystals in question can be separated into different principles, among which they have already isolated a solid and colorless substance containing no iron.

Certain wooden cylinders, usually from 30 to 50 inches long and from 6 to 7 inches in diameter, have become quite common in some places in Florida. They are called veneer cores, and are the waste lumber from the cutting of material for the sides of orange boxes and for other crates. This veneering, most of which is pine, is cut by clamping the ends of sections of the log to spindles, and revolving the logs rapidly under sharp heavy knives. After the bark is off the knives are sunk into the wood and thin sheets are pared off, unrolling somewhat as paper does from a roll. These are conveyed on runners under drop-knives which fall at regular intervals, and cut the veneer pieces of the right size for the crates. The cores are the heart pieces that are left after all the log that is available for crate material is cut for veneering. These cores are used for various purposes, to some extent for fence posts, but most of them for fuel, and are found at many Florida wood-piles. There are several veneer cutting mills in Florida.



The Most Recent of the Ice Automobiles.



One of the Spiral Runners and a Steering Disk.

AN ICE AUTOMOBILE.

others come to this country to seek employment as automobile experts because they cannot obtain work at home. Some have previously been waiters and a great many have had no experience in handling automobiles before landing in America.

"Not sufficient effort is made by owners to find out the capabilities of men who apply for jobs as automobile drivers. If an applicant speaks a foreign language he goes a long way toward qualifying for the position. The owner is probably ignorant of the mechanism of his car, and so is unable to question the applicant. He takes it for granted that the latter is all he claims to be, and then intrusts his own life, the lives of his family and those of his friends to a man who possibly knows no more of the machine he is to handle than does his employer.

"In my experience I have found that the most capable and trustworthy driver of an automobile is a man who has been schooled in the driving of horses. The most reliable chauffeur is a good, level-headed coachman. He knows the rules and courtesies of the road; he understands that danger is likely to be met in getting the car off the road; he has a proper respect for the care of the varnish on a vehicle, and if given a little instruction he becomes better able to care for a car, to keep it clean and to turn it out smartly than a so-called expert foreign chauffeur.

"Lessons necessary to evolve a good chauffeur from a good coachman are, first, the theory on which the gas engine works; second the theory of ignition; third,