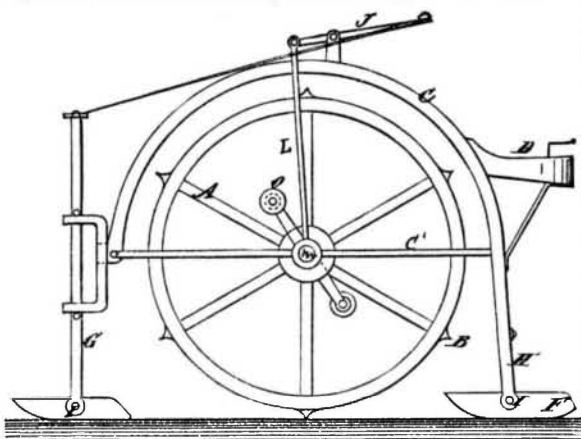


bespeaking its high quality. The timbers were considerably started, a pile next the target in the rear to the left proper being sheared clean off. In fact the proper side of the target was thrown back about 7 inches, and, of course, it generally suffered severely. The results as regard penetration were such as had been anticipated by the Heavy Gun Committee, so that practice here has satisfactorily confirmed theory, and has afforded data of considerable value to the authorities.—*Engineering.*

NEW ICE VELOCIPEDE.

In the annexed illustration is represented a novel ice velocipede, invented by Messrs. Juan Arnao and Juan Arnao, Jr., of Brooklyn, N. Y., and patented through the Scientific American Patent Agency. A represents a drive wheel, having points, B, on its periphery, and arranged on a shaft that



is journaled in two longitudinal springs. C is the frame, and D a seat located on its rear so that the rider may conveniently operate the foot cranks, O. H are rear bifurcations of the frame, to whose lower ends are pivoted the runners, F; while G is an independent standard, swiveled in the front of the frame, and connected, by cross pieces and cords, with the front end of a lever, J. This enables the rider to guide his velocipede with great facility. The lever, J, is pivoted to a stud on top of the frame, so as to bring its power end near the driver, and is connected at the other end, by pivoted rods, L, with the drive shaft. By this arrangement the driver can readily lift the wheel from the ground at any time, and the runners are enabled to pass over small obstructions on the ice.

A Solar Distillery.

M. Mouchot, whose steam boiler, heated by the sun's rays concentrated by a concave mirror, we described not long ago, recently exhibited to the French Academy of Sciences a new apparatus whereby by solar heat he distilled excellent brandy. The mirror was but 19.5 inches in diameter. A little over a quart of wine was placed in the boiler, and brought to boiling for 15 minutes by the concentrated rays. The alcoholic vapor entered a tube placed in the center of the boiler, traversed the supporting foot of the mirror, and descended into a room, where it condensed. The liquor was of remarkably good flavor, free from the disagreeable taste of alcohol peculiar to that obtained from wine in the usual way, and savoring strongly of the best cherry brandy.

M. Mouchot afterward placed flowers and odoriferous leaves in his boiler, and made a variety of perfumes and essences. Finally leading the steam into a cooking apparatus, he prepared an entire dinner by the agency of the sun's heat.

NEW METHOD OF SETTING HAIR TRIGGERS OF RIFLES.

This is a timely invention, which will interest riflemen and the many amateurs who are engaged in the laudable effort of attempting to rival the famous scores made by the international teams at Creedmoor recently. The usual manner of setting the set trigger is to throw the trigger, B, in the engraving, forward with the thumb. This operation requires both time and some exertion, and the present device is intended to obviate the difficulties. Referring to the engraving, which is a side elevation, A is a finger lever, which is pivoted to the lock at a, in the usual manner. B is the trigger, and C the set trigger. D is a milled head screw, which runsthrough the finger lever to a point near the trigger, and is capable of moving the trigger sufficiently to set the set trigger, C, when the finger lever, A, is moved either away from or toward the rifle stock. b is a jam nut placed on the screw, D, that bears on the finger lever, A, to prevent the screw from turning when once adjusted. The rifle can then be discharged with greater rapidity and with less exertion.

The device was patented through the Scientific American Patent Agency, September 5, 1876, by Mr. George O. Leonard, of Red Bluff, Cal.

What a Patent Agent Ought to Be.

A patent agent ought to be careful and honest, because he is the repository of his clients' secrets. No class of property is more highly valued by its possessors than that which derives its origin from invention. No matter how trifling the idea may be, the person who conceives it is apt to place a much higher estimate upon its value than others, and he is therefore jealous of its possession. This jealousy is excusable, however, on account of the fragile nature of the tenure by which he holds possession, and because his title cannot be permanently established until the patent is actually allowed and issued. An improper exposure or unwise placing

of confidence in a third party by the inventor or his confidants is liable to, and often has, cost the inventor not only time and money to obtain his rights, but has entailed the entire loss of his invention.

It is therefore necessary that the patent agent should not only have the confidence of the inventor, but that he should carefully guard the interest of his client and see that no injudicious exposure or explanation is made that parties liable to create trouble can get hold of. The utmost confidence ought to be maintained between an inventor and his attorney or agent.

A patent agent ought to be patient. Inventors are proverbially tedious. They like to talk about their inventions, especially to the person whom they have employed to prepare their patent papers and attend to prosecuting their applications. This is also excusable, because it relieves the mental pressure. It is the inventor's safety valve. Fear of exposing his secret to others compels him to keep it locked up in his brain; and there it lies, unfolding itself, expanding in value and importance and permeating every tissue of the human anatomy until the accumulated pressure is relieved by a distribution of the burden with a confidant, and the patent agent is usually that confidant.

The agent should patiently listen, for the talk of an inventor is valuable to him. It gives him the inventor's peculiar ideas; and if he is a student of human nature, it enables him to frame the case so that the inventor will be satisfied with it in every particular.

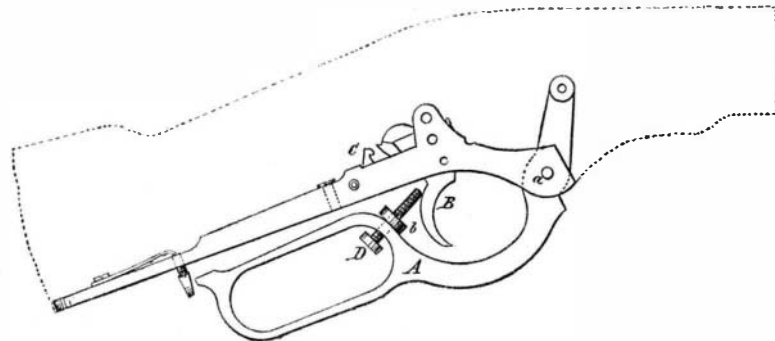
The patent agent should be accommodating. Inventors are often whimsical; the very nature of their undertaking is apt to lead them to peculiar theories and incorrect conclusions, although the general result of their theories and conclusions may be correct. These theories the agent must not combat, unless they are vital and enter into the essence of the case. He had better let their possessor retain them than incur his distrust and possible enmity by opposing them. The inventor will find his errors when he comes to enter upon the actual and practical field of operation.

The patent agent must be familiar with the law of patents; otherwise how can he guard the vulnerable points of the invention? Every specification must be prepared with a view to its having to pass at some time or other through the ordeal of a judicial examination, and a judgment as to its validity and scope; and unless the person who prepares the specification fulfills the legal requirements, and in a legal manner sets forth the description and claims, the patent will not stand.

No general knowledge which he may possess will make up for the want of legal knowledge: this want is the one thing that may defeat the end sought, and the knowledge must be properly possessed and properly employed.

The patent agent must be a mechanic, theoretical, at least. In this particular, a patent agent must be qualified by nature, and not by education, although education is necessary to enable him to dress his mechanical points in proper language and render his points plain, certain, and intelligible. Technical knowledge of each particular art, trade, or profession is not required, but a general knowledge of the various steps and requirements is necessary. A person who possesses the inventive faculty, if otherwise qualified, makes the best patent solicitor; he can then see each invention through the same medium and in the same light that the inventor himself sees it; he can pick out and embody the small mechanical points that form the real safeguards of a patent, and thus more absolutely prepare the case for the scrutiny of judicial investigation and the criticism of mechanical experts.

Few men possess all of these qualities, therefore we might say that few men are competent to serve as patent solicitors. The want of proper qualifications in patent agents is the cause of so many worthless patents being issued from the Patent Office. The inventor must absolutely depend upon



LEONARD'S METHOD OF SETTING HAIR TRIGGERS OF RIFLES.

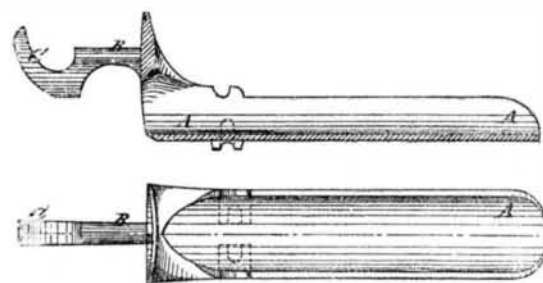
the preparation of his case for his security and defense, and it therefore behooves him to examine into the character and qualifications of the person in whose hands he places his invention and secret.

The safest and best guide for inventors who require the services of a patent agent is to choose those who have been long in the business and who have acquired a settled reputation for integrity and capacity. Mushroom patent agents exist everywhere. They employ the most specious means to entrap the uninformed inventor, but their services are an actual damage nine times out of ten. It is a hundredfold cheaper to pay a competent attorney or agent a fair fee than to accept the services of such men for nothing.—*Mining and Scientific Press.*

To PURIFY glycerin, add 10 lbs. iron filings to every 100 lbs. glycerin. In a few weeks all impurities will lay at the bottom.

IMPROVED SAP SPOUT.

Mr. Hiram A. Lawrence, of West Shefford, Quebec, Canada, has patented through the Scientific American Patent Agency, September 12, 1876, an improved sap spout, which may be applied to the tree without pounding, and, consequently, without injuring the bark: which will prevent leakage, cannot be forced out by the sap freezing in the hole, and which cannot be drawn out or loosened by suspending a bucket from it. The body of the spout, which is of iron, is made in the form of a half tube. At the base the sides of the spout are extended up to meet above the cavity, as shown in the engraving. The hole in the tree is made of such a size that the stem, B C, can be inserted in it by raising the outer end of the spout. When the stem has been pushed so far into the hole that the upper part of the base of the spout strikes against the bark of the tree, the outer end of the spout, A, is then pressed downward. This forces the transverse edge of the end of the hook, C, into the upper part and the longitudinal edge of the base of the



hook, C, into the lower part of the hole in the tree. At the same time, the edge upon the base is forced into the bark of the tree around the lower part and sides of the hole, so that there can be no leakage.

Solvent for Rubber.

This new solvent consists of a mixture of methylated ether and petroleum spirit—the common benzolene used for burning in sponge lamps. This forms the most rapid and, perhaps, the best solvent we have tried; the mixture is as much superior in power to either of its constituents singly as the ether-alcohol is to plain ether in its action on pyroxylin. We make a very thick solution by dissolving sixty grains of good india rubber in two ounces of benzoline and one ounce of sulphuric ether. If the india rubber be cut up fine and the mixture shaken occasionally, the solution will be complete in two or three hours, when it may be diluted to any required strength with benzoline alone. The india rubber should be as light colored as possible, and all the outer oxidized portions must be cut away. Shred the clean india rubber with a pair of scissors, and throw it at once into the solvent.—*British Journal of Photography.*

Wood Pulp.

Many substitutes for cotton wool have been proposed for the making of pyroxylin, such as linen rags, sawdust, flax, paper, etc., the last-named material alone being the only one used practically, though it is by no means certain that sawdust might not supply a good pyroxylin with organic reactions for special purposes. But the most promising material of all is offered in cellulose prepared from wood, which is now made for the paper manufacturers in very large quantities. The mechanical wood tissue obtained by grinding wood does not answer their purpose at all; but the cellulose prepared by chemical means is a substance whose qualities render it suitable for the manufacture of the highest quality of paper. So far back as 1868, a company made paper from this material alone, without the addition of rags. Three years afterwards five large mills were started (by an English company) in Sweden; and in Germany, at the present time, there are six factories in which the same process is carried out. It is somewhat as follows: The wood of pine and fir trees (oak is of no use what ever) is cut into small pieces a little less than an inch long by half an inch wide and a third of an inch thick, which are then comminuted by passing them into a machine very like a large coffee mill. It is then boiled, under a pressure of ten atmospheres, in a solution of caustic soda for about four hours. The residue is well washed, bleached, pressed, and lastly dried and cut up into sizes suitable for packing. It is also sent out unbleached, in which form it is used for a variety of purposes, besides making brown paper. This is the form we should be inclined to think would be most suitable for the manufacture of pyroxylin.

The greatest demand hitherto has been in Germany and Austria, the former country producing, it is estimated, 250,000 tons of paper a year, and Austria about 100,000 tons. If only one fifth part of this be made with cellulose, that would mean 70,000 tons of this material, which would require 280,000 tons of wood for its production.

REMOVING SUBSTANCES FROM THE EAR.—Take a horse-hair, about six inches long, and double it so as to make a loop at one end. Introduce this loop as deeply as possible into the auditory canal, and twist it gently around. After one or two turns, according to the originator of the plan, the foreign body is drawn out with the loop. The method is ingenious, and at all events causes little pain, and can do no harm.—*Medical Record.*

THE Amazon river drains 2,500,000 square miles of land, and is navigable for 2,200 miles from its mouth.