

**NEW PROTRACTOR.**

A useful instrument for the use of draughtsmen and mechanics is represented in Figs. 1, 2, and 3 in the accompanying engraving. It may be employed as a protractor, triangle rule, centrolinead, bevel, rafter and brace scale, etc. It consists of two straight rules connected by a curved slide, so that they may be closed together or opened out on a straight line, so that any angle, up to one hundred and eighty degrees, can be laid off. The two straight rules, A B, have one edge beveled and graduated. The graduations run from the inner ends of the rules outward, and both rules are of the same length along their beveled edge.

A curved slide, C, which forms nearly three fourths of a circle, is secured to the rule, B, and has upon its face graduations suitable for the laying out of angles. The curved piece runs through a dovetailed opening in the rule, A, through which it moves freely. A curved guide, D, projects from the rule, A, for receiving the slide, C, and it has an opening through the top so that the graduations on the curved slide may be readily seen. At one side of the opening there is a scale corresponding to the scale on the curved slide. By means of these scales the two rules may be adjusted at any desired angle, and when so adjusted the slide, C, may be clamped by the binding screw, E.

The rule, A, has an apertured extension, F, which is designed to slide along a graduated rule or straight edge, and it has a point, G, one side of which is straight and forms a line with the inner end of the rule, B, and serves as an indicator to measure off distances on a rule when parallel lines are drawn at certain distances from each other. Address the patentee, Mr. F. L. Cook, Fairfield, Iowa.

**Arsenic.**

According to the London *Mining Journal* a great deal of poison can be had for a very little money in England. It says, a parcel of arsenic, about 10 tons in weight, was sold at South Wheel Crofty, recently, when the private buyer offered. £4 4s. 6d. per ton; the Cornwall Arsenic Company, £4 7s. 9d.; and the English Arsenic Company, £5 0s. 9d.; which is about 15s. per ton advance on previous prices.

**TRUE TIME REGULATOR.**

Ordinary clocks have been made to indicate only the mean time, according to which—were the velocity of the earth uniform—the sun should pass the meridian always at twelve o'clock. This would be the case if the sun were always in the extended equatorial plane; but the sun being in the plane of the ecliptic, and as the orbital velocity of the earth varies with different seasons, the time at which the sun really passes the meridian occurs sometimes before and sometimes after twelve o'clock at noon, with an irregularly increasing or decreasing variation, the greatest difference between the true solar time and mean time being about 16 minutes and 45 seconds.

It is impossible to indicate the true time by means of an ordinary clock, as it must be automatically regulated to run faster or slower, according to the diurnal difference between mean and true time.

The velocity of a clock being proportionate to the number of oscillations of the pendulum in a given time, and these being dependent on the length of the pendulum, it is obvious that the regulation of the clock may be accomplished by automatically changing the length of the pendulum of an accurate mean-time clock according to the equation of time.

The accompanying engraving represents a simple and ingenious device for effecting the required change in the length of the pendulum. It is the invention of Francisco José Martins, of the city of Para, Brazil. Fig. 1 is a rear view of a clock having the improvement applied. Fig. 2 represents the pendulum slide in detail, and Fig. 3 represents a section of the graduated disk.

The rear view, Fig. 1. of a clock of the usual construction, excepting that it has a disk, A, at the back, which is connected with the train, so that it is rotated once in four years. This disk has formed on its edge a series of cams which engage the slide, B, to which the pendulum spring is attached. The cams on the periphery of the disk, A, are so proportioned as to raise or lower the pendulum the proper

distance, and thus change its length for every moment of time, and the disk is divided into four year spaces, so as to include leap year, months, and days. The pendulum spring slides through a bifurcated stud, C, as it is raised or lowered by the action of the disk to compensate for the difference between mean and true time, and cause the clock to keep true time. It is believed by the inventor that this improvement will effect an entire revolution in clocks.

For further particulars concerning the invention address the inventor, P. O. Box 4,775, New York city.

**A Milk Test.**

It is difficult to find milk in this city pure enough to determine the experiment, but a German paper gives a very simple test for watered milk. A well polished knitting

To be practicable, it must be a part and parcel of the machine, and easily managed. Another desideratum is its price. It should not be so extravagant that it costs more than the sewing machine, else it will not become popular, even though fitting the requirements of the user.

**New Mechanical Inventions.**

Mr. Oliver S. Presbrey, of Port Henry, N. Y., is the inventor of an improved Apparatus which may be used for Hoisting Purposes in various situations, but is more particularly intended for use in mines and quarries, and in other situations where a number of drums are employed at the same time and for the same kind of work.

Mr. Thomas Camp, of Covington, Ga., has patented an improved Cotton Condenser, in which perforated rotating cylinders and suction fans are employed for removing dirt and other foreign substances from cotton as it is delivered from the gin; and rolls are combined with the cylinders for the purpose of condensing or compressing the fibers of the cotton, and thereby forming it into a continuous sheet or wad of nearly uniform thickness.

An improved Wrench has been patented by Mr. August Beck, of New York city. This invention consists in a split ring or friction strap, having at one side of the split an arm that is pivoted in a lever handle, and having at the other side of the split an inclined plane, which is acted on by a pin in a short double arm that projects from the lever handle. The split ring is fitted to any object which it is desired to turn, such as a drill stock, or a bushing adapted to the heads and nuts of bolts. A forward movement of the hand lever brings the pin into engagement with the inclined plane, and thus contracts the ring, when a further forward movement results in turning the object to which the split ring is fitted.

Mr. John S. Birch, of Orange, N. J., has patented an improved Wrench, which is simple and convenient. The jaws adjust themselves to the object to be turned, and are not liable to slip off. It will hold a nut after it has been screwed off, and it has several other points of advantage.

An improved Faucet has been patented by Mr. Eugene Duchamp, of St. Martinville, La. The invention consists in a cylindrical pipe having a valve seat and side nozzle, and through its side an inclined slot sided by a stop flange, in combination with a cylindrical slide valve having a handle projecting through the said slot, said handle being surrounded by an oval sliding and turning sleeve, which serves as a bolt to lock it against the said stop flange.

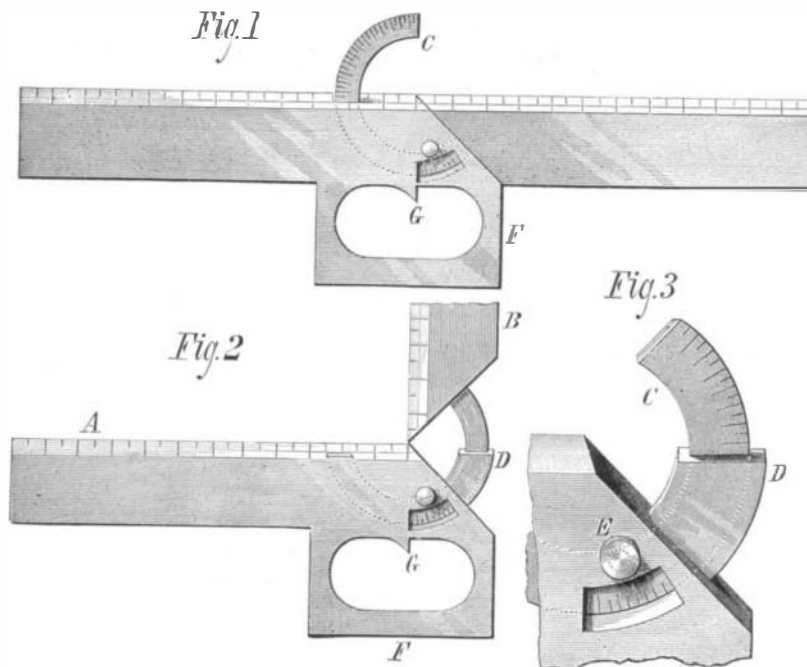
An improved Saw Sharpener has been patented by Mr. T. H. McCray, of Evansville, Ind. This is an improvement in the class of sawsharpening and gumming machines in which a small emery wheel is mounted adjustably upon a standard adapted to be clamped to the saw frame.

Mr. James M. Fate, of Webster City, Iowa, has patented an improved Bucket Pump that may be worked effectively with slow motion without any loss of power or leaking. It consists of a revolving reel, an endless chain made of connected and pivoted buckets, and a trough extending crosswise in the reel below the center of the same, for taking up and conducting off the water.

An improvement in Hoes has been patented by Mr. Joseph N. Parker, of Vineland, N. J. The object of this invention is to improve the common field and garden hoe so that, with little additional expense, its practical utility and value may be doubled without interfering in the least with the common working of the hoe. By a small addition to the hoe it may be used as a scraper, rake, or cutter for pulling out all large or fine weeds by the roots, or for cutting the weeds on the principle of a mowing machine knife, or sickle.

**Recent Inventions.**

An improvement in Photo-Mechanical Printing has been patented by Mr. Johann Baptist Obernetter, of Munich, Bavaria. This invention has reference to an improvement in the art or process of preparing photographic plates for printing by mechanical means with common lithographic inks and presses, so that transparent or non-transparent plates may be employed, and in the prints the half tones

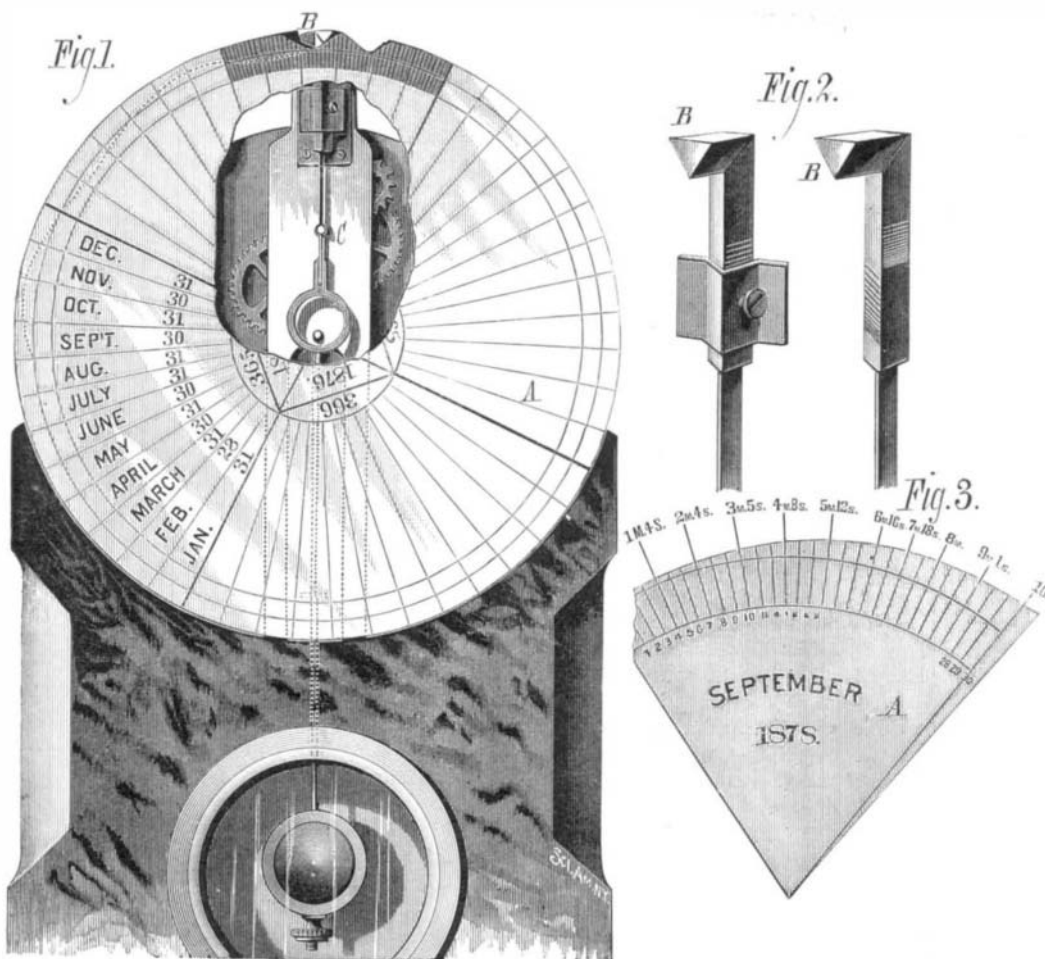


**COOK'S PROTRACTOR.**

needle is dipped into a deep vessel of milk, and immediately withdrawn in an upright position. If the sample is pure, some of the fluid will hang to the needle; but if water has been added to the milk, even in small proportions, the fluid will not adhere to the needle.

**The Want of a Sewing Machine Motor.**

The *Sewing Machine Journal* says that a practical motor for driving sewing machines is the article most wanted. Not a week passes, says the editor, that we do not have one or more inquiries for a motive power that can be applied to the family sewing machine. The last we had was from St.



**MARTINS' TRUE TIME REGULATOR.**

Petersburg, Russia, while about the same time came the inquiry from Mexico. We have heard of some motors that promised wonders; but they have died out, and are forgotten. Then there is the water motor, electricity, and steam—in a small way—all of which have their objections.

brought out so as to give them the appearance of the common photographic albumen prints. The process is adapted to the practical requirements of photographers, as any number of photographs may be printed from the plate cheaply and rapidly, and in colors of absolute permanency.

Messrs. Edgar M. Luckett and Nelson Belanger, of Terrace, Utah Ter., have patented an improved Mode and Device for Packing Valve Stems, whereby the use of glands, bushing ring, and hemp packing is obviated and friction reduced, while the valve stem is exposed to no wear in the stuffing box.

**Influence of Gaslight on the Eye.**

The German Minister of Instruction, in a recent report on the influence of gaslight on the eye, concludes that no evil results follow a moderate use of gas, if the direct action of the yellow flame on the eye is prevented. Grave objections he makes to the use of zinc or lead shades, most evils affecting the eye being traceable to them. Their use, it is said, inevitably tends to blindness or inflammation, and other harmful effects. The milky white glass shade is the best, as it distributes the light and has a grateful effect on the eye. The burner should not be too close to the head, as congestions of the forehead and headaches result from the radiated heat. The glass plate below the gas is especially useful for the purpose, as it causes an equal distribution of the light—necessary where a number are working at one burner—prevents the radiation of heat, and tends to a steady illumination by shielding the flames from currents of air. In cases of highly inflamed eyes, he recommends dark blue globes.

**A Mustard Congress.**

The French are a famous nation for holding "congresses," as they term meetings for examining and discussing the merits of all sorts of discoveries and articles. Among the last announced at the Paris Exhibition is a congress to determine the merits of the mustards of various nations included in the Exhibition. This mustard congress is to consist of twelve gentlemen and twelve ladies, the suggestion having been made that men's palates are vitiated by smoking, and that women are likely to have a nicer appreciation of condiments. The trial is to be made on a large piece of boiled beef, followed by boiled pork, to be served to the twenty-four experts.

**MR. FOWLER CROSSING THE CHANNEL.**

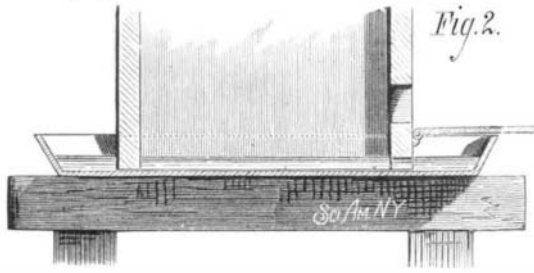
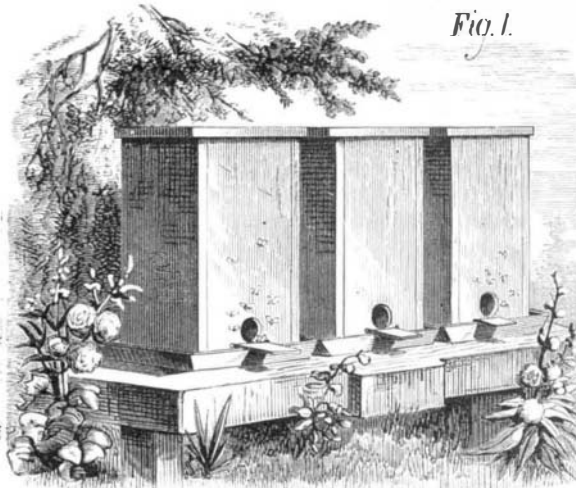
A curious project was recently carried out by Mr. Fowler, an American residing in Bordeaux. He crossed the Channel on a podoscaph, 6 meters in length. Each tube of this podoscaph, which is joined by rods, is 20 centimeters broad, and 30 centimeters high above the water. Leaving Boulogne at ¼ past 4 in the morning, he arrived at Sandgate at 3:35 in the afternoon. He experienced contrary wind and a heavy swell during a great part of the journey. The pilots and fishermen were surprised at seeing a man walking, as it were, on the water. The bold navigator was met with loud acclamations. He arrived at Folkestone somewhat fatigued. During the crossing, which lasted 12 hours, the only refreshment he took was a little coffee and a small piece of bread. The state of the sea prevented his stopping. The feat was accomplished to the satisfaction of everybody, and is a striking proof of energy and boldness. Mr. Fowler is Chevalier of the Legion of Honor, and owner of the yacht Peau-Rouge, which has gained several prizes in England and France. He was accompanied by the Petrel, belonging to an English captain.

**The Durability of Submarine Telegraph Cables.**

The expedition sent out to raise the submarine cable of 1866, like the one sent to raise that of 1865, failed to accomplish its mission. In the middle of last year, a new attempt was made, followed by more success, for two faults, one on the coast of Newfoundland and the other on the coast of Ireland, were then repaired. In consequence of this the Anglo-American Company and Telegraph Construction Company fitted out, at their joint expense, two vessels, which put to sea on the 25th of last May, for the purpose of finding and repairing the cable of 1866. The expedition has just returned to London. It reports having succeeded in grappling and raising the cable to the surface of the water fifteen different times, but the outer wires were so weakened by oxidation that it broke and was lost again in each case. The engineer in charge of the expedition therefore deemed the work of repair as entirely impracticable, and decided to return home. The unanimous opinion of electricians, says *L'Electricité*, is that the two first cables are defunct, and that ten years may be fixed as the average period that any cable will last which is not better protected against the corrosive action of the ocean. Fortunately the new cables are, as well known, better provided for in this respect.

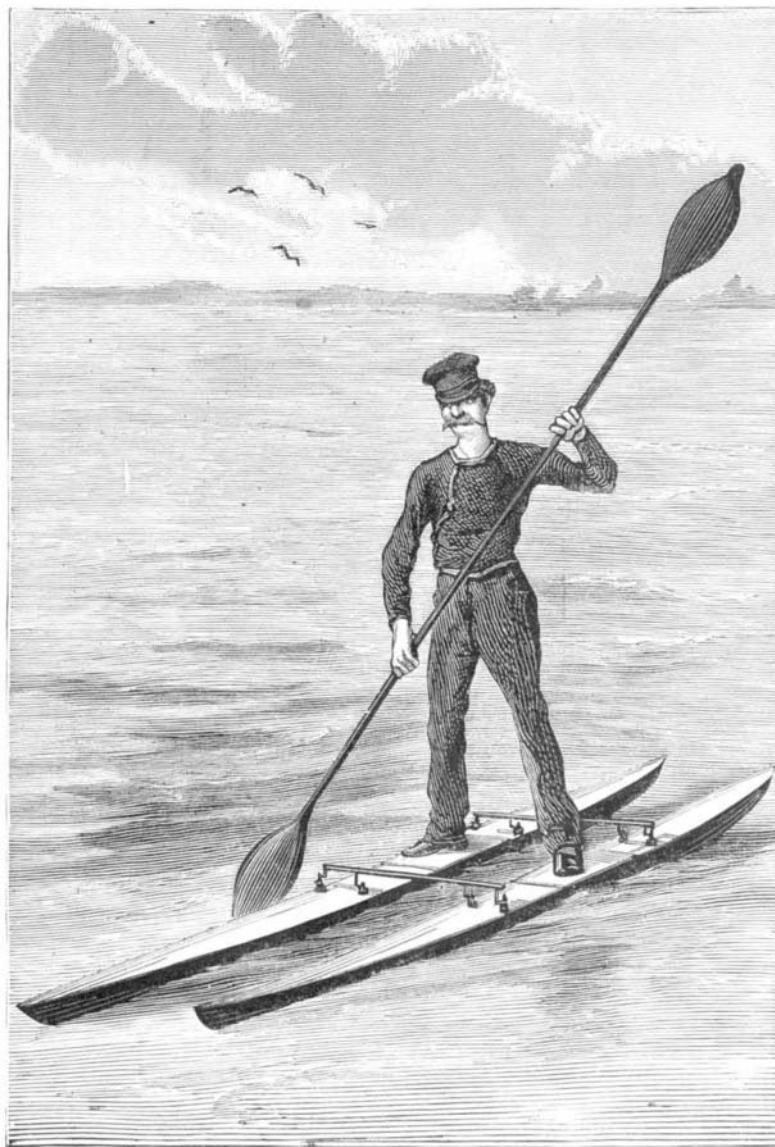
**A NEW BEEHIVE.**

The accompanying engraving represents a simple and effective device for protecting bees from the destructive moths which enter the hives and, depositing their eggs at the bottom of the hive or stand, gradually work upward under cover of their own webs until they reach the honeycomb and cause the bees to abandon the hive.



**SPEARMAN'S BEEHIVE.**

The hive or bee stand is placed in a shallow trough which is somewhat larger than the hive, and is partly filled with water. Below the hole through which the bees enter there is a small platform, which is hinged to the front of the hive so that it may be raised up to close the entrance, or let down upon the edge of the trough as a bridge over which the bees may pass to the entrance.



**MR. FOWLER CROSSING THE CHANNEL.**

Moths can enter the hive only through the entrance for bees, and those that enter will be drowned, and their eggs will be destroyed.

It is claimed that this device is an effective exterminator of the bee moth and protector of the bees, and that it is of great advantage to have the water near the hive, as bees in

summer drink water in considerable quantities. For further particulars address the inventor, Mr. John R. Spearman, Silver street, Newberry county, S.C.

**History of our Mining Laws in Brief.**

A correspondent of the *Mining Record* says: I notice in the *Record* an inquiry by a reader, as to what is meant by a mine having a certain number of feet. The Consolidated Virginia owns 710, he says, and asks if these are square feet. They are linear feet, as mines are located and have been for many years. In early times in California, when rich quartz croppings were first discovered, the locations were confined to 50x100 feet, and some to 100 feet square.

Those were the times when persons could take rock from the croppings and pound it in a hand mortar, and get a great deal of gold; so it was supposed that 50x100 feet would furnish one man his share of gold contained in the country. It was soon ascertained, however, that this was not enough in deep quartz mining. A man was allowed to take up only one claim on a ledge. That law of the miners was evaded in this manner: a person finding a quartz ledge would mark off the number of feet to which he was entitled, 50x100 or 100 square feet, by putting a stake at each corner of the claim, with his name on a center stake; then staking out as many more claims as he wanted, he put the names of friends on the center stake of each. He then went to the Recorder of the district, after putting up his notice of location on the ledge, and had a copy of the notice and name of ledge, also names of locators, put on record. Next he went to the parties whose names he had used, and got bills of sales from them to himself of the claims located in their names. The parties would always sign the bills of sale without hesitation, or even inquire as to the locality of the location or richness of the rock, for they all did the same thing for each other. When it came to be understood that quartz ledges cropping above the surface with rich specimens in such abundance that a man could make a large amount of money in a short time, yet after they had been worked on for a time, and the cream was taken off, they became less productive, a change of the system of location was found necessary. Machinery had to be devised that could be driven by steam or water power to reduce the rock to a powder. Miners formed themselves into companies (unincorporated), and located ledges; then they made arrangements with persons having more money than muscle, or disposition to use what they had, to erect a mill with the appliances to run it and the amalgamating apparatus. The company of miners would put the mine in against the mill, so that each, the miners and person or persons erecting the reduction works, would receive one half of the profit made in the business. Persons would erect mills in the different quartz mining camps to do custom work, and charge so much per ton for working ore. The miner would receive the product, less the amount charged for working it. When the ore did not yield as much as the miners thought it ought, they accused the mill man of stealing the gold. Generally the miners would over value their ore, and of course were disappointed with the result.

A man owning a mill and doing custom work did not occupy a very enviable position. He was accused of stealing, whether falsely or not. Persons with means then began to purchase quartz ledges and form stock companies, and erect reduction works to work the ore. It soon became apparent that the mode adopted of taking up quartz claims would not do. Then the more liberal and reasonable plan was adopted of locating claims 100 feet in length on the ledge to each person locating, except that the discoverer was allowed to include 200 feet in his location. Afterward the miners became more liberal to themselves still, and made laws allowing 200 feet to a claim, the discoverer of the ledge to have 400 feet.

The law of Congress allows an individual or company to locate 1,500 linear feet on a quartz ledge, and 300 feet in width each side of the center of the ledge vein, or lode, with the dip, spurs and angles. That has been the mode of locating all ledge claims since the act was passed, and will continue to be until the law is changed, which is not likely to be done.

**Preservation of Fruit.**

A. Dal Piaz recommends to lay the fruit in a solution of sugar, mixed with salicylic acid. The proportions are 100—500 grammes sugar, 2½ to 3 grammes salicylic acid to 1 liter water. Cherries, raspberries, pears, grapes, etc., have been preserved in this manner for a year without losing their natural aroma.

We intend in our next issue to publish an illustrated description of the new Wilson Sewing Machine which is soon to be placed upon the market. This machine possesses many points of novelty which will be of interest to our readers.