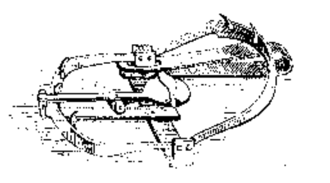
RECENT INVENTIONS.

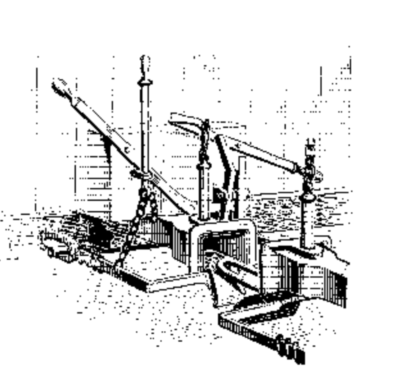
Hamilton's Animal Trap.

An animal trap, especially adapted for catching otter as they slide down their "snow slides," has been patented by Mr. Erastus H. Hamilton, of Community, N. Y. The body of the trap is made with two jaws and a flat U-shaped spring in the usual manner, as shown in the engraving. A series of sharp, strong teeth are held by rivets to the under sides of the jaws, in such a manner that they project from the adjoining edges of the jaws and lugs that project each side of the teeth serve to hold them more firmly. A platform, secured on top of the pan of the trap, stands higher above the ground than the ends of the teeth when the jaws are set open. The trap is placed in the "snow slide," and as the otter passes over it on his belly, the platform is pressed down and the trap sprung. As they slide rapidly, and the fur is soft and yielding, they slip out of ordinary traps, and the jaws must be provided with sharp teeth to catch them.



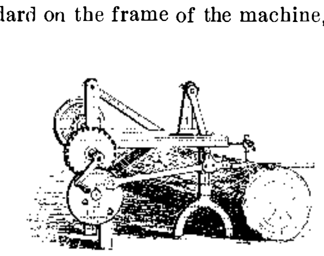
Improved Car Coupling.

Mr. John C. Look, of Yuba City, Cal., has recently patented improvements in car couplings consisting in combining with a draw head of the usual construction, of a swinging guide plate, which is attached to arms pivoted to a cross-piece secured on the draw head. The guide plate is drawn toward the cross piece by springs attached to the arms and the cross piece, that serve to hold the guide plate to the front of the draw head when it is raised. The coupling pin is suspended from a lever, which is held raised by means of a trigger lever, connected with the cross bar of the draw head. When the cars come together, the link is guided by the guide plate into the draw head, then the guide plate drops, and the trigger lever is moved and the pin drops through the link and the car is coupled. The pin is raised to uncouple by means of the lever that suspends it, the lever reaching to the outside of the car.



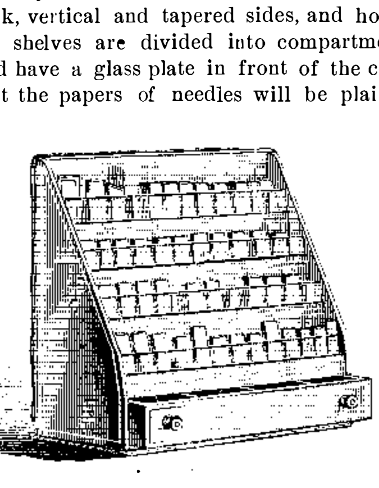
Norris Drag-sawing Machine.

Mr. Otho J. C. Norris, of Rohrersville, Md., has patented an improvement in hand drag-sawing machines, by which they are adapted to the sawing of large trees and logs. The saw of the machine is attached to the lower end of a swinging arm, pivoted to a standard on the frame of the machine, in such a manner that it is adjustable up and down to raise or lower the saw. The swinging arm is operated by a connecting rod pivoted to a crank wheel, revolved by suitable cog wheels driven by a crank. The crank wheel of the connecting rod has a series of holes at different distances from the center, by which the length of the stroke of the saw may be adjusted. By these devices the machine is made adjustable to the size and the resistance of the log.



Roeder's Showcase for Needles.

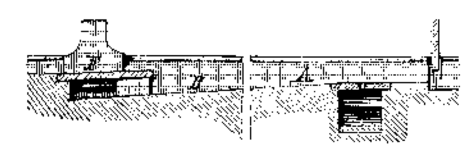
The case for showing needles shown in the annexed cut enables the dealer to so arrange his stock that the several varieties and sizes kept in stock will be exposed to view, and will be readily accessible. The case is constructed with a vertical back, vertical and tapered sides, and horizontal shelves. The shelves are divided into compartments by partitions, and have a glass plate in front of the compartments, so that the papers of needles will be plainly displayed. The compartments are of suitable width to receive the different sized packages. With this case no time will be lost in looking for particular kinds and sizes of needles, as they are arranged in regular order, and can be readily seen. In the bottom of the case is a drawer for the stock that there is not room for in the compartments, and a lid is provided to keep the dust from the stock. The case is patented by Mr. Joseph Roeder, Sr., of 74 Division Avenue, Brooklyn, E. D., N. Y.



Irrigating Ditch.

We give herewith an engraving of an improved irrigating ditch that is so constructed as to prevent filling with sand or other sediment, and also to prevent the sediment from being spread over the land. This is especially important where water enters the ditch from quartz-mills, as the quartz sand is very injurious to arable land.

A is a ditch in which at suitable points are formed depressions, B, the bottoms of which meet the bottom of the ditch upon the up-stream side at a grade much steeper than the grade of the ditch. The down-stream side of the depression is vertical, and the size of the depression depends upon the amount of sediment entering with the water. In the side of the ditch, at the lowest side of the depression, is formed an opening, leading into a branch ditch, through which the sediment may be conducted into a place where it will do no harm. The opening is closed by a gate.



The deeper part of the depression, B, is covered with a plate, F, the under side of which is on a line with the bottom of the ditch, A, so that when the gate is opened the outflow of the water will carry out all the sediment that may have settled in the depression, B, the current being made more effective by the plate, F, that forms a contracted passage through which the water is obliged to pass.

With this improvement the water is made to clear the ditch of sediment. This device has been patented by Mr. Dennis D. McIlvoy, of Golden, Col.

Paper and Pineapple Fiber.

The variety of purposes which paper can be made to serve is every day increasing. A few of the latest of these are worth mention. It appears that thick paper and cardboard can be rendered as hard and horny as papier-mache, by means of a kind of cement called Chinese varnish, which is easily prepared from blood, lime, and alum. With four parts of slaked lime and a little alum are mixed three parts of fresh blood well beaten up. The thick flowing mixture that results is, we are informed, at once ready for application to paper or card.

Among the curiosities of the late Australian Exhibition is stated to have been a house entirely constructed from paper, containing carpets, curtains, dishes, and whatnot, all made of the same useful material. Whether the dishes aforesaid were similar to the plates and dishes made in Germany, we cannot say; but in that country, we are informed, platters are being manufactured from sawdust and paper in the following manner: Selected plain shavings are bound into bundles, and steeped in a bath of weak gelatine solution about twenty-four hours, then dried, and cut into suitable lengths. Plates are cut of strong paper or thin pasteboard of the size of the objects to be produced. These are moistened with a liquid consisting of weak gelatine solution with sodium water-glass, and pressed in heated metallic moulds. After drying, the pressed paper objects are coated on both sides with an adhesive material made of five parts Russian gelatine, and one part thick turpentine; the shavings are applied to them, and the whole is subjected to pressure. (Wood shavings alone would, because of their unequal thickness, present uneven surfaces.) The objects are now cut if necessary, dried, and varnished.

In a former number of this *Journal*, mention was made of the dome of an observatory having been constructed of paper compressed to the hardness of wood. If buildings can be satisfactorily roofed with what is usually considered so frail a substance, it is not surprising to learn that hats and umbrellas can be made from the same material, a paper of extraordinary fineness and strength being said to furnish the people in the Corea with both of those useful articles.

By some enterprising Americans at least, the time is thought not far distant when yachts, lighter, swifter, and stauncher than any craft yet built, will astonish the maritime world. Not very long ago, a citizen of the United States made a journey of over two thousand miles in a paper canoe, built for him by a firm in New York. The total weight of the canoe was only fifty-eight pounds; and for strength, durability, elasticity, could not, they say, be surpassed. The paper-skin, after being water-proofed, was finished with hard varnishes, and then presented a solid and perfectly smooth surface to the action of the water, unbroken by joint, lap, or seam. Unlike wood, it has no grain to be cracked or split; and paper being one of the best non-conductors, boats of this kind appear to be admirably adapted—which cannot be said of steel or iron—for use in all climates. The surface, polished like a coach panel, never shrinks or absorbs moisture. Once employed by boat-builders, the conclusion naturally suggests itself, that some day a new and hitherto unsuspected meaning may attach to the proverbial phrase of a "paper war."

As regards the raw materials out of which paper is made, the immense commercial importance of cotton and jute as textile products suggest a few important considerations. Within a comparatively short space of time, these fibers have been the means of founding industries which rank by the side of the time-honored silk, wool, and linen manufactures. Is it not natural to suppose that if, in scientific matters—notably electricity—we seem almost daily increasing our knowledge, similar progress should be made with respect to those more prosaic subjects which very closely affect the personal and domestic comforts of mankind? Among the latter, clothing is, after food, the most essential requirement. The discovery or application, therefore, of a new textile fiber is of much economic importance; and the recently published accounts of the properties of the ananas (or pineapple) fiber are sufficient to show that in all probability a very valuable raw material for the manufacture of certain qualities of cloth has been placed within the category of textile vegetable fibers.

The pineapple is justly esteemed in Europe for its delicious aromatic flavor, and when grown in this part of the world, requires to be kept in hot-houses. In the more sunny regions of the East and West Indies, South America, Mexico, and the Philippine Islands, the pineapple grows in wild luxuriance. Yet, however widespread its fame as a table-fruit, it is doubtful whether many people know of the plant in connection with the textile fiber it produces. According to one practical authority, the leaves of both the wild and the cultivated kinds yield fibers which, when spun, surpass in strength, fineness, and luster those obtained from flax. It is further added, that in its manufactured state, this product has been long known as an article of commerce in the countries referred to. One of the leading trade papers of the German textile industry has given attention to the investigation of the properties of this fiber. From India and from Central America, two specimens of tissues woven from it had been received. The former was a piece of striped muslin; and the latter a sample of dress material in which the yarn had been bleached; thus showing that the fiber is capable of undergoing that process successfully. As to the uses to which the fiber can be put, it is asserted that it can be employed as a substitute for silk, and as a material for mixing with wool and cotton. It is likewise stated that for sewing thread, twist, trimmings, laces, curtains, and the like, its particular qualities render it specially applicable.

The large size of the leaves gives a great length of fiber, which is an advantage for manufacturing purposes. It has hitherto been mostly used, in the countries referred to, for the making of fishing nets, lines, etc.; its great strength, and its peculiar quality of not being injured by a prolonged submersion in water, rendering it particularly adapted for such purposes. The fact that every portion of the plant is utilized either as fruit or fiber, has been urged to prove the lucrative results which may attend its cultivation. In conclusion, the writer considers that the ultimate adoption of the pineapple fiber as a manufacturing product is assured, and urges on German manufacturers to devote special attention to this new branch of textile industry.—*Chambers's Journal.*

The Solar Constant.—Boiling Water by Direct Sunlight.

Professor S. P. Langley has submitted to the Chief Signal Officer an abstract of the results of the Mount Whitney Expedition to determine the amount of heat the sun sends to the earth, in technical terms the solar constant. Mount Whitney, in Southern California, was selected for the observation because it combined the advantages of great elevation, extreme dryness of atmosphere, and abrupt rise from the plain. The party of observation consisted of Captain O. E. Michaelis, United States Army; two non-commissioned officers of the Signal Service, six soldiers acting as an escort, four civilian assistants, and Professor Langley. Systematic work did not commence until the last days of August, 1881. Professor Langley summarizes the results ascertained as follows:

"The approximate estimate of the solar constant is from 2·6 to 3·0 caloric, by which is meant that the direct solar radiation before absorption by the earth's atmosphere would in falling for one minute, normally, upon an area of one square centimeter, raise the temperature of one gramme of water 2·6 or 3·0 centigrade. This implies its ability to melt annually a crust of ice covering the whole earth over 150 feet thick. This amount is one half greater than the received value of Pouillet, and greater than the latest determinations of Messrs. Crova and Violle."

On the summit of Mount Whitney an ordinary black bulb thermometer *in vacuo* rose to 130 degrees Fahrenheit, while the temperature in a blackened copper vessel, covered by two sheets of common window glass, rose above the boiling point. With such a vessel water could be boiled among the snowfields of Mount Whitney by the direct solar rays.

While the influence of the atmosphere is to shut off from the earth's surface a considerable portion of the sun's heat by absorbing it, the capacity of the air to store heat and prevent its radiation into space serves to make the earth habitable. Otherwise, in Professor Langley's opinion, the surface temperature, even under the tropics, would be lower than the lowest recorded degrees of Arctic cold. Another effect of the selective absorption of the atmosphere is to change the apparent color of the sun. In a transparent atmosphere the now "golden sun" would appear blue.