

IMPROVEMENTS IN RUBBER BELTS.

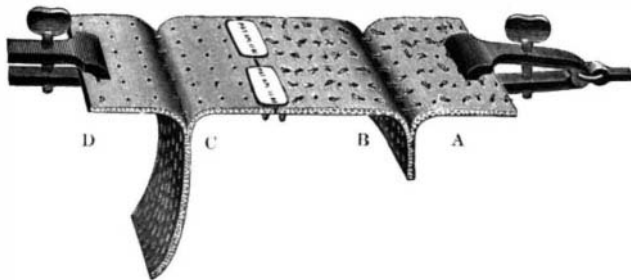
Every year advances have been made in the manufacture of rubber belting, with the object of making a belt that will better stand the enormous strains and hard work to which belting is now put. When belts were first put on the market the different plies of which they were made up were held together by the strength of the duck, but that failed to serve the purpose, so that recently the best belts have been sewed through and



CROSS STITCHED RUBBER BELTS.

through, thus holding the various plies together very solidly. It has been found, however, that these sewed belts are far from perfect. A recent improvement in this direction is called the "cross-stitch" belt, on account of the method of its manufacture, and it is the subject of several patents. The old style sewed belt is sewed with an ordinary sewing machine, one thread at a time; consequently, the threads on both sides run longitudinally, the length of the belt. In the "cross-stitch" belt all the threads are sewed at once. The threads on side run longitudinally, while on the other side they are tied together by threads running transversely, as is shown in the accompanying cut.

All who have had experience with sewing machines of any kind know the difficulty of getting an even tension on the thread at all times, and in the old style of belt it is practically impossible to have all the threads



TESTING STRENGTH OF RUBBER BELTS.

of the same tension. The result is that a portion of the threads take all the strain of the entire belt, for the tighter the tension on any particular thread, the tighter the thread and the more strain on that thread. On the "cross-stitch" belt all of the longitudinal threads are tied together by the under transverse thread, so that if one thread happens to have a tighter tension than the others, the under thread equalizes it with the others, so that the entire number of threads have identically the same tension.

By the very nature of its construction, also, the threads running across the "cross-stitch" belt are in a perfectly straight line, because all the needles are fixed to a single steel bar. This results in making the "cross-stitch" the strongest sewed belt possible, as can be seen by examining carefully the above cut, and making the test yourself.

Take any sewed belt, separate the plies as in the cut A B; separate the plies in the "cross-stitch" belt C D; clamp the two ends B C together, attach clamps to the ends A D, then apply power to A and D to pull them apart. This experiment will illustrate how strongly the threads hold, and that the "cross-stitch" will rip open the other belt. The reason of this is that in the "cross-stitch" the transverse threads are in a perfectly straight line of necessity, and in the other belt the chances are that only a portion of the threads would be in the same straight line at right angles to the line of the belt, because each line of threads is sewed separately.

Another objection to the old style sewed belt is that when the belt runs over a small pulley, the strain on the outside threads of the belt is very great, and they either break or weaken the belt by cutting into the duck. The thicker the belt, the more danger in this respect. In the "cross-stitch" the transverse threads run on the outside, and this difficulty is overcome. They have these belts now in operation which have not had to be taken up once after being put on. For any further information regarding them, address the manufacturers, Boston Woven Hose and Rubber Company, No. 275 Devonshire Street, Boston.

California Trees.

A. H. Taylor, representing the Interior Department at Washington, visited Tulare recently for the purpose of arranging for a section of sequoia, to go to the World's Fair. The *Pacific Lumberman* says the Tulare Board of Trade decided to undertake to procure a fine tree, and, if the cost is not too great, the government will exhibit it in the government building at Chicago, and afterward put it on permanent exhibition at the Smithsonian Institution at Washington. The section of the tree will be at least twenty feet high, and thirty feet through.

Mr. Taylor will take a tree, thirty feet long and thirty feet through. His plan is to have it cut into slabs, three feet thick, for transportation. Two sections of the full diameter of the tree will be cut, and polished so as to show the grain completely. The outside of the tree, in these three-foot slab sections, will be taken to Chicago, put together, and formed into a complete, though hollow, tree. The polished ends will be the floor and ceiling.

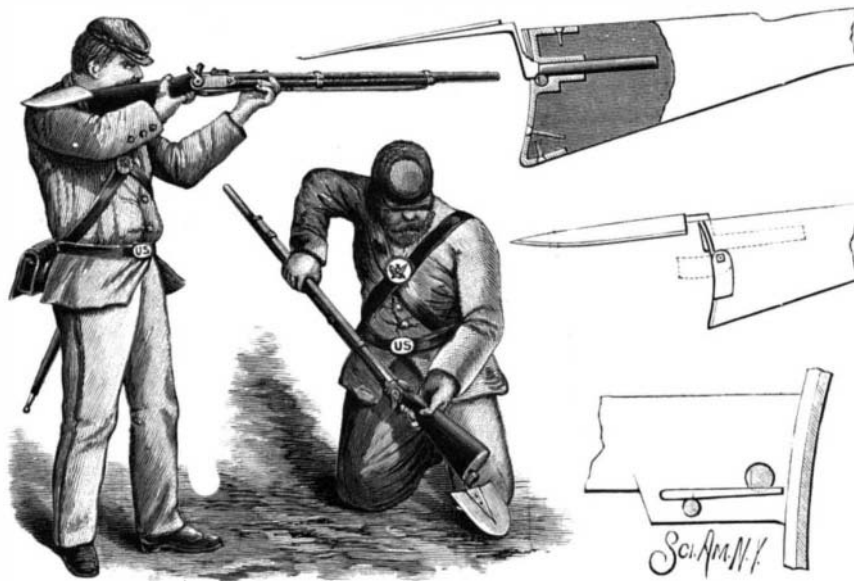
Inside, will be pictures of other trees and California scenery. It will be twenty feet, or over, across in the inside.

Colors in Tempering Iron.

Investigation as to the cause of the production of colors in tempering iron satisfactorily shows it to be due to the formation of thin films of oxide on the surface of the metal when it is heated in the presence of air. It also appears from recent researches that the oxide so produced is practically transparent, first, because the sequence of colors is what would be expected in films of a transparent substance when the thickness of the films gradually increases; also because of observations on the reflected light, the color of which varies somewhat at different angles; but chiefly because it is found that on increasing the temperature a little above the point necessary to produce a dark blue, the color gradually disappears, and the surface, though covered with more oxide, becomes almost colorless again. The colors being the result of oxidation, it is probable that the nature of the surface to be heated, its freedom from any soiling, and the length of time during which it is heated must exert a considerable influence on the shade produced.

AN INTRENCHING TOOL FOR SOLDIERS.

A tool adapted for use on the butt of a rifle or carbine in throwing up earthworks, digging rifle pits, etc., and which may also be used as a spade independently of the gun, is shown in the accompanying illustration, and has been patented by Mr. William H. Hamner, of Fort Assinaboine, Montana. The tool has a shovel blade, from which extends, at a slightly different inclination, a threaded part adapted to be screwed into a hollow handle, in which may be carried a screw driver, shell extractors, etc., the outer end of the handle being closed by a cap. To conveniently attach the tool to the rifle the handle is passed through a sleeve projecting inwardly into the wooden portion of the butt from the heel or base plate, as shown in the sectional views. To prevent the turning of the handle in the sleeve, there is a bolt in a transverse recess directly below the handle. To lock the bolt a spring is secured on one side of the sleeve to engage with its free end two shoulders formed at the inner end of the bolt. When the tool is fastened to the butt of a gun the back

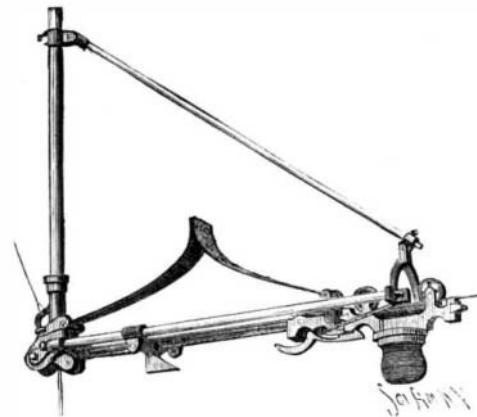


HAMNER'S INTRENCHING TOOL.

of the blade extends about in line with the top of the butt, and the soldier is not hindered from using the piece in case of emergency, the top of the blade then resting on the shoulder. In place of the handle shown, a telescopic handle may be used, and when this is extended the tool forms a regular shovel without the gun. When the tool is not to be used in connection with the gun, it may be carried in a loop on the soldier's belt.

AN IMPROVED CASH CARRIER.

The illustration represents a new device for the conveyance of cash from the sales counter to the cashier's desk, recently patented by Mr. Joseph Starr, of New London, Ct. In the design of this machine all superfluous attachments have been omitted, and it is reduced to the practical and useful. With this machine the car is propelled along the wire by the use of a steel bow spring, which, as will be readily understood, is superior to rubber bands and cord combinations, for

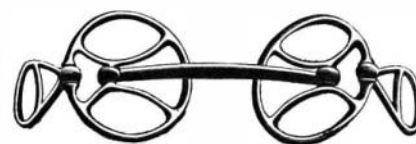


THE NEW STARR SPRING CASH CARRIER.

rubber soon loses its force, and the cord combinations are essentially the same as a hand push carrier, for the same calculation must be used to regulate the speed of the cash car. In the Starr carrier there is nothing to do but pull the cord, the spring does the rest; and by the use of the adjustable tripper the force and distance of the throw can be regulated to a nicety. Not only will this machine throw the car along the level wire, but will throw up grade also, which makes it very convenient for those who desire to have their cash desk elevated. To this propelling machine a basket is also adapted for carrying parcels. These machines are manufactured by the Starr Cash and Package Car Co., of New London, Ct.

AN IMPROVED BRIDLE BIT.

The accompanying illustration represents a bridle bit of novel construction which has been patented by



JOHNSON'S BRIDLE BIT.

Mr. Bernt M. Johnson, of Racine, Wis. The cheek rings are pivoted to the bit bar, which is a single one, and the rings may be used to produce pressure when required on the sides of the lower jaw of the animal, at the option of the driver, as there are pivoted to them independent rein pieces to control the action of the rings and bit generally. When the animal is not a vicious one, the free ends of the rein pieces are united by the ends of the reins with the inner portions of the cheek rings, so that the pull is at right angles to the bit bar, and the rein pieces do not protrude from the faces of the cheek rings; but inusing the improvement with a vicious horse, the ends of the reins are attached only to the back or free ends of the rein pieces, the pull upon the reins then pressing the inner portions of the cheek rings in against the jaws of the animal.

Fuel for the World's Fair.

When bids for furnishing fuel for the World's Fair were opened March 19, the Standard Oil Company was found to have the lowest bid, on the basis of three barrels of fuel oil being equal to a ton of coal. The Standard Oil Company offered to furnish oil at the rate of 70 cents for a barrel of 42 gallons during 1892, and 72½ cents a barrel during 1893. Most of the fuel, of course, will be used in 1893. Various estimates have been furnished of the amount of coal necessary to keep the wheels going around. The lowest estimate was 75,000 tons. On that basis the big oil trust would deliver 225,000 barrels of oil at Jackson Park. The bids for coal were as follows: Weaver, Getz & Co.—Shawnee coal, No. 1 at \$2.44 per ton; No. 2 at \$2.38. Roods & Ramsey Company—Little Mud Creek lump at \$2.60. New Pittsburgh Coal and Coke Company, \$3.08. Silver Creek and Morris Coal Company, \$3.95. Officials of the fair have not decided yet whether to use coal or oil for fuel. The Standard Oil Company have produced statistics to show that oil is cheaper, more convenient, and cleaner. They agree to deliver the oil as wanted, and to relieve the Exposition Company of the necessity of furnishing large warehouses, as would be necessary in case coal were used.

Automatic Sprinklers.

From a recent circular issued by the Boston Manufacturers' Mutual Fire Insurance Company, we learn that automatic sprinklers were placed over the whole of three cotton mills, except the weaving, by Col. T. J. Borden, of Fall River, in 1874. The system was adopted in a few other mills, without any urgent suggestion from the underwriters, in subsequent years to 1877 inclusive. In 1878, the officers of this company became satisfied that it would become the most efficient safeguard against the increasing hazard of our risks, and should be steadily presented for general adoption. The most thorough tests and experiments were then made upon automatic sprinklers by C. J. H. Woodbury, C.E., now one of the vice-presidents of this company, under whose supervision most of this report has been prepared. The result of this work has been largely in suggesting improvements upon automatic sprinklers, and preventing the acceptance as unsuitable for protection against fire of many varieties containing serious defects.

The true measure of the value of automatic sprinklers as a protection against fire is best shown by the experience of this company for fifteen years, on property where this company has shared in the insurance.

The introduction of automatic sprinklers has reduced the average loss per fire, within the experience of this company where they were in service, to 8.3 per cent, and the average loss per claim to 6.9 per cent of what it is apparent that such fires and claims might have been under the previous conditions of protective apparatus. But any classification must be made on arbitrary divisions, and the proportions of each class might be differently placed by another, yet in any case the result would show a very great reduction of fire loss.

Automatic sprinklers have their limitations and may not stop a fire which starts elsewhere and burns to the room where they are installed, although there have been many instances where they performed valuable service under such conditions.

They are not suited to the protection of large open spaces, or to deep piles of combustible material. Manufacturing processes generating corrosive vapors, or producing adhesive deposits upon automatic sprinklers, impair their efficiency.

Exercise for Lame Horses.

The Breeder and Sportsman, of San Francisco, describes the swimming tank on the famous Souther ranch in California. It is built of concrete and is about eight feet deep, 30 feet wide and 90 feet long. There are suitable pipes for filling and emptying it and facilities for warming the water. The horse is taken in and out from the platform shown at one side. Salt water is frequently used, as it acts like a tonic on the horses. In swimming the horse takes the same or even more violent exercise than he would trotting on the track, while there can be no injury to the feet or limbs. It has frequently happened that famous race horses have been taken lame during the season—so lame that it was necessary to give them complete rest for fear of injuring their feet, as they surely would do if exercised on a hard track. When these horses went lame it was of course supposed that their season was ended, for two or three weeks of idleness would surely unfit them for rapid work. It was a great surprise, therefore, when they turned up in perfect training and entirely over their lameness. At first there was a great mystery about the treatment, but it was soon learned that the horses were made to swim every day, thus giving them all the work they needed and at the same time preventing injury to the hoofs by striking on the hard track.

Plating the Monterey.

The armor plating of the Monterey is now in progress at the Union Iron Works, San Francisco. The plates are finely finished, their outside surfaces being as smooth as glass.

They are 24 feet long, and vary in thickness from 14 inches to 7 inches. The outside surface of the armor is moulded so as to preserve the line of the ship's side. The inner surface is curved, being thicker at the water line than at the main deck, and also diminishing in thickness toward the lower edge. The inner surface of the armor plate will be backed by hard wood, varying from 4 to 7 inches in thickness.

The plates are drilled to receive $2\frac{1}{2}$ inch bolts. These bolts pass through the armor plate, then through the sheathing and the vessel's side plate, and are to be fastened by screw bolts on the inside. In addition to these fastenings long bolts will be passed through the armor plate in a vertical direction. The upper ends of these bolts will be fastened to the steel plate beneath the main deck, and the lower end to the angle plate on the vessel's side, specially prepared for it. Between 3,500 and 4,000 pounds of bolts will be used to secure each plate in position.

The two plates just received are two of the smallest that will ultimately form the Monterey's armor. They will all be about the same average thickness, and will

vary in length from 24 feet to 32 feet. The weight of the heaviest of the armor plates will be 40,000 pounds. When finished it is estimated that not less than 1,500,000 pounds of steel will have been used for the total armor plating of the Monterey.

DECISIONS RELATING TO PATENTS.**Supreme Court of the United States.****ANSONIA BRASS AND COPPER COMPANY vs. ELECTRICAL SUPPLY COMPANY.***Decided March 14, 1892.*

Letters patent No. 272,660, issued February 20, 1883, to Alfred A. Cowles, for an insulated electric conductor, *Held invalid.*

The application of an old process or machine to a new and analogous purpose does not involve invention, even if the new result had not before been contemplated.

If an old device or process be put to a new use which is not analogous to the old one, and the adaptation of such process to the new use is of such a character as to require the exercise of inventive skill to produce it, such new use will not be denied the merit of patentability.

Where a patent sued upon describes a method which differs only in degree and not in kind from a previously employed method, and where the utmost that can be said of the patented process is that it produces a somewhat more perfect article than was previously produced, *Held* that the patented method involves no novelty within the meaning of the patent law. (Citing *Smith vs. Nichols*, 21 Wall., 112.)

Appeal from the Circuit Court of the United States for the District of Connecticut.

STATEMENT OF THE CASE.

This was a bill in equity for the infringement of letters patent No. 272,660, issued February 20, 1883, to Alfred A. Cowles, for an insulated electric conductor.

His method of preparing the wire was stated in his specification substantially as follows: The wire was first passed through a braiding machine, and a layer of cotton or other threads braided about it. The covered wire was then passed through a vessel containing paint, preferably white lead or white zinc ground in oil and mixed with a suitable drier. A second braiding was then applied directly upon the fresh paint; the threads thus braided upon the paint force the paint into the first braided covering, and at the same time the paint oozes through between the threads. In this way the paint was incorporated throughout the braided covering and filled up the pores; and the wire thus perfectly insulated, and there was no possibility of inflaming the covering.

The most satisfactory evidence of the prior use of a non-combustible covering for electric wires is found in the testimony of Edwin Holmes, manufacturer of an electric burglar alarm.

The method described by Cowles differs only in degree and not in kind from that described by Holmes. In other words, it is a more thorough doing of that which Holmes had already done, and, therefore, involving no novelty within the meaning of the patent law.

U. S. Circuit Court of Appeals—Ninth Judicial Circuit.**REGAN VAPOR ENGINE COMPANY vs. PACIFIC GAS ENGINE COMPANY et al.***Decided January 30, 1892.*

An instrument purporting to assign an invention yet to be made does not operate as an assignment of such invention when made, but is a mere executory contract.

An indorsement of such an instrument assigning and transferring all "right, title, and interest in and to the above agreement" passes only the written instrument itself, with such right of action thereon as had not at the time of the indorsement become vested in the indorser. (Reversing *Regan Vapor Engine Co. vs. Pacific Gas Engine Co.*, 57 O. G., 1886.)

Appeal from the Circuit Court of the United States for the Northern District of California.

On May 15, 1886, Regan and Garratt entered into an agreement wherein they stated that we "do hereby license and grant and convey each to the other," throughout certain States and Territories, the license to Garratt being for the Pacific coast—

"All such inventions and improvements, whether patented or not, which may be hereafter made by either of us—"
in gas engines and the mechanism by which they are operated.

The lower court decided that the Regan-Garratt agreement of May 15, 1886, operated as an assignment of an invention which Regan three years afterward, on August 6, 1889, made and secured a patent for, as well as the patent issued on April 1, 1890, the same being a reissue thereof, and which was issued to and in the name of the appellant. Accordingly a decree was entered which in effect decides that the appellant has no title to the patent in suit for the Pacific coast and that the Pacific Gas Engine Company has.

The agreement of May 15, 1886, is not the assignment of a patent, though it contains language—"grant and convey"—sufficient for that purpose, if there was any thing to assign. It may be good as an agreement to sell and assign a future invention, but it cannot operate as a sale or assignment of such an invention even when made. No one can sell that which he hath not. (Comyn's Dig., tit. "Grant," D.) A man cannot grant all the wool that shall grow upon his sheep that he shall buy afterward, for there he hath it not actually or potentially. (Bac. Abr., tit. "Grant," D.)

Chancellor Kent says (2 Comm., 468):

"The thing sold must have an actual or potential existence, and be specific or identified, and capable of delivery; otherwise it is not strictly a contract of sale, but a special or executory agreement. . . . But if the article intended to be sold has no existence, there can be no contract of sale."

Benjamin, in his work on sales (sec. 78), says:

"In relation to things not yet in existence, or not yet belonging to the vendor, the law considers them as divided into two classes, one of which may be sold, while the other can only be the subject of an agreement to sell—of an executory contract. Things not yet existing, which may be sold, are those which may be said to have a potential existence; that is, things which are the natural product or expected increase of something already belonging to the vendor. A man may sell the crop of hay to be grown on his field, the wool to be clipped from his sheep at a future time, the milk that cows will yield in the coming month, and the sale is valid. But he can only make a valid agreement to sell, not an actual sale, where the subject of the contract is something to be afterward acquired, as the wool of any sheep, or the milk of any cows, that he may buy within the year, or any goods to which he may obtain title within the next six months."

A man may make a valid agreement to sell an invention not yet made by him, but he cannot make a valid sale thereof.

Curtis on patents (sec. 160) says:

"The statutes, however, which authorize the assignment of an invention before the patent has been obtained appear to embrace only the cases of perfected or completed inventions. There can, properly speaking, be no assignment of an inchoate or incomplete invention, although a contract to convey a future invention may be valid, and may be enforced by a bill for specific performance. But the legal title of an invention can pass to another only by a conveyance which operates upon the thing invented after it has become capable of being made the subject of an application for a patent."

Mr. Robinson, in his work on patents (vol. 2, sec. 771), says:

"A contract for the transfer of inventions not yet in being is valid as a contract, but is not an assignment. The subject matter of an assignment is an existing invention, not only conceived as an idea of means, but actually reduced to practice, and thus invested with the inchoate or perfected right to that monopoly which must always pass with the invention in this form of conveyance. An intended or incomplete invention rests merely in purpose and expectation. It does not clothe the proposed inventor with any special privileges or entitle him to any special rights in the monopoly which, if his purposes were accomplished, he might be able to secure. The transfer of such future inventions is a mere executory contract to assign them if they happen to be made."

To this general rule there appears to be one exception, and that is where a patentee assigns a patent already issued, together with all future improvements thereon. It has been held that such assignments pass the title to the future improvements.

But that is not this case. Here there is no assignment of a patent with any improvements thereon. The document which constitutes the basis of appellees' claim is at most an attempted assignment of any independent inventions to be thereafter made by either of the contracting parties in gas engines.

The decree of the circuit court is reversed, and the case is remanded with directions to affirm the master's report.

Commissioner's Decisions.**HISEY vs. PETERS.***Decided March 11, 1892.*

In an interference between a patent and an application, where the question was not one of independent origination, but a dispute over the invention of the specific thing patented, the natural presumption existing in favor of validity of the patent is greatly strengthened by the fact that the junior party to the interference had full knowledge of the patentee's proceedings before the office, but was fifteen months behind him in filing his application.

Where a skilled workman is employed to embody an inventor's idea in practical form, the results are the property of the inventor unless they show that the workman has discarded the original idea and proceeded upon a wholly distinct and separate plan.