Autumn Glories.

It is now, in mid-October, that the rural landscape is in its glory. The leaves of the deciduous trees are ripe and resplendent in color; that is, the trees whose leaves fall in autumn. The leaves of these trees ripen as the fruits do. It is the same result from the same cause in both leaves and fruit. Every one who walks along the country roads or lanes, or rides or drives, or takes a railway trip where there is a skirting of woodland, has had sight of the beauty of the foliage with its almost infinite variety of color. Some, of course, have not enjoyed opportunities for strolls, drives, or journeys within eyeshot of these scenes since the glories have been put on; but all who can should do so. It is not every season that the colors are so brilliant or so varied as they are this fall. Sometimes the late summer and early autumn weeks are too dry, the flow of sap ceases prematurely, and the foliage dries up and withers rather than ripens. Then there is but little bright color. But the weather has been highly favorable this season, and the woods, especially on the Jersey side of the Delaware, are aglow to an unusual degree.

It does not require that a long journey should be made to see these beauties. Almost any bit of landscape with a copse or grove or stretch of young timber will show the perfection of autumn leaf coloring at this time, if there are swamp maples, sugar maples, sumac, sweet gum, dogwood, oaks, and sassafras well interspersed among the pines, cedars, spruces and other trees of our neighborhood. Where all these are plentiful, together with climbing vines, the effect is, of course, the more beautiful, especially if the trees are on a hillside. The effect is grandest of all on the flank of a mountain, where the colors are in mass; and, where viewed from a distance, the rounded outlines of the rising banks of trees look like cumulus clouds lighted up by a sunset of crimson purple and gold. The perfect scene is where there is a considerable proportion of evergreen trees—pine, spruce, hemlock, cedar—to make a background and to occupy the interspaces between the trees with colored foliage. Then, there is every color of the spectrum and every shade of blended hue, not even excepting the blues, which in some conditions of the air and of the light are observable in charming tints, among the greens in the distance. From the umbers and buffs and russets to rich orange and golden yellow, from the deep purples, maroons, and bronzes to crimsons and scarlets, with every variety of green—all the intermediate colors can be found in any strip of woods that contains the trees above named, or a majority of them.

But some of the colored maples surpass all other trees in their splendor, as their leaves pass from the golden and orange yellows in the lower branches to the flaming tints on their crowns. The sweet gum is next in varied brilliancy, but these trees are far less numerous hereabouts than maples. They abound, however, in the near counties in South Jersey. The sumacs and dogwoods show handsomely in the distance, but their leaves do not bear close inspection like those of the maple and sweet gum. Some of the oaks, too, are exceedingly beautiful in their variegated leaves of green and red. When you go to look at these roadside or mountain pictures, try to see them in the sunlight. An hour after sunrise or an hour or two before sunset are the choice times; but at all times of the day they are beautiful.—*Philadelphia Ledger.*

Hard-Headed Practice.

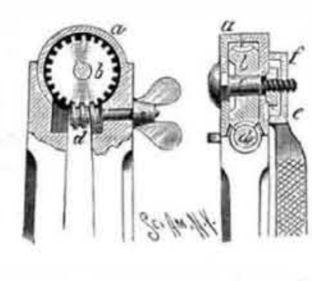
Dr. Walker, President of the Boston Institute of Technology, will have the country much beholden to him if he continue the good work he has so admirably begun of leading youths into useful and practical channels of study. He finds the tendency of the young is toward a professional calling, and as his elder experience proves these avocations to be dangerously overcrowded, he is striving to correct the fanciful disposition to a common-sense regard of the demands of life. He is inducing many of the boys of that city to pursue mechanics as a study, and is by that means fitting them for paths in life that are not already choked up with futile toilers after fame and fortune. The fact is, this country needs more industrial institutions and fewer colleges of law and medicine. We want more common sense and less ideality, more hard-headed practice and less theory, more workers and fewer puddlers. Success in the workshop is infinitely preferable to and more honorable than failure in a profession, and the mere matter of name has come to make but little difference with the estimate of men's worth nowadays. Technical education is what is wanted in our manufactories, and in them is our life.—*Chicago Journal.*

The Signal Service Clock.

A clock of peculiar construction has been manufactured for the United States Signal Service Bureau at Washington. The case is of brass, and allows the swing of a pendulum 39 inches long; it is air tight, and admits of the air being exhausted, and the movement run in a vacuum, thus obviating any possibility of variation due to atmospheric changes. An electrical attachment is connected with the movements, by means of which the clock is wound as it runs, so that there is not the usual liability to variation arising from the differing conditions of the mainspring. This is accomplished by alternately breaking and closing an electric current. The motion thus obtained and the power of the current are used to rewind the spring by means of a worm and other mechanism. The winding keeps exact pace with the running, and the slightest deviation from this standard is shown on an indicator. The train is jeweled, and is therefore little affected by friction.

CALIPERS AND DIVIDERS.

The pair of calipers or dividers herewith illustrated is provided in the joint with a disk having a worm-threaded edge with which a screw pintle engages, which is held loosely in one of the legs, thus permitting the points to be adjusted accurately by turning the screw after the legs have been adjusted in the usual manner. One of the cuts is a longitudinal sectional elevation, and the other is an enlarged detail cross sectional elevation. The disk, *b*, is provided with one flat surface and also with a recessed surface, so that the friction on one will be greater than on the other, so that the disk will be held on the cap of one leg by friction while adjusting the points. The upper end of each leg is provided with a disk having an annular flange, *a*, forming a cap. One of these disks is provided with a circular and the other with a square aperture. Passing through the two disks and through the worm-threaded disk is a bolt, *c*, provided with a head, and having a squared part fitting in one of the disks. The bolt has a tapering shank, the free end of which is screw-threaded. A nut, *e*, holds these parts together. A screw key, *f*, then screws on the threaded end of the bolt, *c*. A pintle, *d*, is held loosely on one of the legs directly below the disk, and on the outer end is provided with wings, and on the inner end, which is enlarged, is a screw thread engaging with the worm thread of the disk, *b*. If the dividers are to be opened or closed, the nut, *f*, is unscrewed, when the legs can be moved as desired. When the legs are moved by hand, the flat surface of the disk, *b*, will slide on the surface of the disk, *a*. When the legs are moved by turning the wings, the disk, *b*, will remain stationary in regard to one disk, and the sliding will take place on the other disk.

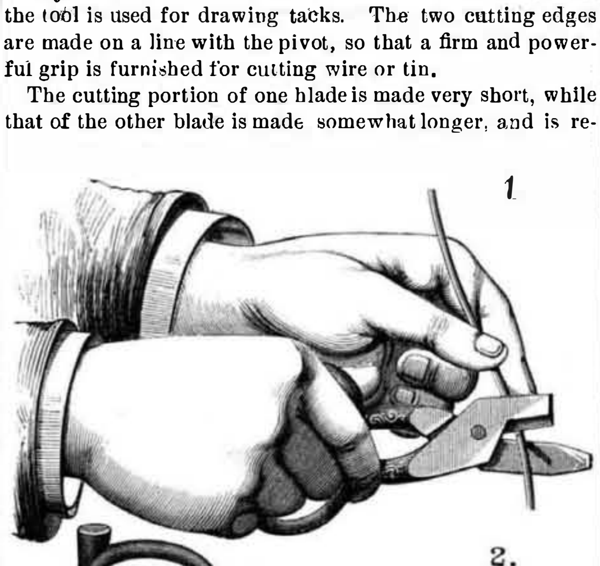


This invention has been patented by Mr. William H. Mitchell, Lebanon, N. H.

COMBINATION TOOL.

A novel combination tool recently invented by Mr. I. T. Torrey, of Beeton, Ontario, Canada, is especially intended for the use of railroad men for cutting the wires and tin clips used in sealing freight cars, and combines shears, tack hammer, claw for pulling tacks, and a screw driver. The blades are formed with bows similar to those of an ordinary pair of shears. One bow is formed with a hammer head, and the other with a claw so situated that the part of the bow just in front of the claw will furnish a fulcrum when the tool is used for drawing tacks. The two cutting edges are made on a line with the pivot, so that a firm and powerful grip is furnished for cutting wire or tin.

The cutting portion of one blade is made very short, while that of the other blade is made somewhat longer, and is reduced in width at its extremity, so as to form the screw driver blade. The construction of the tool will be readily understood from the engraving.



TORREY'S COMBINATION TOOL.

Melted Wool.

M. Heddebault has discovered a method of preparing soluble wool from tissues in which wool and cotton are combined. When subjected to a current of superheated steam, under a pressure of five atmospheres, the wool melts and falls to the bottom of the pan, leaving the cotton, linen, and other vegetable fibers clean and in a condition suitable for paper making. The melted wool is afterward evaporated to dryness, when it becomes completely soluble in water, and is called azotine. The increased value of the rags is sufficient to cover the whole cost of the operation, so that the azotine is produced without cost. It contains all its nitrogen in a soluble condition, and can, therefore, be compared to dried blood, which is worth 2·50 francs per kilogramme of nitrogen. M. Ladureau regards this discovery as one of great interest for agriculture and mechanical industry.—*Soc. Industr. du Nord.*

Waterproofing Fabrics.

Formerly some preparation of India rubber or gutta-percha was generally employed for rendering textile fabrics waterproof, but since that time many other and cheaper materials have been pressed into this service. Some of the processes are thus described in the *Polytechnisches Notizblatt*, No. 12.

Dujardin's process makes use of alum and sugar of lead. It is applicable to cordage and fabrics as well as to wood, leather, and paper. He takes of pulverized potash alum and crushed acetate of lead, each 20 parts, bicarbonate of potassium and Glauber's salt, each 12 parts, and pours over this mixture 3,000 parts of soft water, all by weight. He also dissolves separately in an equal quantity of water 9 parts of oleine soap, and then mixes both solutions. The articles are left in this solution until thoroughly saturated, allowed to drain, dried, brushed, and finally pressed.

For linen, leather, and wood he also adds margarine, 6 parts, and for cotton or paper some gelatine, 3 parts, and resin, 6 parts. Impregnation with this preparation, it is claimed, does not injure the colors. Alum and sugar of lead alone, or alum and caoutchouc, can be used for the same purpose.

To waterproof linen, the *Pharmaceutische Zeitung* recommends a solution of sulphate of alumina in ten times its weight of water, and a soap bath of the following composition: One part of light colored resin and one part of crystallized soda (sal soda) are boiled in ten parts of water until dissolved. The resin soap is precipitated with half part of table salt, and is subsequently dissolved along with one part of white curd soap in thirty parts of hot water. It should be put in wooden tubs for use. On made up articles the two solutions can be applied with a brush and then rinsed off.

According to Stenhouse, paraffine is excellent for waterproofing hempen hose and other things. The article to be treated is tightly stretched and heated over a hot plate of iron, and then rubbed as evenly as possible with a piece of paraffine. It is then pressed with a hot iron or between rollers, so that it will penetrate it thoroughly. Instead of using a piece of paraffine, the paraffine may be cast in a cylinder with a wooden core (like a printer's roller), and the goods drawn over it, pressing them down sufficiently. Or the paraffine can be rubbed on cold and then a hot iron passed over it. Paper can be saturated with melted paraffine on a warm plate of iron, the goods wrapped in it, and the whole pressed between hot iron plates or metallic rolls. Where long pieces of goods are to be treated, the process can be made continuous by passing the stuff over one, or more warm rollers that are kept covered with paraffine by running in a bath of melted paraffine. The excess of paraffine is removed by a scraper, a brush, or hot rollers.

When paraffine is employed in solution, the goods must be previously well and thoroughly dried, or the moisture will prevent the solution from penetrating within the goods and repel it.

A Great Loss from Spontaneous Combustion.

The origin of the disastrous conflagration which destroyed in a few minutes the other day the buildings of the Pittsburg Exposition, with all their contents, has been explained by a theory which is, to say the least, very plausible. It seems that Mr. Warner, the aeronaut, having an ascension to make, spent the day before the fire in repairing his balloon, and in revarnishing the canvas of which it was made with boiled linseed oil. As the most convenient place for his work, he chose the boiler room, and after the varnishing was complete, the balloon was rolled up and put by to dry. A more reckless operation than this it would be difficult to conceive, the warmth of the room, the rolling together of the canvas, and the boiling of the oil all conspiring to make the spontaneous combustion of the inflammable mass almost inevitable, and the opinion of the Pittsburg Fire Marshal will be concurred in by every builder, architect, insurance agent, and painter's apprentice, that the result was simply what ought to have been expected under the circumstances. The only thing that could have made the canvas more certain to take fire than simple saturation with linseed oil would have been to sprinkle it with water before rolling up, but this is by no means essential to the effect. It is, however, a very common factor in the cases of spontaneous combustion which occur every week or so. Some uninstructed person, having been engaged in painting or polishing woodwork, undertakes to save the cotton rag which he has been using by washing out the oil or paint, but after one or two trials, finding this a rather difficult operation, abandons the attempt, and rolls up the rag in a knot, and throws it into some corner, where the oil and water speedily react upon each other to set the whole in a blaze.—*American Architect.*

Electric Light Carbons.

M. Jacquelain has endeavored to prepare a pure carbon for electric purposes that should be as hard and as conductive as gas carbon. He first takes gas carbon, which he submits to four processes: (1) treatment with dry chlorine at a red heat for thirty hours; (2) treatment with hot alkali for about three hours; (3) immersion in hydrofluoric acid (1 to 2 of water) at a temperature of 15° to 25°; (4) carbonized by heating strongly in the vapor of a high boiling hydrocarbon, for commercial purposes gas tar will do well. All these operations may be performed after the carbon has been cut into sticks. By these processes the impurities have been reduced to a minimum and a good, pure carbon obtained.