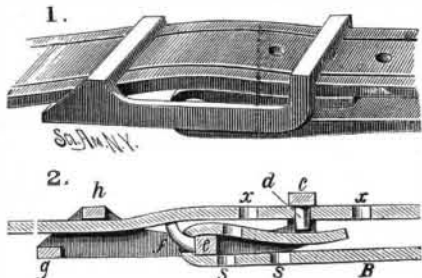


BUCKLE.

The buckle and fastener may be made complete in one solid piece, and consist of a frame composed of side bars united at one end by a raised cross bar, *c*, having a straight tongue, *d*, projecting from its inner side, an intermediate depressed cross bar, *e*, having a curved tongue, *f*, projecting in an outward and opposite direction relatively to the tongue, *d*, and an inner cross bar, *g*, and outer cross bar, *h*, at the opposite ends of the sides. To apply the buckle to a breeching strap, one end of the strap is looped over the bar, *e*, and a hole in it engages with the tongue, *f*; the end portion of the strap is then passed back under the cross bar, *c*, from whence it is passed through a ring and is then run to and under the bar, *e*, and engaged by a hole with the tongue, *d*, and from thence it is passed over the bar, *e*, and between the bars, *h g*. The construction and arrangement will be readily understood from the engraving, Fig. 1 being a perspective view, and Fig. 2 a longitudinal section. The buc-



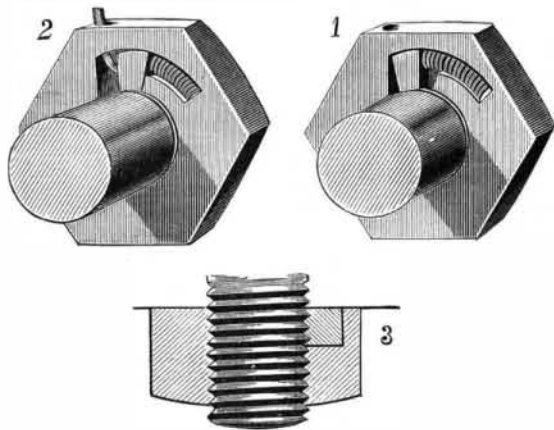
MITCHELL'S IMPROVED BUCKLE.

kle forms a very perfect self-fastener which may be cast in one piece without joint or tongue, and which, applied to a breeching strap, precludes all possibility of the horse's tail catching in it.

This invention has been patented by Mr. William F. Mitchell, of Williams, Ind.

LOCKING NUT.

The locking dog or block is fitted in a recess at the under side of the nut, the recess opening into the central aperture of the nut, and being formed on its outer face curved or inclined eccentric to the central aperture, so that the dog has two bearings—one against the surface of the bolt and the other upon the inclined side of the recess. The recess is extended at one side in a backward direction to receive a spring (shown in Figs. 1 and 2) that bears upon the dog so as to retain it in place and assist the locking movement. The dog, as represented in the engravings, is of angular form, the inner end being formed with thread sections to fit the thread of the bolt, so as to avoid injury to the thread and locks by a rocking movement. For the purpose of releasing the dog the nut is formed with a hole entering the recess at one side through which a key, as shown in Fig. 2, can be entered, and the dog pressed back into the wider part of the recess, when the nut can be turned backward. Fig.



SAMPSON'S LOCKING NUT.

3 is a section longitudinally through the bolt and nut. As will readily be seen, the dog holds the nut from any backward movement, but does not prevent its being turned forward for tightening or taking up wear.

This invention has been patented by Mr. General W. Sampson, of Springfield, Iowa.

The U. S. Railway Mail Service.

A recent report to the Postmaster-General reviews work in this department from 1842 to the close of last year. In 1842 the miles of railway mail service were 3,000, and the cost \$400,000; last year the mileage was 110,000, and the cost \$13,800,000; while at the present rate of growth, in the year 1900 it is estimated the mileage will amount to 200,000, at a cost of \$25,000,000. The ratio of cost to mileage has been nearly constant, but the speed has been greatly increased, it requiring 16 hours to take the mails from New York to Washington 40 years ago against 6 hours now. In 1839 the service was divided into three classes: first class, \$300 per mile per year; second class, \$100; third class, \$50, with an extra allowance of 25 per cent in all cases if one-half the service was performed at night. In 1867, when the railway mails were subjected to the process of weighing, astonishing inequalities were discovered. On fifteen routes where the pay was \$200 per mile, the greatest weight per day carried by any one road was 19,183 pounds, and the

least weight per day by any one road was 367 pounds, for which exactly the same compensation was received.

The first railway post office forced itself into use nineteen years ago. The previous system of distributing offices did not meet the necessities of the service. Experiments with railway or traveling post offices were therefore begun, and its economy has fully justified the new system. Taking the expenses of last year on the old basis, the cost of maintaining the distributing offices would have been \$8,000,000, or \$3,100,000 more than the new system, which is of immeasurably greater convenience, and avoids the delays of the old one. Forty years ago the mails sent out of New York in seven days weighed in the aggregate 19,000 pounds; now 19,000 pounds of mail matter on the average are sent out of that city by railroads every two hours, or about 150 pounds per minute.

Japanese Lacquer (Urushi).

HIKOROKURO YOSHIDA.

Urushi is the milky secretion of *Rhus vernicifera*, and is the material for the well-known Japanese lacquer varnish. The tree is cultivated in many parts of the country, throughout almost all latitudes, *e. g.*, at Dewa, Aizu, Hiroshima, and in many places about Tokio; the best urushi, however, is obtained at Yoshino. The tree is very similar in aspect to the ordinary wax-tree, and attains the height of 9 to 12 feet; trees about fifteen years old yield the largest amount of the juice. Two sorts of the juice are generally obtained from a tree, and by different processes; they are distinguished as ordinary "ki-urushi" and "seshime-urushi."

Ki-urushi (or raw lacquer) is the better of the two, and is collected best in June by making shallow cuttings in the stem of the tree, when it exudes as drops from between the outer and inner barks. A single tree yields on an average about 2½ grammes of this kind of juice. Branches and twigs of the tree, some of which are usually cut down each year, when steeped in water for some months and afterward warmed in the fire, give out an inferior kind of juice; this is seshime-urushi, which is used as under varnish after being mixed with some drying oil.

The juice is never sent to market in the form in which it comes from the tree, but is usually mixed with more or less of what is called "mokuyiki" (literally wood-juice), *e. g.*, what is ordinarily called Yoshino. Urushi consists of 60 per cent of the genuine juice with 40 per cent of mokuyiki, while the inferior quality contains as much as 70 per cent of the latter substance. Further, in the hands of varnish makers, some quantity of linseed oil is generally added to the already mixed juice, which, if excess is avoided, does not much impair the drying power of urushi.

Different colors are imparted to urushi by the addition of body pigments, such as lamp-black, vermilion, indigo, orpiment, etc.; thus red lacquer is prepared with 20 parts of linseed oil, 70 parts of urushi juice, and about 10 parts of vermilion, etc. Such is a rough yet general account of the extraction and preparation of urushi juice for varnish-making. The pure and unaltered urushi is a thick grayish fluid of dextrinous consistence, which under the microscope is found to consist of minute globules, some of darker, the others of lighter color, mixed with small particles of opaque brownish matter, the whole being held mixed in the form of intimate emulsion. It has a characteristic sweetish odor, and specific gravity 1.0020 (20° C.); some specimens, such as that obtained from Hachioji, contained a good deal of bark dust and other impurities, which raise its specific gravity as high as 1.038. If the juice be exposed to moist air in a thin layer at about 20°, it rapidly darkens in color and dries up to a lustrous translucent varnish. It contains a small quantity of volatile poison, which acts terribly on some persons, producing very disagreeable itching.

A peculiar acid, which I now call *urushic acid*, is the main constituent of the original juice, as well as of the portion soluble in alcohol. The juice also contains a very small quantity of a volatile poisonous body, which also passes into alcoholic solution, being almost completely driven out during the drying of the acid at 105° to 110°. It is a pasty substance of somewhat dark color, having the characteristic smell of the original juice, readily soluble in benzene, ether, carbon bisulphide, less easily in fusel oil and petroleum of high-boiling point, completely insoluble in water. Its specific gravity taken at 23° is 0.9851; it remains unchanged at 160°, and above 200° decomposes slowly with carbonization. Exposed to the air, it neither dries up, nor shows any sign of change as the original juice does, and in other respects it is a very stable body. From the alcoholic solution of the acid many metallic salts can be produced, most of which are slightly soluble in alcohol, but almost insoluble in water.

Gum is another normal constituent of urushi, and forms 3 to 8 per cent of the original juice.

As gum is insoluble in alcohol it is conveniently separated by treating that portion of the original juice insoluble in alcohol with boiling water, filtering, and finally evaporating the aqueous solution of gum over the water-bath till the weight of the substance remains constant. In this way a friable light colored substance is obtained, tasteless and inodorous; this is the anhydrous gum.

A mixture of gum and urushic acid (and with water) in the proportion in which they exist in the juice, does not undergo any change whatever, even when exposed to the condition most favorable for the drying of the lacquer. Moreover, part of the gum can be extracted in an unchanged state from the once perfectly dried lacquer; and since it exists in the original juice in the form of aqueous solution, it probably serves

to keep the constituents of the juice in a state of uniform distribution and intimate emulsion. It may also act as a binding material, and assist the adhering power of the lacquer when laid upon any surface.

The results, so far arrived at, may be summed up in the following statement:

Urushi juice (lacquer) consists essentially of four substances, viz., urushic acid, gum, water, and a peculiar diastatic matter; and the phenomenon of its drying is due to the oxidation of urushic acid, $C_{14}H_{18}O_2$, into oxyurushic acid, $C_{14}H_{16}O_3$, which takes place by the aid of diastase in the presence of oxygen and moisture.

Action of Dilute Hydrochloric Acid upon Starch.

BY DR. F. ALLIHN.

Starch cannot be entirely and completely converted into sugar by dilute sulphuric acid, but this can be easily accomplished, as Sachsse has shown, by dilute hydrochloric acid; and, besides, the latter does not decompose the grape sugar so easily as sulphuric acid. The author has recently made a series of investigations upon the saccharification of starch with hydrochloric acid to ascertain the conditions under which the largest quantity of starch should be most rapidly and completely converted into sugar with the least quantity of acid. In all these experiments twelve grms. of starch and 100 c. c. of dilute acid were employed, the acid containing from 1½ to 10 per cent of real acid. The reactions were made at the boiling point of each liquid over an open flame, with a return cooler. When the action was stopped the solutions were diluted and a solution of caustic soda added until it was but faintly acid. It was then made up to two liters, and 25 c. c. were taken out and the sugar estimated in this. The process of analysis was that devised and previously described by Allihn (*Chemiker Zeitung*, vii., 1193), namely, by using an alkaline solution of copper in excess, then filtering out the reduced cuprous oxide and reducing it to metal with hydrogen and weighing, then calculating it into sugar.

In his experiments the author employed potato starch, which contained 98.6 per cent of pure starch, 0.9 of ash, and 0.3 of insoluble residue. The results are given in the following table:

No.	Starch used.	Time.	Sugar formed.	Strength of acid.
1	12 grms.	2 min.	92.55 per cent.	10 per cent.
2	"	5 "	92.14 "	" "
3	"	15 "	91.74 "	" "
4	"	30 "	89.55 "	" "
5	"	50 "	87.37 "	" "
6	"	10 "	96.60 "	5 "
7	"	30 "	94.33 "	" "
8	"	50 "	93.27 "	" "
9	"	30 "	93.27 "	3½ "
10	"	60 "	94.65 "	" "
11	"	90 "	94.49 "	2 "
12	"	30 "	84.94 "	" "
13	"	60 "	93.68 "	" "
14	"	90 "	95.05 "	" "
15	"	105 "	94.89 "	" "
16	"	1 hr.	87.85 "	1½ "
17	"	1½ "	92.87 "	" "
18	"	2 "	93.84 "	" "
19	"	2½ "	94.65 "	" "

These results show that when the ten per cent acid is employed the percentage of sugar obtained decreased with the time, as the acid decomposes the sugar to a considerable extent on long boiling. Similar phenomena were observed with five per cent acid when the boiling exceeds half an hour. With three and one-third per cent acid the maximum quantity of sugar is obtained at the end of one hour, and with two per cent acid in one and a half hours, while one and one-third per cent acid takes two and a half hours, and no decrease is noticed then.

The best results were obtained with two per cent acid, which produces 95.02 per cent of sugar in an hour and a half.

Although hydrochloric acid, in spite of its great saccharifying power, may be for commercial purposes too expensive to get rid of after the sugar is made, this acid is very suitable for the preparation of pure glucose on a small scale in the laboratory, as the acid is easily removed by means of caustic soda or sodic carbonate. The crude grape sugar may be purified by recrystallization from methyl alcohol having a specific gravity of 0.810.—*Chem. Zeitung*.

Hunyadi Janos.

H. Fresenius analyzed the Hunyadi Janos water and found it to contain the following salts:

Sodium sulphate.....	19.662123
Magnesium sulphate.....	18.449451
Calcium sulphate.....	1.321953
Potassium sulphate.....	0.132943
Sodium chloride.....	1.421068
Magnesium carbonate.....	0.731347
Iron carbonate.....	0.002059
Silica.....	0.011218
Carbonic acid (semi-combined).....	0.383668
" " free.....	0.012683
Lithium.....	Traces.
Strontium.....	"
Nitric acid.....	"
Boric acid.....	"
Bromine and iodine.....	"
Nitrogen.....	"
Phosphoric acid.....	"

The carbonates are calculated as simple moncarbonates, and all the salts are anhydrous, *i. e.*, without water of crystallization. The cathartic properties are due to the salts of magnesia and sulphate of soda.

ENGINEERING INVENTIONS.

An improved platform for railway cars has been patented by Mr. Samuel M. Beery, of Omaha, Neb. The object is to devise means so the space between the ends of the platforms may be entirely closed, and to this end the invention provides a special construction of sliding platforms.

A car coupling has been patented by Mr. M. H. Merrill, of New Lebanon Center, N. Y. It has few and simple parts, may be cheaply made, and has a positive self-coupling action, so train men need not pass between cars to couple them; the coupling is of same size as the ordinary link and pin drawhead, and may be readily substituted therefor.

A torpedo holding attachment for railway danger signals has been patented by Mr. James A. Bonnell, of New York city. It consists in a bar or rod to hold the torpedo, and connected with the danger signal shaft, so that when the signal is set for "danger" the rod holding the torpedo will be operated, and the torpedo placed and held on the rail, so it will be exploded by a train passing over it.

An improved steam engine has been patented by Mr. Anton Eberhard, of Philadelphia, Pa. The cylinders are curved upon the arc of a circle, and have four pistons connected in pairs by curved piston rods, connected by levers with the slotted lugs of cross heads whose pivot arms carry the inner ends of pitmen, the outer ends of which are connected by crank pins with the fly wheels of the drive shaft.

An improved car axle has been patented by Mr. Francis P. Smith, of Boston, Mass. The axle is in two sections for independent action when running on curves; one part of the axle may turn freely in a sleeve, and revolve independently when running on curves, while otherwise both parts will be bound together and to the sleeve, so as to avoid slack and looseness, and making the divided axle as substantial as the common solid ones.

AGRICULTURAL INVENTIONS.

An improved cultivator has been patented by Messrs. George W. Lilly and James E. Norman, of Center, Mo. Its object is to keep the plows of each part of the cultivator frame at the same distance apart laterally, and at the same angle with the line of draught, whatever lateral movement may be given to the frame in guiding the plows.

A straw stacker has been patented by Mr. Joseph J. Cox, of Lawrence, Kas. It is intended for use in conjunction with a thrashing machine, and conveys the straw as dropped from the carrier of the thrasher to the rick where it is to be stacked. It may be drawn from place to place in the rear of the separator, or it may be permanently coupled thereto.

A revolving harrow has been patented by Mr. Thomas McClelland, of Mattoon, Ill. It has a frame carrying rollers with teeth for loosening the soil, and rollers with knives to cut up rods, clods, and lumps, cross bars to hold the knives to their work, a platform and its supports to carry the driver, and a depth regulating weight, the whole promoting thorough harrowing and easy clearing of the harrow teeth from rubbish.

A fertilizer, more especially adapted for tropical countries, has been patented by Mr. William R. Wilkinson, of Brooklyn, N. Y. It consists of special proportions of bone ash, gypsum, sulphate of iron, sulphate of potash, and dried blood. This fertilizer improves the soil permanently, and produces exceptionally large quantities of saccharine matter. The prepared ingredients in their specified proportions make a compound particularly valuable for orange culture and all tropical fruits and vines, promoting rapid growth, vigorous and healthy plants, increase in yield, and improved quality and flavor.

MECHANICAL INVENTIONS.

A pipe tongs, that may also be used as nippers and as a hammer, has been patented by Mr. James L. Strait, of Thomas, Mo. It is a cheap and strong tool, adapted for quick and easy use in grasping pipes, rods, or bolts, of different sizes, without adjustment.

A machine for forming and cutting links has been patented by Mr. Henry A. Iddings, of Warren, O. The object is to bend and cut the links at one operation, instead of using separate machines therefor. The cutting is done slowly, while the bar of metal is being forced around the mandrel, so the link bar is being made as it is cut, and with only a moderate use of power.

A machine for forming axle skeins has been patented by Mr. Andrew C. Emmick, of Columbus, O. This machine makes skeins ready for welding more rapidly and uniformly than can be done by hand, especially better as to part extending inside the collar, and this may be changed definitely from the round to the square form, to avoid dressing off the corners of wood axles to fit the skeins.

MISCELLANEOUS INVENTIONS.

Mr. Franklin B. Kendall, of Turnwater, Washington Ter., has patented an improved construction of odorless privies. It has a special arrangement and design of parts to prevent the escape of offensive odors.

A portable door fastener has been patented by Mr. E. F. Pfund, of Sacramento, Cal. It is adapted to be jammed in between the door and the casing and held by a part which is then set against the door, for which the inventor has devised a novel construction.

A machine for making match splints has been patented by Mr. Henry A. Steber, of Utica, N. Y. It consists of a peculiarly constructed die, in which the rows of holes are arranged parallel to planes traversing the die at right angles to each other, and their upper edges sharpened to effect the cutting of the entire block of wood into whole splints, in combination with other special devices and a novel arrangement of parts.

An improved pin tag has been patented by Mr. Oscar J. Cohn, of New York city. The invention consists in the peculiar construction, whereby the wire is bent to form lips with the ends inclined inwardly toward each other and away from the body of the wire, then bent laterally under and outwardly.

An improved pipe coupling has been patented by Mr. Robert McConnell, of Omaha, Neb. The coupling tube has a conical end with an enlarged screw threaded portion back thereof, a collared thimble made to form a female cone, a packing between the cones, and a flanged coupling nut.

An improvement in two wheeled vehicles or carts has been patented by Mr. Charles A. Foster, of Elkhart, Ind. The invention consists in supporting bars carried on the axle, and carrying the cart body on springs, so that it does not partake of the motion of the horse, and the vehicle rides easily.

An improved gas engine has been patented by Mr. Harmer Denney, of Brooklyn, N. Y. It has a special arrangement and construction of parts whereby the igniting gas jet can be cut off very rapidly and effectually, and so the concussion produced by the explosion cannot extinguish the igniting jet.

A safety oil tank has been patented by Mr. Samuel Lander, of Bloomington, Ill. This invention consists of a protecting device for the filling tube, faucet, and vent of submerged oil tanks, to protect these parts from fire and from danger of being struck by lightning.

A reservoir attachment for ammonia ice machines has been patented by Mr. Perry Small, of Guaymas, Mexico. It provides for separating the oil and black lead taken up by the gas in the pump, so the same will leave the reservoir perfectly pure, and the clogging of the pipes by the oil and plumbago is avoided.

A sheet metal fastener, formed from a single blank, has been patented by Mr. George W. Trapagen, of Glens Falls, N. Y. It is more especially intended for securing buckles upon harnesses, carriage tops, and the like, but may also be used as a clasp or staple for general purposes, being cheap, durable, and easily applied.

A buckboard wagon has been patented by Mr. John M. Mayer, of Rondout, N. Y. The buckboard works in combination with the axles and peculiar intermediate springs and braces in such a way that the article is made easy riding, strong, and free from rattling noise and lateral or forward and backward movement.

A magnetic call has been patented by Mr. Henry Thau, of New York city. It combines two or more pulls and pairs of electrical contact points, etc., and a pull having an inclined or beveled shoulder for operating contact springs, a toothed sector and magneto-electric machine, in contact with circuit wires and contact springs.

A cap or shield for buckle straps of carriage tops has been patented by Mr. George W. Trapagen, of Glens Falls, N. Y. Its object is to avoid the labor of stitching the caps or shields in place, and for this purpose the caps or shields have metallic flanges with tongues that can be passed through the material of the carriage top or curtain and clinched.

A press for sacking bran, sawdust, and other substances has been patented by Mr. Arthur L. Battson, of Morrisburg, Ontario, Canada. In connection with a receiving case to inclose the sack and keep it in position while being filled, is suitable mechanism for compressing the bran, saw dust, etc., and the sack is held in place until its cover is sewed on.

A miner's safety lamp has been patented by Mr. John L. Williams, of Shenandoah, Pa. There is a sleeve or tube on the wick tube and a wire extending therefrom into a recess in the bottom of the lamp, the wick tube having a flange with a notch for the other tube, and the whole so arranged that the lamp may be extinguished very quickly without opening.

A flour mill feeder has been patented by Mr. Peter Harnist, of Marine, Ill. It provides for a special construction and arrangement of parts to secure uniformity in feeding flour middlings, grain, and other substances to sieves and rollers in flour mills, whereby the feed is delivered in a wide, thin sheet, so as to be evenly distributed.

A machine for hulling and cleaning grain has been patented by Mr. Samuel K. Todd, of Eugene, Ind. It consists in a special construction and combination of parts whereby the machine acts upon the wheat by abrasion, to reduce the hulls to powder, and by atmospheric suction to withdraw the powder and other dirt.

A machine for making the bodies of artificial flowers has been patented by Mr. Louis Lafon, of New York city. In combination with a revolving needle or spindle, on which the ball is formed out of fiber, is a pattern plate with an aperture of the shape the ball is to have, and in which the ball is revolved while being made to give it the desired shape.

A dough or butter worker has been patented by Mr. William H. Bryan, of Warm Springs, Va. Beaters with handles are pivoted to work in a sort of pan or trough representing a section of a circle, in the arc of which they may also be moved laterally, so as to thoroughly work all the dough or butter between the beaters.

An automatic lamp extinguisher and wick trimmer has been patented by Messrs. Thomas J. L. Smiley and Charles H. Stombs, of San Francisco, Cal. The wick tube has a removable frame with an aperture carrying plates adapted to be opened by the wick in raising it, and so pivoted to the frame as to fall by gravity, so they are automatically closed when the wick is lowered, and the lamp is extinguished and trimmed.

An improved separable button has been patented by Mr. Albert G. Weber, of New York city. The stem secured to the outer disk or head has a groove, the stem being passed into a slot in the inner surface of the inner disk, where there is a locking spring, the object being to render the inner disk or head easily detached from or attached to the end of the shank or stem.

A frictional hinge for mirrors has been patented by Mr. James C. Blair, of Columbus, O. It consists, in combination with the frame of a swinging mirror, of an angular bracket with a split pivot, a second angular bracket with an orifice for the passage of the split pivot, and a wedge foreexpanding the split pivot, the whole to hold the mirror frame stationary at any desired angle.

A safety attachment for gunlocks has been patented by Mr. Jeremiah Deyo, of Denton, Mich. It combines great simplicity with a positive lock or hold of the hammer in one or more positions, and can be easily and rapidly adjusted. It consists in a simple lever or pivoted catch, with a standard for carrying and a spring for controlling it, the whole designed to prevent the premature or accidental discharge of guns.

A headway and leeway indicator for vessels has been patented by Mr. Burton E. Blakeslee, of Cambridge, Md. The invention consists of a device after the general principle of a ship's log, but is more especially designed to indicate the leeway of a vessel, the case being pivoted on its center, and combined with a relatively stationary pointer, so that the scale indicating leeway moves about the pointer.

A regulator for dynamo electric machines has been patented by Mr. J. Edwin Giles, of Hazleton, Pa. It is designed to obviate the difficulties arising from brushes running at a uniform speed, under different changes of current, and intended to insure a gradual movement of one or both of the commutator brushes under ordinary variations, and a very rapid movement of one or both brushes with a sudden and considerable increase in the strength of the current.

A key board attachment for musical instruments has been patented by Mr. Jethro M. Hooper, of Fort Smith, Ark. A perforated paper or metal web, with perforations corresponding to the music, is made to pass over a grooved roller; there are levers corresponding to the keys of the instrument, with bearing points on the keys, so they will drop through the holes of the perforated web by their own weight when the attachment is set in accordance with the design of the patent.

An improved gate has been patented by Mr. John B. Whiteman, of Centerville, Oregon. It has a long rearwardly projecting weighted top bar pivoted to a supporting post and resting upon a recessed cross bar with two tilting bars, the forward ends of the latter inserted in slotted side posts with spring catches; the spring catches have trip cords supported by bars attached to the side posts, so the gate can be opened by operating one of the trip cords.

A peanut cleaner and polisher has been patented by Mr. Charles W. Nicholson, of Assamossick, Va. This is an improvement on a device for the same purpose patented in 1881 by the same patentee and Richard H. Leigh, and consists in a special arrangement of a cylindrical brush within the cylinder of the machine, geared to run in a direction opposite to that of the cylinder, for more thoroughly cleaning the nuts of dirt and other impurities.

An improved form of carbon for electric lights has been patented by Mr. Walter C. Beckwith, of Allegheny, Pa. The ends of the carbons are so shaped with dovetailed slots and tenons adapted to engage each other, that they may be spliced one upon another, and will then burn right over the splice; there is in connection a holder in which the carbon is similarly fitted, and the arrangement is such that each carbon may be wholly consumed.

A process of coloring photographs has been patented by Mr. Charles L. Wright, of New York city. It involves the use of egg albumen, neutral sulphate of barium, chloride of ammonium, salicylic acid, and glycerine, printing, toning, and fixing in the usual way. Then softening the albumen with concentrated ammonia, and applying the colors in a mixture of albumen, salicylic acid, glycerine, aqua ammonia, and water, and setting the color in prints by passing them through a bath of alcohol, water, and nitric acid.

A process of producing artificial marble and rendering it fireproof and waterproof has been patented by Mr. Richard Guelton, of Brighton, Eng. The fabrication is by means of cements, gypsum, or alum, applied to polished surfaces or placed in moulds, fibers being applied to the surfaces to form the veins. An enamel is obtained by laying on one or more coats of varnish, exposing the article to heat after each coat, and by polishing the varnished surface with pumice stone and finally with tripoli.

An improved projectile for breech-loading rifled guns has been patented by Mr. John G. Butler, of Watertown, Mass. It is designed to allow of the projectile moving through the rifled barrel with less friction than usual, while securing a good enough fit to take the motion of the rifling, so the projectile has one or more circumferential grooves, in combination with sheet metal bands to fit said grooves, the ridges of the corrugations forming air spaces between the bands and the projectile.

A liquid tester, for taking a fair sample of oil or other liquid in any receptacle, has been patented by Messrs. J. O. Schubert and Van H. Bukey, of Parkersburg, W. Va. In combination with a tube of uniform diameter, and open at both ends, there is a valve disk carried by a spring-retained rod, and a vertically acting trip rod engaging therewith, so the tube may be inserted to any depth required in a liquid without agitating the same, and when withdrawn bring up a sample of its quality from top to bottom.

A barrel former has been patented by Mr. Thomas H. Lee, of Memphis, Tenn. It provides means for holding the two heads and the partition or hoop in line, means for preventing the rotation of the same and for holding the staves parallel with the axis, while they are nailed on to the partition or hoops. The same inventor has likewise obtained a patent for a ventilated barrel, in which the heads and staves are fitted in the ordinary manner, but there is an open space left between each two staves, and there is a central circular partition. The barrels can be easily taken apart and the material packed closely, it being designed to furnish a good means of conveying fruit to market and readily returning the barrels.

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