NEW TRAPLESS WATERCLOSET.

Noxious gases issuing from defective closets and sewerage connections are an intolerable nuisance, productive of disease, and always injurious to health.

The waterclosetillustrated in the accompanying engraving is designed so as to prevent efflux of these dangerous gases. Fig. 1 represents a sectional view of it, by which its peculiar construction will be easily understood. R is a detachable ring, which holds a porcelain non-corrosive valve seat; O, the overflow; T, overflow trap; W is a socket that can be closed with a cap or used as a connection with a washbasin waste; V is a socket for ventilator.

The feature of novelty in this closet is the absence of a trap between the basin and the soil pipe. It is, however,

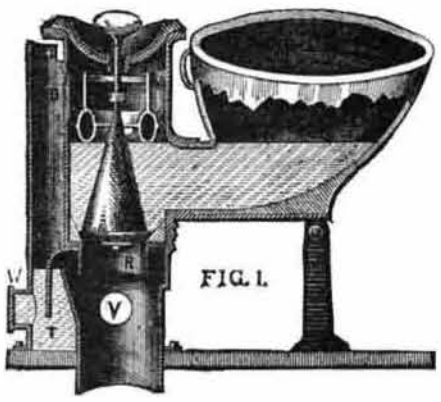


FIG. 1.

doubly protected by the tight seating ball valve and the water seal left in the basin after flushing. The overflow is trapped, as shown in the cut, with a sufficient depth of seal to resist any ordinary pressure, and much more than ever takes place in properly ventilated pipes. The valve of this "trapless" closet is regulated by a float, which makes it automatic and insures an abundant flush when the closet is in use. Cisterns and service boxes are unnecessary, but may be used as safeguards against the possible danger of fouling the service pipe when, from any cause, the head might fall below the closet level. The seat of the solid conical plunger is protected from corrosion by a porcelain non-corrosive coating, and the vent, V, relieves the soil pipe and overflow trap from any pressure of gas or foul air. This should always be provided in waterclosets, in addition to the ventilation secured by the soil pipe. This is a feature that should enter into all good plumbing work. There is no complicated mechanism about this closet; it is strong, simple, and, we are informed, efficient and inexpensive. It is the invention of Mr. Jennings, the well known sanitary engineer, of England. Further information can be obtained at the Jennings' Sanitary Depot, conducted by Mr. A. G. Myers, 94 Beekman St., in this city.

ASTRONOMICAL NOTES.

OBSERVATORY OF VASSAR COLLEGE.

The computations of the following notes, which are merely approximate, have been made by students in the Astronomical Department of Vassar College.

Position of Planets for December, 1877.

Mercury.

On December 1, Mercury rises at 8h. 9m. A.M., and sets at 4h. 53m. P.M. On December 31, Mercury rises at 8h. 37m. A. M., and sets at 6 P.M.

Mercury can probably be seen during the last week of December, after the sun has set, a few degrees north of the sunset point.

Venus.

On December 1, Venus rises at 10h. 45m. A.M., and sets at 7h. 43m. P.M. On December 31, Venus rises at 10 A.M., and sets at 8h. 23m. P.M.

Venus will be very brilliant all through the month; it will pass very near the moon, according to the *Nautical Almanac*, as seen at Washington a little south of the moon's limb on December 8.

Venus will be at its greatest eastern elongation on December 11, but will be higher in altitude later in the month.

Mars.

Mars is conspicuous all through the month, but is becoming smaller, and passes the meridian early in the evening.

On December 1, Mars rises at 1h. 10m. P.M., and sets at 0h. 53m. of the next morning. On December 31, Mars rises at 0h. 20m. P.M., and sets at 11h. 44m. P.M.

Jupiter.

Jupiter sets early and is so nearly in range with the sun that its satellites cannot be seen with ordinary glasses.

On December 1 Jupiter sets at 6h. 18m., and on the 31st at about 5 P.M.

Saturn.

Saturn, although it appears so pale and so small contrasted with the ruddiness of Mars and the brilliancy of Venus, is at present the planet of most interest to astronomers. The ring is so situated with regard to the sun and the earth that but little more than the edge is seen, but the numerous satellites which pass around Saturn, at different distances and at different inclinations, give great variety to the configurations. Some of these satellites pass along the edge of the ring, going around in a few days, and others are weeks in their circuit and depart long distances from the central body. Titan, the largest, can be well seen with an ordinary glass. It is now (November 16) on the right of the planet as seen in the telescope, and in seven days it will be on the left, and around again in fifteen days at the right.

On December 1, Saturn comes to meridian at 6h. 20m., and sets at 11h. 50m. P.M. On December 31, Saturn comes to the meridian at 4h. 28m. P.M., and sets at 10h. P.M.

Uranus.

On December 1, Uranus rises at 10h. 37m. P.M., and sets at 0h. 7m. P.M. of the next day. On December 31, Uranus rises at 8h. 37m. P.M., and sets at 10h. 8m. A.M., of the next day.

Neptune.

Neptune rises on December 1 at 2h. 48m. P.M., comes to the meridian at 9h. 30m., and sets the next morning at 4h. 12m. On the 31st, Neptune rises at 0h. 49m., and sets at 2h. 11m. A. M. of the next day.

New Use for Beet Molasses Refuse.

A promising new mode of producing cold has lately been described to the French Academy by M. Vincent. A short time ago he found that, by distilling the residue of molasses of beet, he could prepare large quantities of chlorhydrate, bromhydrate, and iodhydrate of trimethylamine. He has now shown how it is easy to pass from this body to chloride of methyl, and he insists on the applications of which this latter compound is capable: At 33° below zero (C.) it liquefies, and nothing is easier than to keep it liquid in sealed tubes. If it then be caused to evaporate—*e.g.*, by sending a current of air through the mass—a cooling is obtained which goes down to — 55°. Mercury immediately congeals in such a medium. This method of producing a very low temperature is, moreover, a very cheap one.

DORR'S ADJUSTABLE HAT AND COAT RACK.

We illustrate herewith an improved adjustable hat and coat rack, which may be constructed of either wood or metal and in a variety of styles. The hooks, it will be noted, slide upon parallel rods of polished metal, and can be placed either near together or far apart, as desired. The rods are secured in handsome brackets of either metal or wood. Fig. 1 represents the single rack; Fig. 2 is an ornamental form of metal rack; and Fig. 3 has a wooden bracket in the fashionable Eastlake style. Each rack may be easily taken to pieces for convenience in packing or shipping. The device is exceedingly strong and durable, and is a neat and handy substitute for the ordinary large and expensive stand.

Fig. 1.

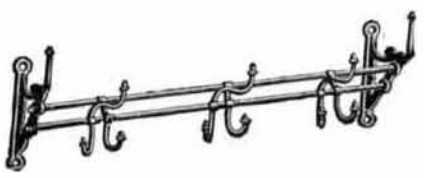
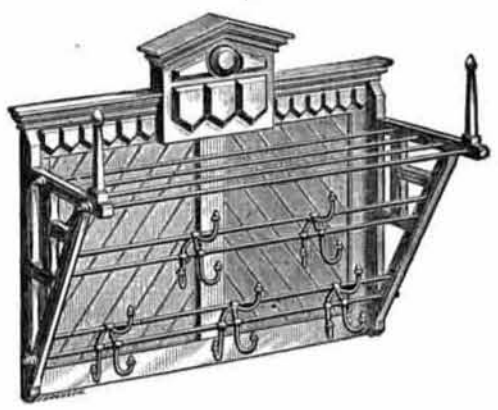


Fig. 2.

Fig. 3.



For further particulars relative to agencies, rights, etc., address the Dorr Hat and Coat Rack Company, 542 Broadway, Albany, N. Y.

The New Tea Region.

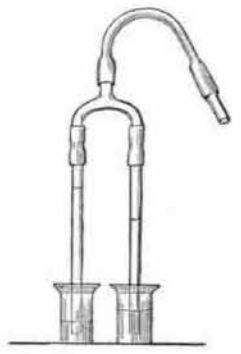
The tea trade is generally considered as being the exclusive business of China and Japan, and tea from other countries is apt to be looked upon with suspicion as a spurious article. Seventeen years ago the first tea plantations were established in Assam, and the growth of tea in India was regarded merely as an experiment. The trade steadily increased until, from 1,300,000 lbs. of tea in 1861, the export from Calcutta advanced to 25,000,000 lbs. in 1875. The cause of the poor quality of China teas of late years lies in hasty preparation, with a view of bringing the teas early to market. Small farmers grow from 50 to 500 lbs. of leaf, and carry it off to a market. If they fail to sell it here they take it to others, and in the meantime the unfired leaf is spoiling fast by exposure to the air. In India the planting, picking, and firing are done more systematically, and consequently a better quality of tea is produced.

A Special Specific Gravity Apparatus.

BY JAMES TAYLOR.

It is often desirable to ascertain approximately the specific gravity of a liquid in cases where the hydrometer and specific gravity bottle are not applicable, or would take up too much time. The following contrivance answers very well for this pnrpose, is very readily applied, even with tolerably small quantities of liquid, and easily gives results correct to the first decimal place.

Two straight pieces of glass tubing, 5 to 10 m.m. bore and 250 m.m. long, are joined by caoutchouc tubing to two ends of a T-joint which have been bent so as to be parallel. The third end of the T-joint has a piece of caoutchouc tubing of convenient length slipped on, and this is stoppered by means of a bit of glass rod. Two small beakers, a rule, and any convenient stand arranged so as to hold the long tubes vertically, complete the apparatus.



Its application is almost obvious. On pouring a little distilled water into one beaker, and the liquid whose specific gravity is to be determined into the other, bringing the beakers under the two vertical tubes so as to immerse the ends of the latter in the respective liquids, and partially exhausting above, the liquids will rise to heights depending on their relative densities. The plug is now inserted, the lengths of the liquid columns are measured, and the specific gravity required, is obtained by dividing the length of the water column by that of the other.—*Chemical News.*

NEW INVENTIONS.

A new Gasket, patented by Cyrus S. Stoy, of Butler, Ind., consists of two thin annular metallic plates, joined together at their inner edges, having a space between them for a coil of packing. In taking the joint apart, there being no part of the elastic packing in contact with the face of the joint, it may be readily removed without injury, and may be used many years without renewing.

A simple Wire Stretcher, the invention of D. A. Smith, of Marak, K., consists of a forked casting having a squared upper end for receiving a wrench, and perforated ears for receiving a nail that prevents the wire from unwinding after being tightened.

An ingenious Automatic Toy Figure of a Man, invented by John Schwippl, of Brooklyn, N. Y., performs somersaults in an amusing manner. A spring inside the body works a geared shaft, imparting a rotary motion to the arms, which causes the body to roll over and over.

An Iron Fence Post, patented by S. S. Crocker and Albert Wilcox, of Clarence, Iowa, has notches on the front edges of the upper part to receive the fence wires. In the bends and angles of the concave post are holes to receive the hook bolts by which the wires are locked together. By tightening the nut of the bolts the wires are drawn into the hollow of the posts, so that they cannot change their position. This invention will be of great service to farmers.

Cellar Bottoms are generally easily permeated by noxious gases exhaled from the earth, or crack from the pressure of gas beneath. To remedy this difficulty Tobias New, of New York city, has patented a vent for the gases. A narrow channel is constructed at the bottom of each cellar wall under the flooring, from which arises an escape pipe, and thence to the roof of the house. By means of this improvement cellars are freed from noxious gas and are rendered healthy.

A neat Basket, invented by J. J. Cole, of Hillsdale, N. J., consists of a single piece of veneer or similar material cut so that when folded together at the ends it may be fastened at a single point, where a handle is also affixed. It will prove very convenient for carrying berries or small groceries.

Abraham Morris, of New York city, has invented an improved Sofa Bedstead. A swinging seat section is hinged to the lounge frame and a head section is swiveled centrally to the swinging section, and connected at the upper rear corner by a strap with the head section of the lounge frame. The head section has a supporting front foot that fits into recesses of the lounge frame. It is a convenient article to have in the house.

A new Water, Grain, and Earth Elevator, patented by Levi Gallaher, of Businessburg, O., has an endless chain of lifting buckets, which are connected together by open links, a lower drum having scoops affixed to it, and which supply the buckets of the chain with the material to be raised. The upper drum has chutes so arranged as to register with the buckets of the chain and guide the water to the receiver. It promises to be an invention of much advantage.

A new Gas Burner Regulator, patented by Eugene Ginss, of New York city, consists of a hollow cylinder screwed on between the burner and gas fixture. Two conically bored nipples are screwed into the bottom of the cylinder and communicate with the interior of the socket. These nipples direct the head of gas against the side of the cylinder, thus

arresting the solid particles. The passage of gas through the nipples, and its expansion in the cylinder modify the pressure so that a uniform light is secured, blowing avoided, and gas economized.

In a new Process for Tanning and Dyeing Leather, invented by Gonzalio De Cordova and H. N. David, of Brooklyn, and Morris Wise, of New York city, an extract of the leaves of the pimento or allspice tree are used. The tanning is rapid and a rich brown color is produced.

Ira A. Paine, of New York city, the well known shooting expert, has patented a new glass ball for trap shooting. The ball is of the usual kind, but filled with feathers, so that when hit it will produce the same effect as when birds are struck by shot. It also enables a marksman to see the effect of his shot, the smoke having time to disappear before the feathers can possibly reach the ground.

The ordinary Billiard Bridge in common use is deficient in many respects. To obviate these difficulties F. E. Doughty, of New York city, has patented a bridge by which the cue may be supported in any desired position above the bridge by merely turning the handle of the bridge. The bridge has a central vertically sliding and guided cue rest, that is raised or lowered by a pinion connected to the end of the bridge handle, and intermeshing with an interior rack of the sliding rest.

Samuel H. Emanuel, of Gloucester, Mass., has invented an improvement on his Combined Overalls and Jumper. The material forming the front of the garment is entire and without transverse seams. The back is divided across the waist and a flap is formed in the overalls, which is supported by three elastic buttoned straps attached to the inner side of the jumper. A band sewed to the jumper over the waist gives it an appearance of a separate garment. This is a neat and desirable article of clothing for working men.

An improved Watch-case Spring has been invented by D. C. Voss, of New York city. It consists of an ordinary spring, but with the hook end turning on a fixed rivet or pivot of the spring, so that the hook end of the catch may be readily locked to or released from a recess of the watch case. The spring lasts longer and is more easily repaired than the old style.

A Coffee Roaster, the invention of A. R. J. Langer, of Mount Olivet, Ky., consists of a sheet iron cylinder with a shaft extending axially through it, upon which arms or rings are arranged radially at different points. These arms extend nearly to the inner surface of the cylinder, and serve to thoroughly stir the kernels of coffee as the cylinder is rotated, so that the whole mass is equally acted upon by the heat.

A Detachable Cuff, invented by E. K. Betts, of Lansingburg, N. Y., furnishes an ornamental and strong article of wear. It consists of a continuous back part, sectional intermediate layers, and front parts, and of a face strip that connects the intermediate and front sections, and is extended over the end of the cuff and down at the back to form stays for re-enforcing the button holes at the points of greatest strain.

Another Cuff, patented by the same inventor, is made with the back cut narrower than the other parts, so that the cuff may be sewed on both sides, and all the fullness will be taken up by the edges and a superior bead formed on both sides. The back extension is turned inward and thus strengthens the button holes.

A Fence Post, the invention of G. W. Chandler and S. H. Ceering, of Moingona, Iowa, fits into a bell-shaped base of hard clay and is bolted at the bottom. The base is filled with earth to make it secure. It is an inexpensive plan and makes a strong fence.

A Liquor Shaker and Strainer, invented by W. H. Trepus, of Chicago, Ill., will be a great convenience to bartenders. In the cover, with screws on the cup, is formed a strainer, covered with a close fitting cap. In the bottom of the cup are two small holes covered with a valve, the stem of which passes through a hole in the bottom, fitted with a spring and ends in a knob. When the ingredients are shaken up in the cup, the cap of the strainer is turned back, and by pressing the knob of the valve stem, air is admitted and the contents can be poured out.

A Nursing Apparatus, invented by G. F. White, of Middletown, is intended to prevent sore nipples. The mother's milk is drawn off by a simple device into a vacuum bulb, whence it is sucked by the infant while the milk is still warm.

A new Window Shutter has been invented by W. S. Everett, of Hyde Park, Mass., which provides for ventilation while a protection against the sun and storm. It can also be turned into an awning. It consists of an outer and inner shutter frame, the latter so hinged to the upper end of the former as to be thrown outward, while side wings close the the sides. The shutter slats have supplementary slats which are thrown up when the shutter is inclined, thus excluding the sun and admitting ventilation. It is a desirable improvement to a house.

A Broom Rack invented by S. W. Sheldon, of New York city, has three rod-connected disks, the upper having notches, the middle one holes, and the lowest disk a beveled edge. It is easy to use and answers the purpose well.

An Evaporator, patented by J. M. Randolph, of Somerset, O., consists of an evaporating pan, extending around the top, sides, and bottom of a sliding firebox, whose main smokepipe passes the cleansing tub to heat up the liquid therein, preparatory to its being let into the pan. The firebox is open at the front through the evaporator. A second smokepipe registers with the fire through the evaporator. It used up all the heat of the fuel and is thus economical.

In a new Hat Die, invented by R. L. Goddard, of Palmer, Mass., the shell is provided with holes in the top through which steam is admitted. A cross bar is secured detachably to its top by screws, the ends of which overlap. The die is kept from being drawn up too far by a flange formed around its lower edges and which fits into a rabbet in the lower side of the shell. It is a convenient device.

A new Grain Tally has been patented by Phillip Thomas, of North Huron, N. Y. To the forward end of the operating lever of the hopper is pivoted the upper end of a connecting rod, the lower end of which is pivoted to the forward part of the bottom. To the forward edge of the hinged bottom is pivoted the middle part of a bar which passes through the guide keeper, attached to the upper part of the hopper. The measure cannot be removed without operating the register. It is a simple and accurate device.

A Bung Extractor, the invention of W. A. Wiley, of Allegheny, Pa., consists of a spindle carrying at its lower end a a wood screw. To the stand which supports the spindle a forked lever is attached which draws the bung. It is easily and quickly operated.

An improved Spring Seat for wagons has been invented by L. J. Bazzoni, of Newburgh, N. Y. It consists in suspending the bottom of the wagon body from the reach bars of the seat, the bars being supported at their ends upon strings. The bottom and seat are thus elastically connected, and the driver is saved from shocks.

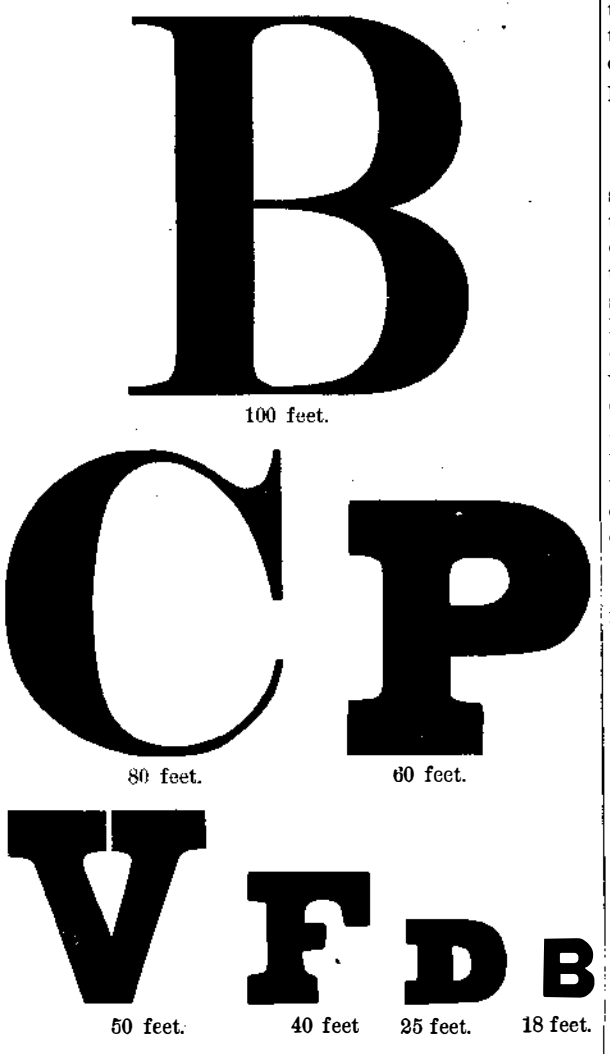
A Wharf Lamp has been invented by L. L. Wilson and L. S. Reagle, of Centre Point, Iowa. A horizontal bent tube with stop cock extends from the oil reservoir and is plugged, the sides being perforated for a short distance near the end. A wire gauze tube, containing an asbestos filling, surrounds this point. The asbestos wick is indestructible and is easily changed when dirty.

Mr. James F. Callaway, of Louisville, Ky, has devised an improved Apparatus for Heating all Classes of Railway Passenger Cars by Steam, derived from the locomotive boiler. A steam pipe leads from the dome of the locomotive and traverses the floor of the cars, the main pipe extending along the sides or middle of the vehicles, and branches leading laterally beneath each seat. Ingenious valves are arranged for allowing escape of water of condensation and controlling admission of the steam

Tests for Vision.

Dr. B. Joy Jeffries, 15 Chestnut street, Boston, Mass., is desirous of ascertaining what proportion of people with normal eyes, that is, who do not wear glasses for distant objects, and also of those who have their focus perfectly corrected for distant objects by glasses, are gifted with a visual power above what is now considered good average vision, called vision *one*.

The following letters are selected as nearest in size to the test letters used by oculists all over the world. The letters should be hung up in a good light; and those of our readers who are able to see them distinctly, further off than



the number of feet marked against each (which would be normal vision), are kindly requested by Dr. Jeffries to send him as above this information on a postal card, simply stating which letters were read and at what distance. From this he hopes to compile and publish some important data.

German Coal.

Hamburg has been the scene of a rather novel exhibition, that of German coal, which we are told, has excited much interest among German patriots and commercial men.

The idea that Germany should endeavor to emancipate herself from the English market and produce her own coal has, it appears, acquired a powerful hold upon the national imagination, and hence the promotion and development of the German coal trade has come to be looked upon as a matter of patriotism. It is also alleged that Westphalian coal is superior in heating power to English, and Senator Godeffroy, in his address on the occasion of the opening of the exhibition, even made it appear that Germany is in possession of coal fields incomparably larger than any that Englandcan show. The Westphalian coal basin alone, said M. Godeffroy, is capable of producing for seven centuries to come the same quantity of best coal annually that all England now yields, and beyond this, the basin is not yet fully explored, and is probably capable of material extension. With all these supposed advantages Germany has not yet been able to beat England out of the field on her own ground. The city of Hamburg imported in 1876 about 1,500,000 tons of coal, of which about six sevenths were the produce of England, and only one seventh of home production.

Wooden Money.

Advocates of inconvertible paper currency may perhaps derive some satisfaction and encouragement from the fact that from the reign of Henry I. down to the period of the establishment of the Bank of England the legal tender money of England was fabricated out of wood. This instrument was called an exchange tally, and by virtue of it the holder was entitled to receive from the Crown the value inscribed thereon. It really consisted of one half of a four sided rod or staff, on which, when in its entire state, the sum it purported to represent was carved in transverse notches, varying in width for thousands, hundreds, scores, pounds, shillings, and pence. These signs were for the unlearned; for the advantage of those who could read, the sum was written in ink on two opposite sides of the staff, and, finally, with a knife and mallet the staff itself was split in two longitudinally. One half, called the tally or check, was given to the person for whose service it was intended; the other half, called the counter tally, was laid up in safe keeping until its corresponding tally should be brought in by the person who had last given value for it. Its intrinsic value was, of course, only that of the wood on which it was composed, but by representation it denoted large sums. It was a current token of real money, and served actually to distribute it from man to man by this exchange. From this primitive tally was derived the Exchequer Bill, first introduced in 1696 by Mr. Montague, the Chancellor of the Exchequer. The word "bill," too, was no doubt obtained from the Norman French word, *bille*, which means a staff. Bank post bills and bills of exchange in our own day came from the same wooden base, and soldiers are said at this hour to be "billeted," because formerly they tendered wooden "billes" or tallies to the victuallers upon whom they were quartered. In olden times officers of the army who were taken into the king's own pay were said to be put on the staff, that is, they were paid with exchequer tallies, or wooden money.

An Unknown Narcotic Plant.

I am tempted to notice a plant that grows here of such strong narcotic powers that, in the hands of a skillful practitioner, it will produce coma of any intensity or duration, or even death itself when so intended. The knowledge of this plant is confined to a few families, who transmit the secret as an heirloom from generation to generation, and the heritage is highly prized, confirming it is thought the power of miracle workers and priests. For the plant is in many ways used in aid of solemn imposture, superstition, and even crime. The power thus exercised is called "wanga," a word that mspires the African with awe and dread. The wanga priest can throw into a death-like coma, and knowing the moment of returning consciousness, he will make a show of recalling to life. If a burglary is to be committed, he can, by means of his art, cast a deep sleep on all indoors; and one may understand how he can attain other forbidden ends in the same way. An experienced botanist could not fail to discover this plant, which, as an anæsthetic, would no doubt prove a valuable acquisition to medical science.—*Major R. Stuart, Port au Prince.*

Bullet Making.

The manufacture of bullets is not so simple as it used to be. At Woolwich, England, the melted metal is poured into a receiver, and as soon as it solidifies, but before it is cold, it is forced by hydraulic pressure through cylindrical holes in the form of long strings. This process is to prevent the formation of air bubbles in the bullet, which would cause it, when fired, to swerve from its course. The leaden strings are thence carried to the bullet moulding department, where they are cut into lengths and roughed; then shaped in one machine, and finished in another. They have now to be plugged. These plugs were formerly made of wood, but are now prepared from a special powder, which solidifies after being pressed into form.—*Ironmonger.*

INK stains in cotton or linen can be removed by washing in salt and water. This should be done before the fabric is washed with soap.

New Agricultural Inventions.

A new Butter Mould has been devised by Mr. Augustus W. Faris, of Red Sulphur Springs, West Va., which presses out the milk and water from the butter and forms it into neat packages of uniform size, so that it can readily be stowed in boxes for transportation, and for the retailer.

Mr. Philip Leitz, of Baton Rouge, La., has patented a Machine for Cutting Sugar Cane, or Corn, Cotton Stalks, and Stubble. As the apparatus is drawn forward, upper knives first meet the cane and cut off the tops, and then a lower set of knives cut off the bottoms. These knives may be adjusted to work higher or lower, with reference to the ground. The new features consist mainly in the mechanical construction.

A novel Ditching Machine, devised by Mr. Peter N. Fowler, of Smith's Mills, Ky., embodies seven new devices. In rear of the machine is a large wheel having a wide smooth-faced rim. Around this passes an endless chain of buckets formed of sharp edged steel bars. As these begin to rise at the lower side of the wheel, the soil within them is separated from the ground by the edge of the plate, which retains the material in the buckets as they pass upward.

Mr. John J. Smith, of Unionville, Mo., has patented a new Sulky Harrow, which adapts itself to the surface of the ground, however uneven said surface maybe. Its parts may be separately or simultaneously raised from the ground in passing from place to place or to clear obstructions.

A new Grain Separator for Thrashing Machines, invented by Mr. James M. H. F. Shepler, has an improved straw carrier by which all the grain that passes over or through the separator is saved and returned to the grain elevator of the thrasher. Another device prevents the choking of the riddle and keeps the same perfectly clean around and below the stacker.

Mr. John F. F. Porter, of Booneville, Miss., has patented a new Fastener for Colters and Plow Standards. It may be applied to any kind of a plow, is not liable to break or get out of order, and holds the colter or standard firmly in place. The colter may be raised or lowered as desired.

Mr. Royal W. Barnard, of Fayette, Iowa, has devised a new Butter Worker. It is made in the shape of a foot, one portion of which is made flat for packing, and the other portion has flanged edges to scrape down the butter from the sides of the tank, and also to prevent the grinding of the grain of the butter by not permitting washing or rubbing of the same.

New Mechanical Inventions.

Messrs. Nimrod Gooder and Bernard Lavin, of Kansasville, Wis., have devised an improved Machine for Punching and Shearing, which enables cold punching, shearing, and similar work to be conveniently and efficiently performed. The new feature resides in the combination of a vertically guided and interchangeable tool with a pivoted actuating cam lever, and interchangeable equalizing plate acting on the top of the tool and with a pivoted spring engaging the lower part of the tool. By retracting the spring the tool may be easily changed.

An Improved Rock Drill has been invented by Mr. W. W. Gaines, of AuSable Forks, N. Y. Ordinarily the serpentine groove which gives motion to the slide valve in these machines is formed of a single segment of a cylinder made of hardened steel. In the present instance it is made of two separate pieces of metal. This is claimed to obviate the danger of the segments cracking and admits of their easy removal from the piston head when they wear out.

A new Car Coupling, devised by Mr. Christmas P. Byrd, of North Cambridge, Mass., has a releasing lever which extends down to the drawhead and throws back, by the concussion of the latter, trigger mechanism so as to release a sliding pin and drop the coupling pin into the drawhead and link for coupling. The coupling link is held in the required position for entering the opposite drawhead by a crank screw and head adjusted from below the drawhead.

A curious and novel device is a new system of Buoyant Propeller Wheels for Vessels invented by Mr. Laurence Brown, of Chatham, New Brunswick. A number of airtight polygonal drums are arranged to turn in bearings on a supporting frame, upon which frame the saloons, etc., are erected. By suitable machinery these drums are revolved and cause the propulsion of the entire structure, on the principle of an airtight float or box which, when upset or turned, will change position and move over to the side towards which it falls.

Mr. Ezekiel Delano, of Greenwich, Conn., has devised a new Addressing Machine, wherein devices are embodied for addressing papers and packages rapidly without the sticking of the label strip so as to clog the machine, and also for removing the papers or wrappers. The construction is very ingenious and well calculated to save time and labor.

Mr. Henry D. Rodgers, of New York city, is the inventor of the latest machine for making car conductors honest. It is a Fare Register, shaped something like a large watch and containing a bell and a moving strip of paper, which last passes from one spool upon another. On the paper are marked numbers indicating the number of fares received, each number being greater than that preceding by the sum of one fare. When the conductor pushes down a follower, the bell is sounded and the paper moved to the second spool. At the same time one of the numbers marked on it is perforated by a needle. The last number found punctured represents the total of fares taken. The device is of exceptional ingenuity, and is well calculated to check the thieving proclivities of even the most conscienceless of conductors.

Those of our readers who may desire further information concerning any of the above described inventions, can obtain the same by communicating with the inventors at the addresses named.

A New Dyestuff from Anthracene.

A mixture of glycerin and concentrated sulphuric acid reacts upon the dyestuffs derived from anthracene and produces new compounds, which likewise possess coloring properties. As yet only alizarine and mono-nitro-alizarine have been tested in this respect. By heating a mixture of 1 part of alizarine paste, 2 parts of white glycerin, and 2 parts sulphuric acid of 66° B., the liquid becomes rapidly dark brown, and a large quantity of gas is evolved containing sulphurous acid and acroleine. The temperature is kept for some time at 200° C. (392° Fah.), in order to accomplish a perfect conversion of all the alizarine. It is then allowed to cool, the product poured in a large quantity of water and filtered. The dark yellow, insoluble residue is washed several times with hot water, then taken up cold by a mixture of equal parts alcohol and water, in which the new dyestuffs dissolve. The shades of red and pink which they yield in dyeing are more yellowish than those of alizarine, the violets are more bluish, and the browns more reddish, while the blacks are also finer than with alizarine. With ammonia and carbonate of soda it yields an orange-red solution, while alizarine with alkali dyes purple. If alcohol is added to these solutions they become dicroitic, namely, in transmitted light red and by reflected light green. It reacts toward alum the same as alizarine, and also resembles it in its other physical properties, such as its reaction toward soap, acid liquids, chlorine, etc. With like treatment the mono-nitro-alizarine produces peculiar results. On treating the washing water with caustic soda, a dark indigo blue precipitate is thrown down, which is reduced by tin salt and caustic soda solution to a pink liquid, which becomes covered with a greenish blue lustre. The precipitate collected upon the filter consists of two different substances, which may be easily separated by a cold mixture of alcohol and water. The substance, easily soluble in this, dyes violet with alum mordants, bluish-black with strong iron mordant and a mixture of iron and alumina, and bluish grey with weak iron mordant. The other and less soluble substance dyes quite a fine black, a grey violet, and instead of red a pink, and for brown a catechu brown without any red admixture. Both dyes resist soap well, chlorine not so well, and are destroyed by strong acids.

Dyestuffs of the anthracene series are known already which produce a violet with alum mordant. One of these is obtained by the action of ammonia upon anthrapurpurine in closed vessels, and has been found by Perkin in crude alizarine. It seems to be identical with the purpuramid of Stenhouse. The other was put into the market about a year ago by Gauhe & Co., of Barmen, under the name of "anthraviolet," but possesses no special interest from an industrial point of view. According to N. Potier's investigations (*Soc. Ind. de Rouen*, Sept. and Oct., 1876), this anthraviolet dyes uneven and with difficulty, and the colors produced do not withstand either soap or chlorine

A dyestuff which yields a series of colors similar to those given by Campeachy wood, and which can replace them, specially by the very fugitive steam dyes, would be of special interest. Both of the dyes obtained from nitro-alizarine by the author seem to satisfy these conditions. As regards the constitution of these substances, the author thinks that in their production the molecule of glycerin takes part in the reaction, and therefore they may perhaps be regarded as glycerides. He reserves to himself the right to subject the other dyestuffs of the anthracene series, such as purpurine, isopurpurine, etc., as well as the non-dyeing members of the series, anthrachinone and nitro-anthrachinone, to the same treatment.—*Bulletin Société Chimique.*

Poison in the Oven.

Sixty-six persons living in the neighborhood of the Parc Monceau, Paris, were almost simultaneously seized with symptoms of lead poisoning. The attention of a sanitary association was directed to the epidemic and a long investigation was then undertaken as to the cause of so many disasters. The water, wine, and groceries used by the sufferers were found to be unimpeachable. It was discovered however that, with two exceptions, all the patients had bought their bread from the same baker, and as to the two exceptions they had unwittingly consumed bread in an eating house which was supplied by this baker. The baker himself and his assistants were more severely poisoned than the majority of their customers. This led to an examination of the stove, and the places that would come in contact with the outside of the bread, and it was then finally revealed that the baker burnt wood brought from old houses recently destroyed. It had constituted the wainscoating of the house and was covered with several layers of paint, which the heat converted into pulverized oxide of lead, and which naturally adhered to the moist surface of the loaves. In consequence of this discovery a regulation has been issued by the Prefecture of Police forbidding bakers to heat their ovens with wood derived from old houses.

Roumanian Amber.

One of the natural products of the Danubian Principalities is amber, which, however, differs totally from the German product found on the shores of the Baltic Sea. Both are the fossil resins of antediluvian trees, and agree in chemical composition, but differ in color. German amber is found only of light colors—yellow, white, and pink—while Roumanian amber is red, pink, brown, blue, green, and black. These colors are frequently found mixed in a single piece, and we also have lumps with silver colored veins and gold specks. On account of this variety of colors, the Roumanian amber is highly esteemed, and darker and more beautiful pieces are more costly than yellow amber, especially as they are more rare.

The Flight of Partridges.

To the Editor of the Scientific American:

Why is it that a covey of partridges cannot fly across the Mississippi river? At this point the river, during low water, is 1,200 yards wide, and 50½ feet above tide water. I have seen whole coveys go down into the water at 600 yards; though in hunting I have seen single birds go nearly as far to windward, until they rose to the height of 40 feet, and then follow the wind to cover. A covey started from immediately below Natchez, Miss. (an altitude of 260 feet) to fly across the river (at that point the river is 1,000 yards wide). They came "like shot," almost describing a "bee line" from the altitude to the bed. They were unable to perch, and what were not killed by striking the houses, were picked up exhausted (October, 1871). They hatch here during May. Frequently the nests are broken up in April; they then continue to lay and hatch and bring their broods out during August. In the case cited at Natchez, Miss., they were old birds, or rather of the May brood. I have seen coveys, during the first quarter, fly from drift pile to drift pile, and accomplish their migrations in that manner. Drift does not generally run in the Mississippi river, only from November to June. Their migrations are always westward.

Bartlett's Bayou, La. C. F. S.

Testing Wool by Entomological Knowledge.

A practical example of the value of a knowledge of entomology in connection with commercial transactions is afforded by M. Viret's suggestion in the *Journal de l' Agriculture*, of a simple method of detecting the admixture of inferior foreign wools with fleeces purporting to be of superior quality. In certain cases the identification of wool is easy, Russian and Buenos Ayres wool, for example, being readily distinguished from all others by the presence in the fleece of wild oats in the one instance and a peculiar variety of small thistle in the other. But in German, Spanish, Australian, and Morocco wools no such test is applicable. To distinguish between these, M. Viret recommends us to have recourse to entomology. The fleeces from each of these countries will be found to contain coleopterous insects peculiar to it, and by an examination of these the real source of a wool in fleece may be indisputably determined by whatever name a dishonest stapler may have placed it on the market.

BLACK FINISH FOR BRASS.—Optical and philosophical instruments made in France often have all their brass surfaces of a fine dead black color, very permanent and difficult to imitate. The following, obtained from a foreign source, is the process used by the French artisans: Make a strong solution of nitrate of silver in one dish and of nitrate of copper in another. Mix the two together and plunge the brass into it. Remove and heat the brass evenly until the required degree of dead blackness is obtained.

"IS THIS a foreign country?" asks an American journal. "Russian leather is made in Connecticut, Bordeaux wine is manufactured in California, French lace is woven in New York, Italian marble is dug in Kentucky, Marseilles linen is produced in Massachusetts, English cassimere is made in New Hampshire, Parian art work comes from a shop in Boston, Spanish mackerel are caught on the New Jersey coast, and Havana cigars are rolled out by the million in Chicago."

A MODE of producing tissues printed in relief, imitating gold, silver, and silk embroidery, has been patented by M. Coffin, in France. The pattern is printed on satin by means of engraved plates and with gilders' fatty mordant, and, afterwards, the fine parts of the design are printed with the same vehicle with the addition of gold or silver in powder.

THE quantity of herrings caught this year on the Danish coasts is said to be enormous, and it is hoped that these fish, which suddenly deserted the Danish waters about three hundred years ago, after having for centuries represented the chief source of revenue to the country, may now again direct their migrations to the Danish coast.

THE *Atlantic Monthly* does honor to one of its old contributors by issuing a life-size likeness of the Quaker poet, John Greenleaf Whittier, in commemoration of the anniversary of the poet's seventieth birthday. The lithograph was executed by Mr. J. E. Baker and is in the highest style of the art. It can be obtained from the publishers, H. O. Houghton & Co., Boston, on remitting the price, $1.00.

THE depositors in the savings banks of New York city are mostly poor working people, who are allowed five per cent interest; but they are required to deliver up a little more than half of their interest money in the shape of personal taxes to the extravagant Tammany Ring who run the city government, and have run up the annual personal tax, on savings bank deposits, to 2.65 per cent.