

RECENTLY PATENTED INVENTIONS.

Electrical Devices.

TELEGRAPH-TRANSMITTER.—W. H. LEONARD, Mount Vernon, N. Y., and J. H. LEWIS, New York, N. Y. Devices which have been constructed for the purpose where the striking of a key will automatically transmit a character of the Morse alphabet upon a telegraph-line are open to many objections. They have to be wound up before they will operate; if the finger is kept too long upon a key it will transmit the same character repeatedly, and they are expensive in construction, therefore their use in practice is limited. The present device eliminates these disadvantages.

TROLLEY.—W. S. TICHENOR, Owensville, Ind. In Mr. Tichenor's patent, the invention has reference to improvements in trolleys for overhead electric-railway systems, the object being the provision of a trolley of simple and inexpensive construction and having shaft-bearings that are practically dirt and dust proof.

MAGNETO-ELECTRIC GENERATOR.—R. C. CROUCH and J. A. TITZEL, Sr., Newcastle, Pa. The invention relates to magneto-electric generators, the more particular object being to produce a type of generator suitable for the production of comparatively weak currents when subjected to movements—as, for instance, the movements of a person when the apparatus is carried in the pocket.

Of Interest to Farmers.

PLOW.—J. B. HUNTER, Woodlawn, Ill. One purpose in this invention is to provide a means for securing the share of a plow to the mold-board and the landside to the beam in a removable manner and without the use of bolts and nuts, and, further, to provide means for making the connection with rapidity and, least possible trouble. Another purpose is to provide an attachment which while particularly adapted for turning plows of all kinds is equally well adapted to one-horse or two-horse plows, gang and sulky plows.

Of General Interest.

SMELTING-FURNACE.—H. L. WRINKLE and N. WRINKLE, Keeler, Cal. The invention is especially intended for use in connection with fluid or pulverized fuel, the arrangement being such that the material charged into the furnace lies in conical position in the crucible, the fuel gases being circulated around the sides of the conical mass of material. The furnace also involves a peculiar roof structure which not only strengthens the furnace but provides chambers facilitating heating the air blast.

ORE-CONCENTRATOR.—W. O. JOURNEAY, San Antonio, Texas. This patentee's invention is designed to improve the construction of ore-concentrators whereby to better control the supply of the pulp and the water supplied thereto and to better regulate the discharge of the concentrates and tailings; the object being to give an increased capacity to the machine which is designed to operate continuously.

DEODORIZING APPARATUS.—J. B. SUTHERLAND, Seattle, Wash. One purpose of the inventor is to provide an apparatus for preventing the escape of objectionable odors or gases from cooking-tanks, rendering-tanks, or the buildings which contain said tanks, said vessels being of that character used in packing-houses, slaughter-houses, or fertilizer-works; and a further purpose to provide a readily applied means whereby the causes of the odors are trapped in their passage from the rendering-tank to the catch-basin or sewer.

OVERHEAD-CONVEYER SYSTEM.—J. F. MCKAY and D. J. MCKAY, Bowie, La. This invention refers to cableways, especially those for "skidding" logs. Difficulty has been met drawing out the skidding-line and the present improvements provide means for paying out the skidding-line after the outward movement of the carriage and preparatory to loading or reloading it. The invention also contemplates a loading-carriage which is employed in connection with one of the guides for the main cable and which permits loading the logs on a wagon, railway-car, or like vehicle. It also contemplates other improvements; for instance—a tension-block, a double-block structure, and a detachable section for the skidding-line.

ATTACHMENT FOR BARBERS' CHAIRS.—A. D. KANBLE, Pencoyle, Pa. Mr. Kanble provides means whereby to facilitate the insertion of the paper-roll in the cylinder and to guide such roll when in the cylinder in such manner as to prevent the edges of the paper sheet from tearing against the metal at the ends of the slot through which each sheet is guided, and also to brace the open end of the cylinder adjacent to the slotted way for the paper both internally and externally in the use of the invention. It is an improvement over a former patent granted to this inventor.

DISPENSING-BOTTLE.—C. B. FORSYTH, Alexandria Bay, N. Y. In the operation of the bottle the person wishing to use a portion of its contents will touch a stem, so as to unseat a plug in an upward direction. A quantity of the fluid will then flow down to a perforation and through a conical bore, as desired. As soon as released a spring will operate the plug once more and close the outlet from the bottle. The receptacle is for the use of antiseptic liquids, liquid soap, etc.

FLY AND MOSQUITO GUN.—R. PETERSEN, Asbury Park, N. J. This invention refers to improvements of guns by means of which any person can catch and destroy flies and other

insects. When operated, a person takes hold on a handle with one hand and the rear end of shooting-rod with the other and pulls his hands apart and then relieves the rod and it will shoot out quickly. If aimed at a fly on the wall, the fly will attempt to escape, then the catchers slam together and kill it.

SOUND-AMPLIFIER PHONOGRAPH.—R. B. SMITH, 153 Third Avenue, New York city, N. Y., and C. McCARTHY, 2380 Broadway, New York. This invention relates to improvements in devices for amplifying sounds from phonographs or like machines, an object being to provide a reproducer comprising a plurality of diaphragms so arranged as to be acted upon synchronously, whereby the sounds from the several diaphragms will be so blended as to be emitted from the sound horn as a single sound, and much more distinct than is possible with the ordinary reproducer.

ILLUSION APPARATUS.—R. B. SMITH, 153 Third Avenue, New York, N. Y., and C. McCARTHY, 2380 Broadway, New York, N. Y. Provision is made in this invention for effective and readily-operated means for securing a delusion effect, and the improvement is particularly adapted for the stage. The vehicle is capable of four distinct primary movements that may be applied singly or two or more impressed simultaneously upon the automobile floating in the air, so that it may be caused to describe complex curved paths, during which it turns to proceed in opposite directions. Any or all motions may be stopped at will. While the apparatus is upon the stage all elements except vehicle and occupants are concealed. Thus the car appears guided through air across the stage space, turns around and returns, then ascends until upside down and returns to the stage again, without support. Simple mechanism operates it from behind the scenes, a special system lights the stage, and motion to the wheels is given by silent electric means.

Household Utilities.

SCREEN.—J. STORK, San Diego, Cal. The invention relates more particularly to those window-screens which roll in the manner of a curtain and which are especially adapted to cooperate with the upper window-sash. Its principal objects are to provide an efficient arrangement in which positive movement in operation is imparted to both the screen and its support. It is slightly durable, keeps tight, and kinking upon the roll is impossible, while the movement of the sash is utilized to secure these results without complication.

BABY-CABINET.—MARY A. KUYKENBALL, Portland, Ore. One intention in this case is to provide a cabinet of convenient size, adapted for movement in any direction over the floor, comfortably padded, and having an open top, thus affording a box-like receptacle wherein an infant may be placed on a bed, and kept out of danger. Another is to provide inner handholds, which enable a baby to get upon its feet and learn to walk around the walls of the structure without being bruised in case of falling, and a further intention, to provide a holder to place playthings.

WINDOW.—C. CHABAU, New York, N. Y. This window belongs to the class designed to be swung into a room for the purpose of conveniently cleaning the outer side of the glass, the object being to provide a supplemental swinging casing in which the upper and lower sashes are arranged to slide and whereby both sashes may be moved together in the inner side of a room.

Machines and Mechanical Devices.

LOADING AND UNLOADING MACHINE.—S. MUNSON, Fowler, Col. Mr. Munson's invention refers to a machine for loading and unloading which is capable of many uses, but is especially adapted for the transportation of rails. The objects are to provide convenient, efficient, and inexpensive means which can be mounted upon an ordinary flat or coal car for unloading rails therefrom or transferring them thereto.

TYPE-CLEANING ATTACHMENT FOR TYPE-WRITING MACHINES.—J. H. LADD, Falls Church, Va. This type-cleaning device is adapted to be detachably secured to the ribbon-carrying bar or plate of type-writing machines of the class represented by the "Remington," the "Densmore," and the "Smith Premier," in all of which machines the type-carrying levers are arranged in a circle and adapted to be thrown upward to bring the types in contact with the ribbon.

TYPE-CLEANING ATTACHMENT FOR TYPE-WRITING MACHINES.—R. C. HARMILL, Woodbridge, Va. Mr. Hammill's invention is adapted to be detachably secured to and supported by the ribbon-carrying bar or guide of type-writing machines of that class represented by the well-known "Remington," in which machines the type-carrying levers are hinged and pendent in a circle traversed diametrically by the ribbon-guide. It is small in size, may be quickly applied to and removed from the ribbon-guide, and is self-fastening and self-supporting in the guide.

Railways and Their Accessories.

COLLAPSIBLE BLIND OR SHUTTER.—G. McMULLEN, Perth, Western Australia, Australia. This improvement has reference to lath blinds and shutters, and more particularly to that kind of blind usually fitted in tram and railway cars and such like vehicles for intercepting the rays of the sun and also

allowing the air to pass freely through the car, such blinds acting as auxiliaries for the ordinary glass windows.

EXTENSION CAR-STEP.—G. G. COMER, Kalama, Wash. In this patent the invention pertains to improvements in extension-steps for passenger cars or coaches, the object being to provide steps that may be readily attached to the ordinary fixed steps and so arranged as to be easily moved to and held in its lowered position and moved automatically to its upper position when not required for use.

Designs.

DESIGN FOR A POCKET SAFETY-CLIP FOR FOUNTAIN-PENS AND PENCILS.—M. H. DURYEA, Hackensack, N. J. Mr. Duryea has invented a new, original, and ornamental design for a pocket safety-clip for fountain-pens and pencils, comprising a human hand firmly gripping the ring portion of the clip.

NOTE.—Copies of any of these patents will be furnished by Munn & Co. for ten cents each. Please state the name of the patentee, title of the invention, and date of this paper.

Business and Personal Wants.

READ THIS COLUMN CAREFULLY.—You will find inquiries for certain classes of articles numbered in consecutive order. If you manufacture these goods write us at once and we will send you the name and address of the party desiring the information. In every case it is necessary to give the number of the inquiry.

Marine Iron Works. Chicago. Catalogue free. Inquiry No. 7290.—For manufacturers of moving and gypsy wagons.

Have you much figuring to do, chiefly multiplication and division? The "Brunsviga" will save you 90 per cent of time and all mental effort. 18 and 13 figure products. Automatic devices make error impossible. Simple. Lasts lifetime. Sent on trial. FELIX HAMBURGER, 90 William Street, New York.

Inquiry No. 7291.—Wanted, manufacturers of collapsible lead tubes, for pastes, also for makers of small pasteboard boxes for tablets.

"C. S." Metal Polish. Indianapolis. Samples free. Inquiry No. 7292.—For makers of tin mucilage brushes and caps.

For bridge erecting engines. J. S. Mundy, Newark, N. J. Inquiry No. 7293.—Wanted, machinery for manufacturing or converting sisal or hemp from the plant.

Drying Machinery and Presses. Biles, Louisville, Ky. Inquiry No. 7294.—For parties to make small stamped steel novelty work, also makers of machinery and outfits for such work.

Handle & Spoke Mch. Ober Mfg. Co., 10 Bell St., Chagrin Falls, O.

Inquiry No. 7295.—For makers of engine gang plows for use behind traction engines.

Adding, multiplying and dividing machine, all in one. Felt & Tarrant Mfg. Co., Chicago.

Inquiry No. 7296.—For makers of hand swiveling acetylene lamps.

Sawmill machinery and outfits manufactured by the Lane Mfg. Co., Box 13, Montpelier, Vt.

Inquiry No. 7297.—For a machine for cutting "scrub," i. e., small trees of hardwood varying from the diameter of a saw to two inches.

I sell patents. To buy, or having one to sell, write Chas. A. Scott, 719 Mutual Life Building, Buffalo, N. Y.

Inquiry No. 7298.—Wanted, catalogues and prices of soap manufacturing machinery, and estimate on complete outfit for making 1,000 to 5,000 pounds of soap per 10 hours.

WANTED.—Patented specialties of merit, to manufacture and market. Power Specialty Co., Detroit, Mich.

Inquiry No. 7299.—For manufacturers of aluminum paper.

Wanted to manufacture some light, quick-selling article. Fully equipped plant.

E. G. Waterhouse, Flatiron Bldg., N. Y.

Inquiry No. 7300.—Wanted, drawing and patterns for making small rowboats.

The celebrated "Hornsby-Akroyd" Patent Safety Oil Engine is built by the De La Vergne Machine Company, Foot of East 138th Street, New York.

Inquiry No. 7301.—For makers of tinfoil.

WANTED.—Ideas regarding patentable device for water well paste or mucilage bottle. Address Adhesive, P. O. Box 773, New York.

Inquiry No. 7302.—For makers of metal horns such as used on talking machines.

Mechanical devices of brass, aluminum, and kindred metals manufactured for inventors and patentees, and marketed on royalty, when desired. Imperial Brass Mfg. Co., 241 So. Jefferson St., Chicago, Ill.

Inquiry No. 7303.—Wanted, right to build a good make of gasoline engine in Canada.

Manufacturers of patent articles, dies, metal stamping, screw machine work, hardware specialties, wood fiber machinery and tools. Quadriga Manufacturing Company, 18 South Canal Street, Chicago.

Inquiry No. 7304.—Wanted, a machine for filing small saws.

Absolute privacy for inventors and experimenting. A well-equipped private laboratory can be rented on moderate terms from the Electrical Testing Laboratories, 548 East 80th St., New York. Write to-day.

Inquiry No. 7305.—For the manufacturers of the Buffalo Hot Air Engine, also of the "Essex," or for a small hot air engine, 1-40 to 1-8 h. p.

WANTED.—The patents or sole agency for Britain and France, of new machines and articles used in the Brewing and Allied Trades. Highest references given and required. State best terms with full particulars to "Wideawake," care of Street's Agency, 30 Cornhill, London, England.

Inquiry No. 7306.—Wanted, hand-braided cotton line 1/4 inch diameter, in loops of about 20 inches; endless, braided at ends.

Inquiry No. 7307.—Wanted, a first-class pattern maker, to do accurate work from blue prints.



HINTS TO CORRESPONDENTS.

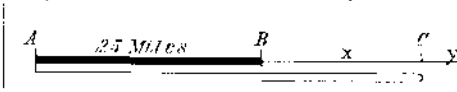
Names and Address must accompany all letters or no attention will be paid thereto. This is for our information and not for publication. References to former articles or answers should give date of paper and page or number of question. Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn. Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same. Special Written Information on matters of personal rather than general interest cannot be expected without remuneration. Scientific American Supplements referred to may be had at the office. Price 10 cents each. Books referred to promptly supplied on receipt of price. Minerals sent for examination should be distinctly marked or labeled.

(9784) J. A. H. asks: Will you kindly explain in your Notes and Queries column a fact that has puzzled me a good deal? Why is it that lightning should splinter a tree up as it does? Now, lightning being electricity, has no shape or weight, and consequently can have no momentum or purely mechanical energy which it would impart to the tree in tearing it to pieces. Will you kindly try to clear up this question? A. Although electricity is not supposed to have ordinary mechanical properties such as momentum, weight, etc., it yet has the ability to produce these effects in other bodies. A shock of a small coil will give a very savage jerk to an arm or a leg, and the blow or kick given is a striking mechanical effect. The shattering of trees and structures by lightning may be in part accounted for by the sudden evolution of heat, vaporizing the water in the tree, expanding the gases, and producing all the effects of an explosion.

(9785) F. G. S. asks: Is there any simple formula for calculating the power of a magnet when the size of wire, number of turns, and E. M. F. of battery are known? Will this formula apply in the case of a solenoid? A. The tractive power of a magnet is found by the formula Pounds = (TCMVA) / 2861L in which T is

the number of turns of wire, C the current in amperes, M the permeability of the iron of the core, A the area of pole pieces, and L the mean length of the magnetic circuit. For a solenoid without iron the permeability is 1, since the permeability of the air is the standard of comparison, and hence is unity. For a straight coil the result will be of little value because of the great leakage of lines of force, and the great length of the circuit of the lines in the air.

(9786) E. C. S. writes us: Solution of problem of soldiers and couriers, SCIENTIFIC AMERICAN September 2, 1905, page 186, No. 9750. Let A B represent the column at the time of commencing its march, the courier being at A. While the column moves a distance equal to B C, the courier moves from A to C; and while



the column moves a distance equal to C D, the courier moves from C to B. Let x represent B C, and y represent C D. Then x + y = 25 (1) x + y - 25 = 0 (2) Now, as the column moves at a uniform rate of speed throughout, and that of the courier is also constant: (x + 25) : x :: x : y (3) xy + 25y = x^2 (4) xy + 25y - x^2 = 0 (5) Multiplying (2) by x, x^2 + xy - 25x = 0 (6) -x^2 + xy + 25y = 0 (7) Subtracting (5) 2x^2 - 25x - 25y = 0 (8) Multiplying (1) by 25, 25x + 25y = 625 (9) Then by addition: 2x^2 = 625 x^2 = 312.5 x = sqrt(312.5) = 17.6776+

Therefore the distance the courier traveled was equal to 25 miles plus 2x = Ans. 60.3553+ miles. I do not think the rate per hour necessarily enters into a consideration of this problem, as it could quite as well be a rate per minute or per year, or even that of Mark Twain's famous glacier.

(9787) J. A. T. writes: Yesterday about four o'clock in the afternoon, while looking toward the east, I saw what looked to be a meteor in the heavens traveling toward the east—quite a ball of fire, about the size of a child's head, with a long tail. Now, this looked to be very near, so much so that one would believe it fell as near as three miles from where I was standing. Now, do you think this possible, or is it very deceiving to the sight, and could it have been in some other atmosphere? I think I have read of where they have fallen on the earth, and it would interest me very much to have this reported. A. The observation of a meteor in the air by daylight is interesting. It is not likely that it was as near as three miles, however. Had it been no farther away, it

would have seemed just at hand. Many of these bodies have fallen to the earth, and may be seen in our museums.

(9788) L. E. S. asks: 1. Increase in distance requires finer wire, or a greater number of ohms resistance, in the telegraphic relay. Why is this? A. A greater distance requires a finer wire on a telegraphic relay in order to secure a greater number of turns of wire in the same space, so that the magnetizing power of the current may be as great as possible. The increase in the number of turns of wire is more important than the increase of resistance due to the finer wire. 2. Why is the glass front in the search light divided into vertical strips of glass? A. The glass in the front of a search light is divided into strips to reduce the loss if a crack is made by the heat. These need not be vertical. 3. A telegraphic cable crossing the ocean is broken. The broken place is some distance from shore. How can the distance from shore to the end of the broken cable be ascertained? What instrument is used? A. The distance to a break in a cable is determined by measuring the resistance of the cable to the break, at which point the wires are grounded, and hence have no resistance. Since the resistance per mile is already known, it is easy to calculate the distance to the break by dividing the measured resistance to the break by the resistance per mile. 4. What is the greatest number of volts that have been passed through the human body without harm? A. Volts are not passed anywhere in an electric circuit. Volts are the pressure which makes the amperes flow, and amperes do the harm to the person who receives the current. If the current has a high voltage, the shock is more severe. Men have received shocks from circuits with 2,500 volts on them without special harm, and again men have been killed when the voltage is only 500. The effect depends upon something more important than volts; that is, upon the resistance of the man who receives the shock. This is affected by the moisture or dryness of his skin and clothing, and to an extent perhaps upon his nervous condition. It depends also upon the time which the current acts upon the man. This answer relates to commercial circuits and heavy currents. When the current is that of an induction coil or high-tension transformer, such as Mr. Tesla used in his famous experiments, a million or more volts seem to be without any perceptible effect. A man may hold an incandescent lamp bulb in his hand, and the sparks fly for a long distance through the air to the lamp and light it to full candle power, while he feels nothing of the current which is passing through him. Your question then does not admit of a categorical answer.

(9789) C. P. P. asks: Will you kindly answer the following question through the column of notes and queries in your valuable paper: Which succeeds the other, day or night? A. In our calendar the day begins at midnight and the morning precedes the afternoon. The answer to your question, however, is, day succeeds night and night succeeds day in ceaseless round.

(9790) H. M. asks: 1. Could not the core of an induction coil be made longer and the secondary coil be placed beside the primary coil and not over it, and thus save considerable length of wire, and also number of turns of wire in secondary? A. Induction coils have been made with almost every possible relation of the various parts, with the result that it is a general agreement of experimenters that the usual mode of arranging is the best. The secondary coil is sometimes placed by the side of the primary in the transforming of alternating currents for lighting, but then the core is especially designed to save the lines of force. In coils for giving sparks the core should not be unnecessarily long, since the object is to secure as sudden a demagnetization of the core as possible. You would better conform to the proportions of coils as given in the best books. Take Norrie's "Induction Coils," for a guide. We can furnish it for \$1. 2. Do the outer coils of the secondary add as much strength to the coil as do the turns of wire wound nearest the core? A. The outer turns of secondary wire have not the same value in producing current as do the turns near the primary. The mode of securing a small-sized secondary is to use the finest possible wire. No. 36 to 40 is employed. 3. How is the magnetic resistance of a piece of iron calculated? If I know the ampere turns how may I know the strength of the magnet? A. The magnetic resistance, or reluctance, as it is called, is equal to the length of the circuit divided by the product of the permeability by the area of cross section of the iron. The tractive power of a magnet in pounds is found by the formula,

$$TC \cdot M \cdot \sqrt{A}$$

Pounds = $\frac{2661 L}{\dots}$

in which TC is the ampere turns, M is the permeability, A is the area of cross section of poles, and L is the mean length of magnetic circuit. 4. What voltage will a five-bar telephone generator furnish? A. The ordinary telephone generator will give from 65 to 75 volts. What a five-bar generator gives we are not able to say. 5. Why is it that a generator requires more power to turn its armature when delivering heavy current than when on open circuit? A. The generator requires more power to drive its armature when it is delivering current because it is then doing work. An engine running free does not require much

power, but when heavy machinery is connected to it, it requires much steam to drive it. 6. Can you give me the formula for constructing a tangent galvanometer so that certain degrees deflection will equal certain value of current? A. A deflection of a certain number of degrees always represents the same current in a given tangent galvanometer. You do not require any special formula to determine the current for any deflection. Use the ordinary formula for the tangent galvanometer, and substitute the natural tangents for tangent a in the formula. Calculate the corresponding current in each case. Form a table of these currents for each angle, and keep it for reference. You will then save the trouble and labor of making the calculation for each reading; we mail you a copy of our SUPPLEMENT Catalogue, in which you will find mention of articles on the construction of galvanometers.

(9791) F. C. B. asks for a padding paste. A. Glue, 4 pounds; glycerine, 2 pounds; linseed oil, $\frac{1}{2}$ pound; sugar, $\frac{1}{4}$ pound; aniline dye, g. s. The glue is softened by soaking it in a little cold water, then dissolved together with the sugar in the glycerine by aid of heat over a water bath. To this the dye is added, after which the oil is well stirred in. It is used hot. Another composition of a somewhat similar nature is prepared as follows: Glue, 1 pound; glycerine, 4 ounces; glucose sirup, about, 1 ounce; tannin, 48 grains. Give the compositions an hour or more in which to dry or set before cutting or handling the pads.

(9792) A. G. H. asks how to restore crape. A. Black crape may be freshened and made to look almost equal to new if treated in the following way: Lay over the ironing table a piece of black cambric or cloth of any kind, and pin the piece of crape smoothly through to the blanket, stretching it out to its original size. Wring another piece of black cambric out of water and lay it over the crape, patting it down with the palm of the hand. Now take hot flatirons and pass them over the wet cloth, letting them just touch the cloth, but allowing no pressure to come upon the crape. When the cloth has become dry from the heat of the iron remove it, but let the crape remain pinned down until all the moisture has evaporated and it is perfectly dry. The crape will now feel and look like new. A long veil can be renovated in this way, making sure that the part redressed comes under the edge of the wet cloth.

(9793) F. J. H. asks how to make koumyss. A. Fresh milk, 12 ounces; water, 4 ounces; brown sugar, $2\frac{1}{2}$ drachms; compressed yeast, 24 grains; milk sugar, 3 drachms. Dissolve the milk sugar in the water, add to the milk, rub the yeast and brown sugar down in a mortar with a little of the mixture, then strain into the other portion. Strong bottles are very essential, champagne bottles being frequently used, and the corks should fit very tightly; in fact, it is almost necessary to use a bottling machine for the purpose, and once the cork is properly fixed it should be wired down. Many failures have resulted because the corks did not fit properly, the result being that the carbonic gas escaped as formed and left a worthless preparation. It is further necessary to keep the preparation at a moderate temperature, and to insure the article being properly finished, the bottles are to be gently shaken each day for about ten minutes to prevent the clotting of casein. It is as well to take the precaution of rolling a cloth around the bottle during the shaking process, as the amount of gas generated is great, and should the bottom be of thin glass or contain a flaw it may give way. Some few days elapse before the fermentation passes into the acid stage, and when this has taken place the preparation is much thicker. It is now in the proper condition to be used.—Pharmaceutical Era.

(9794) J. H. P. asks how to paste labels on cork. A. Gum tragacanth, 1 ounce; gum arabic, 4 ounces. Dissolve in water, 1 pint; strain, and add thymol, 14 grains, suspended in glycerine, 4 ounces; finally add water to make 2 pints. (2) Rye flour, 4 ounces; water, 1 pint; nitric acid, 1 drachm; carbolic acid, 10 minims; oil of cloves, 10 minims; glycerine, 1 ounce. Mix the flour and water, strain through cheese cloth, and add the nitric acid. Apply heat until suitably thickened, and add the other ingredients when cooling. This paste is suitable for almost any kind of labels, and it will adhere to almost anything.

(9795) F. J. C. says: Please give me a formula for library paste. A. A good white library paste may be made by any of the following processes: 1. Water, 1 quart; alum, $\frac{3}{4}$ ounce. Dissolve and add enough flour to bring to the consistency of cream, and then bring it to a boil, stirring all the time. 2. Starch, 2 drachms; sugar, 1 ounce; acacia, 2 drachms; water, sufficient. Dissolve the gum, add the sugar, and boil until the starch is cooked. 3. Rice starch, 1 ounce; gelatin, 3 drachms; water, $\frac{1}{2}$ pint. Heat with constant stirring, until the milky liquid becomes thick and glassy, when the paste is ready for use. Any of these pastes may be preserved by adding a little oil of cloves, or carbolic acid, salicylic acid, or formaldehyde.

(9796) W. B. K. asks for information concerning vanilla extract. The National Druggist, of St. Louis, has published the following formulas for preparing three grades of vanilla essences, translated from the Zeitschrift für Kohlenwasserstoffindustrie: I. Vanilla, 20 parts; absolute alcohol, 600 parts; water, 450 parts.

Dissolve the vanilla in the alcohol and add the water. II. Musk, 1 part; potassium carbonate, 1 part; vanilla beans, 60 parts; boiling water, 240 parts; alcohol, 720 parts. Mix the vanilla, cut fine, the musk and potassium salt, and pour over them the boiling water. Let them stand until quite cold, then add the alcohol and set aside for 14 days. Finally strain, express, and filter the percolate. III. Vanilla in fine bits, 250 parts; alcohol, 2,500 parts; water, 1,500 parts. Mix the alcohol and water and pour one-third of the mixture over the cut beans. Put into a vessel with a tight cover, place in the water bath and keep for one hour at 60 deg. C. Pour off the liquid and set aside. To the residue in the vessel add one-half of the remaining alcohol and water, and treat in the same manner. Repeat the operation with the remainder of the liquid. Remove the vanilla to an extraction apparatus, pack and extract with 250 parts of alcohol and water mixed in the proportion indicated above. Mix the results of the three infusions, filter, and wash the filter with the result of the percolation, allowing the percolate to run through and mingle with the original filtrate. To prepare a sirup with either of these essences, mix 15 parts of the essence, 8 parts of caramel solution, and 4,500 parts of the sirup, in which 15 parts of gelatin have been previously dissolved by the aid of gentle heat.

(9797) E. G. asks: I would like to receive information on the following subject through the columns of your paper. Does it make any difference how the contact is broken on a jump spark coil, that is, will it make any difference in the secondary spark? A. The mechanism for breaking contact in the primary coil does not make much difference to the spark, provided the break is made suddenly.

(9798) C. L. T. asks for a formula for Japanner's gold size. A. Gum animi and asphaltum, each 1 ounce; red lead, yellow litharge and amber, each $1\frac{1}{2}$ ounces. Reduce to a fine powder, mix and put them with a pound of linseed oil into a pipkin, and boil gently, constantly stirring until thoroughly incorporated. Continue the boiling until it becomes as thick as tar, as it cools. Strain through flannel, and keep for use, carefully stopped up. When wanted, grind with as much vermilion as will give it an opaqueness, and dilute sufficiently with oil of turpentine to work freely with a pencil. Or, take linseed oil, 1 pound; gum animi, 4 ounces. Boil the oil, and add gradually the gum animi finely powdered, until dissolved. Let the mixture boil to the consistence of tar on cooling, then strain while warm through a coarse cloth for use. Previous to being used, it must be mixed with vermilion and oil of turpentine, as above. This size may be used on almost any substance, and no preparation of the work is necessary, beyond having an even and perfectly clean surface. To use the size, put a proper quantity prepared as above into a saucer. Then spread it with a brush over the surface to be gilded, or draw with it, by means of a pencil, the designs intended, carefully avoiding to touch any other parts. Let it remain until fit to receive the gold, which is to be determined in the same manner as in oil gilding, by the finger. Then go over the work with a soft camel's hair pencil. The whole being covered, it must be left to dry, and then the loose powder lightly brushed off. When gold leaf is used, the method of sizing is the same, but the operation requires more nicety. There are various sorts of gold powders—pure gold powder, Dutch, mosaic, etc., any of which can be procured at the artists' color shops ready for use. When the whole has been gilt, any parts uncovered may be repaired by wetting with a camel's hair pencil, and covering the part with gold, avoiding, as much as possible, touching the perfect gilding, as it frequently causes it to turn black.

(9799) A. L. B. asks how newspaper pictures can be transferred. A. Prepare a liquid by dissolving $1\frac{1}{2}$ drachms common yellow soap in 1 pint of hot water, adding, when nearly cold, $3\frac{1}{4}$ fluid ounces spirits turpentine, and shaking thoroughly together. This fluid is applied liberally to the surface of the printed matter with a soft brush or sponge (being careful not to smear the ink, which soon becomes softened) and allowed to soak for a few minutes; then well damp the plain paper on which the transfer is to be made, place it upon the engraving and subject the whole to moderate pressure for about one minute. On separating them a reversed transfer will be found on the paper.

(9800) J. B. C. asks for a benzine varnish and polish. A. Various kinds of resin can be carefully melted, according to the variety of the varnish or polish to be produced, in hermetically closed kettles under addition of boric acid and, after cooling, moistened with methylic alcohol. The liquid gums thus treated are completely soluble in benzine. The following gums enter into use: White or yellow shellac, sandarac, mastic, Manila gum lac, stick lac, etc., either alone or mixed together, according to whether the polish and varnish is to be light colored, yellow, or red, dull, or transparent. The percentage of boric acid, gum, and methylic alcohol varies according to the quality of the resins employed and the destination of the varnish and polish, but in no case must the quantity of boric acid exceed 5 per cent of the resin quantity employed, and the proportion of methylic alcohol should not, even in case the hardest and most scarcely fusible gums are employed, make up more than the weight of the resin amounts

to. The contents of solid substances in the varnishes should not be less than 15 per cent and not less than 8 per cent in the polishes. According to the inventor, the benzine varnishes can not only entirely take the place of the spirit lacquers and polishes, but even afford the advantage of facilitating and accelerating the work, on account of the quicker evaporation of the benzine.

(9801) C. L. asks for a formula for red paint used on magnets. A. The "paint" used on magnets is usually non-conducting shellac varnish, carrying cinnabar. Try the following formula: Cinnabar, pulverized, 3 parts; Venice turpentine, 2 parts; shellac, pale, 1 part; alcohol, 95 per cent, sufficient. Melt turpentine and shellac, remove from fire, let cool down to about 140 deg. F., and add 10 parts of the alcohol. Rub up the cinnabar with sufficient alcohol to mix a paste, and add it to the melted mixture. Put on a water bath for a few minutes, and stir continuously, until a smooth, homogeneous fluid is obtained. Remove from fire, and stir until cold. Preserve in well-stoppered vials, and when desired for use return to the water bath, and heat until the liquid can be applied with a brush. The magnet should be warmed before applying.

NEW BOOKS, ETC.

DER EISEN-BETON UND SEINE ANWENDUNG IM BAUWESEN. Von Paul Christophe. Berlin, 1905. Verlag: Tonindustrie Zeitung. 916 illustrations. Pp. 575. Full morocco levant. Crown 8vo. Price, \$8.50.

Although originally published in 1902, it cannot be denied that the work before us is a most exhaustive and valuable contribution to a subject of ever-growing importance. Mr. Christophe's work is divided into five parts, in the chapters of each of which an enormous amount of material, which he was able to gather in his capacity of engineer, has been admirably distributed. In the first part, general principles and methods of construction are discussed. In the second, methods of application are treated. In the third, the preparation of material is discussed. The fourth division is devoted to theoretical considerations, and the fifth is a thorough review of the advantages and disadvantages of reinforced concrete.

MODERN ELECTRICAL CONSTRUCTION. By Henry C. Horstman and Victor H. Tousley. Chicago: Frederick J. Drake & Co., 1905. 16mo.; pp. 345. Price, \$1.50.

This work is intended as a reliable and practical guide to the beginner in electrical construction. The rules of the National Electrical Code adopted by the National Board of Fire Underwriters are contained in full and are used as a text with proper explanatory matter interspersed. The book is thoroughly practical and is well illustrated.

THE OUTLOOK OF NATURE. By L. H. Bailey. New York: The Macmillan Company, 1905. 8vo.; pp. 296. Price, \$1.25.

The contents of this volume consist of four lectures delivered last January at the Colonial Theater, Boston, as a part of the University course, under the auspices of the educational committee of the Twentieth Century Club. The lectures are on the following subjects: "The Realm of the commonplace"; "City and Country"; "The School of the Future," and "Evolution: A Quest of Truth."

THE SANITATION OF A COUNTRY HOUSE. By Dr. Harvey B. Bashore. New York: John Wiley & Sons, 1905. 12mo.; pp. 102. Price, \$1.

This small volume contains many useful hints on the proper sanitation and beautifying of a country place. Its author has had a great deal of experience in his capacity of inspector for the State Board of Pennsylvania. Not only is the subject of sanitation and proper sanitary arrangements of a country house and its surroundings gone into, but the book also describes the proper method of constructing a sanitary camp. The book is very completely illustrated by some fifteen half-tone plates. We recommend it most heartily to all dwellers in the country.

PLANE AND SPHERICAL TRIGONOMETRY. By P. A. Lambert and H. A. Foering. New York: The Macmillan Company, 1905. 12mo.; pp. 104. Price, 60 cents.

The authors believe that this textbook will develop in the student the ability to think out and apply the relations between the trigonometric functions. Tables of the functions are not included in the book, as the authors consider it better that the student should use separate tables. The whole work is so arranged that it encourages the student to use his reasoning powers, not merely to memorize.

FARMER'S CYCLOPEDIA OF AGRICULTURE. By Earley Vernon Wilcox, Ph.D., and Clarence Beaman Smith, M.S. New York: Orange Judd Company, 1904. Small 4to.; pp. 619, 477 illustrations. Price, \$3.50.

Believing that a digest of the results—for it is results that the farmer is after—obtained by farmers and experimenters is greatly needed, the authors undertook the publication of this work. The volume contains a large amount of valuable information which has been culled from the farming papers, the Bulletins of the Ameri-