

## RECENTLY PATENTED INVENTIONS.

## Engineering.

**ROTARY ENGINE.**—Willis and Lyman Carter, Spokane Falls, Washington. In this engine the main shaft has central bores extending from each end to an opening in a central crank portion of the shaft, upon which a compound cylinder is mounted, in connection with various novel features, whereby it is designed the engine may be run at high speed, will be evenly balanced, and very durable, while generating power with a small amount of steam.

## Railway Appliances.

**CAR AXLE BOX.**—William Cross, Winnipeg, Canada. By this invention the bearing block has a pendent tapered front end forming side passages for the lubricant, while the tallo box has a bottom outlet in front of the block and directly over the cross bar, being an improvement in that class of boxes in which the journals rotate in contact with a liquid lubricant held in the bottom of the boxes.

**TRAIN ORDER ANNUNCIATOR.**—Leonard T. Crabtree, Oconto, Wis. This invention provides a device designed to prevent the operator from receiving train orders on a telegraph instrument until he has set a train order signaling device for display on the track, and to insure the exhibition of the signaling device while the operator has an order for an approaching train, the registration being such that each train conductor will be enabled to ascertain without inquiry if one or more orders are awaiting his arrival.

## Mechanical.

**CUTTING TOOL.**—Richard Gabel, Dresden, Germany. This tool has an internally threaded open rear end and a centrally apertured front, with centrally apertured cutting and centering plates held spaced apart at its front, and is adapted for use as a mandrel or spindle head upon turning lathes, drill making machines, etc., or as a hand implement for cutting or shaping material under rotation.

**COP SPINDLE FOR REELS.**—Isaac Walker, Philadelphia, Pa. This is an improvement in spindles used in a reel to hold the cop while the yarn is drawn off to form a skein, and provides means whereby the cop tube will be held in firm engagement with the spindle until all the yarn has been reeled off, thus preventing waste.

**CAN CAPPING MACHINE.**—Mathias Jensen, Astoria, Oregon. A conveyer is mounted to swing vertically and longitudinally to carry the can body forward to a stationary bed mould, while a clamping mould actuated from the arm is adapted to clamp the can body on the stationary bed mould while the caps are forced on to it, thus automatically applying the caps on a certain class of can bodies.

## Electrical.

**ELECTRIC DOOR OPENER.**—Louis Bates, Jersey City, N. J. This invention is designed to improve door openers where a pivoted latch is employed, which is held in closed position by a pawl that is pressed forward by a spring and adapted to be forced out of engagement with the pivoted latch by an armature-controlled electro-magnet.

**CORNSTALK HARVESTER.**—Peter S. Lundgren, Marysville, Kansas. This is a machine to be operated by two men and a horse drawing the machine between the rows, the stalks being cut from two rows at the same time, the machine being simple in construction and effective for its purpose.

**DRAUGHT EQUALIZER.**—Thomas Thompson, Townsend, Montana. This is a device especially adapted for use in connection with mowing machines, and is designed to lighten the work for the team, being so constructed that as the machine is moved forward the draught bar will exert sufficient forward pressure on the rear edge of the finger bar to overcome any tendency toward a side movement, thereby holding the finger bar always at a right angle to the tongue and the tongue straight with the team.

## Miscellaneous.

**THERMOMETER FOR SAD IRONS.**—August Nicolaus, New York City. A thermostat bar, formed of two parallel strips of metal expanding unequally, is attached to the sad iron, and one section is connected to a movable pointer, which is operated by the flexing of the bar to indicate by means of a dial whether the iron is sufficiently heated, or cold, or too hot to do proper work.

**HYDRANT.**—William R. Thropp, Trenton, N. J. This is an improvement for a hydrant such as ordinarily used by the fire department of towns and cities, the vertically movable valve stem having a collar loosely mounted on its lower end, and a socket aligning with the valve stem to hold the collar from turning, the valve being easily controlled and there being no danger of the hydrant being frozen up and becoming inoperative.

**DENTAL SERVICE STAND.**—Walter E. Warner, Brooklyn, N. Y. This is an improvement in stands adapted for use by a dentist, and is designed to hold a drinking glass and spittoon in convenient position for use, the invention covering various novel features.

**SASH HOLDER.**—Albert Ayers, Rahway, N. J. Combined with a spring-pressed plug is a rod having at its outer end a rack received by a slotted plate, there being pivoted in the plate a handle having teeth to fit the rod rack, with other novel features, the device being easily applied to a window, and designed to firmly hold it in any desired position.

**GARBAGE FURNACE.**—Alexander Brownlee, Dallas, Texas. This furnace has a chamber with feed openings in its top, a fire box at each end and in different planes, a sand box between the fire boxes,

and a grate to receive the garbage, the grate being about as high as the grate bars of one fire box and extending partly over the grate bars of the other fire box, the furnace effectively burning wet or dry garbage.

**GLOBE HOLDER.**—Howard R. Burk, New York City. A series of springs is secured on a frame and adapted to press on the globe, arms extending from the springs to form convenient handles, the device being readily applicable to a gas or other fixture to permit of conveniently attaching or detaching the globe and securely holding it in place.

**STARCH TABLE.**—John A. Ostberg, Des Moines, Iowa. This is a continuous automatic device for use in the manufacture of starch to recover the starch from the water or alkaline solutions, a tube supplying the starch liquid to an annular table with raised edges, a scoop lifting the starch from the table, a conveyer removing the starch, and a discharge pipe carrying off the water, thus saving manual labor and avoiding the difficulties of the old system.

**EDUCATIONAL APPLIANCE.**—Adolph F. C. Garben, Hoboken, N. J. This is a readily manipulated game board or chart in which examples in arithmetic may be performed with precision and ease, the board having vertical channels whose lower ends are connected by a transverse channel, an outer storage channel, and numeral buttons sliding in the channels.

**TREATING SEWAGE.**—Charles W. Chancellor, Baltimore, Md. This invention covers an improvement on a formerly patented process and apparatus of the same inventor for discharging solid and liquid matters from the soil pipe under a column or bed of water, separating continuously the solid matters in a sealed receptacle, and filling the supernatant fluids, putrefactive fermentation of the solids being prevented by exclusion of air, and the formation of deleterious gases avoided.

**TYPEWRITING MACHINE.**—Audley E. Harnsberger, Staunton, Va. This machine has two type wheels, a letter and a character wheel, and a shifter, whereby three kinds of letters or characters may be operated by one set of key levers, with other novel features, the machine being compact in form and designed to be easily manipulated, while it is less expensive than the machines most commonly used, and presents a key board that is simple in arrangement and easily comprehended.

**DRAUGHTING INSTRUMENT.**—Robert L. Barnhart, Pittsburg, Pa. This is an instrument designed for use in the offices of architects, civil engineers, etc., for drawing machines and elevations and plotting contours of ground, the instrument having different scales and being readily adjustable for a considerable variety of work.

**CARDBOARD MACHINE.**—John McCoy, York, Pa. As cards are ordinarily made by pasting two or more layers of paper together, this invention provides a machine for easily and effectively performing such work, comprising paper supports, pressure rolls, tension devices, and driers, the machine being designed to unite linen, cotton, or other cloth with the paper when so desired.

**HORSESHOEING RACK.**—Samuel M. Martin, Sidney, Ohio. This is an adjustable device adapted to fit all sized animals, to hold any part of the animal in any desired position, as may be most convenient for the operator, while relieving the animal of all strain, a supporting rack being suspended from a scaffold, in connection with a transverse shifting bar and rope and pulley attachments.

**CUSPIDOR.**—Charles L. Beers, Scranton, Pa. This invention provides a reversible bowl beneath which is arranged a discharge trough, a source of water supply being arranged to wash against the bowl when inverted, in connection with devices for reversing the bowl and turning on the water supply.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

## NEW BOOKS AND PUBLICATIONS.

**WEDDING'S BASIC BESSEMER PROCESS.** Translated from the German by William B. Phillips and Ernst Prochaska. New York: Scientific Publishing Company. 1891. Pp. v, 224. Price \$3.50.

This excellent work goes into the details of the Bessemer steel process from a largely Continental standpoint. Its numerous plates and illustrations elucidate the text, and it contains large numbers of analyses and physical tests, and various formulas and tables of dimensions. Thoroughness is everywhere conspicuous. The utilization of the slag is treated of in a short chapter, and among the results of the process dephosphorization in the open hearth process, the natural sequence of the Bessemer process, is spoken of.

**MAXIMUM STRESSES UNDER CONCENTRATED LOADS, TREATED GRAPHICALLY.** By Henry T. Eddy. Illustrated by twenty-one figures in text and one folding plate. Reprinted from the Transactions of the American Society of Civil Engineers. May, 1890. New York: D. Van Nostrand Company. 1890. Pp. vi, 100.

This useful work introduces a new graphical method for determining what position loads upon bridges must have in order to produce the greatest stress. A class of polygons or curves, which the author has named reaction polygons, is utilized for the method.

**THE METALLURGY OF SILVER, GOLD, AND MERCURY IN THE UNITED STATES.** By Thomas Egleston. In two volumes. Vol. II. Gold and Mercury. John Wiley & Sons, New York. Offices of *Engineering*, London. 1890. Pp. xv, 920. Price \$7.50.

This is the second volume of Prof. Egleston's great work, and is devoted to gold and mercury, thereby

concluding the series. It is beautifully printed and very fully illustrated. Prof. Egleston's standing in Columbia College and his many years' familiarity with the work done in different parts of America give his work a peculiar value. Of course, it is impossible to review so extensive a work in the space allotted it in this column. So we can do no more than to recommend it to all progressive metallurgists.

**SPINNING TOPS.** With numerous illustrations. By Professor John Perry. London: Society for Promoting Christian Knowledge. New York: J. B. Young & Co. 1890. Pp. 136. Price \$1.

A very pleasing addition to the well known "Romance of Science Series" is presented in this book. The subject of top spinning is of fascinating interest to two classes of observers, the boy and the advanced scientist. Prof. Perry treats his subject in a very popular way and shows its applicability to explaining some of the most recondite laws of nature, notably those of polarized light.

**SOAP BUBBLES AND THE FORCES WHICH MOULD THEM.** By C. V. Boys. Illustrated. (Publishers as above.) 1890. Pp. 178. Price \$1.

Mr. Boys has won a world-wide reputation by his exquisite skill in handling and operating with the minute forces of nature. His lectures on soap bubbles have met with great appreciation, and it seems none too soon to have them presented in book form. The numerous illustrations and the elaborate explanations of manipulations give the work interest for young and old. We feel that it deserves special recommendation to our readers.

**DYNAMOS AND ELECTRIC MOTORS, AND ALL ABOUT THEM.** By Edward Trevert. Illustrated. 1891. Bubier Publishing Co., Lynn, Mass. Pp. 96. Price 50 cents.

The subject of dynamo and motor construction for amateurs is treated of in this little work. The descriptions are entirely practical, little or nothing in the way of calculations being given. One of the cleverest things in the book is the motor with field magnets made out of gas pipe.

Any of the above books may be purchased through this office. Send for new book catalogue just published.

## SCIENTIFIC AMERICAN BUILDING EDITION.

## MARCH NUMBER.—(No. 65.)

## TABLE OF CONTENTS.

1. Plate in colors showing the residence of P. H. Hodges, at Stratford, Conn. Perspective view, floor plans, etc. Cost complete \$8,000.
2. Handsome colored plate of an elegant residence in Riverside Park, New York City. Floor plans, perspective elevation, etc. Cost \$30,000.
3. Residence at Bridgeport, Conn. Perspective view, floor plans, etc. Cost about \$7,000.
4. Handsome residence of Mr. F. Chamberlain, at Hartford, Conn. Francis H. Kimball, of New York City, architect. Floor plans, perspective elevation, etc. Cost \$60,000 complete.
5. Illustrations of two attractive semi-detached houses erected for Mr. A. L. Pennock, at Philadelphia, Pa. Floor plans and perspective. Approximate cost \$15,000 each. F. U. Beal, New York, architect.
6. Floorplans and photographic view of a residence at Edgecombe Court, Chicago, Ill. Estimated cost \$5,400.
7. A pillar cottage erected for Mr. G. W. Childs, at Wayne, Pa. Cost \$6,000 complete. Perspective and floor plans.
8. Handsome residence at Hartford, Conn., W. B. Tubby, architect, New York. Cost \$19,000 complete. Floor plans and perspective.
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10. A very convenient and attractive suburban cottage of modern design, erected for Mr. E. W. Given, at Mont Rose, Orange, N. J. Cost \$5,500 complete. Messrs. Rosseter & Wright, architects, New York. Floor plans and perspective.
11. Residence at Alexander Avenue, Buena Park, Chicago. Estimated cost \$5,000 complete. Plans and photographic view.
12. Photographic perspective view of the residence of Mr. Frank Crowell, Minneapolis, Minn. F. E. Joralemon, architect.
13. Miscellaneous contents: Preserving smoke pipes from rust.—Door hanging, illustrated with 6 figures.—Safe construction of buildings, illustrated with 5 figures.—Improved blind slat planing machine, illustrated.—Seamless copper house boiler, illustrated.—Best quality of roofing tin plate.—Blower engines of the Galena.—An efficient sandpapering machine, illustrated.—The "Hero" spring hinge, illustrated.—The Duplex joist hanger.

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## Business and Personal.

The charge for insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

For Sale—New and second hand iron-working machinery. Prompt delivery. W. P. Davis, Rochester, N. Y. Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J. Barrel, Keg, and Hogshead Machinery. See adv. p. 189. For best hoisting engine. J. S. Mundy, Newark, N. J. Best Ice and Refrigerating Machines made by David Boyle, Chicago, Ill. 155 machines in satisfactory use.

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The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$4; Munn & Co., publishers, 361 Broadway, N. Y.

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## Notes &amp; Queries

## 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. 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.

(2903) H. K. G. asks: 1. What is the composition of the cement used to repair rubbers? A. a. Masticated caoutchouc..... 10 parts. Chloroform..... 280 " b. Masticated caoutchouc..... 10 " Resin..... 4 " Venice turpentine..... 2 " Oil of turpentine..... 40 "

Melt the cut-up caoutchouc and resin together before solution b, add the Venice turpentine and then dissolve. Mix both solutions. Dip a piece of cloth in the solution and apply to surface, previously brushed over with cement. 2. Please give also a receipt for a leather cement. A. Bisulphide of carbon solution of gutta percha. See "Rubber Hand Stamps and the Manipulation of India Rubber," \$1 by mail.

(2904) H. C. O. sends photos. of a fine optical lantern made from suggestions obtained from "Experimental Science," also a successful home-made cycloidrotrope constructed at a small expense. He also sends a photo. of a lantern experiment representing a volcanic eruption in full blast. The apparatus consists of a glass tank with a crater projecting down into it. In the crater are inserted two drop tubes, one containing aniline, the other black. By dexterous manipulation the jets of red and black are ejected with fine effects.

(2905) R. S. F. and A. E. S.—The following is an excellent hair tonic:

Quinine..... 5 grns. Cantharides..... 1 dchm. Alcohol..... 2 oz.

Apply morning and evening. Also see SUPPLEMENT No. 388 for an excellent paper on hair hygiene, 10 cents by mail.

(2906) W. L. S. asks how a circular opening three inches in diameter may be made in the center of a plate of glass ten by ten. A. With a good diamond make a circular cut in the glass of the diameter of the hole, then within it make a number of circular cuts. By dexterously hammering the glass at the center of the circle, the break may be started. After this the removal of the remainder is comparatively easy.

(2907) C. P. R. asks: A leather bellows is closed and placed 10 feet under surface of water; bellows is of proper size to displace 1 cubic foot of water when opened 8 inches wide; a 1/2 inch tube runs from surface into bellows. What force will be required to open bellows, it taking air through the 1/2 inch tube? A. The area of the bellows will be 177=216 square inches. The pressure due to a column of water ten feet high is about 435 pounds. 435×216=9396 pounds. As it opens the pressure will diminish about 783 pounds per inch of opening.

(2908) **W. P. N. asks :** Would you please oblige me by publishing a recipe for the cure of catarrh? A. Take equal parts of salt, soda bicarb., and borax. Mix them thoroughly. Use saltspoonful of mixture to cup of warm water. Always have the water warm. Gargle and snuff up the nose three or four times daily. Better consult a good specialist.

(2909) R. A. M. asks : A solid floats at a certain depth in a liquid when the vessel which contains it is in air; if the vessel be placed in a vacuum, will the solid sink, rise or remain stationary ? A. The weight of the water would remain unchanged in a vacuum, consequently the floating body would behave as if the water were under atmospheric pressure.

(2910) H. L. B. asks: Is there anything that will eradicate smallpox pits without injury to the skin? If so, what is it? A. No. There is nothing; the connective tissue is destroyed and it cannot be replaced.

(2911) J. L. S. asks: What will kill the odor of camphor dissolved in alcohol? A. Any essential oil will tend to destroy the odor—bergamot, lavender, etc.

(2912) Old Subscriber asks : I have some old engravings that are stained and spotted by age and dampness. How can these stains be removed without injuring the pictures? A. Immerse them in javelle water of solution of chloride of lime. Wash off in clear water and immerse in a solution of hyposulphite of soda. Use first solution as weak as possible consistent with efficacy.

(1913) W. F. writes: I am very badly in want of a recipe for making in quantity a very quick-drying solution of either gum arabic or dextrine, to be quite free from unpleasant taste or smell when either wet or dry. A. Water 5 parts, alcohol 1 part, acetic acid 1 part, dextrine 2 parts.

(1914) H. L. N. asks (1) how to make a marking ink, either blue or black, without the use of oils, to be used principally for marking sacks. A. An excellent medium is solution of 20 parts shellac in strong borax water (borax 30 parts, water 900 parts). Use any desired pigment. Dissolve borax and shellac by heat. An aniline coloring may be used. 1 part coal tar, 1 part benzine, and one-tenth part lampblack is also used. 2. How can I make a cheap paste that will make labels stick to smooth tin cans? A. Fresh solution of gum tragacanth is good. Also see SCIENTIFIC AMERICAN, vol. 63, No. 15.

(1915) P. C. Manufacturing Co. asks: Can you give us a receipt for preventing paste made from flour from foaming while being agitated or stirred up by machinery? A. It is almost impossible to advise anything effectual. Vapor of ether might do some good.

(2916) J. B. W. asks for a liquid that will have no injurious effect on phosphorus and will not freeze readily. A. Use a strong solution of calcium chloride or sulphate of soda.

(2917) W. H. L. writes for a receipt for making mucilage such as put up for sale in bottles. A. See queries 2913 and 2914. Plain solution of gum arabic in water just perfumed with oil of cloves is an excellent mixture.

(2918) **G. M. P. asks for receipts (1) for** cleaning and polishing marble such as marble top stand tables, bureau tops, etc. **A.** Brush off the marble and apply following:  $\frac{1}{4}$  pound whiting,  $\frac{1}{4}$  pound soft soap, 1 ounce washing soda, a piece of blue vitriol the size of a walnut. Rub over the marble and let it stand 24 hours, then wash off and polish with a piece of flannel. To remove stains use a mixture of 1 ounce ox gall, 1 gill of lye,  $1\frac{1}{2}$  tablespoonfuls of turpentine, made into a paste with pipe clay. Apply as above. For oil stains use perfectly dry clay saturated with benzine, and applied over the spot and allowed to stay for some time. **2.** For cleaning and polishing furniture. **A.** Dissolve 4 ounces best shellac in 2 pints 95 per cent alcohol, add 2 pints linseed oil, 1 pint turpentine, mix and add 4 ounces ether and 4 ounces ammonia, mix, shake before applying. Use a sponge. **3.** For cleaning and polishing ivory, such as piano; keys, etc. **A.** For piano keys use the finest crocus or whiting. You cannot whiten them except by special treatment, such as exposure under turpentine to the sun's rays. **4.** For taking all kinds of stains, etc., out of fine clothing. **A.** Use benzine. Apply in a circle around the spot, and work into the center and sponge off.

(2919) J. B. V. asks (1) how to make blue print paper. What are the formulæ used ? A. See our SUPPLEMENT, Nos. 585, 741, 514, 584, and 714. 2. Can dextrine be made from starch with the use of water alone ? If so, how, or how can it be made without diastase ? 2. No. Starch is boiled with a weak acid. 3. How may a bottle be cut off near the bottom without injuring the rest of the bottle ? A. File a notch, start a crack with a red hot poker, and lead it around. 4. What is the formula for the liquid used in mixing gold paint, bronze, gilding, etc. ? A. Use copal varnish or linseed oil and liquid drier. 5. Can you give me a formula for a mucilage that I can stick paper to tin with ? A. Use gum tragacanth. Also see SCIENTIFIC AMERICAN, No. 15, vol. 63.

(1920) F. G. asks: Kindly give the recipe for putting gold leaf letters on leather. A. The cover is first washed with clear gum water. The parts to be gilded are then coated twice with white of egg beaten into a froth and allowed to subside into a clear liquid. A little ammonia may be added. To gild, spread a leaf of gold on the gilding cushion with a knife, and blow it flat, then cut it into strips about one-fifth inch wide. Heat the tool until it is just hot enough to fizz under the wet finger; if it sputters it is too hot and will burn the leather; touch its edge with a rag slightly moistened with sweet oil, and with the same rag rub over the part of the book to be gilt. Roll the tool softly on the strips of gold, which will adhere to it, and when enough is taken up, roll it with a heavier pressure along the places to be gilt, and the gold will be transferred to the leather the excess being wiped away with a soft rag.

(1921) W. McP. F. writes : I have in my possession a certificate of membership issued by the

"Society of the Cincinnati" to my paternal grandfather. It was signed, I imagine when issued (in the eighth year of the independence of the United States), by the President and Secretary. Both names are becoming obliterated by the gradual fading of the ink. "J. Knox" is quite indistinct now. Is there any means by which partial restoration may be effected, or is there any way of arresting the entire disappearance of the signatures? A. We can only advise careful painting over the signatures with a solution of tannic acid in water. This you should try on a very small portion of the signature first, applying it with a small sable or camel's hair pencil.

(2922) P. J. L. asks (1) how to take the smell out of kerosene, say a gallon at a time. A. Agitate with a perfectly cold solution of bichromate of potash in oil of vitriol; after standing decant, wash with weak soda solution, then with water and decant. 2. How to make vaseline? A. It is obtained by distilling off the lighter portions of petroleum and purifying the semi-solid residue. It is described in the U. S. Dispensatory. 3. How to make camphorated oil in small quantities. A. Dissolve 2 ounces camphor by heat in one pint of olive oil. 4. Have you any book or printed descriptions giving full details? A. We know of no book treating of above subjects.

(1923) I. J. A. asks: Please inform me what paste I can use to stick photographs on concave glass for the purpose of painting them, after making them transparent with oil. Common starch used to do it, but now I fail to make them stick, as they seem to shrink and pull off before putting oil on. A. Try fresh thick solution of gum tragacanth or the "paste that will stick anything," described in the *SCIENTIFIC AMERICAN*, vol. 63, No. 15.

(2924) A. H. G. asks : 1. Please state how a guitar or violin is taken apart (top or bottom off). If steamed, what would be the proper way to proceed ? Please state also how the tail piece or piece that the strings are fastened in on the guitar may be removed. A. Never apply steam, as you may ruin it. Use a rather blunt short table knife. Start the belly off, by forcing the knife in between side and belly at one of the inner bouts, then do same for upper and lower bouts, and finally go all around it. At the neck two short cuts at right angles have to be made. It can then be pulled off. The back is never removed. As regards the guitar, you may pry off the string piece, but it is risky. All this work should be done by an expert, as there is every chance of spoiling the instrument. 2. Please name a few oils other than lard oil and cod liver oil, that are cheap and of a white or creamy color. It matters not whether thick or thin, as long as it is of a very light color or pure white. A. You apparently confuse oils with emulsions. None of the oils you name are white or creamy. 3. What will entirely dissolve gum tragacanth ? A. For ordinary purposes water comes the nearest. A strong solution of borax in water might act better.

(2925) C. S. M. asks: Can you tell me whether there is any metallic solution that could be used to coat over the surface of an electrotype wax mould, which would insure the deposition of copper thereon as thoroughly as the plumbago now used for that purpose? A. Nitrate of silver, to be reduced by exposure to phosphorous or other vapor, can be used. Thus the articles may be dipped in a solution of nitrate of silver in alcohol. The solution must be saturated. The objects are then exposed under a glass shade or bell jar to the vapor emitted from a solution of phosphorus in bisulphide of carbon. The trouble with the phosphorus process is that it is apt to render copper brittle, if the latter is deposited on a phosphorized surface.

(1926) H. W. asks for some formula for detecting arsenic in paper hangings, draperies, etc. A. If a sample of the paper or drapery is burned, it will, while burning, emit an odor of garlic, if it contains arsenic in quantity. Other tests should be executed by a chemist.

**TO INVENTORS.**

An experience of forty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequalled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices which are low, in accordance with the times and our extensive facilities for conducting the business. Address: MUNN & CO., OFFICE SCIENTIFIC AMERICAN, 361 Broadway, New York.

## INDEX OF INVENTIONS

**For which Letters Patent of the  
United States were Granted**

**March 17, 1891.**

**AND EACH BEARING THAT DATE.**

[See note at end of list about copies of these patents.]

Adding machine, G. B. Gates	448.22
Advertising vehicle, T. Gill	448.42
Aerator for milk or other liquids, L. F. Wood	448.56
Ammonia, manufacturing nitrate of, R. S. Penniman	448.36
Ammonia, preparing nitrate of, R. S. Penniman	448.36
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Bank protector, J. A. Saxon	448.54
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