

RECENTLY PATENTED INVENTIONS.

Electrical.

RHEOSTAT.—Thomas J. Parrish, Nevada, Mo. The base plate of this device is preferably made of hard rubber, brass or wood, with binding posts at one end and at the other end an upright supporting a helical coil with hollow central chamber, where a slide is arranged to move into or out of the coil, an external spring being adapted to bear upon different portions of the exterior of the coil to transmit the current through more or less of the coil, as desired.

PHONOGRAPH.—James P. Magenis, North Adams, Mass. This is a device in which, combined with the record cylinders, is a mouthpiece furnished with diaphragms having tracing points, a track to support the mouthpiece in the position of use, and other novel features, forming a phonograph in which a record may be made on two cylinders simultaneously, so that one may be retained as a file, or a message may be repeated from one cylinder to another.

SUPPORT FOR TELEPHONE RECEIVERS.—Simon Leberberg, Berlin, Germany. This is a device to enable the receiver to be held and adjusted for use to leave the hand at liberty for writing, etc., and consists of a horizontal jointed bracket in vertical bearings, a vertically movable upright in the outer member of the bracket, with a horizontal arm having at its outer end vertical spring clamps and connected by a universal joint to the upright.

DRILL HOLE MAGNET.—Charles S. Porter, Ivanhoe Furnace, Va. This is a magnet for lifting particles of iron and steel, broken bits, etc., from drill holes, being a permanent bar magnet flattened at one end and perforated to receive the link of a chain, while the keeper is formed of a bar of soft iron with its ends curved over toward each other and fitted to tightly clamp the ends of the permanent magnet, to preserve its strength when not in use.

Mechanical.

SANDPAPERING MACHINE.—Axel K. Hattberg, Marshfield, Wis. This is a machine which provides for the holding of the work in yielding contact with the sandpapering cylinders, for a reciprocation of these cylinders in a line parallel with the shaft axes, and for the adjustment of the machine so that it can be readily used with material of different thicknesses.

SPINNING AND TWISTING.—Johann Boelsterli, Fussen, Bavaria, Germany. This is a flier and drag device for spinning and twisting machines in which the flier is independent of the bobbin spindle and terminates in a tubular spindle which rotates on a fixed bearing, the fibrous substance passing through this spindle or its bearing, over one arm of the flier, and downward and around half of the periphery of a ring connecting the ends of the flier arms, and thence to the spool, making a stronger spindle and giving easier access to it.

MOTIVE POWER FOR JIGGERS.—James Nicholas, Benton, Wis. The upper ends of the pitmen of two oppositely placed balance wheels are secured to the outer ends of the tongues of one or more jiggling machines, a large central drive cog wheel, rotated by a crank handle, communicating rapid motion to the balance wheels through side shafts and pinions, whereby the work will be lightened and its amount greatly increased, the device being also applicable to a variety of other uses.

WISE.—Charles Wies, Faulkton, South Dakota. This is an improvement in that class of vises whose sliding jaw is operated by a cam lever pivoted on the fixed jaw, and having a pendent lip or flange engaging shoulders or teeth on the shank of the sliding jaw, the novel feature being the means for pivoting and detachably holding the cam lever on the fixed jaw.

Miscellaneous.

MAP CASE.—Charles M. Terrell and Hiram M. Chittenden, Omaha, Neb. This case has a transparent front, and two rollers are revolvably mounted in the case at proper distances apart, a web of flexible material being wrapped on the rollers and adapted by simple mechanism to be transferred from roller to roller reciprocally, thereby exposing any map, design, engraving, or like article to view, as it is drawn before the transparent face of the case.

TIME AND DATE CALCULATOR.—William R. Will, Baltimore, Md. This is a device more especially for use in banks and offices for mechanically determining the number of days between two dates, and consists of two stationary concentric scales oppositely numbered from 1 to 365, combined with a similarly numbered rotary adjustable circular scale, with other novel features.

AERIAL MACHINE.—Stewart Cairncross, Grafton, North Dakota. The gas bag of this machine is held to a suitable frame by netting, and on the lower face of the frame is a shaft carrying a propeller wheel to be operated by gearing devices from the cage below, the machine being normally adjusted to counterbalance the weight of the operator, so that it will only rise as he operates the propeller wheel, but the adjustment being such as to permit guiding the machine in any direction.

MIDDINGS PURIFIER.—Robert L. Hotrel, Cedarville, Cal. This is a machine designed to be simple and durable in construction and very effective in operation, the invention covering various novel parts and details and their combinations.

FRACTURE APPARATUS.—Thomas M. Miller, Medford, Wis. This invention provides a device whereby a fractured limb may be held in position for bandaging or the application of plaster of Paris with the least inconvenience to the patient, while affording great facility for the operator, and whereby also the limb may be stretched or raised and lowered as desired, with rests for the limb capable of lateral adjustment.

COAL ELEVATOR.—Angus H. McLean, Saginaw, Mich. This elevator is designed especially for loading coal from a bin into the tender of an engine, and provides means whereby the bucket will be raised by the engine, and at the proper moment, as the tender is brought in front of the bucket, the latter will be dumped to deliver the coal into the tender.

BOX CLAMP.—Robert H. Blair, Kansas City, Mo. This is a clamp especially adapted for use on boxes containing nursery stock, where there is considerable spring to the sides of the box, the clamp consisting essentially of two upright side pieces adapted to fit against the sides of the box, each piece having an angular lower end to fit beneath the box, and having notches near the top, a cross bar with a slot in one end fitting upon the side pieces, provided with a swinging lever adapted to engage the notches.

VEHICLE SPRING.—Phaon J. Kern, Frankfort, Ind. This invention relates more particularly to springs for road carts, providing what is designed to be a simple, cheap, and effective arrangement of springs, the invention consisting in the novel arrangement and peculiar combination of parts.

DESK AND ITS SUPPORTS.—William A. Roos, New York City. This invention is more particularly designed for a window desk, or for desks to be used in doorways, and other places, and provides novel combinations of parts for supporting the desk, adjusting its top to various angles, shutting or closing it when not needed, and its ready attachment and detachment.

STEAM FOOD COOKER.—Olive C. Christin, Bodie, Cal. This cooker has several sections, the lower one being a boiler and the upper sections divided into compartments with through and through passages for the steam, whereby several different kinds of edibles may be cooked at once, with economy of time, space, labor and fuel, and without giving one the flavor of the other.

DOOR CHECK.—Charles W. Fishel and Frank S. Hotchkiss, Carbondale, Col. This is a door holder whose main feature is a spring catch adapted to receive and firmly clasp a knob or projection attached to the door, the spring catch being inclosed in and protected by a detachable barrel or tube applied to the part having a screw for attaching it to the wall.

SCIENTIFIC AMERICAN BUILDING EDITION.

AUGUST NUMBER.—(No. 58.)

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1. Elegant plate in colors showing perspective and floor plans of an attractive little cottage recently erected at a cost of only \$900 at Sunapee, N. H., from plans by Munn & Co., architects, New York. Sheet of details, etc.
2. Plate in colors of Mr. Charles Barnard's cottage at Stamford, Conn. Perspective elevation, floor plans, sheet of details, etc. Cost \$2,000.
3. Chateau de Chenonceaux, erected in the reign of Francis the First. Page engraving.
4. A cottage at Villa Park, New York. Cost \$3,400 complete. Floor plans, perspective elevation, etc.
5. A residence on Chester Hill, Mount Vernon, N. Y. Cost \$5,500 complete. Perspective view and floor plans.
6. A block of city residences erected for Dr. F. E. Robinson, on West End Avenue, New York City. Floor plans and perspective view.
7. General view and details of Festival Hall of the Union of German Singers at Vienna.
8. Residence at Greenwich, Conn. Cost \$7,800. Perspective and floor plans.
9. Dwelling at Stamford, Conn. Cost \$5,000. Plans and perspective elevation.
10. A dwelling at Holyoke, Mass., erected at a cost of \$9,500 complete. Rosseiter & Wright, New York, architects. Floor plans and perspective view.
11. Dwelling and store at Mount Vernon, N. Y. W. S. Stickles, architect, Mount Vernon. Cost \$5,600 complete. Plans and perspective elevation.
12. An elegant residence erected on the Highlands, Springfield, Mass., at a cost of \$6,000. Floor plans and perspective view.
13. Attractive stable at Montclair, N. J. Cost complete \$3,200. J. C. Cady, New York, architect.
14. Miscellaneous: Steam as a fire extinguisher.—Trees and streets.—Portrait and biographical sketch of John Ruskin.—A porch covered with clematis montana, illustrated.—Prevention of decay in stone.—The porcelain tower at Nankin.—The Howard heater, illustrated.—Effective lightning rods.—An improved square chisel mortiser and borer, illustrated.—Zinc and brick work.—The Hartman sliding blinds.—An improved mitering machine, illustrated.—An improved twist machine, illustrated.—An improved heater, illustrated.—A perfect sanitary wash tub, illustrated.—An improved bench plane, illustrated.—A large contract for steel roofing.—New York Central Iron Works Company.

The Scientific American Architects and Builders Edition is issued monthly. \$2.50 a year. Single copies, 25 cents. Forty large quarto pages, equal to about two hundred ordinary book pages; forming, practically, a large and splendid MAGAZINE OF ARCHITECTURE, richly adorned with elegant plates in colors and with fine engravings, illustrating the most interesting examples of Modern Architectural Construction and allied subjects.

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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. Acme engine, 1 to 5 H. P. See adv. next issue.

Turk water motors at 12 Cortlandt St., New York. Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J. Holeting Engines. The D. Frisbie Co., New York city.

Billings' Drop Forged Lathe Dogs, 12 sizes— $\frac{1}{2}$ to 4 inches. Billings & Spencer Co., Hartford, Conn.

The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Best Ice and Refrigerating Machines made by David Boyle, Chicago, Ill. 156 machines in satisfactory use.

Tight and Slack Barrel Machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv., p. 12.

Screw machines, milling machines, and drill presses. The Garvin Mach. Co., Light and Canal Sts., New York.

Veneer machines, with latest improvements. Farrel Fdry. and Mach. Co., Ansonia, Conn. Send for circular.

For Sale—Patented register for machines, No. 432,441, issued July 15, 1890. See page 89. Address R. Ruhlman, Trenton, N. J.

Guild & Garrison, Brooklyn, N. Y., manufacture steam pumps, vacuum pumps, vacuum apparatus, air pumps, acid blowers, filter press pumps, etc.

The Holly Manufacturing Co., of Lockport, N. Y., will send their pamphlet, describing water works machinery, and containing reports of tests, on application.

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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Send for new and complete catalogue of Scientific and other books for sale by Munn & Co., 361 Broadway, New York. Free on application.

Notes & 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.

(2363) E. W. H. asks: What kind of material is generally used for balloons? A. Muslin varnished with luseed oil varnish is often used. For an excellent article on the subject we refer you to our SUPPLEMENT, No. 726. Silk is often recommended, but is too expensive, and probably more liable to heating while stowed away.

(2364) C. A. asks: 1. What is the mode of cleaning a meerschau pipe? Please give process fully. A. Cork up the stem aperture, moisten the interior of the bowl with a little alcohol, and light it. When burned out, scrape the charcoal out with a knife. A button of meerschau should be kept in the bottom of the bowl to prevent the point of the knife penetrating the base and spoiling the pipe. 2. What is mode of connections on the old style frictional plate electric machine, and what materials should rubbers be made of? A. Either the rubbers or prime conductor must be insulated, and the one that is not insulated should be connected to the ground. The rubbers may be made of felt rubbed with a very little grease and an amalgam of tin and mercury. 3. A good recipe for ginger beer. A. Crush sixteen ounces of the best ginger, and put it in a large tub, boil ten gallons of water and pour thereon, add six pounds best white sugar, one ounce cream of tartar, and ounce tartaric acid, stir the whole up with a stick till the sugar is dissolved, allow it to stand till sufficiently cooled, then add one pint brewer's yeast; stir this in, let it stand for twelve hours or until a scum forms on the top, then drain it off, add one ounce of soluble essence of lemon, clarify, bottle, and tie down.

(2365) J. P. asks how he can plate a silver ring with gold and not use an electric current. A. You must apply amalgam gilding. The article is "quicked" by dipping into a solution of nitrate of mercury. It is then rubbed with an amalgam of gold 1 part, mercury 3 parts. A brush is used for the rubbing. It is then gradually heated until the mercury is all expelled, which requires less than a red heat, and is rubbed up and polished. This is an extinct art practically, as battery plating has displaced it.

(2366) L. W. asks how to detect tinctura cantharidin in coffee. A. Extract the coffee with ether or chloroform and evaporate to dryness. By volatilization, pure cantharidin mixed with caffeine can be obtained. Weak alkali will dissolve the cantharidin. Precipitate with acid, filter, and test by second volatilization and examine under the microscope, comparing it with a sample of known cantharidin.

(2367) H. V. asks where he can purchase a book of designs used for papier mache decorations and terra cotta workings, designs that would answer for interior and exterior work on houses. A. We can supply you with Interior Decoration, by Brunner & Tryon, \$3. 2. Would you also inform me what is the composition of the plaster work on the outside of frame houses? A. Use a cement mortar, 1 part Port land or even Rosendale cement to $1\frac{1}{2}$ or 2 parts sand. The only rule to apply in working rapidly setting cement or plaster of Paris is to mix the ingredients dry, then moisten and mix, and only mix small quantities.

(2368) J. H. J. asks how to blacken brass and German silver. A. A very simple process consists in dipping the metal in solution of nitrate of copper and heating over a flame or clear fire. This must be repeated until a black is produced. Or proceed thus: Polish with tripoli or other agent, then wash with a solution of 1 part nitrate of tin and 2 parts chloride of gold; after 12 or 15 minutes wipe off. If the solution is acid, the color will be darkened.

(2369) F. P. asks (1) for the best preparation to use of soda and tartaric acid for aerated water. A. Use 4 parts bicarbonate of soda to $3\frac{1}{2}$ parts tartaric acid. A slight excess of acid may be used to give pleasant acidity. 2. Is there anything better or cheaper that can be used without a special apparatus? A. No.

(2370) M. H. asks: 1. Is there such a thing as liquid vaseline? A. No. Kerosene and heavy paraffine oils may be taken as the nearest approach to it. 2. What is the most practical formula for determining the flow of water from an artesian well? A. Determine the head of water or pressure at the mouth, and apply the formula

$$Q = a \sqrt{2gh}$$

in which a = area of pipe in square feet, and h head in feet, and $g = 32.5$. 3. What is the formula for determining the number of gallons of water discharged per minute by a mountain stream? A. Determine its profile and the current velocity, and calculate the flow from these data. 4. For determining the number of gallons of water discharged per minute by a river. A. Determine its profile and the current velocity at different depths, and from these calculate the amount of water. 5. Can the magnetic variation be found by means of an ordinary compass, Jacob mounting, or ball and socket movement? A. Not very accurately. Works on surveying tell how to determine the true meridian, with which you can compare your compass. We can supply you with "A Practical Treatise on Surveying," by Gillespie, price \$3.50. 6. What is the best method to preserve poplar trees from being worm-eaten, and what is the scientific name of the worm that destroys them? A. Spray with Parisgreen and water. For publications and information on subject, address the Department of Agriculture, Washington, D. C.

(2371) J. H. J. writes: 1. Where are phonographic dolls to be purchased, and what is the price? A. For phonograph dolls, address the North American Phonograph Company, New York, N. Y. 2. Professor Steele, in his Series in the Natural Sciences, gives two experiments with sodium sulphate ($\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$); one is given in his "Fourteen Weeks in Chemistry," page 133, bottom of page, the other in his "Popular Physics," page 261, bottom of the page. I have tried both of these, and do not succeed. Can you suggest what the difficulty is? A. Sometimes these experiments in crystallization fail unaccountably. By using fresh soda sulphate each time you have a better chance of success. 3. In catalogues of "weights of precision" I have seen "riders" spoken of in connection with some sets. What are they and what is their use? A. A "rider" is a weight made of wire that is used like a steelyard weight upon the arm of the balance which must be graduated, generally in twelfths. Thus a twelve milligramme rider gives one milligramme for each division. 4. In a great number of receipts paraffine is used. What is paraffine? Druggists in Shanghai tell me it is an extra refined kerosene oil. Is this right? A. Paraffine wax is meant—the substance from which paraffine candles are made. It is a white solid substance, a product of distillation of coal. It is not an oil in your case, although it is a common name for refined petroleum.

(2372) G. W. writes: In the process of rendering fat and bone boiling from the refuse of markets, a very strong and disagreeable odor is engendered. By the most recent machinery this odor is directed from the vat through a pipe to a furnace fire. The pressure forcing the odor in steam form through the coal bed in the furnace from six to eight inches thick. Now the question is, does this odor become odorless from this furnace heat, or is it brought back through the chimney in a warm form with the same smell to foul the air? Would the smell be greater some distance from the factory, say a mile to a mile and a half, than near to it? A. The process described we should judge could be made perfectly effectual, and would quite destroy the odors if properly conducted. The odoriferous compounds would be oxidized and decomposed, not merely disseminated. No smell should be found near to or far from the factory.

(2373) P. I. W. M. Co. asks: Can you give process for recovering metals? We melt antimony, lead, and tin together. We have a quantity of the ash or dross. We wish to separate the metal from waste. A. The dross undoubtedly consists of the oxides of the metals. By melting in crucibles with powdered charcoal at a high heat, some could be recovered, but probably not enough to pay. By proper precautions the waste could be kept low. We would suggest keeping melted salt upon the metal in the crucibles, or even a layer of charcoal in coarse powder, and also keeping the crucibles covered.

(2374) C. C. W. writes: I have some pieces of serpentine rock which I wish to polish highly on one surface. Can you tell me how to do this? A. This has to be done by rubbing with proper polishing agent. A piece of moist sandstone may be used to produce the flat surface, or a plate of iron with sand and water will answer. This is followed by pumice stone ground to a flat face, and then a compact linen cushion is used with fine emery. Finally apply to the washed surface putty powder and water with a linen cushion. In Workshop Receipts, 1st series, \$2, there is quite an article on the subject under "Marble Working."

(2375) W. H. H. asks why it is that the manufacturers of best grades of barometers, both mercurial and aneroid, place the words stormy at about 28, rain at 29, dry at about 31, when the instrument has no such range. Is it not misleading and erroneous? A. It is misleading, and the custom should be abandoned. The variations of the barometer in conjunction with other meteorological observations may be used to foretell the weather. In any case and under the best conditions there is much uncertainty.

(2376) S. L. asks: What kind of red powder is used in the manufacture of the metal polishing paste used for polishing all kinds of metal? A. Red oxide of iron, colcothar or jeweler's rouge may be used for this purpose in the proportion of 25 parts to 20 parts of rotten stone. Both enter into the formula.

(2377) G. F. C. asks how to make a good rosewood stain. A. Boil 1/2 pound of logwood chips in 3 pints of water until very dark, then add 1/2 ounce salts of tartar. Stain wood with boiling hot mixture. When nearly dry, repeat. Two or three coats can be given. Streaks can be made on it with black stain applied with a graining brush. The black stain is made by boiling 1 pound logwood chips in 4 quarts of water and adding a double handful of walnut husks. After boiling, stain. Good ink may be used for the black streaks.

(2378) U. L. H. asks: 1. What is the best method to clean sea shells and prepare them for the cabinet? A. If in good natural condition, no cleaning is needed. If encrusted with parasitic calcareous matter, it can be removed with an engraver's tool or other similar instrument. A very weak mixture of hydrochloric acid and water may be used as a last resort. They should be soaked in cold water, dried well, oiled, and polished by rubbing. 2. How are star fish and sea weeds best preserved? A. Immerse in fresh water for some hours, extended and pinned down upon a plank and dried. Thrust the pins into the wood by the side of the rays, not through them. Dry in the shade. The flesh should be cut out of the larger specimens and a preservative applied before drying. 3. How are shells polished in the quickest manner? A. Place in cold water with quick lime and boil for some hours, cool slowly, apply strong acid to the epidermis, which will peel off. Polish with rotten stone and oil. 4. What is the best illustrated work on conchology? A. We recommend and can supply Structural and Systematic Conchology, by Tyron, 1 vol., cloth, \$12. 5. Where can I get a work on polishing shells, and a guide for lapidaries? A. We can supply you with a Handbook for Artists, Mechanics, and Engineers, by Byrne, price \$5, which contains a chapter on lapidary work. 6. In the process of embalming birds of any value? A. No. 7. How are fine shells shipped, also star fish? A. Pack as you would glass or china. 8. How long will specimens keep in alcohol? A. Indefinitely.

(2379) H. W. S. asks the meaning of the words "present" or "addressed," used in sending a letter to a person not far off. A. "Present" should mean left by writer, but is used often when a letter is sent by hand. "Addressed" seems to have no special meaning in this connection.

(2380) J. J. C. writes: I have a small barrel which held orange wine, and I wish to make root beer in it. How can I clean the cask? There is a sort of a mould in it. A. Fill one-quarter of the cask with water, burn sulphur in it, and shake repeatedly, removing the sulphur if necessary while shaking. This will destroy the mould if done well and effectually.

Replies to Enquiries.

The following replies relate to enquiries recently published in SCIENTIFIC AMERICAN, and to the numbers therein given:

W. T. M., in query 2348, in July 26 issue of the SCIENTIFIC AMERICAN, asks how to cut a large glass bottle. The method you recommend him you acknowledge to be a dubious one. If your correspondent will use a sharp triangular file kept wet with turpentine, he can file the glass with ease. It takes patience, but it will be successful.

Answer to query 2353, to keep milk or butter cool in warm weather. Take tin vessel, say 10 or 12 inches diameter and 4 or 5 inches deep. The cover should be conical, the center being raised 3 or 4 inches. On this place a linen cloth, large enough to hang over the side of the vessel. Take about a dozen strands of woolen yarn, slightly twist them together a portion of their length. From the cone of the cover spread the single strands of yarn over the linen. Immerse the twisted portion in a bucket of water near the can. One bucket of water will suffice for several cans. They should be placed on a bench under the shade of a tree. By this method milk may be kept sweet in the hottest weather.—J. M. C., Independence, Mo.

NEW BOOKS AND PUBLICATIONS.

THE DISPOSAL OF HOUSEHOLD WASTES. A discussion of the best methods of treatment of the sewage of farm houses, isolated country houses, suburban dwellings, houses in villages and smaller towns, and of larger institutions, such as hospitals, asylums, hotels, prisons, colleges, etc., and of the disposal of garbage, ashes and other solid house refuse. By Wm. Paul Gerhard, C.E. New York: D. Van Nostrand Company. 1890. Pp. 193. Price 50c.

This little work has as the best evidence of its usefulness the author's name. Mr. Gerhard's authorship gives it the proper stamp. We can confidently recommend it to all interested in sanitary engineering as an excellent exposition of country and suburban practice.

PRACTICAL ENGINEERING FOR ELECTRIC LIGHT ARTISANS AND STUDENTS. By W. Slingo and A. Brooker. London and New York: Longmans, Green & Co. 1890. Pp. vi, 631. Price \$3.50.

Although overshadowed by the influence of the City and Guilds Technical Institute of London, a valuable

contribution is found in the present work to the science of engineering. It purports to be for electric light artisans and students and to embrace branches prescribed in the syllabus of the institute just mentioned. As this syllabus happens to be a very exhaustive one, the work is also comparatively complete. It will be found of value for students and readers in general. We presume it is well adapted for its end, facilitating the work of passing the examinations of the London examining bodies.

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 July 22, 1890.

AND EACH BEARING THAT DATE.

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

Table listing inventions with patent numbers and dates. Includes entries like Acid, making acetic, Bang & Ruffin 432,926; Advertising vehicle, C. Stulpnagel 432,776; Aerial machine, S. Calmrose 432,860; Air moistening apparatus, W. R. Renolds 432,837; Alarm, See Fire and burglar alarm; Alloys of metal of the aluminum group, manufacturing, G. A. Faurie 432,698; Animal trap, J. M. Waddell 432,743; Arm rest, adjustable, E. J. Brandt 432,786; Armature for dynamo-electric machines, N. H. Edgerton 432,748; Auger, earth, A. V. Hartle 432,705; Automatic clamp, T. B. Moon 432,543; Axle boxes, dust guard for, T. H. Symington 432,549; Bag lock, J. F. Mains 432,539; Bands, rinks, etc., by electricity, manufacture of, E. Thomson 432,656; Bark mill, G. T. McLauthlin 432,550; Basin waste, H. M. Weaver 432,658; Bath, See Shower bath; Bath heater, J. L. Brandt 432,506; Battery cell, H. E. Waite 432,681; Battery plates, forming secondary, H. G. Morris 432,834; Battery plates, making secondary, W. P. Kookokey 432,672; Bearing, self-adjusting, Freeman & Donald 432,608; Bedstead, extension for, J. A. Belsber 432,505; Bicycle, locking device for, F. E. Wittig 432,920; Binder, temporary, W. Lumley 432,537; Bisulphite solutions, apparatus for producing, T. P. Burgess 432,692; Bisulphites, apparatus for producing, C. Cornwell 432,604; Bit, See Drenching bit; Blacking, leather, J. J. Baulch et al 432,853; Blast furnace filling contrivance, A. E. Brown 432,788; Boiler bearing, T. B. Merrill 432,950; Boilerfurnace, steam, Harteau & Gaffing 432,668; Boilers, circulating device for steam, J. Keller 432,879; Boilers, fire and water indicator for steam, S. Smith 432,773; Bolt, See Railway splice bar bolt; Book attachment, T. F. Gregg 432,700; Boot jack, R. E. Heth 432,941; Bottle stopper and pouring nozzle, ink, E. H. Alling 432,924; Box, See Miter box, Paper box, Pencil box; Box clamp, R. H. Blair 432,865; Box lifter, Platen & Bennett 432,765; Box strap, J. Mahady 432,538; Brake, See Car brake, Locomotive driver brake, Power brake, Vehicle brake; Brake cylinder head, G. Westinghouse, Jr 432,715; Bread cutter, G. W. Langdon 432,628; Brick and pottery kiln, N. S. Clark 432,601; Buckle, suspender, F. H. Richards 432,740; Burner, See Gas burner; Burnishing machine, J. J. Heys 432,874; Buttonhole barring machine, H. M. Essington 432,795; Button, tuft, Hutchinson & Cables 432,878; Cable, wire, T. Midgley 432,804; Calculator, time and date, W. R. Will 432,919; Calendar, sporting, A. H. Robinson 432,838; Callipers or dividers, J. Stevens 432,578; Can, See Oil can; Can nozzle, Melton & Webb 432,676; Can opener, Cook & Sheppard 432,601; Candle attachment, W. T. Ross 432,678; Candy rolling and cutting machine, W. Glynn 432,937; Car brake, E. Dederick 432,515; Car convertible freight, W. F. Mossop 432,830; Car coupling, J. Dwyer 432,697; Car coupling, B. Himesoth 432,734; Car coupling, M. R. Hubbell 432,830; Car coupling, W. R. Parkinson 432,863; Car coupling, N. T. Quevedo 432,559; Car, logging, G. F. Johnson 432,531; Car seat, H. S. Hale 432,702, 432,703; Carstarter, L. Seebach et al 432,908; Car, stock, D. N. Brownell 432,506; Car, street railway, C. S. Sessions 432,954; Carpet, moquette, R. F. Patterson 432,783; Carpet stretcher, J. Schilling 432,769; Carrier, See Sheaf carrier; Cart, road, C. C. Bradley 432,595; Case, See Map case, Thermometer case; Cash carrier apparatus, curve for, R. W. Soper 432,576; Cash receiver, J. S. Hagerty 432,510; Centrifugal reel, W. R. Dunlap 432,519; Centrifugal separator, C. Von Bechtolsheim 432,719; Chain link and splice, Hunter & Stansbury 432,623; Chair, See Window cleaning chair; Churn, R. H. Socolofsky 432,575; Churn, extractor, A. Wahlin et al 432,714; Clamp, See Automatic clamp, Box clamp; Clasp or buckle, C. B. Griffin 432,731; Clay grinding mill, T. J. Clifford 432,802; Clevis and pin, N. B. Helm 432,736; Closet cistern, D. L. Dwinell 432,830; Clothes lifter, H. H. & H. E. Forsythe, Jr 432,823; Clothes pin, F. S. Weaver 432,809; Clothes wringer, G. E. Jants 432,624; Clutch, friction, J. Clark 432,800; Confectionery machine, J. H. Smith 432,912; Cooker, steam food, O. C. Christin 432,868; Core making machine, sand, D. Carlin 432,790; Corn cutter, Carr & Mallahan 432,508; Corset, H. Phillip 432,885; Corset fastening, B. Beauchamp 432,687; Corset or analogous fastening, T. C. Stodd 432,814; Corset, waist, M. P. Bray 432,787; Cotton huller and cleaner, C. Young 432,921; Coupling, See Car coupling, Pipe coupling, Rod coupling, Rope coupling, Shaft coupling; Crate, J. C. Scoggias 432,907; Crayons, etc., holder for, G. Sandell 432,570; Cuff holder, H. H. Baker, Jr 432,591; Cultivator, L. S. Crittenden 432,518; Current and switch controlling mechanism, E. W. Rice, Jr 432,644; Cutter, See Bread cutter, Corn cutter, Dado cutter, Feed cutter, Leatherthong cutter; Dado cutter, W. R. Fox 432,824; Darning last, L. D. Carhart 432,661; Dehorning shears, T. Fields 432,663; Dental mould, L. F. Seeger, Jr 432,909; Desk and its supports, W. A. Rous 432,901; Die cutting machine, H. Thurston 432,959; Dipper, M. L. Schoch 432,905; Dirt conveyer and grader, J. Toohy 432,915; Door, C. M. Amaden 432,504; Door check, Fishel & Hotchkiss 432,867; Door check, J. B. Thompson 432,958; Dredging and other machinery, roller way or track for, D. C. Kingman 432,947; Drenching bit, S. A. Cox 432,513; Drill, See Rock drill; Drills, machine for making twist, S. Moore 432,635; Drills, machine for straightening and sizing twist, S. Moore 432,636; Drying fish and other articles, apparatus for, E. Robinson 432,900; Dumping cage, automatic, Russell & Parsons 432,569; Dynamo, welding or other, E. Thomson 432,662; Ear protector, G. B. Hamilton 432,612; Eccentric, variable, D. Best 432,594; Elbow blanks, machine for trimming, D. A. Ritchie 432,564; Electric cut-out, S. D. Field 432,523; Electric light shade, J. H. Goshst 432,826; Electric lights, filament for incandescent, L. N. P. Poland 432,710; Electric lighting system, Cooke & Mackay 432,745; Electric machine, dynamo, H. W. Spang 432,577; Electric machine, dynamo, E. Thomson 432,655; Electric meter, E. Thomson 432,654; Electric motor, H. Humbert 432,707; Electric motors, automatic lubricating device for, S. L. Barriett 432,927; Electric motor, brush reverser for, A. Reckensau 432,561; Electrical communicating system, A. G. Holcombe 432,618; Elevator, See Loading elevator; Elevator, A. H. McLean 432,952; Elevator controller, J. Reilly 432,767; Endgate, wagon, W. Beckwith 432,688; End gate, wagon, H. M. Purdy 432,897; Engine, See Fire engine, Gas engine, Gas motor engine, Steam engine; Envelope machine, S. A. Grant 432,749; Envelope moistener, J. Dawson 432,606; Eraser, C. L. Woolley 432,598; Exercising machine, W. J. O. Bryon, Jr 432,538; Fan for elevator cars, Richter & Lancaster 432,768; Fan, toilet, B. R. Maybeck 432,541; Fastening device, M. Hamburger 432,938; Feed cutter, H. Wiese 432,845; Feed trough, F. R. Kent 432,671; Feedwater strainer for boilers, L. O. Crocker 432,793; Fence, machine, wire, E. S. Morgan 432,911; Fence post, G. W. Bond 432,930; Fermenting, E. Cares 432,861; Fiber, producing, S. Fritsch 432,825; Filter, T. A. Myers 432,646; Fire and burglar alarm, C. C. Henderson 432,600; Fire engine, chemical, R. T. Van Valkenburg 432,778; Fire escape, W. Hubart 432,887; Fire escape, W. J. Pratt 432,656; Fire extinguishing apparatus, J. H. Scholding 432,906; Fire extinguishing compound, R. T. Van Valkenburg 432,777; Fire kindler, Ford & Baird 432,934; Fishing reel, E. F. Payne 432,764; Flues, spiral smoke, heating and ventilating, T. T. Moore 432,544; Fracture apparatus, T. M. Miller 432,888; Frame, See Grain binder frame; Frog for overhead wires, E. Thomson 432,581; Furnace, See Boiler furnace, Glass finishing furnace; Furnace, C. F. Miller 432,542; Furnaces, apparatus for charging, P. T. Berg 432,563; Game, A. Cousen 432,792; Garment supporter, W. E. Pullen 432,558; Gas, apparatus for manufacturing wood, J. Hanlon 432,939; Gas burner for heating and cooking purposes, J. H. Keyser 432,881; Gas engine, J. C. Beckfeld 432,720; Gas lighter, electric, J. H. Lehman 432,884; Gas motor engine, G. McGhee 432,638; Gaseous fuel, apparatus for producing, J. M. Ayer 432,718; Gate, See End gate; Generator, See Steam generator, Steam and hot water generator; Glass finishing furnace, A. Ferrari 432,796; Glove, J. J. Kennedy 432,708; Governor, steam engine, S. T. Williams 432,781; Grain binder frame, H. Tuttle 432,907; Guard, See Railway cattle guard; Gun, breech-loading magazine, L. F. Bruce 432,507; Hair curler, K. A. Ryer 432,569; Hair separating machine, plastering, H. A. Garvey 432,609; Harrow, D. Easton 432,521; Harvester, corn, A. N. Hadley 432,750; Harvester, corn, J. W. Terman 432,650; Harvesters, platform flag for, H. E. Pridmore 432,765; Harvesting machine, corn, W. H. Chase 432,725; Haap, car or barn door, H. W. Seemann 432,841; Hat, D. C. Mowry 432,905; Hat ventilator, A. L. Elbel 432,728; Hay rake, horse, A. H. Colby 432,509; Head rest and cane, combined, T. S. Minnias 432,759; Heater, See Bath heater; Heating by electricity, W. J. Burton 432,982; Heel stiffener machine, A. F. Stowe 432,647; Helicobromy, composite, F. E. Ives 432,590; Hotting and loading apparatus, D. L. Van Eman 432,630; Holder, See Cuff holder, Music holder, Paper holder, Poulitce holder, Sash or blind holder; Hook, See Saw hook;

Table listing inventions with patent numbers and dates. Includes entries like Horse arrester, A. Zalud 432,922; Horse detacher, G. W. Sikes 432,911; Horse detacher, J. R. Smith 432,574; Horseshoe nails, machine for forging, C. E. Moore 432,634; House interiors, finishing, M. Ohmer 432,553; Houses, construction of tenement, Smith & Peckwell 432,774; Huller, See Cotton huller; Ice breaking machine, T. Mills 432,758; Indicating races, apparatus for, G. H. Chappell 432,694; Ingots, making compound, L. L. Burdon 432,630; Ingots, manufacture of compound, L. L. Burdon 432,691; Inhaler, J. D. Averell 432,783; Inhaler and respirator, H. F. Williams 432,780; Jack, See Boot jack, Lifting jack; Jigging machines, motive power for, J. Nicholas 432,892; Joint, See Rail joint; Key, See Watchkey; Kiln, See Brick and pottery kiln; Knapsack and shoulder strap bag, combined, J. T. Dwyer 432,607; Knife, See Surgical knife; Knife, A. Schlieff 432,770; Knitting machine, circular, E. E. Kilbourn 432,946; Knitting machine needles with latches, machine for providing, J. J. Jenkins 432,802, 432,943; Knob, sheet metal, W. A. Turner 432,583; Ladder, cot, ironing board, and chair, combined step, S. D. Fry 432,869; Lamp, arc, A. H. Lucas 432,690; Lamp, hydrogen, F. Aurnhammer 432,500; Lamps, windlass for raising and lowering, S. Morse 432,545; Last, D. F. Willis 432,684; Lathe for turning pinion shafts, D. H. Church 432,791; Lathe, screw cutting, E. F. Vallquet 432,585; Lead, manufacture of white, J. A. Board 432,784; Leatherthong cutter, C. E. Ramus 432,641; Lifter, See Box lifter, Clothes lifter; Lifting jack, I. N. Groves 432,732; Loading elevator, T. McConnell 432,637; Lock, See Bag lock, Mail bag lock, Nut lock, Seal lock, Trap lock; Locomotive driver brake, H. H. Welsh 432,960; Locomotives, variable exhaust for, D. Hanney 432,704; Loom picker motion, Hall & Young 432,527; Looms, electric stop motion for, D. E. Coughlin 432,512; Machine carriage, F. McDonough 432,549; Magnet, drill hole, C. S. Porter 432,896; Magnetic separator, G. S. Finney 432,623; Mail bag lock, J. F. Mains 432,756; Malt kilns, spreader and discharge for, S. Hirschler 432,706; Map case, Terrell & Chittenden 432,574; Matrix making machine, A. J. Kletscher 432,627; Mechanical movement, Westaway & Beard 432,686; Metal working apparatus, electric, Lemp & Tregoning 432,629; Metals by electricity, forming or shaping, H. Lemp 432,690; Metals by electricity, working, E. Thomson 432,661; Metallic ornaments on roughened surfaces, mounting, C. B. Healdy 432,940; Meter, See Electric meter, Water meter; Middlings purifier, R. L. Hottel 432,876; Mill, See Bark mill, Clay grinding mill, Saw mill; Milling machine, A. T. Gifford 432,936; Milling machine, J. Hollingworth 432,539; Milling machine, F. Hois 432,621; Millstones, device for dressing or cutting, J. A. Beamslderfer 432,592; Mining machine, F. M. Lechner 432,754; Miter box, Gabriel & Pohl 432,524; Mould, See Dental mould; Mop and wringer, E. C. Rolls 432,806; Motor, See Electric motor, Railway motor, Thermic motor; Mowing machine grinding attachment, C. Beyer 432,660; Mucilage moistener, J. Dawson 432,605; Music holder, T. R. Budd 432,869; Nut lock, A. Simon 432,572; Nut machine, G. J. Forrey 432,532; Oil can, A. Gralke 432,870; Oil can, D. E. Johnson 432,736; Oil from fish, extracting, P. C. Vogellius 432,808; Overalls, Hohman & Cunningham 432,619; Oxygen from air, obtaining, A. Brin 432,515; Packing and refrigerating vessel, Frierson & Barker 432,868; Packing, metallic rod, P. H., Jr., & O. T. X. Adams 432,717; Padlock, F. Wheaton 432,557; Palls, cover fastening and ball ear for, G. D. Strayer 432,913; Paper bag machinery, E. Stanley 432,742; Paper box, knockdown, A. C. Lohmann 432,885; Paper holder, roll, E. Moran 432,728; Partition, fireproof, C. W. White 432,917; Pasting paper strips, machine for, P. Hauck 432,751; Pencil box, H. Legge 432,831; Pencil sharpener, C. L. Burker 432,789; Phonograph, J. P. Maegenis 432,886; Photo-engraving apparatus, W. A. Blomgren 432,783; Photographing, developing, and delivering the finished pictures, apparatus for automatically, J. Sacco 432,908; Piano action, A. D. Dimick 432,516; Pictures, mirrors, etc., frame for, F. Servus 432,910; Pin, See Clothes pin; Pipe coupling, W. H. Hart 432,733; Post, See Fence post; Poulitce holder, C. S. Hirst 432,796; Power brake, L. P. Lawrence 432,949; Power press, A. L. Platt 432,836; Press, See Power press, Printing press, Wood press; Printing attachment for envelope machines, L. P. Bouvier 432,785; Printing in several colors by one impression, F. C. Taylor 432,586; Printing machine, oscillating cylinder, P. S. Dodge 432,518; Printing plate, T. C. Eberhardt 432,822; Printing press, cylinder, H. Huber 432,800; Propeller, ship's, W. H. Wigmore 432,846; Propelling vessels, device for, J. Cochran 432,864; Protector, See Ear protector; Protractor, J. P. B. Wells 432,779; Puller, See Stump puller; Pulley, E. Goss 432,667; Pulley, P. H. Grimm 432,701; Pulley, self-rolling, E. Goss 432,666; Pulley, split, H. T. Briggs 432,857; Pump, E. P. Gleason 432,685; Punching and riveting machine, Harper & Hamlin 432,529; Punching and shearing machine, combined, H. Stolpe (r) 11,086; Puzzle, Deeves & Gauthreaux 432,865; Puzzle, E. M. Sattelle 432,904; Puzzle, F. J. Wooster 432,849;