

## RECENTLY PATENTED INVENTIONS.

## Engineering.

**ROTARY ENGINE.**—Marcellus A. Buford, Thompson's Station, Tenn. The casing has steam inlet and exhaust chambers, a main driving shaft being mounted to rotate in the casing, while a wheel with central disks having inlet openings in their peripheries is secured on the shaft, exhaust disks being secured to the central disks, and the construction is adapted for the use of steam, air, water, or other suitable fluid.

## Railway Appliances.

**CAR COUPLING.**—Josiah Poffenbarger, York, Neb. This device is designed to act automatically, the bumpers having transverse stationary rods combined with a locking book with pivoted head and curved lower end, the locking lever having a spring bolt at its forward end, with other novel features, the construction being simple, strong, and cheap.

**CAR COUPLING.**—John J. Jeter, Campbellsville, Ky. This coupling acts automatically, and the improvement is applicable to the ordinary drawheads, the link being adjustable up or down as desired, while the drawhead is preferably secured to the car so that it may move longitudinally back against a spring when it strikes another drawhead.

## Mechanical.

**WRENCH.**—Sidney Cook, Orlando, Fla. This improved wrench is of simple construction, and so made that one jaw will be removable and adjustable, while the movable jaw may be placed at various angles with respect to the fixed jaw and adjusted laterally while in any position.

**COMBINATION TOOL.**—Samuel L. Heindol, Anderson, Ind. This invention covers a tool comprising a hammer, crosscut-saw set, and gauge and is made also to hold a file for dressing and pointing saw teeth all to a uniform length.

**NUT LOCK.**—Isaac F. Leiby, Baird, Texas. Combined with a loop-formed nut-locking device, and the plate to which it is hinged, is a supplementary locking device, consisting of a wire or rod having one end bent at right angles and embracing the hinge of the main device, while its other end is provided with a hook to receive the side bar of the main device.

**DOFFER CLEANER.**—George Bebb, Indianapolis, Ind. This is a cleaner for carding machines working on woolen and cotton fibers, and the invention relates to that class of cleaners in which a cleaner bar having card clothing is supported so that it may be swung alternately in contact with the doffer and with the stripping bar, the mechanism being such that the cleaner need not be continuously operated, but only at such intervals as may be found desirable.

**BARKING AND SPLITTING MACHINE.**—Otis W. Stearns, Johnson, Vt. This machine has a vertically reciprocating barking knife and a vertically reciprocating splitter, both operated from one drive shaft at different speeds and arranged in proximity to each other, whereby as the log is barked it may be convenient to the splitter knife.

## Miscellaneous.

**SEWAGE PURIFIER.**—James J. Powers, New York City. By this invention the sewage is supplied with lime at intervals and precipitated, the effluent flowing off at the end of the apparatus, while the sludge and solid matter remains to be removed at intervals, the sewage being held in a quiescent state while settling, the flow being intermittent to and from the settling tanks and automatically regulated at given quantities.

**SHAFT SUPPORT.**—Edward Clark, New York City. This is a device for taking off the weight and strain from the back of a horse hitched to a vehicle, a plate being hinged on the vehicle to engage the transverse beam of the shafts, the free end of such pivoted plate resting on a screw, which is adjustable to suit the height of the horse.

**HYDROCARBON BURNER.**—Graves Griffith and Theodore L. Miller, Blanchard, Iowa. This burner is especially adapted for furnaces, stoves, etc., although its principle may likewise be applied to a safety lamp, it being designed to secure safety against explosion of accumulated gas and complete control of the oil supply, while the amount of burning surface is regulated, and the requisite amount of air is fed to the burning oil or fuel.

**CURRENT PROPELLER.**—Ernst Lotze, Spokane Falls, Washington Ter. A chain anchored at one end up stream, where there is a current, is passed through the boat from stem to stern, in close engagement with a shaft on which are side wheels dipping into the water, the design being that the revolving of the paddle wheels by the current will operate to pull the boat, by means of the chain, up stream.

**ELECTRIC LANTERN.**—Charles W. Cox and Thomas E. Van Dyke, Philadelphia, Pa. Combined with a suitable casing containing a battery is an automatic switch arranged to close the circuit as the top of the casing is opened and open the circuit when the casing is closed, a lamp being placed in the circuit in convenient position for use, making a lamp adapted for use where a flame would be unsafe.

**"PICKING" THIMBLE FOR STRINGED INSTRUMENTS.**—Norman E. Barnes, Bay Shore, N. Y. This thimble is preferably made of metal, with a tubular split portion, whereby it may be readily slipped over a finger or thumb, and a rounded point which engages the strings of a stringed musical instrument in performing thereon.

**DREDGING BUCKET.**—Rezin Hosford, Lebanon, Ind. The frame of the implement consists of a head, upon each extremity of which two arms are pivoted, extending downward and outward in opposite directions, and carrying shovel blades, with other novel features, the object being to provide an implement of

simple construction to dredge oysters, gravel, sand, etc., in which the jaws of the bucket may be closed prior to being lifted.

**SCRAPER.**—Etienne L. Lefebure, New York City. This is a tool for scraping wood and other surfaces, being specially designed for plasterers' use in cleaning mouldings, its blade having a central horizontal portion and edge portions inclined thereto, one of which edge portions has a beveled scraping edge and the other a scraping edge formed with short teeth, the blade being detachable for sharpening or repairing.

**PRINTERS' KNIFE.**—Louis J. Dus, Milwaukee, Wis. This is a knife with extensible blades arranged at opposite ends of its handle, presenting a series of sharp cutting edges, for the convenience of a pressman in cutting out "overlays" or "underlays" in making a form ready to work, and making a tool better suited to such work than the ordinary pocket knife.

**TABACCO PRESS.**—Irving A. McKinley, Cicero, N. Y. This is a portable press especially adapted for packing leaf tobacco in boxes for shipment, the press being quickly applied to and detached from the box or case, the invention obviating the necessity of the lifting and handling of the boxes necessary under former methods of doing the work.

**LOAD BINDER.**—Thomas A. Rogers, Bloomdale, Ohio. This device is designed especially for tying or binding a load of logs, a curved arm being pivoted to a head having a handle, and a grab hook linked in the outer extremity of the arm, whereby each end of a chain will be carried in opposite directions and the body of the chain made to firmly bind upon the load.

**VEHICLE BODY.**—Lafayette A. Melburn, Denver, Col. The panels of this body have their meeting ends formed with dovetail grooves and ribs, pins being driven partially in each of the panels at their joints, while dovetail grooves are fitted to receive the seat posts, which are fitted in the grooves, and the sills secured to the inner sides of the panels.

**TYPE WRITING MACHINE.**—Lebbens G. Garrett, Bissell, Pa. This is a machine by which whole words or phrases may be printed at once on the same line across a page and at a reporting speed by depressing keys of a key board conveniently arranged at the front of the instrument, the machine having oscillating type carriers and connected keys operating upon them to bring the type into line.

SCIENTIFIC AMERICAN  
BUILDING EDITION.

MAY NUMBER.—(No. 43.)

## TABLE OF CONTENTS.

1. Elegant plate in colors, showing elevation in perspective and floor plans for a dwelling costing four thousand dollars. Page of details, etc.
2. Plate in colors of a summer cottage for one thousand two hundred dollars. Floor plans and page of details.
3. Design for a bank building, with plan and view of interior.
4. Perspectives and floor plans of an elegant residence at Bell Haven Park, in Greenwich, Conn. S. Edwin Tobey, Boston, Mass., architect.
5. A mountain cottage lately erected at St. Cloud, Orange, N. J. Elevation and floor plans. Architect Mr. Arthur D. Pickering, New York.
6. A dwelling at Springfield, Mass. Plans and perspective elevation. Cost eight thousand five hundred dollars.
7. Engraving showing perspective elevation of a cottage erected at Roseville, N. J., at a cost of six thousand seven hundred and fifty dollars. Floor plans. F. W. Ward, architect, New York.
8. Illustration and floor plans of a combined school house and country cottage erected at St. Cloud, Orange, N. J. Arthur D. Pickering, New York, architect.
9. A residence at Springfield, Mass. Perspective elevation and floor plans. Cost three thousand five hundred dollars. J. D. & W. H. McKnight, architects.
10. A cottage built at Roseville, N. J., for six thousand seven hundred and fifty dollars. Elevation and floor plans.
11. A cottage at Holyoke, Mass., lately erected for Howard A. Crafts, at a cost of three thousand one hundred dollars.
12. View of Anbunrdale Station, Boston and Albany Railroad, with plan of station grounds. H. H. Richardson, architect.
13. Miscellaneous Contents: The final payment clause in building contracts.—The plan.—Bending wood.—The Stanford tomb.—Experiments with cement mortar.—The railroad in horticulture.—The improved "Economy" furnace, illustrated.—The Academy at Mount St. Vincent on the Hudson, N. Y.—Wrought iron and cement lined pipes, illustrated.—Sheathing and lath combined, illustrated.—Artistic wood mantels.—A new ventilating furnace, illustrated.—Creosote wood preserving stains.—Large trees.—Rotary cutting tools for working wood, illustrated.

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.

The Fullness, Richness, Cheapness, and Convenience of this work have won for it the LARGEST CIRCULATION of any Architectural publication in the world. Sold by all newsdealers.

MUNN & CO., PUBLISHERS,  
361 Broadway, New York.

## 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.

Needle slot screens and all kinds of mining screens. Robert Aitchison Perforated Metal Co., Chicago, Ill.

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

Mech'l draughtsman wants situation. "E. C.," box 773, New York.

Engineers wanted to send their addresses and receive free a 25 cent book, "Hints and Suggestions for Steam Users." Lord & Co., 118 9th St., Philadelphia, Pa.

Wanted.—The latest novelty for a corner store awning. L. H. Daloz, 510 Tremont St., Boston, Mass.

For Sale.—Patent No. 400,571, "mirror attachment to opera glasses." See illustration, page 291.

For Sale.—To Wire Fence or Lightning Rod Manufacturers.—License to manufacture "Lightning Conductors for Wire Fences." Patented. See Sci. Am., April 27. Address F. E. Wood, Kingman, Arizona.

Steel name stamps (1-16, 3-32, or 1/4 in. letters), 15c. per letter. F. A. Sackmann, 16 Huron St., Cleveland, O.

For the latest improved diamond prospecting drills, address the M. C. Bullock Mfg. Co., Chicago, Ill.

For best casehardening material, address The Rogers & Hubbard Co., Middletown, Conn. Send for circular.

Water purification for cities, manufacturers, and private users. The only successful legitimate system. Hyatt Pure Water Co., 16, 18 & 20 Cortlandt St., New York.

Ball Engine.

Automatic cut-off. Ball Engine Co., Erie, Pa.

Presses & Dies. Ferracut Mach. Co., Bridgeton, N. J.

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

Screw machines, milling machines, and drill presses. E. E. Garvin & Co., Laight and Canal Streets, New York.

Billings' Double-acting Ratchet Drills. Drop Forgings. Bronze Forgings. Billings & Spencer Co., Hartford, Conn.

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Safety Elevators, steam and belt power; quick and smooth. The D. Frisbie Co., 112 Liberty St., New York.

"How to Keep Boilers Clean." Send your address for free 96 p. book. Jas. C. Hotchkiss, 120 Liberty St., N. Y.

The best Coffee roasters, coolers, stoners, separators, polishers, scourers, glossing apparatus, milling and peaberry machines; also rice and macaroni machinery, are built by The Hungerford Co., 69 Cortlandt St., N. Y.

Lathes for cutting irregular forms. Handle and spoke lathes. I. E. Merritt Co., Lockport, N. Y.

For steel castings of best quality, write the Buffalo Steel Foundry, Buffalo, N. Y.

Planing and Matching Machines. All kinds Wood Working Machinery. C. B. Rogers & Co., Norwich, Conn.

Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works, Drinker St., Philadelphia, Pa.

## NEW BOOKS AND PUBLICATIONS.

**THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC AND PHOTOGRAPHER'S DAILY COMPANION.** 1889. \$1.00. Published by Henry Greenwood & Co., London, England.

This widely known annual, now in its twenty-ninth year, comes to us filled with a great variety and larger quantity of information more valuable to photographers than ever before. It has nearly four hundred pages of reading matter and one photographic illustration, and contains a very full explanation of the various formulas for printing with iron salts, such as making blue prints, printing blue or black lines direct on a white background, and directions for toning such prints. There are also a number of short illustrated articles, covering many subjects, together with reliable formulas and tables of great use to the photographer.

**THE YEAR BOOK OF PHOTOGRAPHY.** 1889. By Thomas Bolas. Piper & Carter, London. Pp. 216. Price \$1.

This excellent annual, now in its thirtieth year, contains much practical information for the photographer. It has as a frontispiece a very fine specimen of a Woodbury type entitled "Group of Champion Great Danes," which are three handsome-looking dogs very artistically posed. The picture is reproduced from a negative by Thomas Fall. Among the useful articles is one "On the Preparation and Use of Gelatine Plates, for Transparencies," by W. K. Burton, which alone is worth the price of the book. There are illustrations of improved lamps for burning magnesium powder, descriptions of the carbon and photo-engraving processes, and under "Every-day Experiences and Processes" are several pages of formulas, illustrations of new devices, and other information of a very practical nature.

**NATURALISTIC PHOTOGRAPHY FOR STUDENTS OF THE ART.** By P. H. Emerson, B.A., M.A. E. & F. Spon, New York. Pp. 307, xii. Price \$2.

This book contains a greater amount of information on the artistic elements to be considered in photography than any that we know of. The author, himself an artist, has elucidated very concisely, yet also very fully, the principles which should be kept in view in making artistic and attractive photographs. Accompanying the text are marginal notes of much convenience in attracting the eye to the special subjects considered on any one page. The work is divided into three books. The first treats of "Terminology and Argument," in three chapters. The second chapter relates to "Naturalism in Pictorial and Glyptic Art," explaining the various styles and schools of art. The third chapter is devoted to a full explanation of "Phenomena of Light, and Art Principles Deduced Therefrom." Book II. includes "Technique and Practice," covering a description of cameras and tripods, lenses, dark room and apparatus, studio and furniture, exposure, development, retouching, printing, enlarging, transparencies, mounting, preparing exhibits for exhibitions, and a very good explanation

of the latest photographic processes. Book III. is on Pictorial Art, and embraces such subjects as "Educated Sight," "Composition," "Out and Indoor Work," "Hints on Art," and "Decorative Art." Following this are some very good suggestions as to what photographic libraries should contain. In his introduction Mr. Emerson states that "to give the student a clear insight into the first principles of art is the chief aim of the book." In these days of amateur photography, when the mechanical and chemical manipulations necessary to obtain a good photograph are so easily acquired, a book like this, calling attention in simple language to the elementary conditions that should be observed in making artistic photographs, will be greatly appreciated. So far as the science of photography is described, enough is said to give the reader considerable general information, but we must take exception to the statement that lantern slides have no place in art. They are as truly useful in illustrating the composition of a picture as a sketch or painting; therefore we think they should be commended. The book as a whole is very well written, and will be an excellent guide to those desiring to learn the art principles of photography and its practice.

**THE AMERICAN ANNUAL OF PHOTOGRAPHY AND PHOTOGRAPHIC TIMES ALMANAC.** 1889. By C. W. Canfield. Scovill Manufacturing Co., New York. Pp. 328. Price \$1.

A book full of the latest ideas, formulas, and descriptions of new apparatus, by American photographers. It contains thirteen full page illustrations by twelve different processes, also a complete record of American photographic societies, a list of books on photographic subjects published during the year, diagrams of shutters, dark rooms, and stereoscopic printing frames, articles on the "Making of Lantern Slides," by W. H. Raw, "Silver Printing on Plain Paper," by Charles L. Mitchell, M.D., the "Preparation of Specimens for Photo-micrography," by C. B. Longenecker, "Formulas for Various Kinds of Blacks," by C. C. Vevers, and a full description of "A Photo-Mechanical Printing Process for Amateurs," by Rev. W. H. Burbank. At the end of the book are very full tables, and formula of special value to either the professional or amateur photographer. A list of American patents on photographic subjects during the year 1888 is also given. The typography is of a superior character. There has seldom been issued a book so excellently printed and, conveniently arranged as this appears to be.

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

Address MUNN & Co., 361 Broadway, New York.



## 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.

(776) F. M. D. writes: 1. Is there any way of preventing white holly in fretwork from turning yellow after it has been in use a short time? A. We cannot recommend any cure. Possibly sponging with javelle water might help it, but this would tend to destroy the glue. 2. Also do you publish or sell a small book called the French Polisher's Manual? I think I saw a reference to it in the Notes and Queries some time ago, but failed to find it again. A. We can supply the French Polisher's Manual. Price 25 cents. 3. Is there any preparation that can be applied to cotton covered wire, so that the insulation will remain good if placed in the ground? If not, what is the best kind of insulation for the purpose? A. We advise you to use gutta percha covered wire, or special underground cable. You will not be able to get any satisfaction out of cotton covered wire. 4. I have a number of jars of Grenet battery, zinc 1 1/4 by 4 and carbons about the same size, made of light carbons. The jars hold about a quart. How many of these cells would be required and how should they be connected to run a three c. p. or five c. p. lamp? A. Use six couples for small lamp and ten couples for larger lamp, arranged in series.

(777) J. R. R. asks (1) why a telephone ear cup, made with same size and power magnet, wound with same size and amount of wire as the Bell, but in a wood case, does not work as well, or should it if properly made. A. It should make no difference. A wooden case works perfectly well. 2. Also give description of induction coil used with Blake transmitter. A. The primary is wound with No. 18 to 24 wire to 1/2 ohm resistance, the secondary with No. 36 wire to 80 ohms resistance. A core of fine iron wire in a cylindrical bundle is best.

(778) J. M. W. asks (1) for the cheapest artificial manner in which to freeze small quantities of water. A. Freezing apparatus are sold for this purpose. A simple method is to cool water by placing it in a tin vessel, surrounding the latter with cold water in which one-half its weight of nitrate of soda is dissolved. Then on repeating the operation with the cooled water as the solvent of more nitrate of ammonia, a second portion can be frozen. We fear that you will find little satisfaction in artificial ice making except with a regular machine. 2. Also if the water on melting will be as pure and wholesome as it was before freezing? A. Yes.

(779) W. R. asks how to make a spark coil. A. Make a  $\frac{3}{4}$  inch bundle of iron wire 8 inches long, wrap it with five pounds No. 20 magnet wire. It will with battery and proper appliances light gas, but not an oil lamp.

(780) J. S. writes: Is beef a more digestible meat than veal? A. Beef is far more digestible. 2. In which time about is the former, and in which time the latter digested? A. Beef—boiled 2 hours 45 minutes, roasted 3 hours. Veal—roasted 4 hours, fried 4 hours 50 minutes.

(781) O. H. P. writes: 1. What is the meaning of the words ampere and ohm? A. See answer to queries 236 (Jan. 26) and 427 (March 9). 2. Give a good receipt for making a copying pad which will not spoil in warm weather. I desire to make from 20 to 50 copies from one copy. A. See SUPPLEMENT, No. 438, which we can send you for 10 cents. Mix a very little oil of cloves with it for hot weather.

(782) S. H. G. writes: Referring to the SCIENTIFIC AMERICAN of January 21, 1888, page 42, Prof. Mendeleef's "theory of the formation or origin of petroleum," where does he place the laboratory—as low down as "Cambrian," or not? A. Far below any geological horizon, in the incandescent regions of the earth's interior.

(783) M. S. asks: What is the usual treatment of apatite to extract the phosphoric acid, and also about what per cent it usually carries? A. It is treated with sulphuric acid to convert it into a superphosphate.

(784) J. W. D. writes: 1. Will vapor gas such as used by gasoline stoves answer for heating purposes, either by hot water or steam? A. Yes; but it is dangerous, as involving the storing and handling of large amounts of naphtha. 2. Would it be as cheap as bituminous coal at \$3 per ton or anthracite at \$6 per 2,000 lb.? A. Probably it would prove cheaper, because so easily extinguished and started, and because of there being no ashes to dispose of, etc. 3. From what is the gas made that H. Diston is using for fuel in his saw works, and is it the same with which Westchester, Pa., is to be supplied for fuel? A. We cannot answer this. Address the party named. 4. What is the probable comparative cost of kerosene, or crude oil, or fuel gas, or coal for generating steam? A. Allow  $\frac{3}{4}$  barrels of oil to the ton of coal, and 55 to 65 lb. of coal to 1,000 cubic feet of gas for equal calorific powers. From these figures make your estimates according to relative prices in your vicinity.

(785) R. T. F. writes: 1. Can you give me a good simple recipe for making a nice liquid or solid shoe blacking, that will produce a quick shine? A. Various receipts have been published in our Notes and Queries. We also refer you to "Trade Secrets," which we can supply for 60 cents by mail. 2. Can you tell me what makes my hands perspire while playing the violin, and can you tell me of a harmless remedy to prevent it? A. It is constitutional. Try bathing the hands in alcohol and use powdered corn starch or soapstone on them before playing.

(786) T. L. R. asks: Will the receipt No. 653 in April 20, 1889, issue, for gumming labels, do to use in fastening papers, such as a bunch of note or letter heads? If not, will you please give a good receipt? Something that does not require heating when to be used, cheap and gummy. A. No. The regular composition used is made from best glue and glycerine and water colored with aniline. This needs heating. A solution of gum tragacanth with a little glycerine might answer your requirements, but we advise the first. For 5 lb. of dry glue allow 1 lb. of glycerine.

(787) H. C. asks: 1. Is there a paper published, anywhere in the world, which is devoted entirely to the subject of "Aerial Navigation"? A. Yes; in France. 2. What is the lifting power of 1,000 cubic feet of what is called "water gas," being made from steam, coal, and naphtha? A. About twenty pounds.

(788) W. H. M. asks: Can you give me the formula of a liniment of which sulphuric acid is a component part? A. No official liniment of this character is given. A mixture of the strong acid with saffron, forming a paste, is a strong caustic which has been used successfully. It is very powerful, and must be used with caution.

(789) O. V. writes: 1. Can you inform me what sort of cement is used in wooden boxes to make battery cells? A. Have boxes perfectly dry, smear them inside with a hot mixture of four parts resin, one part gutta percha, and a little boiled oil. The mixture must be thoroughly melted and stirred before use. A hot rod of iron may be used to melt it into the crevices. 2. Are they only good for Bunsen batteries or Grenet? A. They can be used for any ordinary type of battery. 3. What are dry batteries composed of, and are they any good for a medical coil? A. A good effect can be obtained from a paste of plaster of Paris one pound, oxide of zinc one-fourth pound, saturated solution of chloride of zinc enough to make a stiff paste. They are very good for medical coils.

(790) L. W. asks: 1. How to wash copper wire with mercury. I wish to use it for internal use. A. Dip in mercury covered with dilute sulphuric acid. 2. Also, is mercury poison? A. Yes. 3. Also how to silver copper wire and pan. A. Best by electroplating described in our SUPPLEMENT, Nos. 157, 158, and 159.

(791) O. B. asks how rubber cement is made, such as is used for repairing rubber boots. A. For solution of India rubber see SUPPLEMENT, Nos. 249, 251, and 252. Gutta percha dissolved in bisulphide of carbon may answer your purpose.

(792) A. J. P. writes: What effect has mercury on a man's system, and the way to extract it? A. It produces salivation and tends to disturb the entire gastric and intestinal system, and in sufficient quantity and form acts as a strong corrosive poison. Local blood letting, demulcent drinks, etc., are applied after cases of mercurial poison. Its effects vary according to the form in which it is administered. In many cases, the effects of a disease which has been treated by

mercurial medicines are considered the effects of the mercury itself. A physician should be consulted in all such cases. It probably does not remain long in the system.

(793) Constant Reader asks: Some years ago I had some talk in regard to albumen, caseine, etc., with Prof. Chas. Joy, and he referred to the extraction of albumen by using ozone generated by passing air through spirits turpentine, if I remember correctly. What I want to ask is, Is ozone generated in that way by any one? A. Turpentine, has a bleaching action formerly attributed to the presence of ozone. This is now not credited, the bleaching power being supposed due to an organic compound,  $C_{10}H_{16}O_4$ . We have no record of ozone being thus successfully generated.

(794) An Old Reader asks for a good receipt for making honey, if possible, without using honey as one of the ingredients? A. 5 lb. white sugar, 2 lb. water, gradually bring to a boil and skim well. When cool add 1 lb. bees' honey and 4 drops peppermint. To make of better quality add less water and more real honey. Other formulae are given in Dick's Encyclopedia, which we can supply for \$5. 2. Would also like to know what the chemical composition of honey is. A. Principally of saccharine matter and water, about as follows: Levulose  $33\frac{1}{4}$  to 40 per cent, dextrose  $31\frac{1}{4}$  to 39 per cent, water 20 to 30 per cent, besides ash and other minor constituents.

#### 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

April 23, 1889,

AND EACH BEARING THAT DATE.

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

Acid, purifying acetic, Bang & Ruffin..... 401,922  
Alarm. See Burglar alarm.  
Animal releasing device, G. A. Waterhouse..... 401,914  
Animal shears, A. A. White..... 401,906  
Annunciator drop, J. M. Stuart..... 402,043  
Auger, post hole, H. C. Cloyd..... 401,999  
Axle making machine, A. Paterson..... 402,101  
Axles, making, A. Paterson..... 402,102  
Barrels, mechanism for the manufacture of, W. H. Cram..... 401,981  
Battery. See Galvanic battery. Secondary battery.  
Bearing, ball, H. Kunath..... 401,748  
Bearing, roller, R. W. Hunt..... 401,884  
Beehive, F. Dazebaker..... 402,004  
Belt, electric, C. H. Grimley..... 401,882  
Belt for machinery, W. C. Edge..... 401,779  
Binder, load, T. A. Rogers..... 401,857  
Bit. See Drenching bit.  
Blackening and polishing shoes, machine for, A. Kitson..... 401,890  
Blast furnaces, flux feeder for, N. A. Pratt..... 402,103  
Block. See Glass building block.  
Block barking and splitting machine, combined, O. W. Stearns..... 401,866  
Board. See Condenser switch board. Game board. Ironing board.  
Boiler. See Steam boiler. Wash boiler.  
Bombs, distributor for explosives, H. W. Parsons..... 401,851  
Book, combined record and sales, Harsha & Duval..... 401,948  
Book, pad, E. Schonacker..... 401,909  
Book, school record, J. Du Shane..... 402,072  
Bottle, J. Stone..... 402,042  
Bottle stand, C. K. Hall..... 401,829  
Bottle stopper, D. J. Corcoran..... 402,124  
Bottle stopper, C. C. Haley..... 402,078  
Bottles, stopper receiver for, A. T. Scher..... 401,760  
Box. See Desk box. Display box.  
Box fastener, J. L. Lillienthal..... 401,893  
Brake. See Pump brake. Rail brake. Vehicle brake.  
Brake, Massey & Normand..... 402,092  
Brake mechanisms, automatic, pump governor for, G. Westinghouse, Jr..... 401,915  
Brick machine, wire cut-off, S. W. Lasor..... 401,760  
Bridge, pontoon, S. N. Stewart..... 401,765  
Buildings or bridges, truss for, J. T. Wells..... 401,870  
Bureaus, banger for mirrors of, J. R. Anderson..... 401,921  
Burglar alarm and testing system, F. H. Nutter..... 401,789  
Burner. See Petroleum burner. Stove burner.  
Buttonhole strips, making, M. P. Bray..... 401,935  
Button hook and bracelet, combined, A. Johnston..... 401,746  
Button, separable, G. A. Schlechter..... 401,908  
Button setting machine, J. H. Vinton..... 402,047  
Cab, C. A. Reade..... 401,768  
Cable grip, T. W. Lemieux..... 401,842  
Cable grip, S. F. McDill..... 401,895  
Camera. See Photographic camera.  
Can. See Metal can. Milk can.  
Can bodies, machine for applying heads to tin, W. Hipperling..... 401,886  
Car coupling, J. Coup..... 401,775  
Car coupling, J. J. Jeter..... 402,085  
Car coupling, E. J. Knapp..... 402,021  
Car coupling, J. Poffenbarger..... 401,854  
Car, electric, J. W. Henderson..... 402,080  
Car heater, H. Schreiner..... 401,794  
Car heater, railway, R. M. La Rue..... 401,749  
Car ventilator, Tappay, Jr., & Evans..... 402,044  
Cars, letter box for street, G. B. McAllister..... 402,028  
Cars, steam pipe coupling for railway, L. Aldrich..... 401,920  
Caramel holder, G. W. & E. E. Chase..... 401,774  
Card teeth, making, G. & E. Ashworth..... 401,991  
Carding machines, doffer cleaner for, G. Bebb..... 401,811  
Carriage, folding, J. F. Flad..... 401,939  
Carrier. See Poultry carrier. Quilting machine shuttle carrier. Sheaf carrier.

Carriers, driving mechanism for endless, J. Dick..... 401,777  
Cart, road, M. L. Cleveland..... 401,785  
Cart, road, J. G. Hess..... 401,884  
Cartridges, pocket for, G. Barnard..... 401,928  
Case. See Knockdown case. Show and shot case. Typewriter case.  
Ceiling, metallic, L. L. Sagendorph..... 401,908  
Chain, W. C. Edge..... 401,835  
Chair. See Convertible suspending chair. Reed chair. Reed or rattan chair.  
Chairs, bellows attachment for rocking, F. Marschall..... 402,026  
Chandler, L. F. Griswold..... 402,077  
Check protector, E. O. Abbott..... 401,871  
Chimney, J. A. Hodel..... 401,836  
Churns, motor for operating, Shafer & King..... 401,861  
Cigar bunching machine, J. E. Smith..... 402,088, 402,039  
Clasp, P. Fransen..... 401,890  
Clasp, O. C. Mann..... 401,844  
Clasp, F. B. Spooner..... 401,977  
Clutch, L. Goddu..... 402,014  
Coffee or tea pot, G. W. Adams..... 401,919  
Coffin fastener, C. E. Temple..... 401,767  
Comb. See Curry comb.  
Computing device, D. W. Thompson..... 401,801  
Condenser switch board, W. Marshall..... 402,027  
Convertible suspending chair, M. E. Schutt..... 402,110  
Copying apparatus, G. H. Smith..... 401,762  
Coupling. See Car coupling. Pipe or tube coupling. Thill coupling.  
Crank for motors, S. F. Armstrong..... 402,052  
Cultivator, J. Dodge..... 401,778  
Cup. See Dental impression cup.  
Curry comb, O. Smith..... 401,864  
Cutlery, table, F. C. Felcker..... 401,739  
Dampening machine, Wendell & Wiles..... 401,770  
Dental impression cup, J. Scheffer..... 401,792  
Desk box, A. W. Phillips..... 401,757  
Desk fastening, school, J. B. Sherwood..... 402,037  
Detergent, F. C. Taylor..... 401,766  
Die. See Gipping die. Thread cutting die.  
Diffusion apparatus, F. Bianchi..... 402,066  
Display box, H. D. & F. A. Smith..... 401,974  
Dredging machine, hydraulic, J. McFarlane..... 401,896  
Drenching bit, C. W. Crannell..... 402,068  
Drill. See Ratchet drill.  
Earring lobe, Doran & Hall..... 402,071  
Electric cables, splice box for, T. J. Dewees..... 402,007  
Electric conductor, T. Ezileston..... 401,936  
Electric machine, dynamo, C. Coerper..... 402,066  
Electric meter, E. Thomson..... 401,803  
Electric motor for tramway vehicles, W. D. Sandwell..... 401,970  
Electric motor trolley switch, W. Christy..... 402,064  
Electric wires, box for the distribution of, D. Brooks, Jr..... 401,927  
Electrotype, matrix plate for curved, Benedict & Furlong..... 401,729  
Elevator beltshifter, E. W. Houser..... 401,851  
Emery wheels, instrument for cutting or grinding, W. Diebel..... 401,828  
End gate, A. H. Stark..... 402,111  
Engine. See Rotary engine.  
Engine, J. Jonson..... 402,086  
Excavators, loading and unloading mechanism for sewer, N. E. Green..... 402,016  
Extractor. See Steam extractor.  
Fabrics, machine for centering and drying, F. Craven..... 401,932  
Faucet, automatically closing, E. E. Furney..... 402,075  
Faucet, basin, B. Johnson..... 401,952  
File, newspaper, T. Lomas..... 402,024  
Filtering apparatus, R. Cooper & Co..... 401,980  
Finger ring, M. Freed..... 402,011  
Fire escape, I. H. Athey..... 402,053  
Fireproof plaster cloth for ceilings and walls, A. J. Paris..... 401,967  
Fishing reel, G. Paddock..... 401,849  
Flooding jack, Townsland & Winslow..... 401,898  
Fork. See Hay fork.  
Fracture apparatus, W. H. De Camp..... 401,933  
Furnace grate, W. H. Lahman..... 401,965  
Furnace joint, sectional, E. Gurney..... 401,827  
Galvanic battery, R. J. Pratt..... 402,104  
Game board, S. T. F. Sterick..... 402,112  
Garment hanger, W. Gowen..... 401,943  
Garment pattern, combination, M. Tuch..... 402,046  
Gas incandescent, L. Paget..... 401,899  
Gas incandescent, making, L. Paget..... 401,899  
Gate. See End gate. Railway gate. Water gate.  
Gearing, M. E. Benedict..... 401,993  
Gears, machine for cutting, J. S. Waterman..... 401,987  
Glass building block, G. Falconner..... 402,073  
Glassware, manufacture of, G. W. Leighton..... 402,090  
Governor for engines, hydraulic, W. H. & J. D. Gray..... 402,015  
Grain separator, S. Freeman..... 402,012  
Grinding and sharpening machinery, H. Buckingham..... 401,875  
Grinding mill, J. B. Altree..... 401,872  
Gripping die, W. Taylor..... 401,912  
Halter, E. Barnard..... 401,922  
Handle, J. B. Hartman..... 401,832  
Hanger. See Garment hanger.  
Harness, A. Schunck..... 401,973  
Harrow and cultivator, disk, E. C. Boyer..... 401,934  
Harrow, disk, R. W. Hardie..... 401,745  
Harrow, spring tooth, Hench & Dromgold..... 402,079  
Harrow, springtooth, E. W. Herendeen..... 401,843  
Harrow, spring toothed, T. R. Crane..... 402,000  
Harvester, S. D. Maddin..... 402,025  
Harvester binder, H. E. Fridmore..... 401,901  
Harvester, corn, W. D. Steele..... 402,040  
Hat moulding machine, T. P. Wilkinson..... 401,909  
Hay and grain rack, G. Carr..... 401,733  
Hay fork, N. F. Mathewson..... 402,093  
Head rest, chin support, and eye closer for corpses, combined, F. Moharter..... 402,035  
Heater. See Car heater.  
Heating apparatus, E. N. Gates..... 401,940  
Heating apparatus, automatic heat regulator for hot water, E. N. Gates..... 402,076  
Hides or skins, machinery for shaving or dressing green, J. Rood..... 401,906  
Hinge, spring, Spruce & Comstock..... 401,978  
Hoisting machine, T. W. Lemieux..... 401,841  
Holder. See Caramel holder. Paper bag holder. Shade holder. Tooth holder.  
Hoof shears, J. P. Lee..... 401,892  
Hook. See Button hook. Ladder hook.  
Horse boot, J. J. Ryan..... 402,109  
Horse detach, W. M. Morrison..... 402,097  
Hydrant, A. J. Tyler..... 402,115  
Injector, Lombard & Connor..... 401,753  
Insect powder duster, C. B. Glover..... 401,941  
Insecticide, M. B. Church..... 402,028  
Iron and steel, manufacturing, J. Reese..... 401,903  
Ironing board, A. T. Scanlan..... 401,858  
Ironing table, J. A. Kimball..... 401,796  
Jack. See Flooring jack. Lifting jack.  
Jewelry, plating stock for, J. B. Palmer..... 401,900  
Joint. See Furnace joint. Pipe joint.

Journal bearing, W. E. Elliott..... 402,009  
Key. See Pulley key.  
Kitchen cabinet and flour chest, Stone & Colman..... 402,113  
Knitting machine, circular, Pepper & Davis..... 401,791  
Knockdown case for eggs, etc., W. M. Baker..... 401,873  
Ladder hook, J. B. Foote..... 401,742  
Lamps or lanterns, globe or shade for, P. R. D. D'Humy..... 401,834  
Lawn rake, J. B. Detweiler..... 401,822  
Level, spirit, Lewis & Armstrong..... 401,843  
Lifting jack, A. J. Souders..... 401,865  
Light fixture, extension, G. W. Bayley..... 401,925  
Liquids under pressure, reservoir for holding, W. H. Thayer..... 401,860  
Lock. See Nut lock.  
Loom, H. Wyman..... 402,122  
Loom shedding mechanism, C. Hahlo & Co..... 401,947  
Loom stop mechanism, Crompton & Wyman..... 402,001  
Mandrels, keys, etc., machine for driving, Richards & Walker..... 401,968  
Manure distributor, J. A. Tigner..... 401,798  
Mechanical movement, J. Hunt..... 402,018  
Mechanical movement, F. H. Richards..... 401,904  
Message and time recorder, J. C. Wilson..... 402,120  
Metal can, box, or other receptacle, G. A. Waeber..... 401,913  
Metal strips for ornamental metal lattice or fence work, machine for shaping, F. H. Kindl..... 402,087  
Metallic mould, N. Washburn..... 401,804  
Meter. See Electric meter. Power meter.  
Milk can, A. W. H. Smith..... 401,863  
Mill. See Grinding mill. Ore grinding mill.  
Mould. See Metallic mould.  
Motor. See Electric motor. Railway motor. Water motor.  
Motor, W. H. Patton..... 401,756  
Motor and electric generator, combined, J. F. Shawhan..... 401,761  
Mower, P. C. Close..... 401,817  
Musical instruments, arm rest for, J. Bohmann..... 401,814  
Nut lock, J. L. Bay..... 402,054  
Nut lock, J. F. Leiby..... 402,023  
Oar, bow facing, S. R. Sweet..... 402,114  
Ore concentrator, W. H. Meginness..... 402,094  
Ore grinding mill, J. McKenzie..... 401,964  
Oven and flatiron heater, S. E. Robinson..... 401,969  
Packing, rod, S. Udstad..... 401,984  
Paper bag holder, H. E. Gage..... 401,826  
Paper making machinery, S. Wilmot..... 401,917  
Paper reel, H. T. Wilson..... 402,050  
Paper weight, F. B. Whipple..... 402,048  
Passenger register, A. Romain..... 402,035  
Pavement for streets or roads, M. Levi..... 401,752  
Pen, fountain, W. Van Demark..... 401,865  
Petroleum burner, C. V. Fleetwood..... 401,741  
Phonographs or telephones, mouthpiece guard for, W. L. Candee..... 401,732  
Photographic camera, E. Hackh..... 401,946  
Photographic cameras, attachment for, G. D. Thompson..... 401,802  
Photographic plates with emulsion, apparatus for coating, R. E. M. Bain..... 401,771  
Pin. See Safety pin.  
Pipe joint, F. A. Lane..... 402,089  
Pipe moulding apparatus, former for, McNeal & Stineruck..... 402,029  
Pipe or tube coupling, G. W. H. Brogden..... 401,946  
Pipe wrench, L. J. Bergendahl..... 401,926  
Pitman, P. R. Pulliam..... 402,105  
Planter, corn or cotton, Armstrong & Lowrey..... 401,728  
Planter, seed, J. Mitchell..... 401,897  
Plow attachment, gang, E. H. Farmer..... 401,937  
Plow, ditching, W. Burton..... 401,946  
Plug for sinks, tubs, etc., W. B. Smith..... 401,972  
Pot. See Coffee or tea pot.  
Poultry carrier, G. M. Beerbower..... 401,812  
Power meter, Clark & Low..... 401,929  
Press. See Printing press.  
Pressure contact arm, universal upward, C. J. Van Depoele..... 402,117  
Printing machine, J. W. Osborne..... 401,790  
Printing press, band, J. Kunze..... 401,839  
Printing presses, paper folding attachment for, T. C. Dexter..... 401,737  
Propeller, screw, A. Vogelsang (r)..... 10,397  
Protector. See Check protector. Scarf protector.  
Pulley key, C. W. Clark..... 402,065  
Pulverizer, rotary, M. B. Dodge..... 401,578  
Pulverizing clay and extracting stone, machine for, J. W. Shaffer..... 401,862  
Pump, G. W. Stafford..... 401,979  
Pump brake, A. J. Tyler..... 402,116  
Pump bucket, C. La Dow..... 401,954  
Pumps, valve gear for duplex steam, N. E. Nash..... 402,100  
Punch, W. H. Woglom..... 401,919  
Punching, shearing, and such like machine, C. Schumacher & Co..... 401,795  
Puzzle, F. Howard..... 402,017  
Quilting machine shuttle carrier, Thomas & Creter..... 401,981  
Rack. See Hay and grain rack. Umbrella or cane rack.  
Rail brake, M. A. Michales..... 401,755  
Railway bridges, danger signal for, J. W. Steele..... 401,763, 401,764, 401,799, 401,800  
Railway gate, A. J. McDonald..... 402,054  
Railway, incline electric, R. M. Hunter..... 401,784  
Railway motor, street, B. C. Pole..... 401,855  
Railway rail, E. J. Knapp..... 402,022  
Railway signal and switch connections, compensator for, Mitchell & Stevens..... 402,090  
Railway system, electric, S. H. Short..... 401,796  
Railway tie, metallic, A. J. Hartford..... 401,949  
Railways, sheaf supporting frame for cable, J. Walker..... 401,966  
Railways, system of elevated conductors for electric, S. H. Short..... 401,797  
Rake. See Lawn rake.  
Rammer, steam road, F. W. Carter..... 402,063  
Ratchet drill, W. G. Morgan..... 402,096  
Razor strop, flexible, J. L. Pomeroy..... 402,033  
Recorder. See message and time recorder.  
Reed chair, etc., J. Lemman..... 401,959  
Reed or rattan chair, etc., H. T. Leavis..... 401,959  
Reel. See Fishing reel. Paper reel.  
Reel for machines for forming and reeling ropes or strands, M. H. Day..... 402,044  
Register. See Passenger register.  
Ring. See Ear ring. Finger ring.  
Rivet, A. Kirks..... 401,747  
Riveting, hydraulic machine for, H. Smith..... 401,975  
Roller mill feeder, R. Wilcox..... 402,049  
Rotary engine, M. A. Buford..... 401,816  
Rotary engine, J. F. Hines, Sr..... 401,885  
Ruling machine, paper, H. A. Brissard..... 402,087  
Saddle trees, forming flexible, J. M. Fink..... 402,061  
Safety pin, J. Alcock..... 402,061  
Sash fastener, Trost & Weston..... 402,074  
Sawmill carriages, offset mechanism for, W. Gowen..... 401,942  
Sawmill carriages, offsetting device for, W. Gowen..... 401,944, 401,945