

ENGINEERING INVENTIONS.

An injector has been patented by Mr. Ferdinand Brunbauer, of Vienna, Austria. It is so constructed as to be always gradually started, no matter how it may be operated, having a fixed outer steam tube, a concentric endwise movable inner steam tube, forming a ring-shaped passage between them, a valve within the inner tube, and other novel features.

A railway signal has been patented by Mr. Pierson J. Wicks, of Greenpoint, N. Y. The invention relates to electric signals for block systems, and consists of three conductors, of which one is continuous and supplied from a central station, supplying current to the propelling motor and also for operating the electric signal to sound an alarm when two or more trains are in adjacent sections.

A portable switch table and car replacer has been patented by Mr. Arthur Durieu, of New Orleans, La. It is for facilitating the replacing of cars and locomotives on the tracks in case of derailment, and is to be carried on all trains; it consists of simple devices to be placed on the sleepers at the sides of the rails, and firmly clamped thereto, on which the wheels will run up and down, as on an ordinary rail.

A car coupling has been patented by Mr. James H. Davis, of Danville, Ky. The construction is such that the end of the link may be held at any angle, and when the cars come together to be coupled a lever brings the pin instantly to position, locking the link in the drawhead, while the uncoupling may be done from the top or sides, the invention also covering various other novel features.

A water heater for cars has been patented by Mr. William A. White, of Staatsburg, N. Y. A casing of two metallic shells, with a non-conducting filling between them, incloses a fire box with grate bars, upon which a fuel cylinder discharges, a heating chamber located near communicating with the fire box, coils of pipe extending therefrom, and a water boiler located above, with other novel features, making a construction in which it is intended the fire shall be extinguished when the car is upset.

A railroad spike has been patented by Mr. Thomas A. Davies, of New York City. This invention relates to a former patented inventor of the same inventor, and consists in a spike having the under surface of its head formed with two flat faces, adapting the spike to have a broad bearing upon the base of the rail, whether driven vertically or at an inclination in the cross tie, and also facilitating drawing out without bending.

A railway fish plate has also been patented by the same inventor. It is an angle fish plate made to be bolted to the webs of the rails, and to have a bearing at the outer edge of its base flange upon the cross ties, being slotted beyond the edges of the base of the rails, so that there is no lateral contact with the spikes, but the rails themselves are held from lateral movement by the direct contact of the spikes, and the fish plates have what is called "repose bearings."

A rock drilling machine has been patented by Mr. John Jennings, of Canon City, Col. This invention covers an improvement on a former patented invention of the same inventor, in a machine designed to be especially useful in drilling vertically downward, or nearly so, in which case the drill carriage may be lowered at intervals, or left to fall by gravity, as found necessary or desirable.

A car coupling also forms the subject of two patents issued to the above inventor. In one of them the drawhead has spring-actuated anchor bars, which open to receive and close upon the drawbar automatically, as the cars come together, or may be opened to uncouple the cars by an operating cam, which is worked by a shaft supported in bearings toward either side of the car, so that the coupling or uncoupling can be readily effected without going between the cars. In the other patent the coupling hook is pivoted near its rear end within the drawhead, and has its front end formed with a hook proper for engaging a shoulder on the drawbar, the coupling hook being yieldingly held down by a spring, but so as to admit the entry of the drawbar for coupling as two cars come together, there being levers extending to the sides and top of the car for working the device.

AGRICULTURAL INVENTION.

An improved plow jointer, for cutting off the edge of the furrow slice and depositing it in the previous furrow, has been patented by Mr. Thomas Lowden, of Lowell, Mich. The invention covers a simple construction, whereby it is intended that the draught of the plow shall not be sensibly increased, and the jointer will act substantially in the ordinary form, and it is so made that it can be used as an attachment for any form of plow.

MISCELLANEOUS INVENTIONS.

A folding top for camera stands has been patented by Mr. William H. Lewis, of Brooklyn, N. Y. It is so constructed that it may be folded into a vertical position and made to occupy a very contracted space, and so that great stability and strength are secured and great convenience is afforded for attaching and detaching the camera and legs of the tripod or stand.

A stringed instrument holder has been patented by Mr. Rodolphus T. Fiorini, of New York City. It is an internally threaded socket adapted to be fixed to the bottom of the instrument case, with a standard having a fork adapted to receive the neck of the instrument, and a clamping device for holding the same, being especially calculated for holding violins, guitars, etc., and upon music stands used in orchestras.

A remedy for hog cholera has been patented by Mr. George H. Beckwith, of Charlestown, West Va. It consists of mandrake, sulphur, charred coffee, chlorate of potash, and other materials, prepared and administered in a prescribed way, in connection with certain simple details of treatment which the patentee has found highly effective in years of experience.

A vehicle gear has been patented by Mr. Luther Stouffer, of St. Joseph, Mo. Bolster plates or posts are secured to the head block and the rear axle, perches being supported by the bolster plates and secured to the reaches, springs connected with the perches supporting the wagon box or bed, whereby side bars are dispensed with, cross braces may be used, and the wagon wheels can turn under the reaches.

A filling apparatus has been patented by Mr. John C. Collins, of Chillicothe, Ohio. It is for filling hot salt water or other liquids into cans holding corn or other vegetables, and consists of a sliding frame holding a tray, in combination with a stationary reservoir, filling tubes extending therefrom, with valves which can be opened and closed automatically, and other novel features.

An end gate for wagons has been patented by Mr. Charles F. Bassett, of Hillsdale, Ind. It is so made that it may be applied to either or both ends, will act either as an end gate, scoop board, or dump gate, may be held or placed at any desired angle, is capable of being removed or applied at will, will prevent the sides of the wagon from spreading, and also prevents the contents of the wagon from spilling out.

A fruit drier has been patented by Mr. Sylvester Stigler, of Claysville, Ohio. Combined with apartments open at both ends are horizontal partitions with transverse slots and rearwardly and upwardly bent flanges, with drawers having upwardly bent front ends, for drying fruit, preferably by hot water, and also by steam, drying it quickly, evenly, and so that it will retain all that is possible of its fresh flavor.

A weather strip has been patented by Mr. William R. Allan, of Pittston, Pa. It consists of a weather strip hinged to the door, in one end having a roller journaled, so that as the door is closed the roller travels upon the saddle, carrying the weather strip in advance of the door, and as the door latches, the roller drops into place, the weather strip fitting so as to form a complete seal.

A chimney cap has been patented by Mr. Hiram F. Henry, of Gowanda, N. Y. It consists of a section of pipe with outwardly and upwardly projecting branches having their angle of meeting directly over the center, with imperforate deflecting cones, and other novel features, offering the least possible resistance to the smoke and products of combustion, while effectually preventing the entrance of the wind.

A door check has been patented by Messrs. Elver H. Shaw and Justin D. Wixom, of Clay Center, Kansas. It consists of a latch device to be attached to the base board or wall and a catch to be attached to the face of the door, whereby as the door is opened its catch will be automatically engaged by the latch, and may be readily disengaged to allow the door to be closed, the device being simple and inexpensive.

An apparatus for drying and cleaning ramie and other fibers has been patented by Mr. Christian C. Kauffman, of New Orleans, La. It is for use after decortication, and embraces a hot air drying chamber to solidify the gum or sap in the fiber, with cleaners adapted to mechanically remove the solidified material, and feeding devices to pass the fiber through the drying chamber and the cleaners.

The treating of ramie and other fibers also forms the subject of a patent granted to Messrs. Christian C. Kauffman and John Austin, of New Orleans, La. The invention consists in treating the fiber in a continuous manner, first to a decorticating operation, then to a drying one by artificially heated air, and afterward to a mechanical cleaning, all being performed while the fiber is in motion, and saving rehandling.

A portable stationery case has been patented by Mr. Joshua F. Tannatt, of Springfield, Mass. This invention covers a novel construction, combination, and arrangement of parts, in a case forming a general receptacle for articles used by letter writers and others, and adapted for use either on the table or by suspending it from the wall, so that no matter how it is thrown about or handled, the articles will always remain in place.

A spectacle joint has been patented by Mr. Paul Moews, of New Castle, N. Y. The invention consists of end pieces, each having a trunnion formed on its face, a temple disk having a central aperture fitting over the trunnions and a screw for holding the parts together located between the inner ends of the end pieces and the temple disk, being durable, easily manufactured, and giving a fine appearance to the spectacles.

A hand pasting machine has been patented by Messrs. Ezra T. Hazeltine and John J. Benzino, of Warren, Pa., and Frank A. Weld, of Stanton, Neb. It has a sliding table with a swinging paste box, with a disk for distributing paste on a line across sheets held on the sliding table, and arranged that the paste box may be held raised so that the sheets can pass under it during the movement of the table in one direction without receiving any paste.

A system of aerial navigation has been patented by Mr. William Beeson, of Dillon, Montana Ter. This invention covers various novel features of construction and combinations of parts relating to a system of aerial navigation, comprising a balloon and attached propelling or flying sail-suit aerial motors, whereby the influences of wind currents and gravitation may be utilized to good advantage in navigating the air.

An adjustable window screen has been patented by Messrs. Forest M. Sampson and George W. Hogben, of Ripon, Wis. This invention covers improvements on a former patented invention of the same inventors, so that guide pins separate from the springs by which the adjustable strips or plates are forced outward may be dispensed with, and the spring-pressed plates will be held snugly to the face of the main screen frame.

A carding engine has been patented by Messrs. Benjamin A. Dobson and William J. Brom-

ley, of Bolton, Lancaster County, Eng. This invention is designed to provide improved means, where the revolving flats travel upon flexible bands, for one or both bands to be adjusted separately or simultaneously, and also to provide for automatically adjusting the front and rear carrier shafts or rollers around which the flats pass when the flexible bands are adjusted, so that the flats may be accurately adjusted at all points with reference to the main cylinder.

Interlocking bolts form the subject of two patents issued to Mr. Thomas J. Bush, of Lexington, Ky. The inventions relate to former patented inventions of the same inventor, in the first place covering straight bolts, notched to interlock, in a tie having diagonal intersecting holes, and blocks against which the nuts of the bolts bind, being especially adapted for railway ties and rails, bridge timbers, scaffolding, etc., and in the other case the improvement consisting in so forming the interlocking recess and the lower portion of one member of each pair of bolts that they shall intersect in the same plane and be locked by imparting a quarter turn to one of the pair, they being then tightened by means of screw nuts at their outer ends.

A fiber cleaning machine has been patented by Mr. Arthur W. Savage, of New York City. The material is drawn by an upper gripper from a delivery chute to a carrier belt continually advancing toward a macerating roller, and after the material has been acted upon by the roller it is drawn back against the action of the roller, the cleaned ends being caught by a lower set of gripper fingers, and the uncleaned ends thrown over upon the endless carrier belt to be advanced thereby to the macerating roller; these ends having passed between the roller and its bed, the material is again drawn back against the action of the roller and automatically dropped from the machine, while a second lot of material is drawn from the chute to be operated upon.

SCIENTIFIC AMERICAN BUILDING EDITION.

MAY NUMBER.

TABLE OF CONTENTS.

1. Plate in Colors of a Country House, in perspective, enlarged and improved at moderate expense, with floor plans, also sheet of details, specifications, bills of estimate, etc.
2. Plate in Colors of a Dwelling at Orange, N. J., with plans, sheet of details, description, etc.
3. The Queen of England's Cottage at Cannes, with half page engraving.
4. A Twenty-five Hundred Dollar Cottage. Page engraving, showing perspective, and floor plans.
5. New Apartment House in Brooklyn, with perspective view and floor plans.
6. A Two Thousand Dollar House, with three-quarter page engravings, including perspective and floor plans.
7. An Eastlake Cottage, with elevation and floor plan.
8. The New Law Courts Birmingham, page engraving—a splendid example of recent architecture.
9. Design for Local Offices. Half page engraving.
10. A Double Cottage of Moderate Cost, two pages of engravings, with elevations, floor plans, and partial specifications.
11. A Thirty-five Hundred Dollar Cottage, with elevation and floor plans.
12. New Hotel at Mentone, page engraving, showing perspective and plans.
13. A Dwelling of Moderate Cost, page engraving, perspective and floor plans.
14. Design for a Seaside Cottage, perspective view and plans.
15. A Country Church costing \$5,000, a picturesque design in perspective with floor plan.
16. A Church in Stone, to cost from \$20,000 up. An elegant design, with plans.
17. Shop Fronts in Birmingham, a suggestive and elegant design.
18. The Ponce de Leon Hotel, at St. Augustine, Fla. An elegant and unique specimen of architecture; two engravings.
19. Mode of raising and Repairing the old U. S. Court House at Boston, with three engravings.
20. The Arch of Triumph at Karlsruhe. Designed by Prof. Gotz. Half page engraving.
21. Design for a Monument and Mausoleum to Gen. Grant, by George Matthias; half page engraving.
22. Miscellaneous Contents: Heating by Hot Water, illustrated.—Architectural Wood Turning, illustrated.—Ruling and Section Lining, illustrated.—Iron Ceilings, with illustrations.—Rose covered Porches, with engravings.—Thin Roofing, with an engraving.—Planing Mill Construction, with diagrams.—Reservoir with Automatic Valve, engraving.—How to make Good Roads.—How to make a Cold Room for Eggs, etc.—New way of building Concrete Walls under Water.—How to remove P. int.—Embossed Wood, how made.—Knitting, and Its Uses.—Strength of Plaster of Paris.—Water Back Explosions.—Stone Fliters.—Experiments in Drying Woods.—Shrinking of Seasoned Timber.—Cement Buildings.—The Acropolis of Athens.—Architectural Excellence.—Artificial Rubies.—Gelatine Moulds for reproducing Carvings.—Paper Roofs.—Floors and Ceilings, Ancient and Modern, by C. Powell Karr.—Built-up Doors.—Staining Wood.—Shelter Belts and Hedge Screens.—Building Constructions under Water.—How to Finish in Natural Wood.—Best Arrangement of Plumbing.—Bursting of Lead Pipes.—Costs of Different Kinds of Walls.—Imitation Stone.—How to Grain Walnut.

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 Fulness, 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.

Special.

THE TEST BY RESULTS.

When George Stephenson, the inventor of the locomotive, was about to start out on his first trip, he declared that the water in his boiler carried a power that would revolutionize the carrying trade of the world. The same test which decided the merits of the claims for the powers of steam is a fair one for to-day. One of the most striking of these developments is Compound Oxygen. For a while it also met with incredulity. The idea that it could be stored in water and transported long distances met with the same doubt that had greeted every other new statement as to the powers in nature. But the same perseverance that had in so many fields won success led to patient endurance of the test by results; and they have made it an accomplished fact that oxygen in a compound form can be stored away for future use, to be drawn upon as may be required. Tens of thousands are now living witnesses of this truth. The letters received and on file in the office of Drs. Starkey & Palen, No. 1529 Arch St., Philadelphia, from their patients, report cures in asthma, bronchitis, catarrh, dyspepsia, eczema, epilepsy, dropsy, cancer, hay fever, heart disease, diseases of the eye, of the ear, consumption, rheumatism, diseases of the kidney, headaches, and other diseases. Nervous prostration from mental strain and overwork has in many cases given way to renewed powers and enjoyment of life.

These reports are numbered by thousands, and come from men and women in every position in life. A college president in Vermont writes that though he is well on in years, his voice has been restored so that he can give his lectures and addresses without inconvenience, after for a long time having been a sufferer from throat disease. When such widespread agreement as to results is witnessed, there can be no doubt as to Compound Oxygen. A well prepared digest of the history and working of this remarkable revitalizer, in the form of a two hundred page brochure, will be sent free by addressing Drs. Starkey & Palen, No. 1529 Arch Street, Philadelphia, Pa.

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.

Fine Models. Haven, 211 Mulberry St., Newark, N. J. To Let—Part of large store, 43 Dey St., New York.

Wanted—A thorough mathematical instrument maker. Address P. O. box 1543, Philadelphia, Pa.

Rare Chance.—For sale, the malleable iron Samson jack and press patent. These are the only rack and ratchet machines in the world. They received the first prize in the American Institute and in Atlanta, Ga.; the patent having ten years to run. Call or address John Paar, No. 356 E. 4th St., New York.

Stationary and Boat Engines, Boilers, best made, cheapest price. Address Washburn Engine Co., Medina, Ohio.

For the latest improved diamond prospecting drills, address the M. C. Bullock Mfg. Co., 138 Jackson St., Chicago, Ill.

Just Published.—A new and enlarged catalogue of scientific hooks, furnished free of charge on application by addressing Munn & Co., 361 Broadway, N. Y.

For Sale—Machine shop plant, in operation. Best tools. Address Chas. W. Griggs, 175 Dearborn, Chicago. Steam Yacht for Sale—48 ft. length, 1 1/2 ft. beam. Price, \$1,800. Address Wm. Stein, Blue Island, Ills.

The Australian-American Trading Co., 20 Collins St., West Melbourne. Sole agencies for American novelties desired. Correspondence solicited. Care of Henry W. Peabody & Co., Boston.

The Knowles Steam Pump Works, 113 Federal St., Boston, and 93 Liberty St., New York, have just issued a new catalogue, in which are many new and improved forms of Pumping Machinery of the single and duplex, steam and power type. This catalogue will be mailed free of charge on application.

Link Belting and Wheels. Link Belt M. Co., Chicago.

The Railroad Gazette, handsomely illustrated, published weekly, at 73 Broadway, New York. Specimen copies free. Send for catalogue of railroad books.

Protection for Watches.

Anti-magnetic shields—an absolute protection from all electric and magnetic influences. Can be applied to any watch. Experimental exhibition and explanation at "Anti-Magnetic Shield & Watch Case Co.," 18 John St., New York. F. S. Giles, Agt., or Giles Bro. & Co., Chicago, where full assortment of Anti-Magnetic Watches can be had. Send for full descriptive circular.

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

Supplement Catalogue.—Persons in pursuit of information of any special engineering, mechanical, or scientific subject, can have catalogue of contents of the SCIENTIFIC AMERICAN SUPPLEMENT sent to them free. The SUPPLEMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physical science. Address Munn & Co., Publishers, New York.

Woodworking Machinery of all kinds. The Bentel & Marzedant Co., 116 Fourth St., Hamilton, O.

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, polishing compositions, etc. \$100 "Little Wonder." A perfect Electro Plating Machine. Sole manufacturers of the new Dip Laquer Kristaline. Complete outfit for plating, etc. Hanson, Van Winkle & Co., Newark, N. J., and 92 and 94 Liberty St., New York.

Iron Planer, Lathe, Drill, and other machine tools of modern design. New Haven Mfg. Co., New Haven, Conn.

Catalogue of books on civil and mechanical engineering, electricity, arts, trades, and manufactures, 116 pages, sent free. F. & F. N. Spon, 35 Murray St., New York.

Guild & Garrison's Steam Pump Works, Brooklyn, N. Y. Pumps for liquids, air, and gases. New catalogue now ready.

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

Power, 113 Liberty St., N. Y. \$1 per yr. Samples free.

Packer Ratchet Drills are drop forged from Norway iron and bar steel. Billings & Spencer Co., Hartford, Conn.

Pat. Geared Scroll Chucks, with 3 pinions, sold at same prices as common chucks by Cushman Chuck Co., Hartford, Conn.

Get estimates from Christiana Machine Co., 206 North 4th St., Philadelphia, Pa., for shafting, pulleys, hangers, and gearing before ordering elsewhere.

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

Hoisting Engines. D. Frisbie & Co., New York city.

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

Tight and Slack Barrel Machinery a specialty. John Greenwood & Co., Rochester, N.Y. See illus. adv., p. 28.

Lick Telescope and all smaller sizes built by Warner & Swasey, Cleveland, Ohio.

Send for new and complete catalogue of Scientific Books for sale by Munn & Co., 361 Broadway, N. Y. Free on application.

NEW BOOKS AND PUBLICATIONS.

REPORT OF THE BOARD OF COMMISSIONERS OF THE GEOLOGICAL SURVEY OF PENNSYLVANIA TO THE LEGISLATURE, JANUARY 1, 1887. Pamphlet. Pp. 6.

This is a report of progress. It is preceded by two charts showing what part of the State has been mapped and reported on. The text particularizes the work of the past years, and states what remains to be done. A final clause recommends an appropriation of \$90,000 to carry on the work of the survey.

NINTH ANNUAL REPORT OF THE CONNECTICUT BOARD OF HEALTH, FOR THE YEAR ENDING NOVEMBER 1, 1886. New Haven. Pp. xi., 167.

In the ninth annual report of the Connecticut health authorities, we find in addition to the general reports a number of treatises on subjects of present and vital interest. A report gives the health of towns, the character of each town being reported by a special observer, in many cases physicians. This gives an admirable diagnosis of the village sanitary aspect, and upward of 70 pages are devoted to the summary. Malaria and its etiology are exhaustively treated of by Dr. R. W. Griswold. This portion of the work is of interest to all, not being limited in its scope to the State. Pollution of Streams, by James B. Olcott, the Warming of Dwelling Houses, by Dr. G. Elliot, Analyses of Well Waters, an exhaustive series of papers on diphtheria and its causes, follow. Abstracts from Report on Adulteration of Foods, by Dr. A. J. Wolf, and a report on disinfectants end the main portion of the volume. The list of subjects shows how valuable the work is to sanitarians, and the book sustains the high reputation enjoyed by the Connecticut health reports during the past.

INDIANA: DEPARTMENT OF GEOLOGY AND NATURAL HISTORY. Fifteenth Annual Report. Maurice Thompson, State Geologist. 1886. Indianapolis. Pp. 359.

The annual report of the State Geologist of Indiana treats of the mineral resources of the State and of points in its geology, mineralogy, and flora. Prehistoric man is the subject of a monograph by S. S. Gorby. Natural gas and oil wells in the State are described by Maurice Thompson, who figures as the author of a great part of the volume. In testimonial of the good work done by these reports, the director states that he has answered over 1,500 letters from outside the State, touching on subjects of the survey in his charge. The paper by Professor Gorby on the anticlinal, termed by him the Wabash Arch, is of especial importance as touching the probabilities of a gas country being discovered. The work throughout bears a practical aspect, that will tend to make it of more immediate direct benefit than a purely theoretical work would be. It will attract attention from all interested in the mineral and mining development of Indiana. A glossary of scientific terms is a good feature not often found in this class of works.

ELEMENTARY TREATISE ON DETERMINANTS. By William G. Peck. New York and Chicago. 1887. A. S. Barnes & Co. Pp. 47. Price, 75 cents.

This little work treats in a very clear and intelligible style of the subject of determinants, now becoming an essential branch for those studying the higher mathematics. The general resolution of determinants is illustrated by algebraic and arithmetical examples—an excellent method in a text-book. The multiplication, squaring, and raising to higher powers of these functions is clearly explained, and in conclusion the differential of a determinant is treated of.

NATURAL LAW IN THE BUSINESS WORLD. By Henry Wood. Boston and New York. 1887. Lee & Shepard and Charles T. Dillingham. Pp. 222. Price, 75 cents.

This little work on political economy in its more practical field treats of the labor question, of poverty, and of the kindred topics occupying so much attention at the present day. The book is too concisely written to yield its spirit to a review. In the main a conservative spirit seems to guide the writer, and his treatment of the complex subjects to which the book is devoted will, we are sure, prove acceptable to many thinkers.

CURVE TRACING IN CARTESIAN CO-ORDINATES. By William Wooley Johnson. John Wiley & Sons, New York.

GEOMETRY: CREATION OF THE CONTINENTS BY THE OCEAN CURRENTS. By J. Stanley Grimes. J. B. Lippincott & Co., New York.

THE PEANUT PLANT: ITS CULTIVATION AND USES. By B. W. Jones. Orange Judd Company, New York.

THE TOBACCO REMEDY. By Gen. T. L. Clingman. Orange Judd Company, New York.

* * Any of the above books may be purchased through this office. Send for new catalogue just published. Address Munn & Co., 361 Broadway, N. Y.

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 a 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.

(1) G. H. D. N. asks the constituents of the usual common black varnish much used as a painting on iron vessels, etc. A. Boil coal tar until it shows a disposition to harden on cooling; this can be ascertained by rubbing a little on a piece of metal. Then add about 20 per cent of lump asphalt, stirring it with the boiling coal tar until all the lumps are melted when it is allowed to cool, and is kept for use. Asphaltum and gas tar are frequently sold one for the other. The source of supply is different, but they are very similar in their results.

(2) B. O. F. asks: What is the best or safest way of reducing flesh without material injury to the body? A. Reduce the quantity of your diet and increase your walks, say to nine miles daily.

(3) J. L. asks if hot water or steam will take the temper out of a spring. A. It is possible, and sometimes occurs. Springs in cylinders of engines working under high pressures sometimes lose their temper from long exposure to the heat.

(4) G. F. W. asks how to fasten wire to electric light carbons so that the wire will not corrode when the carbons are used in a sal ammoniac battery. A. Dip the upper ends of the carbons, if they are not coppered, into paraffine, then plate them in a sulphate of copper bath with copper, and solder your wires to the copper; or you may dip the coppered ends into melted type metal, and use a clamp to hold the wire. This is far the best method.

(5) T. H. asks: Is there any sure way of detecting sewer gas except by feeling its effects? A. No sure way is known. The most reliable would be a bacterial analysis of the suspected air. The reducing action of the air upon a solution of permanganate of potash also gives a possible clue for solving the problem. Instead of testing directly for the gas, the usual practice is to examine the pipes for leakages at the joints, or for defective seals, by pouring oil of peppermint and hot water into the pipes and then tracing leaks by the odor. The oil should, if possible, be introduced from the outside and by another person. Experience is necessary to conduct the test properly.

(6) E. M. asks for a good work on dry plate emulsions. See "Photography with Emulsions," \$1.00, by Captain Abney, and "Dry Plate Making for Amateurs," 50 cents, which we will mail on receipt of price. Also see SCIENTIFIC AMERICAN SUPPLEMENT, No. 541.

(7) H. E. B. asks: 1. If I take a Leyden jar and charge it with electricity, and then slip another jar not charged inside of the first jar, and connect the inside of the inner jar with the earth, will the second jar become charged? A. The inner jar will become charged. 2. Why cannot any one charge a Leyden jar by connecting the inside of the jar with the positive pole and the outside with the negative pole, and not depend on induction for charging one side of the jar? A. The jar can be so charged, and the Holtz machine is very conveniently used in this way to charge jars. 3. What is a cascade in electrical parlance? A. A cascade of Leyden jars indicates their arrangement in series, the inner coating of one communicating with the outside of the other; during the charging process, the jar at one end has one coating, generally the inner, connected with the machine, while the opposite coating of the last jar is grounded. The arrangement gives a very high tension spark. 4. Is there any element that is as strongly diamagnetic as iron is magnetic? I have been told that bismuth, when suspended between the poles of a magnet, tends to arrange itself transversely to the poles of the magnet, and with nearly as much power as iron would tend to arrange itself from pole to pole. Is this true? A. No such element is known; the phenomena of diamagnetism are far weaker in degree than the direct magnetic action (paramagnetic) of a magnet upon iron.

(8) G. F. asks some common sense arrangement for regulating an incubator to keep it any desired temperature, say 103° Fah. A. There is a variety of ways for regulating incubators, many of which are patented. The most simple one, and easiest made by an amateur, is to fasten a strip of hoop iron about one inch wide to a similar strip of sheet zinc of same size, by lightly riveting or only winding with twine. Rivet or solder the ends together solid, or so they cannot slide upon each other. Make the strips somewhat shorter than the distance across the hatching box. Fasten one end at one end of the box near the top, leaving the other end free to move. The changes of temperature will swing the free end to and fro for a short distance, and this can be made to move a delicately hung ventilating shutter or vary the height of the wick in the lamp as desired. If you are ingenious, we think you can figure out the detail yourself.

(9) L. M. asks: How many and what kinds of lenses would be required to make a first class magic lantern, and can as good results be got with poly-opticon as with magic lantern? A. For a first class lantern use achromatic lenses, plano-convex, 1/4 to 2 inches diameter and from 8 to 16 inches focallength, ac-

ording to sizes of pictures to be shown and distance of screen. Also plano-convex condensers, 3 inches to 4 inches diameter, 8 inches to 12 inches focus, placed convex sides together. You may use the same size and focus single plano-convex lenses for a poly-opticon, but it does not give as much satisfaction as a well equipped magic lantern.

(10) F. W. S. asks: If the pumps fail to work, the water is low, and you are in danger of being driven on a lee shore, what course would you adopt? and says the question was asked an engineer trying to take out papers in a Western city. A. Such a question can only be answered circumstantially. No sea or lake going steamer should be licensed with but a single means of feeding the boilers. A steam pump and an injector should be provided, as well as hand pump that can be used in case of necessity for the boilers and for clearing the vessel in case of leaks otherwise uncontrollable. When all supplementary means fail, steam until the water reaches the tubes or flues, then shut down, draw fires, and go ashore, if sails cannot save you.

(11) C. A. S. asks how to coat a number of small articles with bronze, by dipping. A. You may make a bronze dip by mixing bronze powder with thin varnish. Thin any ordinary varnish with turpentine, and keep it thoroughly stirred while dipping. A better and brighter bronzing is made by dipping in very thin varnish and allowing it to partially dry, then brushing the work with the dry powder on a fur brush.

(12) J. J. P. asks how gelatinized paper is prepared for performing the experiment of the paper mermaid, described on page 56 of the January 22, 1887, issue of the SCIENTIFIC AMERICAN. A. Dip a piece of tissue paper in a weak solution of gelatine and water, from 4 to 12 grs. to 4 oz. water. When dry, the paper will operate as described.

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

May 3, 1887,

AND EACH BEARING THAT DATE.

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

Table listing inventions with patent numbers, including: Acids, method of and apparatus for testing, T. C. Stearns... 362,402; Adding, counting, or registering machines, stop device for, W. Koch... 362,219; Addressing machine, W. Barr... 362,148; Alarm. See Gas stoppage alarm. Alarm box, electric police call, J. J. Coughlin... 362,477; Alarm indicator, A. J. Wright... 362,198; Aluminum and aluminum bronze, production of, R. Gratzel... 362,441; Amalgamator, H. Cook... 362,363; Animal trap, W. P. White... 362,343; Arch bar jig, O. M. Carey... 362,201; Auriphone, J. A. Maloney... 362,099, 362,100; Automatic brake, W. M. McCollum... 362,101; Axle, carriage, J. Sadler... 362,184; Axle lubricator, T. L. Randall... 362,318; Bag holder, W. I. Jordan... 362,092; Bag tie, G. Alderson... 362,349; Bagasse furnace, F. Cook... 362,362; Bale for baling wood for transportation, R. E. Dietz... 362,148; Bale ties, machine for making wire, Lenox & Cook... 362,452; Baling press, W. R. & N. J. Green... 362,272; Baling press, Hagquist & Rydbeck... 362,156; Baling press, J. B. & O. B. Johnson... 362,290; Barrel, metallic, C. R. Penfield... 362,107; Bars, device for breaking, W. R. Hinsdale... 362,381; Bath tub, D. R. Watson... 362,340; Bedstead, W. L. Drake... 362,433; Bell and lock, alarm, J. Fee... 362,151; Bell ropes, coupling guard for, J. E. Root... 362,388; Belting, machine, A. J. Gasking... 362,269; Bicycle, G. T. Warwick... 362,407; Bicycles, speed gearing for, P. E. Linnell... 362,220; Bird cages, extension chain attachment for, J. B. Underwood... 362,127; Block. See Embossing block. Blotter, adjustable, E. Covert... 362,361; Board. See Multiple switch board. Boiler. See Steam boiler. Boilers, manufacture of hangers for steam, H. L. Wilson... 362,473; Book holder, J. L. Clark... 362,060; Book support, P. O. Peterson... 362,226; Boot or shoe holding jack, C. J. Addy... 362,347; Bottle case, E. A. Galbraith... 362,375; Bottle stopper, H. P. Brooks... 362,245; Box. See Alarm box. Music box. Stuffing box. Veneer box. Bracket. See Drawer bracket. Lamp bracket. Brake. See Automatic brake. Shaft brake. Brake and car starter, combined, M. G. Hubbard... 362,159; Brewing beer, apparatus for, J. Irlbacher... 362,086; Brick machine, C. Chambers, Jr... 362,204; Brick machine, S. E. McGregory... 362,102; Bridges, submerged bracing for pile bridges, Carpenter & Watson... 362,144; Brooches, etc., pin attachment for, O. G. Fisher... 362,264; Broom, D. Block... 362,066; Brush, J. F. Bartlett... 362,351; Buckle slide, Carter & Churchill... 362,268; Buggy seat, G. G. Harris... 362,275;

Table listing inventions with patent numbers, including: Bustle, J. C. Betten... 362,055; Bustle, G. Eckles... 362,290; Bustle spring, L. Moschowitz... 362,391; Button, A. E. Jones... 362,281; Button fastening, J. E. Tilt... 362,198; Buttonhole attachment, J. M. Griest... 362,442; Button making machine, W. W. Wade... 362,335; Button setting tool, W. Keppler... 362,284; Button, sleeve, E. I. Coombs... 362,426; Button, sleeve, F. W. Richards... 362,315; Cabinet, label, H. & W. F. Neitzel... 362,306; Calender protector, W. F. McCarthy... 362,294; Camera. See Photographic camera. Can. See Lamp filling can. Sheet metal can. Shipping can. Can opener, J. J. Molony... 362,389; Car coupling, J. L. Cheshire... 362,425; Car coupling, J. H. Davis... 362,253; Car coupling, J. Jennings... 362,090, 362,091; Car coupling, E. Laline... 362,221; Car coupling, J. Tyzick... 362,126; Car coupling, Westbrook & Cook... 362,408; Car heater, J. S. Hagerty... 362,214; Car signal, railway, T. M. Jenks... 362,068; Car wheel, W. H. Masterman... 362,292; Car wheels, making, J. Rigby... 362,113; Cars, attachment for holding vehicles in, E. M. Lozier... 362,463; Cars, water heater for, W. A. White... 362,342; Carbureting apparatus, O. W. Bennett... 362,197; Cardboard, etc., apparatus for cutting grooves in, T. Remus... 362,180; Cardboard, apparatus for grooving, T. Remus... 362,179; Card, show, J. H. Adams... 362,060; Carpet fastener, M. B. McCastline... 362,171; Carpet fastener, T. W. M. Worley... 362,476; Carpet lining, J. C. Mayall... 362,293; Carpet stretcher, J. A. Risdon... 362,114; Carpet stretcher, A. Stockdale... 362,122; Carriagejack, Gibson & Stone... 362,075; Carrier. See Harvester bundle carrier. Lamp carrier. Cart, road, B. S. Porter... 362,460; Case. See Bottle case. Pencil case. Writing case. Casket lowering device, J. H. Beattie... 362,248; Castings, making metal, J. Walker... 362,337; Chair. See Extension chair. Chart, dress cutting, T. Hawkins... 362,378; Churn, B. Zipperlen... 362,196; Churn, B. F. Staggs... 362,401; Churn, atmospheric, F. Farley... 362,373; Churn dasher, C. Berst... 362,416; Cigar fillers, mold for measuring and partially shaping, F. A. Ford... 362,267; Circle and gasket cutter, A. O. Kittredge... 362,218; Clamp. See Lasting machine clamp. Clasp. See Harness clasp. Spring clasp. Clasp, L. B. Prahar... 362,461; Clevis fastening, W. H. H. Snellbaker... 362,327; Clevis, plow, M. L. Gibbs... 362,073; Clip. See Electric cable clip. Clock, night, C. C. Adams... 362,140; Clock system, pneumatic, P. G. Puttemans... 362,462; Clod crusher and harrow, combined, Flohre & Perrin... 362,071; Clod crusher and pulverizer, D. Lubin... 362,454; Clothes wringer, J. J. Collins... 362,359; Clutch, friction, M. G. Hubbard... 362,084; Coal receiver, self-feeder dust preventing, D. S. Kelton... 362,283; Cook or tap, metal, S. W. Smith... 362,326; Coffee pot, W. W. Newcomb... 362,105; Coke from ovens, machine for pulling, F. C. Weir... 362,130; Collar, horse, C. Blok... 362,353; Compositor's frame, F. M. Neff... 362,394; Conduits, etc., machine for cleaning, D. Fitz Gerald... 362,153; Cooling board, C. Blood... 362,057; Corsets, elastic core for, M. P. Bray... 362,419; Cotton gin, M. Toulmin... 362,126; Cotton or hay press, A. & F. T. McGowen... 362,299; Cotton scraper, M. Danos... 362,365; Coupling. See Car coupling. Thill coupling. Cover fastening, G. L. Mason... 362,170; Crusher. See Clod crusher. Cuffs, adjustable holder for, D. C. Williamson... 362,134; Cultivator, sulky, I. B. Kilgore... 362,285; Curtail pole, E. Roos... 362,316; Cutlery show case, H. Dechent... 362,207; Cutter. See Circle and gasket cutter. Rod and bolt cutter. Tobacco cutter. Weed cutter. Dental apparatus, H. W. Parsons... 362,310; Die. See Heel die. Drawer bracket, A. L. Moore... 362,457; Drawers, skeleton frame for, T. Kundtz... 362,288; Drill. See Rock drill. Rock and coal drill. Seed drill. Dumping apparatus, Smith & Dresbach... 362,324; Earthenware, coloring glazed, M. C. Stone... 362,123; Elastic braid, open work, B. Goodman... 362,440; Electric cable clip, Gould & Smith... 362,376; Electric light carbons, compensating mechanism for regulating, J. A. Lakin... 362,289; Electric lights, support for, A. G. Schlotterbeck... 362,399; Electric motor, R. J. Sbeehy... 362,322; Electric switch, A. Swan... 362,469; Electrical appliances, connector for, C. G. Perkins... 362,109; Electrical circuit closer, G. E. Thaxter... 362,192; Electrical current indicator, P. Lange... 362,451; Elevator. See Hay elevator. Hydraulic elevator. Embossing block, G. Marchetti... 362,169; Embroidery frame, C. Schaubel... 362,290; Emery wheels, tool for dressing, A. E. Convers... 362,380; Engine. See Gas engine. Rotary engine. Steam engine. Excavator, J. K. Howe... 362,083; Exhibitor, Thompson & Kramer... 362,124; Extension chair, A. H. G. Elten... 362,066; Fabric for packing portable articles, J. S. Richardson... 362,229; Fabrics from coarse long staple wool or hair, making, E. & E. Scheppers... 362,317; Fabrics, machine for turning, C. W. Dikeman... 362,363; Fare register and indicator, Patterson & Davis... 362,176; Faucet, self-closing, E. Homan... 362,277; Feed water heater, G. A. Otis... 362,386; Fence, C. Gibson... 362,074; Fence, hedge, H. Taylor... 362,332; Fence machine, wire, A. J. & G. W. Forsythe... 362,489; Fence post, F. L. Fairchild... 362,438; Fence post and base, F. L. Fairchild... 362,437; Firearm, E. E. & J. H. Redfield... 362,110; Fire escape, H. M. Jones... 362,448; Fire escape, A. Nudd... 362,173; Fire extinguishing compound, S. J. Sornberger... 362,332; Fire lighter, F. E. Corwin... 362,147; Fireplace heater, J. Spear... 362,130; Flanging machine and drill press, combined, J. Brien... 362,308;