

(4) J. D. B. asks: 1. Why is it true that, if the direct rays of the sun are permitted to enter a darkened room through a square opening, where they impinge upon the floor or wall, the figure will be round? A. The sun, having sensible magnitude, produces a penumbra. This prevents the reproduction with sharp outlines of the aperture, and hence it is somewhat confused in shape, tending toward a circle. This refers to an opening of large size. If the opening is very small, not much larger in area than a pinhole, then a "pinhole" image of the sun will be produced. The production of such an image depends on the practical cutting off of all except one set of rays emerging from the sun. 2. Do motions possess the quality of cohesive attraction? A. No. 3. Is it not true in physics, as in physics and in politics, that we are expected to accept the dictum of some man as leaving nothing further to be said, and whose ipse dixit it were rank heresy to question? A. We know of no ipse dixit in physics, politics, or physics. The assertion of the highest authority is open to contradiction or discussion.

(5) R. Y. asks: 1. Is it necessary for the discharge end of a siphon pipe to be submerged in water to insure a continuous flow? A. No; provided the pipe is unobstructed for its full length. If partially stopped, so that there is a slow discharge, air may enter and stop the siphon from working. 2. What is the theoretical difference in the length of the pipe from the apex to the fountain, and from the same point to the discharge in order to insure a continuous flow? A. Any difference in length will insure a flow toward the longer leg. The height must not exceed 33 feet, as this is the limit of action.

(6) F. T. P. asks (1) how salicylic acid is made. A. Salicylic acid is made by treating sodium phenol (carbolic acid and soda) with carbonic acid gas. Caustic soda solution is evaporated with a proper amount of carbolic acid to a dry powder, and carbonic acid gas is passed over it while warm, the temperature being gradually increased from 212° Fah. to 482° Fah. Carbolic acid is made from coal tar. 2. Is salicylic acid injurious to the system? A. It has an injurious effect upon the system when taken in sufficient quantities. The effect of minute amounts long continued cannot yet be considered established.

(7) Shep asks what commercial value (if any) solidified petroleum or solidified kerosene has, and also mention some of the uses to which it could be put. A. It is impossible to say what value solidified petroleum would have. It is mainly as a method of preparing it for transportation that inventors have worked upon the problem. It has been suggested that it might be used as a fuel.

(8) R. B. H. asks: At what distance (in feet) would an iron steamship cause a deflection of a sensitive compass needle? A. The exact distance cannot well be stated. Probably a distance of one hundred feet would practically prevent defective influence.

(9) F. L. writes: A sheet of zinc about a foot square was accidentally dropped into a well. Will it poison or injure the water, so as to make it unfit for drinking purposes? A. While it is doubtful if the zinc will seriously contaminate the water, it would be good policy to remove it.

(10) J. J. B. asks: What will remove paint from window glass? A. Try solution of washing soda. If this is not strong enough, use caustic soda. These solutions will spot any other paint that they may fall upon.

(11) J. P. S. asks: 1. If there is a remedy to stop show windows from sweating in cold weather. A. Ventilation from the top is the most efficacious method in general use. 2. What will drive away or kill cockroaches that infest dwellings? A. Powdered borax is sometimes very effectual.

(12) R. W. W. writes: I wish to make a balloon of 4 or 4½ feet in diameter, suitable to raise a two-pound detective camera. What would be the best material (rubber, gutta percha, gold beater's skin, or what), and how should the seams be cemented? What dimensions would be necessary if coal gas was used instead of pure hydrogen? A. If filled with pure hydrogen, the gas contained in your balloon would have a lifting capacity of about 2½ lb.; as it would have to carry the weight of the balloon as well as camera, it would be far too small. With coal gas it would have about one-half the above lifting power. Silk varnished with a mixture of India rubber, linseed oil, dissolved in essence of turpentine, would be a good material. In storing it, the balloon should be suspended to prevent the varnish from heating. Your balloon should be about 8 feet in diameter for hydrogen, and 10 feet for coal gas, and even then unless the silk was very light and the varnish very thin, it is doubtful if it would have enough ascensional power.

(13) A. C. S. asks: 1. How to make asbestos a conductor of electricity. A. Soak it in nitrate of silver, dry, and expose to hydrogen gas, or ignite at a red heat. Or you may dip it in bichloride of platinum solution, then in chloride of ammonium, and ignite. 2. If a disk of any light material, about twenty feet in diameter, rests on a fine pivot (on the style of a compass dial), and the pivot is revolved very slowly, will the disk make as many revolutions as the pivot, or will there be a constant slip between the pivot and the disk? A. If the point is sharp and has a hard, smooth bearing, there will be a constant slip.

(14) D. D. C. asks: 1. Can brass or copper be silver plated without a battery, if so, how? A. Not very satisfactorily. 2. Will it be durable? A. The coating will be thin and not very durable.

(15) J. N.—Block tin is the only commercially successful lining ever used for soda water fountains. Glass fountains inclosed in iron or steel bands or cases have been used, but are very heavy and somewhat fragile. There is nothing dangerous in iron, though it may affect the color and taste of the water slightly.

(16) H. P. asks: Can you tell me if any one in this country has tried to get the coating of

tin off the scrap from can and tinware factories? If so what process is used, and oblige? A. This has never been successfully accomplished, though many attempts have been made to do it. A practical process would be very valuable.

(17) F. E. W. asks: What is the process and apparatus used in the manufacture of gas retort carbon black? A. The material in question is formed as a by-product in the manufacture of gas from bituminous coal. The hydrocarbons are decomposed by the heated walls of the retort, and carbon separates and is deposited in hard masses upon the back and upper surfaces of the retorts.

(18) S. W. R. writes: Replying to a query in your issue of September 1, you say that there is no substance that if placed between the poles of a magnet and its armature will counteract or insulate the magnetism. Now, I am puzzled to understand the principle of the "magnetic watch shield." Supposing that I had a proper grip on this law of magnetism, I have always held that these "shields" are frauds, but I find that their popularity is increasing, and that many of the case makers make their cases so fitted or not as ordered, and I notice also that some of the railroads that require a certain grade of watch to be used by their employes, specify the "magnetic shield" among other requirements. If you can enlighten me as to the composition of these "shields," and their general usefulness and the principles involved therein, it will be appreciated. A. Magnetic watch shields are not frauds. They operate, not by insulating the magnetism, but being made of iron they practically absorb it, acting like an armature of any neighboring magnet, and disposing of the lines of force before they can reach the inclosed watch. These lines of force are principally kept within the metal of the shield, so that the watch is partially protected.

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INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted September 18, 1888, AND EACH BEARING THAT DATE.

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

Table listing inventions with patent numbers, including: Acid phosphate, making, C. Glaser; Air brake, T. S. E. Dixon; Amalgamating apparatus, A. D. Searles, Sr.; Armature winding for dynamo electric machines, W. H. Knight; Awning, D. Jannopoulos; Axle box, J. Des Brisay; Axles and shafts, roller bearing for, C. D. Meneely; Bag holder, J. E. Coles; Bagasse furnace, W. W. Sutcliffe; Ball trap and target, Day & Colt; Banker's case, M. F. Langfeld; Basket or box, folding, C. R. Maguire; Batteries, rheotome mechanism for medical, H. B. Cox; Bearing, roller, R. W. Hent; Beating engine, J. Norton, Jr.; Belt fastener, M. Seebold; Belt rest, B. F. & J. F. Comstock; Belt tightener, chain, O. Cooley; Bit. See Bridle bit; Blind slats, machine for smoothing and finishing, A. F. Tyler; Block. See Snatch block; Board. See Bosom board; Boat. See Portable boat; Boiler. See Steam boiler; Boiler cleaner, steam, J. S. Roake; Boiler furnace, W. W. Sutcliffe; Bolt, J. T. Gunniss; Bolt, J. J. Holland; Bolt cutter, D. J. Sligh; Boot or shoe heel, J. Germun; Boring machine, H. Longwell; Bosom board, F. H. Argersinger; Bottle stopper, P. Kottzen; Bottle stopper, T. G. Turner; Box. See Axle box. Casting box. Letter box. Bracket. See Coffin bracket; Brake. See Air brake. Sled brake. Wagon brake; Bridge, D. M. Eddy; Bridge guard, W. C. Newman; Bridle, B. L. E. Gowen; Bridle bit, A. W. Helms; Broom head, G. H. Kimbler; Buckle, W. A. Meyer; Buckle and trace carrier, combined back band, W. H. Hayden, Jr.; Buggies, drop reach for, R. H. Munro; Burner. See Gas burner; Butter package, metallic, Higgins & Wheeler; Button, I. Dreihlinger; Button machines, nail and washer feeder for, B. Hamilton; Buttoner, C. L. Ury; Calipers, micrometer, J. D. Bishop; Cam mechanism, C. H. Willcox; Can forming machines, horn for, B. Adriaance; Cane, J. E. Hale; Cane and camp stool, combined, H. Hendrickson; Cane mill, scraper for, M. L. Flowers; Car coupling, J. Clarridge, Sr.; Car coupling, I. Shotwell;

Table listing inventions with patent numbers, including: Car coupling, S. H. Shull; Car coupling, J. F. Zeigler; Car door, W. J. Keyes; Car mover, M. F. Connett; Car mover, O. E. Rose; Car, passenger, C. H. White; Car platform, MacMakin & Crow; Car seat, J. O. Buerk; Car wheel, cast steel, Bagaley & Hainsworth; Carriage elevator, G. L. Loomis; Cart, road, F. Higgins; Case. See Banker's case. Medicine case. Wall case; Casting box, stereotype, J. Thompson; Casting horsehoes, flask for, F. I. Freeman; Chain, drive, B. A. Legz; Chair. See Rocking chair; Checkrein hook, D. W. Brownell; Chuck, drill, L. C. Taber; Cigar box trimming machine, H. Leiman; Cigar cutter, Richardson & Ridgway; Circuit maker and breaker, automatic, W. W. Estabrook; Clay to make ballast, etc., feeding apparatus for use in burning, W. Davy; Cleaner. See Boiler cleaner. Flue cleaner; Cleaner and heater, combined, J. D. Sullivan; Clips, die for forming spring head, E. J. Hess; Clock, E. M. & M. Moulton; Clothes wringer, A. Groves; Cock, stop and waste, J. Heltzle; Coffee or tea pot, J. Boutell; Coffin bracket, W. Hollis; Collar machine, horse, E. Crawley; Corn cutter, T. C. Williams; Cot legs or other articles of like construction, bracing, attaching, and detaching, L. Banks; Cotton scraper and chopper, W. E. Morris; Coupling. See Car coupling. Pipe coupling. Thill coupling; Cultivator, W. Sobey; Cultivator, sulky, J. C. Bird (r); Cultivator, wheel, W. Sobey; Cutter. See Bolt cutter. Cigar cutter. Corn cutter; Darning last, C. Austin; Decorations, transfer, C. J. B. Jensen; Dental engine, C. Doriot; Desk or other furniture, school, E. Haney; Die. See Screw cutting die. Sole cutting die; Distilling alcohol, apparatus for, L. Bechaux Fils; Door check, Shaw & Wixom; Door check, A. Sohns; Door or window stop, N. Van Allen; Draught equalizer, A. F. Gillet; Drill. See Rock drill; Drills, mechanism for opening, W. Thiem; Drilling machine, T. Townsend; Drum, snare, H. C. Plowe; Dust separator, Allington & Curtis; Ear muff, A. L. Britton; Ear wire, B. A. Ballou; Egg beater, E. Baltzley; Egg testing packet, M. L. Windlate; Electric battery cell, S. L. Trippe; Electric energy, means for distributing, S. Z. De Ferranti; Electric light circuits, ground detector for, A. W. Morrell; Electric machine, direct welding dynamo, E. Thomson; Electric machine, dynamo, T. H. Hicks; Electric machines, conductor for dynamo, E. F. H. H. Lauckert; Electrical distribution by secondary batteries, T. P. Conant; Electro therapeutic cap, N. P. Rutter; Elevator. See Carriage elevator. Water elevator; Elevator safety apparatus, C. E. Ongley; Embroidery frame, C. Herrmann; End gate, E. C. Ward; End gate, wagon, U. S. Tym; Engine. See Beating engine. Dental engine. Gas engine. Pumping engine. Steam engine; Exercising apparatus, S. Wild; Fair stitch loops, machine for cutting, A. G. Williams; Fans, power translator for driving, J. M. Orford; Fare register, E. M. Green; Fare register, electric, E. A. Scales; Faucet attachment, W. H. Tingle et al.; Fence, J. A. Harnsberger; Fence machine, wire, J. & C. Lane; Fence making machine, E. Blockett; Fence making machine, P. Miles; Fences, machine for making picket, E. E. Witter; Fertilizer distributor, Malaler & Smith; Fifth wheel, G. A. Lane; Fire alarm system, T. G. Turner; Fire escape, J. M. Pink; Fish, device for stringing, F. A. Roberts; Flour packer, J. T. Melch; Flue cleaner, G. W. Berkshire; Frame. See Embroidery frame. Paper machine frame; Fruit gatherer, G. A. & C. F. Fleming; Furnace. See Bagasse furnace. Boiler furnace. Puddling machine. Regenerative furnace; Furnace, W. R. Jones; Furnace grate, Z. F. Bryant; Gauge. See Pressure gauge; Galley, Schnieidewand & Lee; Game scoring tablet and indicating device, A. Kulper; Garments, shoulder form for, J. J. Byers; Gas, apparatus for the manufacture of, T. G. Hall; Gas burner, E. Moreau; Gas burner, incandescent, W. J. McNorton; Gas engine, H. Skinner; Gas lighting and extinguishing, system of electrical, H. T. Downs; Gas saver, O. W. Bennett; Gas scrubber, J. F. Allen; Gate. See End gate; Gate, T. M. Russell; Glass articles, manufacture of ornamental, J. Reder; Grader, road, J. J. Mungen; Grain binder, S. D. Locke; Grapple, D. S. Sanborn et al.; Gridiron, J. W. Sankey; Guard. See Bridge guard; Hairdressing device, A. F. Godefroy; Harrow, P. J. Parmiter; Harrow and seeder, combined disk, A. Corbin, Jr.; Harvester and binder, grain, S. D. Locke; Harvester reel support, J. S. Davis; Hay rickling device, H. A. Alden; Heating apparatus, electrical, J. West; Heel trimming machine, Noble & Childs; Hing, spring, G. W. Warner; Hinge, spring, G. M. Waldorf;

Table listing inventions with patent numbers, including: Holder. See Bag holder. Paper holder. Spool, needle, and thimble holder. Stereotype plate holder; Hook. See Checkrein hook; Hook, C. H. Thurston; Horse power machine, W. H. Williscraft; Indicator. See Pressure indicator; Initial ring, interchangeable, Thie & Levy; Insurance policy, complementary/accident, J. F. Lee; Interlocking switch and signal, G. D. Fowle; Iron, manufacturing wrought, L. D. Chapin; Ironing machine, J. J. Daley; Jack. See Lifting jack; Joint for furniture, boxes, or like articles, H. L. Beach; Knitting machine for knitting rib tops, C. M. Musgrove; Lamp, hanging, H. D. Richardson; Lamp, kerosene, A. G. Heath; Lamps, extension standard for, J. Kintz; Lantern or lamp, tubular, L. F. Betts; Lathe for turning wooden dishes, W. S. Shotwell; Lead, making white, Morris & West; Ledger and bull book, combined, C. L. Searcy; Letter box, G. H. Flister; Lifting jack, W. Dixon; Lifting jack, A. L. Stanford; Lock. See Nut lock. Permutation lock. Seal lock; Log turner and loader, W. A. Durbin; Loom, take-up mechanism, W. M. Larned; Lubricator, Mattes & Lewis; Medicine case, W. H. Warren; Medicine, remedy for scrofula, H. Helm; Metallic fastener, Mandel & Henderson; Metals, material for cleaning and polishing, J. Dean; Motor. See Weight motor; Mower, lawn, F. E. Grothaus; Mowing machine, A. O. Carman; Nailing machine, W. Z. Bean; Newspaper folding, wrapping, addressing, and binding machine, G. S. Alden; Nut and bolt, A. Schutz et al.; Nut lock, H. F. Corey; Nut lock, W. A. Jordan; Oil distributor, T. F. Townsend; Organ action, reed, L. K. Fuller; Packing, H. R. Gillingham; Packing ring, J. J. Sullivan; Paddle wheel, Thayer & Phelan; Paint, asbestos, F. De Coninck; Paper holder, A. B. Sherwood; Paper holder and cutter, roll, S. D. & N. W. Locke; Paper machine frame, G. Kaffenberger; Permutation lock, C. Hill; Pin or match box and advertising card, combined, Hunter & Mackay; Pipe coupling, S. R. Dresser; Pipe wrench, P. Reagan; Pipes, boilers, etc., non conducting covering for steam, H. C. Bradley; Planter, hand, T. N. Lupton; Planter, seed, H. Thaden; Plaster, composition of matter for, Turley & Chamberlin; Platform. See Car platform; Plow, J. King; Plow and harrow, combined, A. Trexler; Plow attachment, J. & S. W. Miles; Plows, sulky attachment for walking, D. T. Jones; Portable boat, C. W. King; Postal package, H. R. Gillingham; Pot. See Coffee or tea pot; Pressure gauge and draught regulator, combined steam, M. Wilkes; Pressure indicator and recorder, W. H. Bristol; Pressure regulator, C. E. Brown; Printing machine, color, W. H. Fuller; Printing machine sheet delivery mechanism, J. T. Hawkins; Printing machines, delivery mechanism for, G. P. Fenner; Printing presses, folding machinery for, G. W. Kendall; Puddling furnace, T. C. Jones; Pump, J. W. Vanmeter; Pumping engine, E. G. Shortt; Pumping engine, duplex, E. G. Shortt; Punching and shearing machine, E. Jones; Punching the eyes in axes, etc., device for, A. Garrow; Rack for exhibiting garments, S. Wolerstein; Railway, cable, G. W. Shepherd; Railway system, electric, J. D. Nicholson et al.; Railway switch, G. N. Reif; Railways, turntable for street, J. W. Warhurst; Reel. See Winding reel; Regenerative furnace, W. & J. C. Swindell; Register. See Fare register; Regulator. See Pressure regulator; Resonator, tubular, J. Harrington; Ring. See Initial ring. Packing ring; Rock drill, A. W. & Z. W. Daw; Rock drill, J. Massett; Rock drill, steam, A. J. Sypher; Rocking chair, adjustable folding and convertible, Holden & Rasmussen; Rovins, etc., mechanism for evening, G. F. Evans; Rules, attachment for carpenter's, Hall & Traut; Running gear, A. T. Dickey; Saddle, riding, D. R. Lakin; Saw mills, automatically adjustable press roll for gang, F. O. Kilgore; Saw set, H. Gates; Saw wheel, band, R. H. Trumbull; Scale, automatic grain, T. J. Underwood; Screw cutting die, A. Wirsching; Seal lock, G. W. Amos; Seat. See Car seat. Vehicle seat; Seed, delinting cotton, F. C. Cooper; Semaphore, A. A. Strom; Separator. See Dust separator; Sewage and sea water, electrolyzing, W. Webster, Jr.; Sewers, apparatus for flushing, H. H. Mitchell; Sewing machine, buttonhole, A. L. Coombs; Sewing machine buttonhole attachment, A. W. Johnson; Sewing machine take-up, J. Bolton; Sewing machines, belt removing and replacing device for, J. Bolton; Shaping fleecy masses, machine for, E. Goldman; Shield, heart, H. Gross; Shoe cabinet, W. S. Settle; Signal. See Thermometric signal; Sled brake, T. Gilgoley; Snatch block, T. R. Ferrall; Soldering tool, C. L. Wagandt; Sole cutting die, O. Rock;

