

ENGINEERING INVENTIONS.

A car coupling has been patented by Mr. William Stamp, of Susquehanna Depot, Pa. This invention covers a novel construction and arrangement of parts to facilitate the coupling and uncoupling of cars in making up and breaking trains, and the device can be worked at the side of the train as the cars pass the train men, thus promoting safety and convenience.

A spark arrester has been patented by Mr. James R. Werth, of Richmond, Va. This invention covers several novel features, a greater area of netting surface being obtained, and the plane in which the netting lies being parallel with the line of the blast, while no attempt is made to separate the smoke from the sparks until after the mingling of the same with the exhaust steam.

A method of casting car wheels has been patented by Mr. William Wilmington, of Toledo, O. This invention relates to a former patented improvement of the same inventor, and by it the chill hardening properties of molten cast iron are modified in various degrees by a method of imparting rich ferro-manganese to the molten iron immediately before or at the time the iron is entering the mould, so the iron composing the brackets and flange of the wheel is somewhat modified without materially affecting the iron of the tread.

MECHANICAL INVENTIONS.

A screw cutting machine has been patented by Mr. Edward H. Freter, of Roedelheim, near Frankfurt-on-the-Main, Germany. It has a hollow head stock spindle, pawl, chuck, sliding rests, die spindle, cog wheels, with various novel features of construction and arrangement for operating a chuck gripping mechanism, feeding the wire, and other details of a complete screw cutting machine.

MISCELLANEOUS INVENTIONS.

A fire escape has been patented by Mr. William Craddock, of New York city. It is constructed with a carriage moving up and down on guide ropes attached at their upper ends to bars fixed to the building, and at their lower ends to a bar or plate fixed in a vault beneath the sidewalk.

A check rein clip has been patented by Mr. Frederick J. Smith, of Brooklyn, N. Y. This invention covers a special construction and arrangement of parts whereby the horse may be both checked and unchecked without the necessity of leaving the vehicle and without stopping the motion of the horse.

A peanut roaster has been patented by Mr. Louis Rosenkranz, of Rhinebeck, N. Y. It combines a heater, roasting drum, and warming box in which the peanuts are placed after being roasted, all contrived to secure an efficient distribution of heat and economical working.

A wrench has been patented by Mr. Joseph Lassier, of Minneapolis, Minn. This invention relates to wrenches having rocking or adjustable heads, and is especially designed for use in corners and other hardy accessible places, where it is inconvenient or impossible to use an ordinary wrench.

A scaffold clamp has been patented by Mr. Arthur B. Flach, of New York city. It consists of a U-shaped bar having hooks on its free ends and pegs or studs on the inner surface of its cross piece, making an improved clamp for uniting and holding together the posts and beams used in erecting scaffolding.

A life preserver has been patented by Mr. Zenane N. De Ledochowski, of La Salle, Ill. It is formed of a buoyant ring, with a bag for receiving the body, the ring having also a float with inflatable pockets, while on the top of the float are attached slabs of cork and pockets are formed for receiving different articles.

A seal padlock has been patented by Mr. David B. Reeve, of New York city. It has in its top a slot, through which a ticket or card can be passed into the casing, the card covering an opening in front of the casing, so if the shackle is to be released the card must be cut or destroyed to permit pushing to one side the locking hook in the lock.

A staple setting instrument has been patented by Mr. Henry Rose, of Fayette, Mo. It resembles generally a pair of tongs or pliers, with two crossing links pivoted together, the rear portions of which form handles, and the forward portions making jaws, constituting a setting implement for metallic staples for closing seams in boots and shoes, clothing, etc.

An improved kind of plated ware has been patented by Mr. William A. Warner, of Syracuse, N. Y. The improvement is more especially designed for articles such as spoons, forks, etc., and covers a novel means of plating, whereby the portions most exposed shall receive a heavier plate without making apparent any extra ridge or film of metal at such places.

A saddle girth has been patented by Mr. Peter J. Peffey, of Boise City, Idaho Ter. It combines two bands or strap pieces with a transverse brace bar held at the ends in the centers of the bands by straps, so the bands can be held at a greater or less distance from each other, and the girths can be adjusted to be wider or narrower as desired.

A stove truck has been patented by Mr. John G. Arnold, of Wellsville, N. Y. Combined with a frame having casters is an additional frame connected with and held above the first by pivoted links, thus adapting the upper frame to swing upward and forward, and making a truck to facilitate the lifting and moving of stoves.

A back band has been patented by Mr. James B. McHugh, of Ambrosia, La. It is for draught animals, and made of a web of woven material with attached end skirts of leather, with buckles and straps, securing greater comfort for the horse, and so the connection of the band with the trace chains may be easily changed, while the band may be readily lengthened or shortened.

A see saw has been patented by Mr. Jesse M. Harr, of Baltimore, Md. It is so constructed that the seats may be kept horizontal, and the device is easily operated by very young children, a slight pressure on the treadles working it when the occupants are of equal weight, while, when the occupants are of unequal weight, they may be readily balanced by adjustable weights.

A brick machine has been patented by Mr. Charles A. Tarragon, of Portland, Oregon. It is made with a vertical shaft placed in a vertical hollow cylinder, and having radial arms carrying teeth to break up the clay, and plates to force the clay through a grate secured in the cylinder, whereby the clay will be crushed as it passes down into the machine, with other novel features.

A compound harness for Jacquard looms has been patented by Messrs. Holden Rigby and David Lindsay, of Paterson, N. J. This invention, with several other novel features, covers the use of rubber washers, whereby the shafts connected to the hooks are kept from wearing the knots, the construction and combination of parts being especially adapted to promote durability.

An adding machine has been patented by Mr. Martin O. Dolson, of Eldorado, Kansas. This invention covers a novel construction and combination of parts for rapidly and accurately adding columns of figures by moving a little crank handle which moves hands over dials, one representing the units up to one hundred, another to a thousand, the third to ten thousand, etc.

A nut lock has been patented by Mr. Erasmus J. Clark, of Urbana, Ill. This invention covers two forms of nut lock, one of which is intended primarily for railway rails, while the other is for general use, in the former one the key being adapted to take a bearing on the flange of the rail instead of throwing a strain upon the washer, while the key is also adapted to act by gravity.

A calcimine composition and method of preparing the same has been patented by Mr. George A. Marsh, Jr., of Sandusky, Ohio. It consists of glue, gum tragacanth, water, and ground plaster, prepared and mixed in a special way, so that when ground and ready for use it will not harden in the pail, may be mixed with cold water, and will spread smoothly and easily and be free from cracking.

An auger handle has been patented by Mr. Henry Sager, of Girardville, Pa. It is a simple and substantial handle, from which the auger will not slip when pulling chips out of the hole, although it may be readily detached for changing the augers, and it is so constructed that one arm may be detached and the other used in the manner of a wrench for turning the auger in a close corner.

A sash balance has been patented by Mr. Jonathan D. Price, of Cherokee, Iowa. It consists of a frame or plate with a small projecting cog wheel working against a loose, block shaped detent which bears on one side against one spring and on the other side against another, which locks the cog wheel strongly enough to hold the sash through a rack or toothed bar attached to the frame.

A lock has been patented by Messrs. Rudolf E. Woodrich, of New York, and Charles Langbein, of Brooklyn, N. Y. This invention covers an improvement on a former patented invention of the same inventors, and provides a lock which can be fixed and held in place without the use of screws, and can be adjusted at different lengths, and in such manner, if desired, that it cannot be unlocked from the outside.

A pea and bean sheller has been patented by Mr. Ellis R. Yonng, of Thomasville, Ga. This invention relates to rotary mills, in which circles of long teeth on one plane are opposed by circles of short teeth on the other plane, the teeth alternating with each other on each plane, and tending to catch hold of the shells with more certainty than if the points were in a single plane, while the opposing teeth are not near enough together to damage the fruit.

A hoisting gear has been patented by Mr. William W. Wythe, of Ocean Grove, N. J. This invention relates to an improvement on a former patented invention of the same inventor, and consists in the combination with a yoke of a gear wheel and a grooved pulley united or made integral and journaled in the yoke, and a gear wheel and friction pulley united and journaled in the lower end of the yoke, the gear wheels engaging and the friction pulley pressing the hoisting rope in the grooved pulley.

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.

Whistles, Injectors, Damper Regulators; guaranteed. Special C. O. D. prices. A. G. Brooks, 261 N. 3d St., Phila.

We consider the Remington Type-writer an efficient aid in our correspondence, and its absence from the office for a single day would prove a serious drawback to the proper execution of the same.

WINCHESTER REPEATING ARMS CO., New Haven, Conn. The Remington Type-writer is the one used by the United States Government. Wyckoff, Seamans & Benedict, 281 and 283 Broadway, New York city, sole agents.

For Sale.—One heavy Driving Wheel Quartering Machine, with all its attachments. Address Baldwin Locomotive Works, Philadelphia, Pa.

Young Men! Read This! The VOLTAIC BELT Co., of Marshall, Mich., offer to send their celebrated ELECTRO-VOLTAIC BELT and other ELECTRIC APPLIANCES on trial for thirty days, to men (young or old) afflicted with nervous debility, loss of vitality and manhood, and all kindred troubles. Also for rheumatism, neuralgia, paralysis, and many other diseases. Complete restoration to health, vigor, and manhood guaranteed. No risk is incurred, as thirty days' trial is allowed. Write them at once for illustrated pamphlet free.

Agents with \$2 capital wanted. Brown, Elliott & Spears, Silver Creek, N. Y.

Inventor desires to correspond with manufacturers for introduction of sheet metal Tubular Steam Radiators, or will sell patents. Efficient, strong, cheap, light. John Gormly, Provo, Utah.

The Cartridge Whistle, advertised in this issue by J. A. Ross & Co., is considered by all users to be fully worth the price asked.

Second-hand machinery and tools for machine and blacksmith shops wanted. Address Thos. R. Sharp, No. 1 Broadway, New York.

Signs.—How to prevent boards from splitting, bulging, and opening at the joints, free. Address J. G. Jory, Baltimore, Md.

Cheap, cheap, cheap. Best Popular Science Works. J. Fitzgerald, 20 Lafayette Place, N. Y. Catalogue free.

Experimental Machinery Perfected, models, patterns, etc. Tolhurst Machine Works, Troy, N. Y.

Brush Electric Arc Lights and Storage Batteries. Twenty thousand Arc Lights already sold. Our largest machine gives 65 Arc Lights with 45 horse power. Our Storage Battery is the only practical one in the market. Brush Electric Co., Cleveland, O.

The Cyclone Steam Flue Cleaner on 30 days' trial to reliable parties. Crescent Mfg. Co., Cleveland, O.

For Steam and Power Pumping Machinery of Single and Duplex Pattern, embracing boiler feed, fire and low pressure pumps, independent condensing outfits, vacuum, hydraulic, artesian, and deep well pumps, air compressors. address Geo. F. Blake Mfg. Co., 44 Washington St., Boston; 97 Liberty St., N. Y. Send for Catalogue.

Quinn's device for stopping leaks in boiler tubes. Address S. M. Co., South Newmarket, N. H.

Mills, Engines, and Boilers for all purposes and of every description. Send for circulars. Newell Universal Mill Co., 70 Barclay Street, N. Y.

Walrus and Sea Lion Leather for polishing all kinds of metal. Greene, Tweed & Co., New York.

Wanted.—Patented articles or machinery to manufacture and introduce. Lexington Mfg. Co., Lexington, Ky. "How to Keep Boilers Clean." Book sent free by James F. Hotchkiss, 86 John St., New York.

Stationary, Marine, Portable, and Locomotive Boilers a specialty. Lake Erie Boiler Works, Buffalo, N. Y.

Presses & Dies. Ferracuti Mach. Co., Bridgeton, N. J. For Power & Economy, Alcott's Turbine, M. L. Holly, N. J.

The Hyatt filters and methods guaranteed to render all kinds of turbid water pure and sparkling, at economical cost. The Newark Filtering Co., Newark, N. J.

Steam Boilers, Rotary Bleachers, Wrought Iron Turn Tables, Plate Iron Work. Tippet & Wood, Easton, Pa.

Send for Monthly Machinery List to the George Place Machinery Company, 121 Chambers and 103 Reade Streets, New York.

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

If an invention has not been patented in the United States for more than one year, it may still be patented in Canada. Cost for Canadian patent, \$40. Various other foreign patents may also be obtained. For instructions address Munn & Co., SCIENTIFIC AMERICAN Patent agency, 361 Broadway, New York.

Guild & Garrison's Steam Pump Works, Brooklyn, N. Y. Steam Pumping Machinery of every description. Send for catalogue.

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, polishing compositions, etc. Complete outfit for plating, etc. Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

Supplement Catalogue.—Persons in pursuit of information on 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.

Machinery for Light Manufacturing, on hand and built to order. E. E. Garvin & Co., 139 Center St., N. Y.

Curtis Pressure Regulator and Steam Trap. See p. 390 Woodwork'g Mach'y. Rollstone Mach. Co. Adv., p. 390.

Drop Forgings, Billings & Spencer Co., Hartford, Conn.

Practical Instruction in Steam Engineering, and situations furnished. Send for pamphlets. National Institute, 70 and 72 West 23d St., N. Y.

We are sole manufacturers of the Fibrous Asbestos Removable Pipe and Boiler Coverings. We make pure asbestos goods of all kinds. The Chalmers-Spence Co., 419 East 8th Street, New York.

Clark's Rubber Wheels. See adv. next issue.

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

Emerson's 1884 Book of Saws. New matter, 75,000. Free. Emerson, Smith & Co., Limited, Beaver Falls, Pa.

Hoisting Engines. Friction Clutch Pulleys, Cut-off Couplings. D. Frisbie & Co., Philadelphia, Pa.

Barrel, Keg, Hogshead, Stave Mach'y. See adv. p. 422.

Munson's Improved Portable Mills, Utica, N. Y.

Machine for grooving chilled rolls for flour mills. Pratt & Whitney Co., Hartford, Conn.

Linen Safety Hose, all sizes, at greatly reduced prices. Greene, Tweed & Co., New York.

Mineral Lands Prospected, Artesian Wells Bored, by Pa Diamond Drill Co. Box 423, Pottsville, Pa. See p. 422.

For best low price Planer and Matcher, and latest improved Sash, Door, and Blind Machinery, send for catalogue to Rowley & Tiername, Williamsport, Pa.

Catalogue of Books, 128 pages, for Engineers and Electricians, sent free. E. & F. N. Spon, 35 Murray Street, N. Y.

A Present to Every Lady!

A 25 cent book on Art Needle Work and Crazy Patchwork, with 100 new stitches and transferable designs and full instructions for the work, will be given to every new subscriber to Strawbridge & Clothier's Fashion Quarterly. This offer only holds good to February 1, 1885.

The Fashion Magazine contains 120 large pages, with over 1,000 illustrations each issue, and is the cheapest magazine in the world. Cut out this notice and mail with 50 cents, the price of a year's subscription, to STRAWBRIDGE & CLOTHIER, Eighth and Market Sts., Phila.

The Porter-Allen High Speed Steam Engine. South-wark Foundry & Mach. Co., 430 Washington Ave., Phil. Pa. Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works. Drinker St., Philadelphia, Pa.



HINTS TO CORRESPONDENTS.

Name 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 Information requests on matters of personal rather than general interest, and requests for Prompt Answers by Letter, should be accompanied with remittance of \$1 to \$5, according to the subject, as we cannot be expected to perform such service without remuneration. Scientific American Supplements referred to may be had at the office. Price 10 cents each. Minerals sent for examination should be distinctly marked or labeled.

(1) F. N.—Plante's secondary battery is put through a long course of preparation before it is ready for use. The preparation consists in submitting the plates to an electric current, at first changing the poles at stated times, and finally finishing up for a longer period with the current passing in one direction. The more recent secondary batteries are constructed with lead plates to which is applied minium-red oxide of lead. These plates need no special preparation.

(2) L. A. asks: The strength of alcoholic liquids is quoted differently in various countries of consumption, viz: In degrees of Sykes, Dycas, Baume's, and Cartier's hydrometer; in bubbles, whatever that may mean; in centigrades of Gay-Lussac; in per cents absolute alcohol, etc. Can you give me the exact equivalent of 40 over proof in either of the above determinations or denominations, or else name a book containing complete tables of comparison? A. Proof spirit, according to the United States national tax law of 1862, is that proof of a liquor which corresponds to 50 degrees of Tralles hydrometer at the temperature of 60° F. Proof spirit therefore is of the alcoholic strength of 50 per cent by volume, having a specific gravity of 0.8335, or a mixture of equal quantities of absolute alcohol at the specific gravity of 0.793 and distilled water at 60° Fah. In other words, proof spirit is one-half pure water and half absolute alcohol. Proof on the Genlar scale is equal to 50 on the Tralles scale, so that 40 over proof on the Genlar scale would be equal to 70 on the Tralles scale, and equal to 0.8892 specific gravity, equal to between 28° and 27° Baume—liquids lighter than water. In Dick's Cyclopaedia of Practical Receipts you will find as much information as anywhere. The other book you ask for can be furnished by New York dealers.

(3) W. H. A. writes: Will you please inform me what kind of glue is used for making guitars, and why pine is always used for the sounding board? Is there a better wood for the purpose? If so, what is it? What is used for filling hard wood for instruments, also the best varnish for finishing? Is there a treatise published on the manufacture of the guitar? A. For glue use a good quality of the ordinary article. It has been found that pine has the greatest vibratory power and has the straightest grain. No better wood is known. There are various filling compositions, consisting of equal parts by weight of whiting, plaster of Paris, pumice stone, and litharge, to which may be added in suitable proportions to match color a little French yellow asphaltum, Vandyke brown. Mix with 1 part japan, 2 ounces boiled oil, and 4 ounces turpentine. Grind fine in a mill. There is no special book on the subject as far as we know, but Moore's Universal Assistant and Complete Mechanic contains a great number of receipts that would be useful.

(4) E. W. M. writes: Within the past month, and at least three weeks constant, when disrobing at night preparatory to retiring, in taking off the pantaloons at least a dozen sparks or flashes of light, like a phosphorescent gleam, make their appearance on each leg. During the time these flashes make their appearance, there is a sort of hissing or cracking noise. A. The phenomenon described by you is common in houses in which the atmosphere is very dry, and in articles of clothing not liable to absorb moisture. You have probably discovered that it occurs only on what might be called good electrical days, that is, in dry, cool weather.

(5) J. A. D. writes: About a year ago I built a fence, using three 8 by 8 inch posts, which were supposed to have been seasoned. I primed them with ready mixed white paint, and afterward gave them two coats of white lead (Atlantic) and linseed oil; in a few weeks the paint blistered and cracked off. I sandpapered them and gave them another coat, but the same thing happened again. It has fallen off four times. Can you tell me the cause, and what will stop it? A. Probably the ground is wet, and the posts absorb water. The sun heating the paint may vaporize the water under it sufficiently for blistering. Try covering the parts of the posts underground with tar.

(6) C. M. G. asks how glass may be successfully coated with mercury or quicksilver so as to make a mirror. A. The usual method of coating glass with the amalgam of tin and mercury is to spread a sheet of tin foil evenly upon a flat stone table, and cover it uniformly to the depth of an eighth of an inch with clean mercury. A plate of glass perfectly clean is floated on the mercury carefully, so as to exclude all air bubbles. It is then pressed down by loading it with weights sufficient to press out all of the mercury which remains fluid. The glass is allowed to remain in this condition for about twenty-four hours, when it is

raised carefully upon its edge, and allowed to remain for some days in that position. To silver convex and concave mirrors with amalgam requires a mould, usually made of plaster of Paris.

(7) O. S. writes: 1. Is it to be taken for granted that a wooden house on clayey loam is damp, even if location be well drained? A. A house on clayey loam is not necessarily damp because of its situation. Such soil is generally more damp than a sandy soil, yet thorough ventilation of cellar, as well as drainage, is a vital point in its sanitary condition when so situated. 2. Does a cistern of water, covered with boards, in a cellar where there is a furnace, add, by evaporation, to the dampness of a house, even if the board covering is dry and there is no sign of moisture about the cistern? A. A cistern should not be tolerated in a cellar, according with modern sanitary practice. They are a source of miasma. 3. Of two houses or more situated on the same street, with same foundations, cellar, and soil, and built alike in every respect, apparently, is the one which shows the most frost on the windows, during winter, the dampest house, or is there some other way to account for the frost? A. Frost on windows in freezing weather indicates a moist atmosphere within, but does not always indicate a damp house. There are many reasons for a damp atmosphere within a house, such as the evaporation of water on stoves or furnaces, the use of baths, etc. The kitchen on a wash day is enough to soak a whole house. The hygrometric condition of the atmosphere within a house should correspond with the mean hygrometric condition of the outer atmosphere in fair weather, or from 60° to 70° of saturation. 4. What is the proper temperature for living rooms during the winter months? A. 65° to 75°, according to the vitality of the persons occupying the rooms. 5. What is the proper temperature for sleeping rooms? A. 45° to 55°, for reasons in fourth question.

(8) A. B. writes: 1. I have an engine as follows: 14 inches diameter of cylinder by 24 inches length of stroke. Wishing to ascertain the horse power of it, by my calculation I got 40.73. Am I correct or not? A. Nearly correct for a mean engine pressure of 40 pounds and piston speed of 200 feet per minute. 2. How can it be ascertained what amount of power certain part of machinery requires more than another part of machinery run by the same engine? A. Only by the use of a dynamometer, which you will find described and illustrated in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 194, 272, 309, 314.

(9) P. R.—In ship building, salting is considered beneficial as a preservative. The best rock salt is used, placed between the frames.

(10) F. W. P.—The brilliant star now seen in the east at early morn is the planet Venus. This may have been the star of Bethlehem.

(11) E. B. asks the composition of metal that fountain pen makers use, that does not tarnish when exposed to the air. A. Supposed to be what is called Britannia metal, composed of 25 parts tin, 50 parts antimony, and 25 parts lead; or pewter made of tin 8 parts, lead 2 parts, or a little harder of tin 8 parts, antimony 2 parts.

(12) J. M. H. asks a recipe for brightening and polishing the nickel plating on a bicycle, and for preventing rust on same. A. Rouge with a little fresh lard or oil on a wash leather or piece of buckskin. Rub the bright parts, using as little of the rouge and oil as possible; wipe off with a clean rag slightly oiled. Repeat the wiping every day, and polishing as often as necessary.

(13) H. P. G. asks where the largest saw mill in the United States is located, and capacity of same. A. One mill at Winona, Minn., cuts 250,000 feet of lumber per day, and several from 150,000 to 200,000 feet per day. Some Michigan mills run from 100,000 to 200,000 feet per day.

(14) L. S. R.—For information on batteries for plating consult SUPPLEMENT, No. 310; it would require thirty cells of Bunsen battery to produce a light equal to that of a good gas jet. We cannot advise you to try producing electric light by means of batteries.

(15) E. W. E. asks: What will take the rust off nickel plating without removing the plating? A. Try rouge applied with a chamois skin.

(16) W. R.—You cannot make rubber moulds by melting rubber and pouring it over the pattern, as in the case of gelatine moulds. The rubber must be vulcanized; any one who understands working rubber could make you such moulds.

(17) F. H. B. writes: I have some office windows which my predecessor had frosted. How may I remove the frosting? A. Only by grinding and repolishing, which would be very expensive. If it is ordinary paint, you can remove it with a strong solution of caustic potash.

(18) R. C. H. asks whether there is any nutriment in buckwheat hulls. A. Little or none.

(19) D. C.—There is no method of brightening up gold frames other than regilding them. Platinum incandescent lamps are not practicable; it would take a large number of gravity cells to run such a lamp; a battery of the Bunsen bichromate type would be better.

(20) H. W. asks how to refine an old silver solution, and how to get the silver out. A. Add salt solution until a white precipitate ceases to form. Collect this white powder on a filter paper, and mix with borax and fuse in a small sand crucible. The silver will collect in a lump in the bottom of the crucible, and on breaking open the crucible, can readily be taken out.

(21) L. E. R. Co.—Stick rouge as used by the jewelers is supposed to be made with paraffine as a cementing element, as little as will hold the rouge together.

(22) F. G. H.—Paraffine and creosote are no doubt good preservatives for fence posts and shingles, but too expensive for general use. Coal tar is much used, and is no doubt cheaper. Crude paraffine can be had at from 7 to 8 cents a pound. Crude creosote, about the same.

(23) F. W. F. asks how the imitation of amber is made which is used on cheap cigar holders, etc. A. A receipt for imitation amber is given on page 210 of SCIENTIFIC AMERICAN, for October 6, 1883.

(24) P. O. B. asks (1) how much coal two 56 horse power boilers and two 50 horse power engines will consume in 12 hours. A. From 2 1/2 to 5 pounds of coal per horse power per hour, according to the construction of boiler and engines. 2. Can I make an Edison dynamo to supply six 16 candle power lamp work with an engine of two-thirds horse power? A. We do not think you can work sixteen candle power lamps with an engine of the size given, as economy in dynamo decreases with the size. For information on making small dynamos consult Gordon on Electric Light or Dredge's Electric Illumination.

(25) J. H. asks if a man is required to have engineer's papers or license to run a steam launch 25 feet long on a fresh water river? A. Yes. 2. What speed will a boat of that length make against a current 3 miles per hour with a 5x6 engine and a 22 inch wheel? A. If a good model boat, probably 4 1/2 miles per hour; possibly 5 miles.

(26) J. T. G. asks how to get daylight into a room having a large window space, there being a blank brick wall about five feet distant from the side of building. A. The common method of illuminating such rooms as you describe is to place outside of a window a mirror arranged at an angle of 45 degrees, which will receive the light from the sky and throw it into the room.

(27) P. B. asks what the preparation is for the portable electric lighter. A. For your battery make a saturated solution of bichromate of potash in hot water, allow it to cool, then add to the solution one-fifth of its bulk of commercial sulphuric acid; this will heat the solution and redissolve the crystals formed on cooling the aqueous solution. To every pound of this solution add a half drachm of bisulphate of mercury.

(28) J. H. M.—We believe that the University of New York gives much attention to biology.

(29) E. H. C. asks our advice how he may become a civil engineer. A. If you can associate yourself in some capacity with a first class civil engineer, so that you might study and practice with him, we think it would be your best course. You might, however, enter some of our technical schools, and take a course in civil engineering. If you wish to pursue the study alone, you might send to some of the technical schools for their prospectus, and pursue the course laid down for their students.

(30) R. G. asks: Why is the point 32 degrees below the freezing point on Fahrenheit's thermometer called zero? A. The Fahrenheit thermometer scale was invented in 1714; a mixture of equal weights of sal ammoniac and snow produced the lowest artificial temperature then known, and was thought to represent absolute cold, which was marked as the zero point of the scale. The interval between this point and the boiling point of water was divided into 212 degrees; the melting point of ice is at 32 degrees of this scale.

(31) A. A. A. writes: What can I do to stop my eyes from tearing? My time is very precious to me, and very often this tearing of my eyes prevents me from learning. I study in the evening for about three hours, and one in the morning. Do you think it does any harm to my eyes? A. The eyes are too delicate and too important to be treated by random advice. Much injury is constantly caused by so doing. Go to a good physician for treatment; that is your only wise course. At your age there must be some special, perhaps local, cause for the increase of the lachrymal secretion, and you may injure your eyesight permanently by attempting to remove it without sufficient knowledge.

(32) L. L. D. asks the cause of the disease called "hives," also its cure, if there is any. A. The trouble is caused by a perversion of the digestive functions accompanied by a disturbance of the circulation. It is not attended with danger, and is of importance only from the annoyance which it causes. Relief may be obtained in most instances by the use of cream tartar daily to such extent as to move the bowels slightly. Make a strong solution, sweeten it pleasantly, and take a teaspoonful, say after each meal, until the effect above mentioned is produced, and continue the treatment until the hives cease to be troublesome.

(33) L. C. Z.—For browning gun barrels, wet a piece of rag with antimony chloride, dip it into olive oil, and rub the barrel over. In 48 hours it will be covered with a fine coat of rust; then rub down the rust with a scratch brush and wipe with boiled linseed oil. All varnish or old dry oil must be removed before the application of the chloride by caustic potash, or if a plain barrel fine emery cloth may be used. A fresh, clean surface gives the best result.

(34) I. D. W. & Co., ask how to treat rancid or old butter to make it sweet. A. Rancid butter may be restored, or at all events greatly improved, by melting it with some freshly burnt and coarsely powdered animal charcoal (which has been thoroughly freed from dust by sifting) in a water bath, and then straining it through clean flannel. A better and less troublesome method is to well wash the butter with some good new milk, and next with cold spring water. Butyric acid, on the presence of which rancidity depends, is freely soluble in fresh milk.

(35) R. W. C.—There is no part of chemistry devoted to this special subject of the internal corrosion of marine boilers. There is a large "blue book" of the British Admiralty devoted to the subject. The trouble with the decay of steam boilers seems to be beyond the reach of chemistry.

(36) W. W. S. asks what to use that will brighten up, and make shine as when new, white metal or nickel plated show cases that have become tarnished, dull, and dirty. A. Ordinary rouge is used by nickel platers. The following is excellent: Take equal parts of precipitated iron carbonate and prepared chalk, or take quicksilver with chalk half an ounce, and

prepared chalk 2 ounces; mix them. When used, add a small quantity of alcohol, and rub with chamois leather.

(37) J. Y. asks for information concerning the manufacture of nitrate of silver. A. Silver nitrate is prepared by dissolving silver in nitric acid and evaporating to crystallization. This operation is repeated until the crystals are considered sufficiently pure.

(38) S. M. G. asks how to make a gum to put on cardboard so that when wanted for use it can be moistened the same as stamps or envelopes. A. Use gum dextrine, 2 parts; water, 5 parts; acetic acid, 1 part; dissolve by aid of heat and add 1 part alcohol.

(39) J. G. writes: We are heating our office by steam. The boiler is on the basement floor. We intend carrying the pipes to the second and third floors. Can the condensed steam be returned to the boiler? If so, at what particular place on the boiler? A. Return the water of condensation to any part of the boiler where the feed is usually supplied; generally at the bottom of the front head near the hand hole. In a closed return circuit the coils or radiators should not be less than from 3 to 5 feet above the water line, as the water enters the boiler only by its gravity. Also the pipes conveying steam to the coils or radiators should be larger than for the discharge system, that the pressure in the whole line of pipe and coils shall be as near as possible to that in the boiler.

(40) L. J. S. writes: We use shellac varnish to varnish our fermenting tubs, which are of oak and pine woods; would paraffine heated (and the tubs heated), and then applied hot, be just as good? Would it be detrimental to the beer fermentation, etc.? A. We think paraffine would answer your purpose, if applied to the wood when dry and hot. It would not affect the fermentation.

(41) J. C. asks: 1. Will a 1 1/2 inch propeller drive a boat 16 feet long by 3 ft. 6 in. beam 8 miles an hour? A. We think your propeller should not be less than 15 or 16 inches diameter. 2. What is the best speed to run such a propeller? A. Engine should make 350 to 380 revolutions per minute.

(42) B. G. F.—It is not necessary to superheat the steam for digesting bone material. Steam at 80 to 100 pounds pressure is equal to the work. Use a cylinder upright with a conical bottom made double for a steam jacket, and a short perforated coil upon the inside for direct steam upon the material. The digester should have a strong manhole at the top and bottom, to facilitate charging and discharging. The whole to be made strong enough to work at 100 pounds pressure. The usual process is to charge the digester with bones one-half or two-thirds full, cover with water, and boil under the full pressure of the boiler, regulating the height of water by addition of steam through the perforated pipe. Draw off the oil and grease through a pipe inserted at the water level. When no more oil or grease flows, blow out the water from a tap at the bottom, open the manholes, and discharge the bones at the bottom. Any boiler maker can make the apparatus required.

(43) E. N. L. asks: 1. How can I on a short line of ordinary telegraph wire, say 200 feet long, duly insulated and connected to batteries, make resistance sufficient to equal 100 miles, 1,000 miles, and 10,000 miles, or a resistance that would indicate the same as if the same (electrical) currents were passing over 100, 1,000, or 10,000 miles of the same wire? A. We know of no means of producing an artificial circuit which will fulfill all of the conditions of the actual line. The resistance of the circuit is an insignificant matter compared with leakages and the effects of induction. A telephone that will work through a resistance equivalent to 10,000 miles of line wire might be incapable of working over an actual line 100 miles long. You can readily supply the artificial resistance by means of an ordinary rheostat. 2. Does the electricity help carry the human voice or any other sound along the wire, or does it simply insure the same movements in the receiving diaphragm as the sound waves make upon the transmitting diaphragm? A. The electric current does not carry the sound, but reproduces in the receiving instrument movements similar to those in the transmitting instrument. 3. How can I also make resistance to sound alone, without any electric connection for the same distance on the same length line (200 feet), that is 100, 1,000, or 10,000 miles. My particular object is long distance telephoning. A. By using a poor conductor of sound, or in some manner damping the conductor so as to prevent its free vibration. 4. If you should recommend the getting of some instrument now in the market, please state where it could be purchased. A. You can purchase a rheostat from any of the dealers in electric instruments who advertise in our paper.

(44) M. E.—For laying up your boilers for the season, change the water by thoroughly blowing out, so as to have it as fresh as possible, then pump or put into the boiler about 3 quarts of kerosene oil for each 10 horse power, get up steam, and draw the fire; then blow out all of the water and close all openings to boiler. Clean flues and furnace thoroughly. If the boiler is set in brick work, time must be given for the brick furnace to cool down before blowing off, so the hot brick work may not injure the shell by overheating. Frequent blowing off is the only recourse, where salt or brackish water is used, for preventing foaming or scale.

(45) F. H. L. asks for a good and inexpensive receipt for making a liquid cement for cementing leather, that will not be affected by the action of water and can be applied cold and adhere the parts with little or no pressure. A. We know of nothing that can be applied cold that is satisfactory, and therefore recommend the following: A good cement for splicing leather is gutta percha dissolved in carbon disulphide, until it is of the thickness of treacle; the parts to be cemented must first be well thinned down, then pour a small quantity of the cement on both ends, spreading it well so as to fill the pores of the leather; warm the parts over a fire for about half a minute, apply them quickly together, and hammer well. The bottle containing the cement should be tightly corked and kept in a cool place. Another excellent recipe is given on page 3727 of SCIENTIFIC AMERICAN SUPPLEMENT, No. 234, that can be used for this purpose.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

December 9, 1884,

AND EACH BEARING THAT DATE.

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

Adding machine, M. O. Dolson..... 309,035
Amalgamator, J. Knoche..... 309,148
Animal shears, F. W. Carter..... 309,131
Auger handle, H. Sager..... 308,995
Axle lubricator, C. H. Cummings..... 309,136
Back-band, J. B. McHugh..... 308,974
Bag. See Mail bag.
Bale tie, W. M. Jenkins..... 309,061
Bale tie band, F. Cook..... 309,133
Balloon or aerial ship, R. Thayer..... 309,008
Barrel, H. S. Tipton..... 309,010
Battery. See Electric battery.
Bearing, anti-friction, G. L. Brownell..... 308,873
Bed, wardrobe, I. R. Van Slyke..... 309,111
Beer, preserving, W. M. Henderson..... 308,965
Bessemer converters, etc., manufacture of refractory linings for, H. D. Poobin..... 308,884
Bicycle, L. C. Perkins..... 309,086
Bitters, N. Kieffer..... 308,900
Blind or shutter, window, Bristol & Page..... 309,024
Block. See Brake block.
Boiler. See Furnace boiler. Steam boiler.
Bolt. See Spring bolt.
Bolting reel, D. Schindler..... 309,102
Bolting reel, J. Warrington..... 309,176
Book attachment, E. L. Yewell..... 308,942
Boot stretcher, I. W. Myers..... 309,154
Boots or shoes, wearing plate for rubber, F. Richardson..... 308,989
Boots, shoes, etc., machine for manufacturing felt, L. Ruel..... 308,929
Bottle, H. A. Chalvin..... 308,950
Bottle stoppers, manufacture of vulcanized, Manning & Street..... 309,072
Bottling machine, J. Matthews..... 309,913
Box. See Paper box.
Brake. See Carriage brake. Locomotive brake. Vehicle brake. Wagon brake.
Brake block, J. A. Allen..... 309,017
Brick machine, C. A. Tarragon..... 309,037
Bridle box loop, L. C. Voorhees..... 309,173
Bridge truss or girder, C. L. Strobel..... 309,171
Broom machine, S. P. Fraley..... 308,888
Brushes, machine for cutting top knots for blacking, C. A. Mahle..... 309,068
Buckle, J. W. Meaker..... 308,915
Buckle and loop, F. A. Neider..... 309,156
Buckle and strap attachment, J. P. Hisley..... 309,051
Button, W. H. Halsey..... 309,045
Button or stud, separable, J. Wright..... 308,939
Button setting machine, G. A. Mosher..... 309,080
Calamine composition and preparing the same, G. A. Marsh Jr..... 308,973
Can. See Milk can.
Cannon, pneumatic, W. A. Bartlett..... 308,945
Car basket rack, J. Denver..... 309,983
Car coupling, F. V. Isotredit Provencal..... 309,058
Car coupling, W. Stamp..... 309,169
Car door hanger, E. Y. Moore..... 308,916
Car draw bar, freight, W. A. Jones..... 309,146
Carrunning gear, railway, T. B. Mackey..... 309,067
Car safety attachment, railway, H. Listerud..... 308,909
Car stock, B. W. Rhodes..... 308,928
Carbureting air or gases, apparatus for, A. J. English..... 308,886
Carburetors, automatic hydrocarbon feeding apparatus, C. F. Copeland..... 308,877
Carriage brake, child's, M. R. Dillin..... 308,882
Carrier. See Hay carrier.
Cart, J. H. Tiffany..... 308,933
Cartridge, T. Yates..... 308,941
Cartridge loader, F. H. Perry..... 309,088
Case. See Watch case.
Casting car wheels, W. Wilmington..... 309,120
Cement, manufacturing Portland, E. F. Loiseau..... 309,150
Chop grader, J. T. Obenchain..... 308,977
Churn, A. J. Borland..... 308,869
Cigar perforator, Larsen & Bersted..... 308,906
Clamp. See Scaffold clamp.
Clay crushing machine, W. W. Wallace..... 309,174
Clip. See Rein clip.
Clocks on telephone and other lines, circuit controller for electric, J. E. Smith..... 309,001
Clocks synchronously, electric apparatus for setting, J. E. Smith..... 309,000
Cloth machine for coating, W. H. Nash..... 309,083
Clutch, friction, W. D. Brock..... 308,922
Cock or faucet, W. J. Wilson..... 308,838
Cock, stop, W. M. Mixer..... 308,975
Coffee, rice, etc., apparatus for hulling, J. A. Villavicencio..... 309,112
Coffee roaster, J. Just..... 309,147
Collar and hame, combined horse, F. R. Hogeboom..... 308,966
Collar, horse, Degan & Meyer..... 308,891
Combs, etc., manufacture of, O. B. Gallop..... 308,889
Combustion apparatus, portable, W. L. Lowrey..... 308,911
Commode, cabinet, Q. S. Backus..... 308,863
Compressing and moulding powdery and pasty substances, machinery for, J. M. Wilcox..... 309,117, 309,118
Converter, J. Reese..... 308,986
Cooler. See Water cooler.
Cotton press, W. C. Pinson..... 309,090
Cotton scraper attachment, J. H. McMurray..... 308,820
Coupling. See Car coupling. Strap coupling. Thill coupling.
Crank shaft bearing and connection, S. F. Byrnes..... 308,949
Cultivator, E. V. Caldwell..... 309,130
Cultivator, tongueless, J. O. Humble..... 309,057
Cutter. See Key seat cutter. Rotary cutter.
Cutting, harrowing, and loosening ground, device for, J. W. Alderson..... 308,865
Damper, C. L. Wilkins..... 309,175
Desk and seat, school, H. Weber..... 309,113
Detector. See Low water detector.
Dock or coffer dam, portable dry, F. Cox..... 309,080
Door check, E. F. Decker..... 308,880
Drill. See Grain drill.
Drilling machine, P. G. March..... 309,073
Dust collector, H. Kelsner..... 308,898
Dyeing, pattern, G. Witz..... 308,016
Educational apparatus, I. S. Kinch..... 309,064
Egg beater, O. Kitcher..... 309,900
Egg holder, F. P. Hervey..... 309,049
Electric battery, I. L. Roberts..... 308,992
Electric gauge, C. D. Warner..... 309,114
Electric wire supporter, O. M. Draper..... 308,854