

RECENTLY PATENTED INVENTIONS.

Engineering.

INJECTOR.—Joseph H. Killey, Hamilton, Ontario, Canada. This injector is designed for operation by low pressure or exhaust steam, and by high steam pressure in emergencies, having simple parts, easily accessible for cleaning or repairs, and being capable of supplying very hot water to the boiler, the invention covering various novel features of construction and combinations of parts.

Railway Appliances.

CAR COUPLING.—Lewis W. Brewster and Robert Swift, Palmyra, Tenn. A horizontally swinging frame with coupling hook guard is mounted on the bumper, a swinging coupling hook being located within the frame, a spring holding the coupling hook toward the guard arm, while a cam plate is pivoted to the coupling hook with a projecting arm, and a shaft is mounted on the car with a hand wheel at its upper end and a chain at its lower end connected to the arm on the cam plate, whereby the cars may be automatically coupled, and may be uncoupled without the trainmen going between them.

REPLACING FROG.—Joseph J. Ladd, Callao, Peru. This is a light, portable frog, for replacing derailed locomotives and cars, and is designed to be entirely supported by the rails, while gravity will be made available for shifting the car or locomotive laterally.

Mechanical.

CORDAGE SPINNING MACHINE.—Anton Weber and Clement Lambert, Elizabeth, N. J. In this machine the twisting and winding mechanism is of the usual construction, but the invention covers an improvement whereby the operation of the machine is automatically stopped if the cord breaks, and the machine cannot be started until the bobbin upon which the twisted cord is wound is securely mounted upon its spindle.

MECHANICAL POWER.—Lemuel B. Walkins, Washington, La. This is a driving gear mechanism, consisting of wheels having grooved spokes with V-shaped edges, in combination with a connecting rod to which slides are pivoted, these slides working in the grooves in the spokes, the mechanism being designed for use with different machines operated by a crank.

MACHINE FOR SETTING CAR SPRINGS.—James B. Illingsworth, Monroe, La. This invention covers novel features of construction and combinations of parts in a machine designed to greatly facilitate the setting of locomotive springs and passenger and other car springs, and whereby the setting may be accomplished in a positive and accurate manner.

Agricultural.

HARROW ATTACHMENT FOR PLOWS.—John F. Williams, Grand Forks, Dakota Ter. This attachment consists of a toothed bar pivoted by means of a drag bar to form a flexible connection with the plow beam, whereby the harrow may be readily and effectively operated in connection with the plow, and will automatically adjust itself to any irregularity of movement of the plow.

CULTIVATORS.—Charles R. Hartman, Vincennes, Ind. Two patents in this class have been issued to this inventor, one of which embraces special improvements for readily adjusting the shovels from one pitch to another, applicable to all ground-stirring implements, as the depth of the furrow can thereby be regulated at will, regardless of the condition of the soil, or as required for the cultivation of plants in different stages of growth. One of the patents also provides a simple construction by which the cultivator teeth may be set to different adjustments, and firmly held in any suitable adjustment, the improvement being applicable to double shovel plows and similar implements as well as to cultivators, while both patents are in the line of improvements on former patented inventions in this class by the same inventor.

HAY LOADER.—Adolph Lasack, Oxford Junction, Iowa. This invention covers an improvement in hay loaders having side rakes and reciprocating elevating bars, whereby the hay may be effectually gathered from the sides as well as from the rear of the machine, and conveyed from the sides to the body, and from thence to a wagon or other vehicle.

POISON DISTRIBUTER.—Fred Eaton, Conway, N. H. The frame of the device is supported by a carrier wheel and has supporting standards with vibrating levers pivoted thereto, boxes with perforated bottoms attached to the lever arms, and a reciprocating slide, making a convenient garden implement for use in distributing poison on plants.

STRAW CUTTER.—John Topfer, Brooklyn, N. Y. Combined with a box and a knife wheel, and an endless belt in the bottom of the box, is a vertically sliding block near the cutting end of the box, a fluted roller in rear of the block and a plain roller above the fluted one, whereby straw or hay may be conveniently and expeditiously cut to any desired length.

Miscellaneous.

WIRE STRETCHER.—Frederick Stiles, (of Harrell, Burns & Stiles), Burnet, Texas. This invention covers a stretching device for building and repairing wire fences, telegraph lines, etc., and is so arranged that with it one can pick up both ends of broken wire and draw them together, the device embracing a novel arrangement of the detent or pawl in relation to the chain and toothed wheel in the frame with crank handle.

LAMP.—Charles H. Grube, Robinson, Ill. This lamp is provided with a novel form of adjusting screw for raising and lowering the wick, one which is positive in its action and not liable to become dis-

ordered, while the oil is prevented from overflowing, and the wick may be lighted without removing the chimney.

BALING PRESS.—Leigh H. Hallam, Belton, Texas. The press consists of a plunger and plunger rod with which a reciprocating sliding frame is connected, a rotary shaft on which a draught sweep is mounted having an arm actuating the sliding frame, by which a direct stroke is given to the plunger, and the latter permitted to rebound by the recoil of the hay, while the hay is properly held in position.

INK ERASER.—Charles W. Johnston, Louisville, Ky. This eraser consists of a thick plate or block-like piece of steel, having a rounded and convex erasing surface, with a file-cut dress, one of the sides or edges also having a further double convex surface of smooth finish, to be used in glazing or smoothing the paper afterward.

CONVEYER.—Charles N. Newcomb, Omaha, Neb. This invention covers a novel construction and combination of parts in conveyers adapted to carry parcels or loads from one point to another upon the same level, and provides for the transportation by gravity of a load suspended from a cable, from end to end of the cable, the empty carrier or another load being returned.

PAPER HOLDER FOR TYPE WRITERS.—William B. Northrop, Charleston, S. C. This is an attachment to be adjusted to any machine to permit the use of any width and length of paper, holding the print clearly in view, and providing for automatically feeding the written paper away from the impression roller, the device being simple and inexpensive.

ENVELOPE.—John O. Donnell, Louisville, N. Y. This invention covers a triple-sealed safety envelope, which cannot be opened as can the ordinary envelope by a pencil or other instrument, and which is designed to protect letters, or the envelopes containing them, from being surreptitiously opened and resealed.

SCIENTIFIC AMERICAN BUILDING EDITION.

JUNE NUMBER.—(No. 44.)

TABLE OF CONTENTS.

1. Elegant plate in colors, showing elevation in perspective and floor plans of a field stone residence, costing about nine thousand five hundred dollars. Page of details, etc.
2. Plate in colors of a cottage costing three thousand two hundred dollars. Perspective elevation, floor plans and details.
3. Engraving of the new Federal building to be erected at Worcester, Mass. Cost two hundred and fifty thousand dollars.
4. A cottage of moderate cost lately erected at Bedford Park, New York. Perspective and floor plans.
5. Plans and perspective of a convenient stable erected at Bedford Park, N. Y.
6. A handsome residence lately erected at Chattanooga, Tenn., from designs by Blotherwick & Penn, architects. Cost ten thousand dollars complete. Plans and perspective elevation.
7. A residence at Florence, Northampton, Mass. Cost ten thousand dollars complete. Perspective and floor plans.
8. Engraving of a half-timbered house at Chester, England.
9. View and plans of a fine barn lately erected near Providence, R. I.
10. A modern residence at Belle Haven Park, Greenwich, Conn. Perspective and floor plans.
11. A handsome house in the colonial style lately erected at "Reholds Terrace," Orange, N. J., at a cost of fifteen thousand dollars complete. Chas. A. Gifford, of London, architect. Perspective elevation and floor plans.
12. A cottage at Bedford Park, New York. Cost eight thousand five hundred dollars. Plans and perspective.
13. Engravings of the great Eiffel tower at the French exhibition.
14. St. Cloud Presbyterian Church, Orange, N. J. Potter & Robertson, architects, New York. Perspective elevation and floor plan. Cost seven thousand five hundred dollars.
15. Miscellaneous Contents: Brick piers.—Home decorations.—Delights of color.—Foundations in alluvial deposits.—Portland cement and sea water.—The effect of moisture on wood.—The weeping larch, illustrated.—Nashville's estimating rules.—Selected lumber.—The science of dry rot.—Sewage a protection against the tereedo.—Ornamental borders, with illustrations.—Hot air *vs.* steam.—The new Catholic cathedral at Pekin.—Advantage of sanitary measures.—Which are the hardwoods?—An ideal living room.—A water motor for elevators, illustrated.—Granite rust.—Ventilating grates, illustrated.—French building laws.—Mahogany.—Artistic wood work, with illustrations.—Stains for mortar and plaster.—An enduring tin roof.—Wood filling and finishing.—Shell fish marbles.—Fire-resisting ceilings.

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

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

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

Business and Personal.

The charge for insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

"The best thing yet!" That is the way a young man put it who made arrangements to work for B. F. Johnson & Co., Richmond, Va. You can get further information by dropping them a card.

Special facilities for manufacturing light machinery, hardware, and novelties. Stamping, presswork, punches, dies, and special tools. Correspondence invited. Rockaway Manuf. Co., 3 E. 14th St., New York.

Walrus leather, hippopotamus, giraffe, elephant, and buffalo for polishing. Greene, Tweed & Co., New York.

For the best Hoisting Engine for all kinds of work, address J. S. Mundy, Newark, N. J.

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

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

Steel name stamps (1-16, 3-32, or 1/8 in. letters), 15c. per letter. F. A. Sackmann, 16 Huron St., Cleveland, O.

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

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

Ball Engine.

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

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

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

Screw machines, milling machines, and drill presses. E. E. Garvin & Co., 1 Aightand Canal Streets, New York.

Blake's belt studs. The strongest fastening for leather and rubber belts. Greene, Tweed & Co., New York.

Perforated metals of all kinds for all purposes. The Robert Atchison Perforated Metal Co., Chicago, Ill.

Billings' Patent Adjustable Tap and Reamer Wrenches. Bronze Forgings. Billings & Spencer Co., Hartford, Conn.

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

Investigate Edson's Recording Steam Gauges. Save coal, etc. Write for pamphlet. J. B. Edson, 86 Liberty St., N. Y.

Hoisting Engines, Friction Clutch Pulleys, Cut-off Couplings. The D. Frisbie Co., 112 Liberty St., N. Y.

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

Tight and Slack Barrel Machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv., p. 23.

Rotary veneer basket and fruit package machinery. I. E. Merritt Co., Lockport, N. Y.

Pedestal tenoner. All kinds woodworking machinery. C. B. Rogers & Co., Norwich, Conn.

Woodworking machinery, planers, surfacers, matchers, beaders, etc. Rollstone Machine Co., Fitchburg, Mass.

Manufacturers Wanted at Lyons, N. Y. 5 railroads, canal; low taxes, rents, fuel, and labor. Address Secretary Board of Trade.

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

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information, and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and though we endeavor to reply to all, either by letter or in this department, each must take his turn.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each. Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(913) W. B. P. asks: Can you tell me how paint can be made to dry, made of Venetian red, naphtha, and Smith's Ferry (mineral) oil? What will give a gloss? What proportions should I use for dipping paint? A. Your only relief is to mix a quantity of linseed oil with the paint, and you will probably have to abandon entirely the use of petroleum. The proportions for different uses you must determine by experiment. Everything depends on the quality of the pigment and whether it is ground with the oil or not.

(914) S. K. K., of Bombay, writes: 1. I have successfully constructed the dynamo described in SUPPLEMENT, No. 600, and the motor described in SUPPLEMENT, No. 641, and I now desire to make a dynamo for the electro deposition of copper. How shall I proceed to construct a machine that will yield a large current with a low electromotive force? A. An electroplating machine of the size of the eight-light dynamo may be made by modifying that dynamo in the following way: Make the commutator cylinder and the brushes of double the present width. Increase the diameter of the commutator cylinder 1/2 inch, and use only half the number of commutator bars. Wind on the armature the same quantity of the same size wire, but

instead of carrying it several times around the armature core, arrange the eight wires in parallel so as to form in each coil of the armature a multiple conductor of very low resistance, beginning at one commutator bar and terminating at the next. Wound in this way the armature will have in each division one coil of one convolution and only half the number of coils used in the 8-light machine. The field magnet may remain as it is, but it must be connected as a shunt to the armature, and a switch must be provided which will throw all the wire in series, or two in parallel or four in parallel, or the wire of both legs of the magnet in parallel, according to the current required. In view of the large number of wires to be connected with each bar of the commutator, it would be well to provide the bars with radial arms for receiving the conductors. There would be an advantage in winding the armature with a smaller number of coarser wires, say half the number of No. 17, or quarter the number of No. 14, the conductivity being the same in each case. 2. Can I charge storage batteries with such a dynamo? If so, how? A. Yes; by connecting them up in parallel. For information on storage batteries we refer you to Reynier's "Voltaic Accumulator," price \$3. 3. What is the *modus operandi* of refining sugar by electricity? A. We believe the electric sugar refining process has proved a failure. The details of the process have not been made public.

(915) C. E. L. writes: 1. In your No. of April 27 you give, "bicarbonate of ammonia and sulphate of soda in strong solution" as the best solution for hand grenades to extinguish fire. How long will this compound keep without losing its properties as an extinguisher? A. Indefinitely, if the bottle is well corked. 2. To how high a temperature could water be raised in flat sheet iron or cast iron vessels before doing damage, if strongly braced? What number of pounds pressure would the temperature indicate? Of course I desire the results in iron of different thicknesses. A. It depends on the bracing; no general answer can possibly be given. The iron begins to soften as it approaches red heat at about 750° Fah. 3. What are the elements in sorghum molasses that boiling removes before the sirup loses its greenish color and becomes clear? And what, if any, chemicals will remove the same? A. It contains nitrogenous impurities and salts of organic acids of which little is known. Lime is used in its defecation.

(916) E. C. A. says: Will you please inform us grape growers of Oswego County, N. Y., through your paper, what to put on our vines to rid us of the pest (bug) which we inclose? A. The specimens were the common grapevine flea beetle, *Haltica chalybea*. The principal damage done by this insect is in the early spring, when it issues from its hibernating quarters and gnaws the buds of the grapevine. Taken at this time it can be destroyed by the spraying of the vines in the heat of the day with a dilute kerosene emulsion or with one of the arsenical solutions, which however should not be used in stronger proportion than 1 ounce to 10 or 15 gallons of water. They are also readily jarred from the vines and can be caught upon cloths saturated with kerosene. This last method was practiced with great success some years ago in a large vineyard near Washington.

(917) D. C.—High pressure engines are those that run by steam direct from the boiler and exhaust into the air. Low pressure engines are those that run with a vacuum on the preceding side of the piston, and are "condensing" in the manner of forming the vacuum by injecting cold water into a receiver of the exhaust steam. Eccentrics are the cam pieces on the shaft for moving the valve. See a good work on the steam engine, such as the American Steam Engineer, by Edwards, which we can mail for \$2.50.

(918) W. P. P.—For the information you desire regarding electric motors we refer you to "Dynamo Electric Machines," by Hering, price \$2.50, or Thompson's "Dynamo Electric Machinery," price \$5. For full information on storage batteries we refer you to Reynier's "Voltaic Accumulators," price \$3.00. We can mail you the above named books on receipt of price.

(919) H. S. asks for a recipe for coloring wool cloth black, jet black, and the process. A. Perhaps the easiest way is to use aniline black or nigrosine dissolved in water into which the goods are dipped. Or a bath of logwood extract may be employed, followed by a bath of copperas. The latter black is best over some ground, such as indigo. The cloth in the latter case should be well washed after drying. Or try following: Work for one hour in a bath containing 8 ounces bichromate potash, 6 ounces alum, 4 ounces fustic to the gallon; lift and expose to the air for a short time, wash well, and work for an hour in a bath of 4 pounds logwood, 4 ounces barwood, and 4 ounces fustic to the gallon; lift and add to bath 4 ounces copperas in solution; work half an hour in this.

(920) H. R. asks for some preparation that will clean the green mould of brownstone. A. Scrub it with sand and water; we know of no other effectual way. To insure prompt attention, your letter should have been signed in full.

(921) "Scientist" asks for the best way to liquefy the T. & M. blacking. I have used vinegar, but it dries too quickly on leather. A. To prevent too rapid drying use a little molasses, sugar and water, or glycerine. Determine the exact amount by trial and be careful not to use too much.

(922) A. F. asks if there is any process for preserving fruit in its natural state. A. On a small scale some attempt may be made by tightly wrapping the fruit in tinfoil. Otherwise it must be canned or preserved in sirup or alcohol.

(923) B. L. asks: Will you kindly tell me how to mix the ingredients for cologne, the recipes of which were given in one of your recent issues? Also how much alcohol is used in making hellebore? A. Mix in a large bottle so as to shake well, and if necessary distill. Use strongest alcohol. For 26 quarts of alcohol 85° use 19 to 40 ounces extract of hellebore.

(924) E. S. F. asks for a receipt for making kumys or koumiss. A. Mix 100 parts condensed milk with 1,000 of water, add 1 part lactic acid, 1/4 part

citric acid, and 15 parts best Jamaica rum. Saturate with carbonic acid gas, fill in bottles, and keep for a few days in a moderately warm room; after this keep in a cool place.

(925) R. L. D.—The water line in the mercury flask boiler described in SUPPLEMENT 182 should be at a point about half way up the upper tier of flasks.

(926) A. S. asks how to make a rain box such as is used on the stage to represent rain. Also how to make and what powder to use in a flash box. Also how to represent the blowing of wind on the stage. A. For description of stage machinery we refer you to our SUPPLEMENT, No. 268, and to the SCIENTIFIC AMERICAN of December 22, 1888. Powdered resin, lycopodium, or magnesium powdered may be used in flash boxes.

(927) M. H. S. asks for a material which can be applied to or incorporated with paper which will render it waterproof. A waterproofing which is effectual and cheap is desired. A. Use spirit varnish, linseed oil, or melted paraffin.

(928) C. R. asks: Would it be practical to make the dimensions of the motor described in SUPPLEMENT, No. 641, about half size? Also would it be practical to use annealed cast iron for the cores and pole pieces of the electro-magnets instead of those bands of wrought iron? About how many batteries would it take of an E. M. F. of about two volts, strength of current about 5.5 amperes, to run a sewing machine or small electro-plater's lathe? A. The motor referred to cannot be made smaller to advantage. Cast iron will answer for the field magnet. It will require eight cells of the battery you describe to drive the motor.

(929) A. B. F. writes: 1. In close plating silver on carriage work, I have noticed that they use a file to scratch the iron in order to make the solder stick, which is a slow process. Why not use a belt machine or wheel with coarse emery? A. A rotary file might answer, but we think an emery belt would be objectionable on account of the particles of emery that might become embedded in the iron. 2. I have a large number of electric arc lamps under my care, and I find a great many of the rods crack in cold weather. Why is this? These rods are hollow. Would it help if the hollow rods had a vent hole to allow the hot air to escape when lamp stopped burning? A. The fault in the carbons is in the manufacture. They are probably too dense. 3. In stores where electric light wires run along the ceiling much dust collects on ceiling around the wires. What will remove this from ceiling? A. We know of nothing better than a stiff brush. The accumulation of dust cannot be prevented when the wires are very near or in contact with the ceiling.

(930) C. T. H. asks: 1. How much current in amperes No. 30 copper wire, American gauge, will stand without heating? A. 0.09 ampere. 2. What is the rule for finding capacity in amperes of any given size wire? A. Multiply the sectional area of the wire in inches by 1,900. The result will be the number of amperes the wire will safely carry.

(931) C. P. W. asks: What is the gum lac spoken of in the article about batteries in the SUPPLEMENT, No. 159? Also what kind of carbon, whether graphite or coke, and whether powdered or granulated, and in what proportion to use to make the depolarizer for an improved Leclanche battery, also whether the manganese dioxide should be powdered, or the natural crystals or ore. Also what is the gold beater's skin that is used for the diaphragm to the phonograph? A. The gum lac referred to is simply shellac. If drug stores do not keep it, inquire at the paint stores. The carbon is pulverized coke. The proportions are as follows:

Table with 2 columns: Material, Amount. Manganese... 40 parts. Carbon... 52. Shellac... 5. Potassium bisulphide... 2.

Mix dry and compress under a pressure of 800 to 1,000 lb. per square inch at a temperature of 212° F. Gold beater's skin is a thin membrane taken from the intestines of the ox. Probably a thin piece of fish's bladder will answer your purpose.

(932) L. W.—In your simple electric motor, have you tested the polarity of the field magnet above and below the armature? Of course the upper and lower parts should have different polarity. If your field magnet is a made of sheet iron, we doubt if you will be able to generate a current without separately exciting the field.

(933) F. E. H. asks: Does a bichromate of potash battery need to be covered? A. The only advantage in a cover is to prevent evaporation.

(934) F. L. M.—You can work your relay and sounder on the line, but you will need a large battery, and the arrangement will prove uneconomical. Better dispose of your 150 ohm relay and replace it with one of the same resistance as the sounder.

(935) T. M. asks: 1. Would sheet zinc, if amalgamated, do in place of the cast zinc in the Bunsen battery? A. Yes; provided it is thick enough. It should not be less than 1/8 inch thick, and it might be 1/4 inch thick to advantage. 2. Should the side of porous cell be very thick? A. They should be of medium thickness. If too thin, they cause the battery to run down quickly. If too thick, the resistance of the battery will be unduly increased. 3. Can the carbon rods used in electric lights be used in the battery? A. Yes; after removing the copper coating with nitric acid.

(936) N. G. P. asks: What are the three best non-conductors of heat? A. It is hard to answer this question without qualification. For high degrees of heat zirconia is about the best non-conductor known, while lime and porous clay come close to it. Among building materials, plaster and sand mixed come very low, having less than one-fifth the conducting power of slate. Water is an exceedingly bad conductor, and it is by convection that heat is generally distributed through its mass.

(937) D. J. B. asks: 1. How to cut the round hollow glass for a lubricator? A. To cut glass tubing for lubricators and water gauges, break the end off from a round file of suitable size, so as to have a sharp edge to the point. Insert the file inside of the glass tube and carefully scratch around the inner surface at the proper distance. A crack will follow the file, when the tube can be easily broken at the file mark. Try it on an old tube, as a little practice may be required. 2. How to find the dead center of a steam engine, in order to set the slide valve. A. For all practical purposes for setting the valve, the dead center may be obtained by marking the extreme positions of the gibs on the slide, moving the flywheel both ways across the dead center to check the mark, when the mean difference can be marked on the flywheel by a fixed pointer, and the difference divided, when the flywheel can be moved, so that the differential mark will coincide with the pointer. 3. What kind of oil would you recommend the best for high speed engine? A. You require the best "cylinder oil" for high speed engines. It is known in the oil trade.

(938) G. B.—Cast iron for nickel plating should be finished fine with a soft emery buff, made by covering a wheel with leather and applying fine emery, about No. 100 to 120, with glue. Goods that are not flat are sometimes finished in a tumbling machine to the desired finish for nickeling.

(939) E.—Iron sliding poles in engine houses would have less friction than brass, if kept bright and smooth. The brass poles do not rust and are easily kept bright. Their appearance also probably recommends the brass poles to firemen. The iron poles, besides, will rust so much as to stain the hands in one wet day.

(940) G. H. R.—Acoustic telephones requiring no batteries are now used to some extent in the U. S., and are much cheaper than the price you name. They are in use for distances over a thousand feet. These telephones are made of thin metallic disks or combinations of metal and hard rubber disks 3 to 4 inches in diameter, attached at their centers to a wire of hard copper or steel stretched between the points of communication. The disks are held in frames fastened to the building. In long distances the wires may be suspended in rubber slings to poles. In fact, it is the common toy telephone on a large scale. For the horse power of a water way, approximately, measure the area or section of a stream (its mean depth multiplied by the width in feet) at a convenient place for measurement of the velocity in feet per minute by the floating of an object in the water. Multiply the area by the velocity, which will give the number of cubic feet passing per minute. Multiply this product by 62.5 (pounds per cubic foot), and the last product by the height in feet which can be obtained or utilized upon a wheel or turbine. Divide the whole product by 33,000 for the horse power. Of this power you may utilize about 75 per cent.

(941) W. S. asks: 1. Would glass cells answer for plunger battery (such as you described in the SCIENTIFIC AMERICAN) as well as mill board? A. Except for liability to breakage, glass is the best material for plunging battery cells. 2. What will be the best liquid solution to use in the battery? A. Into a cold saturated solution of bichromate of potash in water slowly pour sulphuric acid, one-fifth of the volume of the solution by measure. This mixture should be made in a glazed earthen vessel. 3. Would sheet iron in 4 or 6 foot lengths, joined with rivets to make the full length, not do better than butting them? A. There is no advantage in riveting the pieces of iron together. 4. Would not light hoop iron do as well as sheet iron? A. Yes. 5. What is it that becomes exhausted in the battery; is it the zinc or the carbons or both? A. The zinc and the solution. The carbon plates are not affected. 6. Will it be necessary to renew the solution when the zinc or carbons become exhausted? A. The solution requires frequent renewal. The zinc will last some time if properly amalgamated.

(942) W. M. S. asks: 1. How much of the energy is lost in charging and discharging a storage battery? A. About 10 per cent. 2. How must I adjust the brushes of simple electric motor which has a commutator like a large one? A. Arrange the commutator brushes so that they will touch the commutator at points opposite the center of the spaces between the arms of the field magnet. 3. What is the best book which tells all about electricity, motors, dynamos, storage batteries, etc.? A. Probably the best single book for your purpose is "Electricity in the Service of Man," by Urbinsky. 4. How many volts does it take to kill a person instantly? A. It requires an electromotive force of from 600 volts upward. 5. Does a so-called "interrupter" make it easier for a current to pass through the body? A. The interrupter does not facilitate the passage of the current through the body, but it intensifies the effect of the current upon the nerves.

(943) F. W. S. writes: 1. How shall I proceed to extract the perfume from the petals of roses or other flowers by the use of grease? A. Melt a mixture of purified lard and purified tallow over a water bath and immerse an equal weight of rose petals in it. After they have been stirred well together, keep covered for 24 hours, stirring occasionally the cool mass. Remelt and keep in fusion another day, with frequent stirring. Strain through a coarse cloth and repeat a number of times; twelve repetitions with fresh petals is prescribed. After all is done, allow the melted pomade to settle, and pour off into pots. 2. What is black soap? A. Black soap is the name given to the crude soap separated by remelting from the first saponification. It is also applied to a farrier's soap made from fish oils and potash. 3. Give a formula for a good white rose extract without the use of pomades? A. Distill 5 quarts of rectified spirits from 3 lb. of rose petals; repeat with the same distillate but with a fresh portion of petals a number of times until sufficiently strong. At the end of the operation only distill one gallon, and do it rapidly. Or simply add a little atar of roses to alcohol and perfume to suit the taste. 4. How is coumarin prepared? A. Tonkabean are cut up finely, and are heated for a long time with alcohol (0.863 spec. gr.) nearly to boiling. The tincture is poured off and the process is repeated. The tinctures are mixed and the alcohol is distilled off until the residual liquid is turbid, when four times the bulk of water is added. It is heated to boiling, filtered, and coumarin separates on cooling. One pound of beans gave 108 grains of coumarin.

ture is poured off and the process is repeated. The tinctures are mixed and the alcohol is distilled off until the residual liquid is turbid, when four times the bulk of water is added. It is heated to boiling, filtered, and coumarin separates on cooling. One pound of beans gave 108 grains of coumarin.

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 28, 1889,

AND EACH BEARING THAT DATE.

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

Table listing inventions and their patent numbers. Includes items like Adding machine, Air engine, Attrition mill, Auger bit, Auger ground, Axle, Baby jumper, Bag, Balcony, Balsa or life-boat, Batteries, Battery, Bed, Bed folding, Bed furnace, Beer steaming apparatus, Belt, skirt, Brunner, Bin, Binder, Binder, temporary, Boiler, Boiler, Boiler feeder, Boilers, safety apparatus for steam, Bolt, Bolt heading machines, Bolt for, S. Uren, Bolting chest, Book, account, Book, pocket memorandum, Books, machine for lettering the covers of, Boot and shoe lasts, machinery for the manufacture of, Bottle stopper and faucet, Bottle washing machine, Bottle wiring machine, Bottles, jars, etc., machine for finishing the necks of, Bottle, jars, etc., stopper and fastener for, Box, See Cigarette box, Cock box, Electric converter box, Guide box, Journal box, Letter box, Bracket, See Shelf bracket, Brake, See Car brake, Dumb waiter brake, Locomotive driver brake, Vehicle brake, Brick kiln, P. Jochum, Broom, F. J. Case, Broom, J. A. Middleton, Brush, cotton gin, W. M. & R. T. Swann, Buckle, G. M. Tyrrell, Bung, Pettig & Metzger, Burner, See Hydrocarbon burner, Oil burner, Regenerative burner, Button strips, making, H. W. Lyon, Cabinet and cutter's size ticket, combined, J. Keller, Calipers, micrometer, M. F. Smith, Camera, See Photographic camera, Can, See Milk can, Car brake, A. M. Kendall, Car brake, G. B. Quigg, Car coupling, Brewster & Swift, Car coupling, A. Harter, Car coupling, O. E. Michaelis, Car door, J. Charlton, Car frame, railway, Green & Murison, Car heater, railway, Springer & Spring, Car pedestal, P. M. Kling, Car springs, machine for setting, J. B. Illingsworth, Car wheel, F. W. Taylor, Cars, bed frame for railway, Green & Murison, Cars, safety guide for railway, J. G. Blau, Cars, track brake for street, railway, P. M. Kling, Card clothing to flats, machine for fastening, W. Decker, Card setting machine rest, N. C. Estes, Carding engines, stripping mechanism for, A. Falls, Carriage body, C. J. Mingle, Carriage jack, E. F. Burtis, Carriage seat, child's, C. W. Klippert, Carrier, See Cash carrier, Cartridge for ordnance, G. Quick, Cash carrier, S. H. Soper, Jr., Cash indicator and register, M. U. Loree, Cash indicator and register, Loree & Grimes, Cash indicator and register, J. H. Patterson, Caster frame for tubs, etc., W. E. Washburn, Castin ordnance, core for, C. H. Wilder, Catch pin, E. H. Nash, Centrifugal machine for treating grain, etc., J. Boyd, Chain, drive, G. G. F. Boswell, Chair, See Window chair, Chest, See Bolting chest, Churn, Hoyt & Murray, Cigarette box for automatic vending apparatus, J. M. O'Keilly, Clamp, See Electric motor clamp, Clamp, E. C. Stearns, Clasp, See Corset clasp, Shoe clasp, Clock escapement, gravity, F. Gundorph, Cloth, ornamenting, A. Vehon, Cloth stretching machine, clip or holder for, D. P. Smith, Clothes pounder, Tucker & Orr, Clutch, friction, G. A. Barnes, Coal, conveyer for piling, J. M. Dodge, Cock box, stop, Ormsby & Eberhart, Color blindness, device for testing, L. T. Stanley, Coloring matter, production of yellow, A. Liebmann, Colors, dissolving aniline, J. Hahn, Comb and curling iron, combined, G. L. Thompson, Commutator, H. H. Blades, Conduit, closed slotted, C. J. Van Depoele, Cooker, steam, I. S. Brandenburg, Copal, etc., dissolving gum, G. A. Bobrick, Copying plates, frame for holding, A. B. Dick, Cores, chaplet for sand, A. J. Fisher, Corset clasp, D. H. Warner, Corsetsteel, covered, G. Bouzard, Cotton, machine for opening and scutching, S. Tweedale, Coupling, See Car coupling, Pipe coupling, Crank wrist and boxing, O. H. Castle, Crushing or grinding mill, E. C. Griffin, Crutch, L. H. Remillard, Cultivator, C. R. Hartman, Curling iron, G. L. Thompson, Cutter, See Paper cutter, Stalk cutter, Straw cutter, Dental mirror, E. A. Tice, Desk and chair for schools, G. A. Bobrick, Digger, See Post hole digger, Direct-acting engine, J. S. Bartlett, Ditching machine, D. J. Powers, Door check, T. K. Hansberry, Door spring, J. W. Davis, Drain for sinks, wash bowls, etc., F. A. Strater, Drill, See Grain drill, Drill press, E. C. Stearns, Drilling machine, F. H. Richards, Dumb waiter brake, H. Donohoe, Dust collector, O. M. Morse, Dye, blue azo, F. Schmidt, Dye, compound orcin, R. Greville-Williams, Dynamo, W. S. Belding, Easel, W. V. Ackerman, Egg basket, J. T. Feager, Electric circuits, automatic circuit interrupter for, Reinmann & Lange, Electric converter box, A. Schmid, Electric generators, regulating self-exciting alternate current, W. Stanley, Jr., Electrometer, R. P. Sellon, Electric motor, W. S. Belding, Electric motor clamp, W. S. Belding, Electric wires, pole for, U. Snead, Electrical distribution, system of, G. Westinghouse, Jr., Electro-dynamic motor, C. J. Van Depoele, Elevator, See Water elevator, Elevator controller, W. E. Nickerson, Elevator controlling mechanism, W. E. Nickerson, Elevator slack rope stop, W. E. Nickerson, Elevators, electrical apparatus for controlling, R. F. McFeely, Elevators, electrical switch for, W. E. Nickerson, End gate, vehicle, T. B. Burr, Engine, See Air engine, Direct-acting engine, Steam engine, Traction engine, Engine compensating device, G. F. Blake, Engines, starting gear for compound, R. Lindner, Envelope, E. Morgan, Faucet, sirup, E. Haas, Feed mechanism, F. H. Richards, Felt hardening machines, cone or former for, J. & D. Pendergraat, Fence, W. E. & C. W. Arnett, Fence, Wickers & Wickers, Fence post, W. Crabb, Fence riveting machine, W. W. McCallip, Fertilizers, making, H. Endemann, Fertilizers, mechanism for deodorizing refuse matter and converting it into, O. D. McClellan, Filaments, apparatus for treating, F. S. Smith, Filter, J. E. Warren, Finger pull, coin-operated, W. H. Gilman, Firearm, breech-loading, E. Harrison, Firearm, breech-loading, J. H. & S. H. Redfield, Fire escape, F. D. Chandler, Fire extinguisher for ships, W. D. T. Travis, Flour bin and sifter, J. H. Thomas, Folding gate, D. E. Ladd, Foot guard, T. A. Griffin, Fork, See Hay fork, Frame, See Car frame, Caster frame, Frog, replacing, J. J. Ladd, Frying pan, M. S. Tracy, Furnace, See Bed furnace, Heating furnace, Metallurgical furnace, Ore roasting furnace, Gauge, See Micrometer gauge, Saw table gauge, Game wheel, musical, G. Wilkening, Garment stays, apparatus for making, A. Taylor, Gas, apparatus for producing, R. R. Turner, Gas, apparatus for the manufacture of, G. E. Cummings, Gas, apparatus for the manufacture of, B. Loomis, Gas lighter, electric, J. H. Lehman, Gas, manufacturing, G. K. Cummings, Gas, manufacturing, B. Loomis, Gas, process of and apparatus for the manufacture of, B. Loomis, Gate, See End gate, Folding gate, Swinging gate, Gate, S. A. D. Bozell, Gate, J. M. Hawley, Gate, Jameson & Baird, Gate, W. R. White, Generator, See Steam generator, Grain drill, Patric & Packham, Grain meter, automatic, E. H. Reynolds, Guard, See Foot guard, Guide box, P. L. Day, Hackling machine, A. W. Montgomery, Hair crimping device, Helmer & Lietz, Hammer, bush, F. D. & W. Lison, Hand bag or sack, collapsible, F. Emeric, Harrow, Macphail & Needham, Harrow, spring toothed, H. Ward, Harrow tooth holder, M. B. Williams,