

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 at least as Thursday morning to appear in next issue.

Rowland's Vertical Engine. Wearing parts of steel. Broad bearings. F. C. & A. E. Rowland, New Haven, Conn.

Ladies can wear boots one size smaller after using German Corn Remover. 25 cents of druggists.

Owners of steam boilers can save fuel, repairs, and delays by using Hotchkiss' Mechanical Boiler Cleaner, which removes all mud or scale making properties from the boiler. Send for circular. 84 John St., New York.

Uniform in price and quality. Van Bell's "Rye and Rock." \$1 per bottle.

Wanted.—An experienced Machinist and Tool Maker, who is also able to design and construct light machinery. Address, with references, A. B., Box 773, N. Y. city.

4 Roll Planer and Matcher; simple and substantial; weight, 3,500 lb.; price, \$500. O. L. Packard, Milwaukee, Wis.

The man who invented the German Corn Remover is a public benefactor. 25 cents. Sold by all druggists.

Houghton's Boiler Compound contains nothing that can injure the iron, but it will remove scale and prevent its formation. Houghton & Co., 15 Hudson St., N. Y.

Lead Foil for Secondary Batteries. E. M. Wood & Co., Worcester, Mass.

Manufacturers and others, send postal at once to *Manufacturers' Gazette*, Boston, Mass., for first number free. Ready first week in July.

'Tarred Roofing, Sheathing' Felts. Wiskeman, Paterson, N. J. Silica Paints (not mixed); all shades. 40 Bleecker St., N. Y.

Callow's Lettering Pat., illus. p. 355. Catalogue free.

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.

Propellers, 12 to 26 in. Geo. F. Sheard, Waltham, Mass.

Abbe Bolt Forging Machines and Palmer Power Hammers a specialty. S. C. Forsyth & Co., Manchester, N. H.

List 26.—Description of 2,500 new and second-hand Machines, now ready for distribution. Send stamp for the same. S. C. Forsyth & Co., Manchester, N. H.

Combination Roll and Rubber Co., 27 Barclay St., N. Y. Wringer Rolls and Moulded Goods Specialties.

Cope & Maxwell Mfg Co.'s Pump adv., page 397.

Punching Presses & Shears for Metal-workers, Power Drill Presses. \$25 upward. Power & Foot Lathes. Low Prices. Peerless Punch & Shear Co., 115 S. Liberty St., N. Y.

Improved Skinner Portable Engines. Erie, Pa.

"Rival" Steam Pumps for Hot or Cold Water; \$32 and upward. The John H. McGowan Co., Cincinnati, O.

The L. B. Davis Patent Feed Pump. See adv., p. 13.

The Eureka Mower cuts a six foot swath easier than a side cut mower cuts four feet, and leaves the cut grass standing light and loose, curing in half the time. Send for circular. Eureka Mower Company, Towanda, Pa.

Pure Oak Leather Belting. C. W. Army & Son, Manufacturers. Philadelphia. Correspondence solicited.

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

Wood-Working Machinery of Improved Design and Workmanship. Corliesman, Egan & Co., Cincinnati, O.

Experts in Patent Causes and Mechanical Counsel. Park Benjamin & Bro., 50 Astor House, New York.

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

Malleable and Gray Iron Castings, all descriptions, by Eric Malleable Iron Company, limited, Erie, Pa.

4 to 40 H. P. Steam Engines. See adv., p. 414.

National Steel Tube Cleaner for boiler tubes. Adjustable. Chalmers-Spence Co., 10 Cortlandt St., N. Y.

Corrugated Wrought Iron for Tires on Traction Engines, etc. Sole mfrs., H. Lloyd, Son & Co., Pittsburg, Pa.

Best Oak Tanned Leather Belting. Wm. F. Forepaugh, Jr., & Bros., 581 Jefferson St., Philadelphia, Pa.

Gardiner's Pat. Belt Clamp. See illus. adv., p. 413.

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, importers Vienna line, crocus, etc. Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

Presses, Dies, Tools for working Sheet Metals, etc. Fruit and other Can Tools. E. W. Bliss, Brooklyn, N. Y.

The Sweetland Chuck. See illus. adv., p. 396.

Machine Knives for Wood-working Machinery, Book Binders, and Paper Mills. Also manufacturers of Solomon's Parallel Vise, Taylor, Stiles & Co., Riegelsville, N. J. Skinner's Chuck. Universal, and Eccentric. Sec p. 397.

For best Duplex Injector, see Jenks' adv., p. 413.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 414.

Peck's Patent Drop Press. See adv., page 14.

For the best Diamond Drill Machines, address M. C. Bullock, 80 to 88 Market St., Chicago, Ill.

Brass & Copper in sheets, wire & blanks. See ad. p. 13.

For best Portable Forges and Blacksmiths' Hand Blowers, address Buffalo Forge Co., Buffalo, N. Y.

The Brown Automatic Cut-off Engine; unexcelled for workmanship, economy, and durability. Write for information. C. H. Brown & Co., Fitchburg, Mass.

The None-such Turbine. See adv., p. 413.

The Chester Steel Castings Co., office 407 Library St., Philadelphia, Pa., can prove by 15,000 Crank Shafts, and 10,000 Gear Wheels, now in use, the superiority of their castings over all others. Circular and price list free.

Wren's Patent Grate Bar. See adv. page 13.

Diamond Tools. J. Dickinson, 64 Nassau St., N. Y.

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

Eagle Anvils, 10 cents per pound. Fully warranted.

Geiser's Patent Grain Thresher, Peerless, Portable, and Traction Engine. Geiser Mfg Co., Waynesboro, Pa.

Baxter Wrenches fit peculiar corners. Indispensable to first-class mechanics. Greene, Tweed & Co., N. Y.

Houston's Four-Sided Moulder. See adv., page 14.

New Economizer Portable Engine. See illus. adv. p. 12.

Cutters for Teeth of Gear Wheels formed entirely by machinery. The Pratt & Whitney Co., Hartford, Conn.

Rue's New "Little Giant" Injector is much praised for its capacity, reliability, and long use without repairs. Rue Manufacturing Co., Philadelphia, Pa.

For Shafts, Pulleys, or Hangers, call and see stock kept at 79 Liberty St., N. Y. Wm. Sellers & Co.

Long & Allstatter Co.'s Power Punch. See adv., p. 13.

Wm. Sellers & Co., Phila., have introduced a new injector, worked by a single motion of a lever.

For Mill Mach'y & Mill Furnishing, see illus. adv. p. 12.

Don't buy a Steam Pump until you have written Valley Machine Co., Easthampton, Mass.

Saw Mill Machinery. Stearns Mfg. Co. See p. 13.

Use the Vacuum Oils. The best car, lubricating, engine, and cylinder oils made. Address Vacuum Oil Co., No. 3 Rochester Savings Bank, Rochester, N. Y.

Wiley & Russell Mfg Co. See adv., p. 396.

For Machinists' Tools, see Whitcomb's adv., p. 12.

Fire Brick, Tile, and Clay Retorts, all shapes. Borgner & O'Brien, M'Frs, 23d St., above Race, Phila., Pa.

For Mining Mach'y, see ad. of Noble & Hall, p. 14.

Notes & Queries

HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the *SCIENTIFIC AMERICAN SUPPLEMENT* referred to in these columns may be had at this office. Price 10 cents each.

(1) S. L. R. writes: 1. We have a boiler 15 feet long, shell $4\frac{1}{2}$ feet in diameter, having eighty 3-inch flues. We wish to burn shavings and sawdust. How much grate surface should we have? A. About 36 square feet. 2. What kind of grate? A. A thin, plain grate with narrow openings. 3. How high should the chimney be and what size the flue? A. 6 feet, and 36 inches square. 4. The engine is 14x30. What should be the size of the steam pipe leading to the engine, and what size the exhaust? A. Steam $3\frac{1}{2}$ inches diameter, exhaust $5\frac{1}{2}$ inches diameter. The furnace should be at least twice the usual depth for coal.

(2) E. J. C. writes: A well known writer on stationary engines says of the curved or coiled pipe that connects the boiler and steam gauge: "The cock which is placed at the lowest part of the inverted siphon pipe is designed to draw off any water which may have collected in it; if the water was not drawn off it would rise into the gauge and the steam pressure would be incorrectly indicated." Please explain. A. It would act like a siphon gauge, by the difference of height of column of the liquid in the two legs of the siphon; but as these siphons are usually made, the inaccuracy would be inappreciable.

(3) L. G. G. asks: What is the best and most economical way of producing a bright surface upon several iron pins, $\frac{1}{4}$ x $\frac{1}{2}$ x 3, having the fire scale still on? A. Use emery wheels.

(4) A. D. W. writes: If your correspondent, J. A. D., will put a cork into the top of the air chamber of his Niagara pump and fill it with water it will be all right. Such at least is my experience with one of them. I take it the steam takes the place of the air, and then a current of air causes condensation, which produces a vacuum which tends to hold the valves.

(5) G. G. M. asks if there is not some mistake in reference to \$500,000,000 gold weighing 4,500 tons, as stated in No. 24, late volume, under head "The sub-treasury gold wagon." A. Yes; it should be 1,000 tons.

(6) W. W. asks: Will the boilers used in ranges, some of which are warranted to stand 200 lb. pressure per square inch, answer for an engine $1\frac{1}{2}$ x 8? How would you arrange it to obtain the best results? A. Yes; for moderate pressures, say, not over 40 lb.; we have seen them set in masonry; they may be set either vertically or horizontally.

(7) E. L. B. asks: Can you inform me how the hydrostatic press and jacks came to be commonly called hydraulic press and jacks? A. We cannot; either term is correct. When the pressure is being exerted, the fluid is in motion; it is then hydraulic. When the pressure is obtained, and the water is at rest, it is then properly hydrostatic.

(8) D. R. asks how to feed turtles and fishes? How often should fresh water be supplied? How long will a turtle live with nothing to eat? A. Feed the turtles and fish on earth worms after they have been placed in grass or moss over night to scour them of all earthy matter, then cut them up to one quarter of an inch and feed to the animals. Look out that none are left after the animals have had all that they require. Remove from the aquarium what are left, or decomposition will take place, which will spoil the water and turtles. Raw beef answers well as a food for fish. In a true self-supporting fresh water aquarium the water needs never to be removed if the proper kinds of plants

are used for oxygenation. A good sized turtle will live three months without food, a young turtle one month.

(9) A. W. asks: How much steam pressure will a boiler stand, 15 inches diameter by 30 inches high, made of cold rolled copper, No. 21 English wire gauge? A. Not over 16 lb. per square inch. The heads should be braced with care, and it should be tested with water pressure to at least 80 lb. before using.

(10) E. F. J. asks if any benefit is derived from combining magnesium with steel. A. A half per cent of magnesium changes coarse-grained into fine-grained steel and greatly improves the quality. The magnesium is introduced through an opening in the cover of the crucible, after inserting some small bits of charcoal, in order to remove the free oxygen. Without this precaution there would be danger of an explosion.

(11) C. wants to know how to make shoe blacking. A. Mix intimately 1 pound of molasses, 1 pound of best bone black, in very fine powder, and $\frac{1}{4}$ pound olive oil; then add $\frac{1}{4}$ pound sulphuric acid, previously diluted with $\frac{3}{4}$ pound water. The whole is allowed to stand for three hours or longer, and afterward as much water is added as is necessary to give it the proper consistence.

(12) G. I. J. asks: Is there any device by which I may regulate the strength of the current from a powerful electric battery? The ordinary resistance coils will not do. I wish to change the strength gradually by means of a resistance placed at some point in the circuit. A. You can make resistance coils that will answer your purpose, by making a wooden reel in the shape of a cross, and winding uninsulated wire upon it so as to have an air space all around each convolution. If the current heats the wire so that it will burn wood, you may place strips of asbestos board along the edges of your reel.

(13) M. E. W. asks how to find the point at which to place the weight on a safety valve so that steam will blow off at the required pressure. A. 1. Multiply the pressure per square inch by the area of the valve; the product is the total weight required upon the valve. 2. Divide this total pressure by the weight to be hung on the valve lever; the quotient is the number of "leverages" which you must give the weight from the fulcrum. Suppose 100 lb. steam and 12 inches area of valve; then total pressure on the valve is 1,200 lb.; and if the weight be 80 lb., then $1,200 \div 80 = 15$ "leverages." Now, if the distance from fulcrum to center of valve be 3 inches, then the weight must be set at $3 \times 15 = 45$ inches from fulcrum, or 42 inches from center of valve. Of course this does not take into account the effect of the lever or weight of the valve.

(14) O. R. M. asks for a simple method of testing or assaying specimens of rock. A. Charge into a 6-ounce crucible, 1 ounce each of the ore and dry bicarbonate of soda, 2 ounces of litharge (free from silver), $\frac{1}{2}$ ounce of argol, and cover with $\frac{1}{4}$ inch of dry salt. Heat the crucible until the contents are in a quiet state of fusion, remove from the fire, cool, break, and clean the lead button by pounding on an anvil. If the button weighs more than, say, half an ounce, scorify it down in a scorifying dish in an open muffle. Heat $\frac{1}{4}$ inch bone ash cupel in the muffle, drop into it the button, and keep up the temperature of the muffle to a bright red heat until all the lead has been scorified off and absorbed by the cupel, and the small bead of gold or silver (if the ore contains any) becomes well rounded and clear. The ore must be finely powdered, and the whole of it passed through an eighty-mesh sieve.

(15) A. S. asks for information as to the direct determination of silver in galena on Volhard's principle. A. From two to five grammes of the galena, according to its supposed richness in silver, are very finely ground and intimately mixed in a porcelain mortar with from three to four times its weight of a flux composed of equal parts of soda and saltpeter, placed in a porcelain crucible, covered, and heated over a burner to thorough fusion, when the mixture is well stirred with a glass rod. It is then let cool and placed in an evaporating dish partly filled with water, in which the melted matter is softened, dissolved out of the crucible into the dish, which is then heated, and the watery solution is filtered into a flask. The residue on the filter, after being well washed, is rinsed back into the dish, very dilute nitric acid is added, and the whole evaporated to dryness. The dry residue is taken up in water acidulated with nitric acid, heated, and filtered into the same flask in which is the aqueous solution. The residue is washed with hot water, the filtrate is allowed to cool in the flask, ferric sulphate or iron alum is added, and the liquid is titrated.

(16) H. J. asks how to make a good quality of domestic grape wine? A. Put 20 lb. of ripe, fresh picked, and well selected grapes into a stone jar, and pour on them six quarts of boiling water. When the water has cooled enough, squeeze the grapes well with the hand; cover the jar with a cloth, and let it stand for three days; then press out the juice, and add ten pounds of crushed sugar. After it has stood for a week, scum, strain, and bottle it, corking loosely. When the fermentation is complete, strain it again and bottle it, corking tightly. Lay the bottles on their side in a cool place.

(17) A. W. asks: By what means can an enameled surface be gilt with a name, same as on a lead pencil? A. Polished pencil, having a coating of shellac, can be stamped with gold by aid of a heated dye; not so an enameled surface—the gold will rub off entirely. A. Use thin gold size and a hot brand.

(18) A. B. asks how to case-harden small articles. A. Make a paste with a concentrated solution of prussiate of potash and loam, and coat the iron therewith; then expose it to a strong red heat, and when it has fallen to a dull red, plunge the whole into cold water.

(19) R. W. inquires how to prepare emery for optical purposes. A. Mix four pounds of the flour emery of commerce with one ounce of powdered gum arabic, and then throw the powder into two gallons of clean water. Collect the deposits at the end of ten seconds, thirty seconds, two minutes, ten, twenty, and

sixty minutes, and that which is not deposited by one hour's subsidence is thrown away as useless for grinding lenses. The use of the gum arabic renders the water slightly viscid.

(20) J. N. L. asks: 1. Is there any liquid fuel, sootless and smokeless, that could be used in bed chambers having no flue or means of keeping up an ordinary fire? A. We know of no cheap fluid that we can recommend for such purposes. Fires without flues to carry off the products of combustion should never be used in sleeping apartments under any circumstances. 2. If gasoline or other liquid will answer for such purpose, about what would be the cost per hour to heat 1,000 square feet 100° Fah.? A. Gasoline cannot be used in this way.

(21) R. W. S. writes: I have a telegraph line a few rods over one mile in length. Wire is No. 14, well insulated. Have two twenty ohm sounders on the line and six cups, gravity battery all at one end. When battery sets one way I get no current at all. Reverse it, and the sounders work faintly. What is the trouble? Is main line of too great resistance for battery, or are the grounds weak? Have had some experience in making grounds, and never before had anything which would not work well. I thought four cups would run the line. A. If your line wire is iron, the resistance is too great; you must use a larger wire or more battery. If your wire is copper, your grounds or connections must be at fault.

(22) C. W. R. asks how the magic solder wire is made, such as pedlars sell for mending tinware, copper, etc. It is some kind of composition of chemicals run together, then drawn out into wire, and is to be used without the acid, simply by holding the light or heat underneath the place to be mended, then simply let the solder melt. A. For an easily fused solder, mix together in a crucible or iron pot, at a very moderate heat, bismuth, 1 part; tin, 3 parts; lead, 2 parts, and cast in slender sticks. For the common solder wire melt together equal parts of tin and lead and pour it through a vessel having a very small opening in it, into a tub of water. If the metal is the right temperature, and if the apertured vessel is supported the proper distance above the water, the stream of melted metal will be cooled, forming a more or less perfect wire.

(23) N. E. writes: 1. I am running a hand saw, and have a great deal of trouble with the lap. We use common solder, but it will not hold the ends together but a short time. The saw is two inches wide by one-sixteenth thick. How long should I make the lap, and what is the best solder, or how can I braze it? Can you give me a receipt to make a solder better than the common solder that tinmiths use? A. Make your lap about an inch long. Coat the adjacent surfaces well with borax paste, and wire the two ends together with iron binding wire. Support the joint over a large piece of charcoal, and apply pieces of silver solder to the edges of the joint, having previously coated the solder with borax. Now with a strong blow pipe flame heat the saw at the joint until the solder flows. 2. I have about 100 of the *SCIENTIFIC AMERICAN* I wish to bind. What is the cheapest and the best binding that I can get? A. We know of no cheaper way than to employ a bookbinder.

(24) W. W. C. asks: 1. How can I preserve some manuscript written on common paper and with an ordinary lead pencil so that it will not rub off, or in other words, how can I make the writing indelible? A. Lead pencil marks cannot be rendered indelible, but if the lines are washed over with a clear solution of $\frac{1}{4}$ oz. of gum arabic in 6 oz. of water they will not rub off readily. 2. Two bodies of exact size and shape, but of unequal weight, and each presenting an entirely smooth and non-compressible surface to the atmosphere, are dropped from a given height at the same time: will they reach the ground together? Some philosophers say they will, others say they will not unless they be dropped in a vacuum. A. In a vacuum, yes; in the air, no; the heavier body is capable of overcoming the resistance of the air more easily.

(25) J. J. S. writes: I wish to know something of the nature of nitro-glycerine. Please answer the following questions through *SCIENTIFIC AMERICAN*: 1. After being prepared, and coming suddenly or otherwise in contact with air, does it (the air) have any effect on its explosive properties? A. The air has little or no effect upon it. 2. In its liquid form for what purposes is it generally used and when so used? How is it exploded? A. Chiefly in blasting, in tunneling, and mining. It is used extensively for cracking the rock in the bottom of "dry" petroleum wells. It is exploded by fulminating or percussion caps by electric spark or fuse. 3. Where is it made, and what size cans is it generally put up in? Also the difference in explosive power while in liquid form, and such preparations as "giant powder," "dynamite," and other high explosives having nitro-glycerine as a basis. A. See article on nitro-glycerine, pages 344, 345, current volume of the *SCIENTIFIC AMERICAN*. The cartridges usually vary from four ounces to five pounds or more. With regard to the relative efficiency of dynamite, giant powder, and nitro-glycerine, consult Mowbray's "Trinitroglycerine." 4. I read of two empty glycerine cans being found in the woods somewhere in Pennsylvania by two small boys. A man to whom they were shown attempted to open them, causing an explosion, thereby losing his whole arm, tearing it from his body. Now, the cans being empty, how do you account for the explosion? What are the most serious objections to its being handled in liquid form? A. Such packages always retain a little of the explosive adhering to their sides after their contents have been poured out.

(26) W. C. R. says, in answer to N. J. A., who asks for the best method of preserving fence posts: "My experience is to bore a large hole in the end of the post that is to be put in the ground, fill it with salt, and then plug the hole tight with a wood plug."

(27) C. M. K. asks: Can you inform me of any means by which the flesh can be taken from the bones of small birds, leaving a perfect skeleton? A. The following method will answer in some cases: Put the bones in a strong, warm alcoholic solution of caustic potash for a short time, then immerse them in running water until clean.

(28) J. P. F. asks: When ironing shirts, etc., what is the best way to put on a gloss? A. Raw starch, 1 oz.; gum arabic, 1 drachm; white of egg or blood alum, 1/2 oz.; soluble glass, 1/4 oz., water, q. s. Make the starch into a fine cream, dissolve the gum in a little hot water, cool and mix it with the albumen, and beat up the mixture with the starch liquid. Then add the water-glass (solution) and shake together. Moisten the starched linen with a cloth dipped in this liquid, and use a polishing iron to develop the gloss.

(29) G. A. C. asks if paper is saturated with cupric ammonia can metallic copper be reduced on the surface and in the fibers of the same, and by what process? Iron will not. Will an acid, hydrogen, or tin dust, will anything? A. Try exposing the paper for some time in a current of heated hydrogen; or dip the saturated paper in ammonium sulphide; rinse, spread on a plate of copper, dip in dilute sulphuric acid, connecting the copper by wire with the zinc pole of a good battery, the other pole being connected with a second strip of copper also immersed in the dilute acid. If the current is strong enough to decompose water it will reduce the copper on the paper.

(30) A. M. F. asks as to the average number of tons of coal consumed daily by any steamer of the following lines, on a voyage across the ocean: White Star, Cunard, Inman, Anchor. Also the number of firemen generally employed on any one ocean steamer. A. White Star steamers, 95 to 100 tons per day; 18 firemen. City of Berlin. City of Brussels, each 110 tons per day; about 28 firemen. Ansona, 120 to 130 tons per day; 24 firemen.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

F McL.—Nos. 1 and 2, calcite-carbonate of lime. No. 3 is quartz.—M. M. R.—It is a split leather—that is a thin sheet cut from thick tanned leather by appropriate machinery. It may be purchased from leather dealers.—J. M. P.—No. 1. Quartzose rock with horn silver—a rich ore. No. 2. Quartz rock with selvage. No. 3. Chiefly iron—copper sulphides.

COMMUNICATIONS RECEIVED.

On a Growth of Grain in Ice. By D. J. B. Electric Light for Purifying Sewers. By J. G. S.

NEW BOOKS AND PUBLICATIONS.

THREE HUNDRED YEARS HENCE: OR, A VOICE FROM POSTERITY. By William Delisle Hay. London: Newman & Co.

A highly imaginative forecast of human affairs, in the guise of a series of lectures delivered by a Professor of History in the year A.D. 2180, tracing the progress of humanity from the beginning of the "Era of Development," A.D. 1880. The author has a curiously inventive turn of mind, and has filled his book with novel ideas and pictures at once original, whimsical, and plausible.

THE STUDENT'S DREAM. Published for the author. Chicago: Jansen, McClurg & Co.

If the author is, as he professes to be, a youthful student, his ambitious attempt to forecast the philosophy of the future is not a discreditable performance. When he is older and knows more he will dream less.

PEACE MAKER GRANGE; OR, CO-OPERATIVE LIVING AND WORKING. By Samuel Leavitt. New York: Published by the author, No. 5 Worthstreet. 25 cents.

A suggestive story, reprinted from the Phrenological Journal, describing the development and working of an ideal yet entirely human, thrifty, and practical community. Unlike most social reformers Mr. Leavitt scrupulously conserves what is good in human experience, and seeks to reconstruct society by lifting life and labor to a higher, purer, and kinder level, by sloughing off the barbaric elements of modern civilization, not by relapsing toward barbarism. The work is germinal and is worthy of a better dress.

DR. J. H. McLEAN'S PEACE MAKERS. By Dr. James Henry McLean, St. Louis, Mo., projector, inventor, and patentee, with Myron Coloney, New Haven, Conn., mechanical inventor and patentee. New York, 1880.

An illustrated catalogue of deadly engines, by means of which the inventors expect to command peace throughout the world, by making war so terrible and destructive that nations shall not dare to engage in it. How many of Dr. McLean's devices—which are as marvelous in number, variety, and scope, as they are threatening on paper—will prove of practical utility, remains to be seen.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending

June 7, 1881,

AND EACH BEARING THAT DATE

[Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1866, will be furnished from this office for one dollar. In ordering please state the number and date of the patent desired and remit to Munn & Co., 37 Park Row, New York city. We also furnish copies of patents granted prior to 1866; but at increased cost, as the specifications not being printed, must be copied by hand.

Advertising balloon, H. T. Sisson..... 242,483 Amalgamation of gold and silver, compound for facilitating the, W. H. C. Mathews et al..... 242,669

Table listing inventions with names and page numbers. Includes: Amalgamator, Ashes, hopper for leaching, Axle box, car, Axle support and skein fastener, Bird cage, Bit gauge, Blacking box, Bobbin, Boot and shoe heel, Bottle, case, Bottle stopper, Bottles, etc., Bow socket, Box, F. E. Brown, Brick pallet, Broiler, Brush handle, Buckle, T. O. Potter, Buckle, S. Wales, Burglar alarm bolt, Button, covered, Button hole cutting machine, Cabinet for holding scraps, Calendering machine, Calipers, Candle moulding machine, Car brake, Car brake and starter, Car coupling, Car coupling, W. H. Roundy, Car wrought and buffing apparatus, Carriage, implement for resizing, capping, and uncapping, Caster, G. W. Horne, Caster, trunk, Chain bolt, Chair bottom, Chart and square for measuring and draughting dresses, pattern, Chart, dress, Cheese hoop follower, Churn dasher, Cigar cutter, Cigar holder, Cigarette machine, Clothing clasp, Coal washing machine, Coffin, Saxton & Quayle, Color, azo, Comb, T. Schnitzlein, Cooking apparatus, Cop winding machinery, Corkscrew, Corset, I. W. Birseye, Corset, W. A. Nettleton, Corset stiffener, Cotton and hay press, Cotton ginning and lapping machine, Cotton opener, Cotton picker, Cotton press, Counterpoising the weights of bodies, method of and apparatus for, Cow tail holder, Crutch, A. Farr, Cultivator, I. S. Mussetter, Cultivator, R. B. Robbins, Cultivator, E. A. Wright, Cuspidor, J. Welf, Cuspidor, W. Westlake, Desk, business, Die, I. A. Kilmer, Dilator for cure of phimos, Direct-acting engine, Distilling apparatus, Ditching machine, Door spring, Dovetailing and lath machine, Drawer of furniture, store fixtures, etc., Dredger or earth excavator, Dumping trap, Earring, T. Granbery, Electric cable and conductor, Electric call, Electric lighting apparatus, Electric machine, dynamo, Electric machine, dynamo, Sample and Rahl, Electric machines, commutator for dynamo, Thomson, Electrical alarm apparatus, Electrical signaling apparatus, Electro-magnetic brake, End gate and scoop board for wagons, Fanning mills, Feeding attachment for, Fatty matters from bones, apparatus for separating and recovering, Faucet, A. Eske, Feeding animals, automatic mechanism for, Fence, J. Du Bois, Fence, J. L. Ferguson, Fence, barbed, Fence, wire, A. Wesson, Fence wire, machine for making barbed, Sprague & Dancel, Filtering apparatus, Firearm, breech-loading, Firearms, auxiliary sight for, Fire escape, Fire extinguisher and chemical engine, Flux, I. J. Moore, Fly trap, Furnace for burning liquid fuel, Game counter, Game table, Gas for preserving purposes, manufacturing and purifying, Gas generating furnace, Gas lighting, electric, Reclining chair, A. C. Yengling, Gas regulator, Gate, A. P. Campton, Gate, J. W. Fiester, Gear, friction, Gem setting, Glove button fastening, Glass lamp founts, manufacture of, Glassware, mould for manufacturing seamless, Gold and silver from ores, apparatus for extracting, Grading, ditching, and leveling machine, Grain drill, spring tooth, Grain separator, gravity, Grape elevator, crusher, and stemmer, Grinding mill, Grindstone, family, Grits, preserved, Grub puller, Hame, L. E. Jones, Hame fastener, Harness tree, Harrow, H. Doolittle, Harvester, corn, Hat trim curler, Heel trimming machine, Heeling machine, Hoisting machine, Hominy for preservation, treating, Horse rake, S. T. Ferguson, Horse rake, self-dumping, Horseshoe, O. J. Irish, Horseshoe blank bars, machine for making, Horseshoe blanks, machine for bending, Horseshoe nails, machine for forging, Hose coupling, Hot air furnace, Hub, wheel, Ice harvester, Indicator lock, Injector, feed water, Jaw block and boat detacher, safety, Jewelry, etc., ornamenting the surface of, Joint, M. G. Crane, Journal box, E. Meaden, Journals of balance wheels, supporting the, Knitting machines, set-up device for circular, Lace machine, Laces, etc., case for preserving and displaying, Lamp fixture, extension, Lamps, etc., electrical apparatus for lighting street, Lathe, hub, Lead fumes, apparatus for catching and collecting, Lewis & Bartlett, Leather skiving machine, Life raft, T. Hall, Lifting jack, Locomotive ash pan, Locomotive tender, Locomotives, induction pipe for bogie, Marbleizing machine, Matches, manufacture of, Measure, cream, Measuring and registering machine, cloth, Milk, apparatus for treating, Milk transporting can, Mines, device for removing fire damp from, Mining machine, B. Yoch, Mirror hanger, Motor, Mowers and reapers, attachment for, Musical instruments, mouth piece for brass, Nut lock, Oil can, Oil press mat, Oils, press for treating paraffine, Orphanage, breech-loading, Orewashing, apparatus for separating sulphurets in, Ores, especially those of the precious metals, process of and apparatus for the reduction of, Organ stop draws, name plate for, Packing, piston, Pantaloon, J. E. Bloom, Pantograph engraving machine, Paper bag, Paper bag, Leinbach & Wolle, Paper bag, C. A. S. Lockwood, Paper bag machine, Paper cutting machine, Paper cutting machine, E. L. Miller, Paper machines, pulp screen and breast roll box for, Paper, ornamenting, Paper, apple, Pavements, laying, A. Pelletier, Peach pitting machine, Peanut cleaner, polisher, and assorter, Pianoforte damper action, Pipe joints, device for securing, Piston head, Plaiting machine, Planing machine cutting tool, Plow, C. H. Carter, Plow, ditching, Plow, hillside, Plow, riding sulky, Pneumatic dispatch tube receiver, Pneumatic tube carrier, Press mat, Propeller, vibrating, Pump, force, Pump, steam, Pump, steam, C. P. Deane, Railway elevated, Railway signal, Railway signaling mechanism, Railway spike, Railways, machine for preparing ballast and ballasting, Reclining chair, Refrigerator, Rein attachment, overdraw check, Rivet, Rock crushing machine, Rocking chair, Rolling car axles, machine for, Rolling certain sections of T rails, machinery for, Roofing, slate, Ruier, proportional parallel, Saccharated extracts, Saccharification of amylaceous matters by malt, etc., Saddle, riding, Sash fastener, Scale beam, Scraper, road, Screw seat, rotary, Seeding machine, Sewing machine, Sewing machine, Partridge & Kitzmiller, Sewing machine, button hole, Shade holder, Shears for cutting metal plates, Shipping case, Soldering machine, Sorghum or sugar evaporator, Spool exhibiting case, Steam meter, Steam trap, automatic, Steering apparatus, steam, Stigmographs, vulcanized rubber pad for, Stocking blanks, cutting out, Stove extinguishing device, Stove grate, Stove grate, A. W. Eldredge, Stove grate, P. Good, Stove grate, J. D. Pierce, Stove, oil, Stove rack or shelf, Surgical and invalid chair, adjustable, Swing, D. B. Clement, Swinging gate, automatic, Telegraph conductors, underground conduit for, Telephone, J. W. Clark, Telephone, T. A. Watson, Telephone, contact, Telephone, microphonic, Telephone switch, Thill coupling, Thill support, Thrasher and separator, Tire tightener, Toy, J. H. Bowen, Toy picture, dissected, Truck, plow, Trucks, bolster for car, Trucks, former for arch bars of car, Tweezers, Twisting machines, etc., stop motion mechanism for, Valve, balanced, Valve gear, Varnishes, application of, Vehicle, W. Collin, Vehicle spring, L. C. Wood, Vehicle spring brace, Velocipede, Veneer cutter presser bar, Violin, E. Berliner, Wagon running gear, Wardrobe, cabinet, Warper, T. C. Entwistle, Washing and wringing machine, combined, Water wheel, turbine, Wells, etc., drilling tool for oil, Wheat heater, Wheelwright's gauge, Whip, Wind engine, Windmill, Wire tubes, machine for making, Yoke, horse, C. M. Hall, 242,555 242,597 242,622 242,643 242,422 242,687 242,638 242,622 242,646 242,659 242,572 242,671 242,640 242,613 242,565 242,588 242,671 242,653 242,645 242,552 242,412 242,466 242,686 242,569 242,540 242,629 242,589 242,630 242,545 242,452 242,584 242,535 242,587 242,564 242,549 242,683 242,524 9,747 242,652 242,541 242,649 242,513 242,672 242,519 242,435 242,463 242,657 242,596 9,743 242,468 242,460 242,579 242,448 242,735 242,430 242,586 242,464 242,728 242,427 242,433 242,642 242,641 242,599 242,624 9,744 242,713 242,729 242,734 242,708 242,454 242,570 242,487 242,500 242,704 242,576 242,554 242,538 242,610 242,647 242,692 242,527 242,426 242,449 242,499 242,662 242,664 242,661 242,515 242,551 242,428 242,604 242,660 242,689 242,701 242,680 242,732 242,714 242,626 242,479 9,738 242,508 242,450 242,697 242,489 242,458 242,459 242,553 242,567 242,486 242,609 242,440 242,606 242,712 242,614 242,558 242,581 242,733 242,555 242,597 242,622 242,643 242,422 242,687 242,638 242,622 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