

A GREAT PAPER.

We desire to call the attention of our readers to one of the greatest newspapers of the age—one that secures the best writers in this country and Europe, regardless of expense; has the best and fullest book reviews of any paper in the country; has able articles upon financial subjects; has departments devoted to Fine Arts, Biblical Research (something that cannot be found in any other newspaper in the United States), Farm and Garden, Insurance, Weekly Market Reports, Cattle Market, Prices Current, Dry Goods Quotations etc.—in fact, a newspaper fully suited to the requirements of every family, containing a fund of information which cannot be had in any other shape, and having a wide circulation all over the country and in Europe. We refer to THE INDEPENDENT, of New York. "The largest, the ablest, the best." See advertisement, in another column, and send for specimen copy.

SCIENCE IN AID OF THE HOUSEWIFE.

Mending all kinds of clothing, table and bed linen, etc., and elegant embroidery, is now done on the Wilson Oscillating Shuttle Sewing Machine, without an attachment. Wonders will never cease in this age of progress.

Through a number of years the H. W. Johns Mfg Co. have established an enviable reputation for making liquid paints that are remarkable for their durability and beauty. Their Asbestos Liquid Paints have real merit, and all who contemplate painting their farm and other buildings should bear this in mind. We can gladly refer the reader to our recommendations of this firm and its paints in the past.—*American Agriculturist*, November, 1880.

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 publishers of this paper guarantee to advertisers a circulation of not less than 50,000 copies every weekly issue.

Chard's Extra Heavy Machinery Oil.

Chard's Anti-Corrosive Cylinder Oil.

Chard's Patent Lubricant and Gear Grease.

R. J. Chard, Sole Proprietor, 6 Burling Slip, New York.

The Mackinnon Pen or Fluid Pen. The commercial pen for the age. The only successful reservoir pen in the market. The only pen in the world with a diamond circle around the point. The only reservoir pen supplied with a gravitating valve, others substitute a spring, which soon gets out of order. The only pen accompanied by a written guarantee from the manufacturers. The only pen that will stand the test of time. A history of the Mackinnon Pen and its uses, with prices, etc., free on application. Mackinnon Pen Company, 200 Broadway, New York.

We may look for a long winter. Be sure and see that your roofs are in order. The genuine Asbestos Roof Paints for restoring and preserving roofs, are strictly first-class articles, and are the cheapest, quality considered, of any in use. The H. W. Johns Mfg Co., 87 Maiden Lane, New York, are the sole manufacturers.

Among the numerous Mowing Machines now in use, none ranks so high as the Eureka. It does perfect work and gives universal satisfaction. Farmers in want of a mowing machine will consult their best interests by sending for illustrated circular, to Eureka Mower Company, Towanda, Pa.

Wanted—First-class Novelty and New Patents, suitable for city canvassers. Will buy or sell on royalty. Buckeye Novelty Works, 66 Courtlandt St., New York.

OSWEGO STARCH FACTORY, N. Y., Oct. 28, 1878.

H. W. Johns, 87 Maiden Lane.

DEAR SIR. We have several acres of your Asbestos Roofing on our buildings. The first roof, put on fifteen years ago, is in good condition, and we prefer it to any other.

Yours respectfully,

T. KINGSFORD & SONS.

Wanted—A Man as Superintendent and Foreman of Machine and Foundry (N. Y. State). Manufacturing a specialty. Good business and mechanical ability required. Giving antecedents, references, and salary desired. Address Iron, P. O. Box 255, New York City.

We recommend Messrs. Boomer & Boschert's Cider Press to every one manufacturing cider or vinegar. The results of the process are wonderful as regards quantity and quality. Send for illustrated catalogue, with prices. Boomer & Boschert, 15 Park Row, N. Y.

For Heavy Punches, Shears, Boiler Shop Rolls, Radial Drills, etc., see illustrated adv. in our last number.

The Inventors Institute, Cooper Union Building, New York. Sales of patent rights negotiated and inventions exhibited for subscribers. Send for circular.

Peerless Colors—For coloring mortar. French, Richards & Co., 410 Callowhill St., Philadelphia, Pa.

The practical printer who penned a pen to the pen must have had on his mind one of Esterbrook's Falcon Pens, the most popular in use.

Wanted—A Manufacturer of Builders' Hardware to make and introduce a small article. W. J. Decker, 408 West 45th St., New York.

Lenses for Constructing Telescopes, as in Sci. Am. SUPPLEMENT, No. 282, \$6.50 per set; postage, 9 cts. The same, with eye piece handsomely mounted in brass, \$8.00. McAllister, Mfg Co., 49 Nassau St., N. Y.

No. 4 Blandell Drill, good as new, Bolt Cutter, several Second-hand Lathes, Engines, and Boilers, for sale by Wm. M. Hawes, Fall River, Mass.

Fragrant Vanity Fair Tobacco and Cigarettes. 7 First Prize Medals—Vienna, 1873; Philadelphia, 1876; Paris 1878, Sydney, 1879—awarded Wm. S. Kimball & Co., Rochester, N. Y.

Superior Malleable Castings at moderate rates of Richard P. Pim, Wilmington, Del.

Wood-Working Machinery of Improved Design and Workmanship. Cordesman, Egan & Co., Cincinnati, O. Jenkin's Patent Gauge Cock; best in use. Illustrated circular free. A. W. Cadman & Co., Pittsburg, Pa.

Wanted—First-class Agents in all Cities to sell Novelty. Will give exclusive right in Cities and States to competent men. Buckeye Novelty Works, 66 Courtlandt St., New York City.

The E. Stebbins Manufg Co. (Brightwood, P. O.), Springfield, Mass., are prepared to furnish all kinds of Brass and Composition Castings at short notice; also Babbitt Metal. The quality of the work is what has given this foundry its high reputation. All work guaranteed.

The "1880" Lace Cutter by mail for 50 cts.; discount to the trade. Sterling Elliott, 282 Dover St., Boston, Mass.

The Tools, Fixtures, and Patterns of the Taunton Foundry and Machine Company for sale, by the George Place Machinery Agency, 121 Chambers St., New York.

Improved Rock Drills and Air Compressors. Illustrated catalogues and information gladly furnished. Address Ingersoll Rock Drill Co., 1½ Park Place, N. Y.

Collection of Ornaments.—A book containing over 1,000 different designs, such as crests, coats of arms, vignettes, scrolls, corners, borders, etc., sent on receipt of \$2. Palm & Fechteler, 403 Broadway, New York City.

Packing once tried always used. Phoenix Packing from 1-16 up in spools or on coils. Phoenix Packing Company, 108 Liberty St., N. Y.

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

Green River Drilling Machines. See ad. p. 333.

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

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

Skinner & Wood, Erie, Pa. Portable and Stationary Engines, are full of orders and withdraw their illustrated advertisement. Send for their new circulars.

Penfield (Pulley) Blocks, Lockport, N. Y. See ad. p. 348.

Tyson Vase Engine, small motor, 1-33 H. P.; efficient and non-explosive; price \$50. See illus. adv., page 348.

Power, Foot, and Hand Presses for Metal Workers. Lowest prices. Peerless Punch & Shear Co., 52 Dey St., N. Y.

Recipes and Information on all Industrial Processes. Park Benjamin's Expert Office, 50 Astor House, N. Y.

For the best Stave, Barrel, Keg, and Hogshead Machinery, address H. A. Crossley, Cleveland, Ohio.

National Steel Tube Cleaner for boiler tubes. Adjustable, durable. Chalmers-Spence Co., 40 John St., N. Y. For Mill Mach'y & Mill Furnishing, see illus. adv. p. 349.

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

Gun Powder Pile Drivers. Thos. Shaw, 915 Ridge Avenue, Philadelphia, Pa.

Light and Fine Machinery to order. Foot Lathe catalogue for stamp. Chase & Woodman, Newark, N. J.

For Separators, Farm & Vertical Engines, see adv. p. 349.

Tight and Slack Barrel machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv. p. 349.

Elevators, Freight and Passenger, Shafting, Pulleys and Hangers. J. S. Graves & Son, Rochester, N. Y.

For Patent Shapers and Planers, see illus. adv. p. 349.

Steam Engines; Eclipse Safety Sectional Boiler. Lambertville Iron Works, Lambertville, N. J. See ad. p. 349.

Best Oak Tanned Leather Belting. Wm. F. Forepaugh, Jr. & Bros., 531 Jefferson St., Philadelphia, Pa.

Stave, Barrel, Keg, and Hogshead Machinery a specialty, by E. & B. Holmes, Buffalo, N. Y.

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

Silent Injector, Blower, and Exhauster. See adv. p. 348.

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

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

Pays well on small investments.—Magic Lanterns and Stereopticons of all kinds and prices. Views illustrating every subject for public exhibitions and parlor entertainments. Send stamp for 16 page catalogue to McAllister, Mfg Optician, 49 Nassau St., New York.

Catechism of the Locomotive, 625 pages, 250 engravings. The most accurate, complete, and easily understood book on the Locomotive. Price \$2.50. Send for a catalogue of railroad books. The Railroad Gazette, 73 Broadway, New York.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 348.

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

The only economical and practical Gas Engine in the market is the new "Otto" Silent, built by Schleicher Schumm & Co., Philadelphia, Pa. Send for circular.

Clark Rubber Wheels adv. See page 317.

National Institute of Steam and Mechanical Engineering, Bridgeport, Conn. Blast Furnace Construction and Management. The metallurgy of iron and steel. Practical Instruction in Steam Engineering, and a good situation when competent. Send for pamphlet.

Peck's Patent Drop Press. See adv., page 333.

Reed's Sectional Covering for steam surfaces; any one can apply it; can be removed and replaced without injury. J. A. Locke, Agt., 32 Courtlandt St., N. Y.

For Yale Mills and Engines, see page 316.

Downer's Cleaning and Polishing Oil for bright metals, is the oldest and best in the market. Highly recommended by the New York, Boston, and other Fire Departments throughout the country. For quickness of cleaning and luster produced it has no equal. Sample five gallon can sent C. O. D. for \$8. A. H. Downer, 17 Peck Slip, New York.

Blake "Lion and Eagle" Imp'd Crusher. See p. 333.

Presses, Dies, and Tools for working Sheet Metal, etc. Fruit & other can tools. Bliss & Williams, B'klyn, N. Y. Eclipse Portable Engine. See illustrated adv., p. 317.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 349. For Wood-Working Machinery, see illus. adv. p. 349.

4 to 40 H. P. Steam Engines. See adv. p. 317.

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

Sheet Metal Presses, Ferracute Co., Bridgeton, N. J.

Wright's Patent Steam Engine, with automatic cut off. The best engine made. For prices, address William Wright, Manufacturer, Newburgh, N. Y.

Saw Mill Machinery. Stearns Mfg. Co. See p. 333.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 349.

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

50,000 Sawyers wanted to send their full address for Emerson's Hand Book of Saws (free). Over 100 illustrations and pages of valuable information. How to straighten saws, etc. Emerson, Smith & Co., Beaver Falls, Pa.

NEW BOOKS AND PUBLICATIONS.

ELECTRICITY. By Professor Curt W. Meyer. New York. Paper, pp. 25.

An elementary guide book of practical experiments, prepared to accompany the student's portable electrical machine and apparatus sold by Mr. Meyer. Mr. Meyer is doing good work in preparing for students and schools, at relatively small cost, sets of apparatus for practical experiments in physics and chemistry. The series of experiments described in this pamphlet are such as any bright boy or girl might try and in so doing gain a real knowledge of the fundamental principles of electrical science.

COTTAGE HOSPITALS: THEIR PROGRESS, MANAGEMENT, AND WORK. By Henry C. Burdett. Philadelphia: Presley Blakiston.

A second edition, rewritten and much enlarged, of Mr. Burdett's valuable work on cottage hospitals. His aim has been to embrace everything of importance to the successful management of hospitals and medical institutions having not more than 50 beds. A chapter has been added on cottage hospitals in this country, the number of which is far too few. It is to be hoped that this instructive volume will be the means of their more general adoption in our larger towns and villages.

ANGUS'S PRACTICAL STAIR RAILING. Grand Rapids, Michigan: Charles Angus.

Ten folio plates, scale three inches to the foot, for the use of practical carpenters and joiners who have occasion to construct stair railing.

STRESSES IN BRIDGE AND ROOF TRUSSES, ARCHED RIBS, AND SUSPENSION BRIDGES. By Wm. H. Burr, C.E. New York: John Wiley & Sons. 8vo, pp. 344, xii. plates. \$3.50.

A text book prepared for the department of civil engineering at the Rensselaer Polytechnic Institute.



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) B. E. N. writes: 1. There is a lighting rod agent about here who claims that his rod will attract at either end and throw the discharge out at the other. Said rod has no ground connections, simply an insulated rod fastened to the ridge of the roof of the building, with bright points at either end. What is it good for? A. Nothing. 2. What per cent of the power could be realized by converting motion from a windmill into air pressure, and using said pressure to run an engine, supposing the windmill to be 6 horse power with 10 mile wind? A. Probably not over 35 to 40 per cent.

(2) H. M. P. asks: 1. What length of stroke I would want on a pump ¼ inch in diameter, to feed a boiler running an engine of 1½ inch bore, 3 inch stroke, running 300 revolutions per minute at 60 lb. pressure, the pump to work continuously? A. Two inch stroke will be sufficient. 2. Is there any method of bluing or blackening brass so as to resemble the bluing on a rifle barrel? A. Pour muriatic acid over arsenic (arsenious acid), and allow it to dissolve as much as possible of the arsenic; dip the articles in the solution, or rub on the solution with a swab.

(3) W. A. O. writes: I have a portable saw mill. When it was built it had a 16 inch stroke, but for some reason it was changed to an 18 inch stroke, which makes the piston head run within ¼ of an inch of the cylinder head. Will it add or diminish the power to have a new crank and shorten the stroke back to 16 or 17 inches? A. It will diminish the power, if run with the same steam pressure and same velocity. If you wish more clearance, put a joint ring ¼ inch thick, under the cylinder heads.

(4) N. L. asks: 1. How fast will an over-shot wheel, 30 feet in diameter, run with one bucket to the foot, each bucket to receive 1 gallon of water? A. May run 4 to 4½ revolutions per minute. 2. What would be its power? A. 2½ to 2¾ horse power. 3. What speed ought a three-foot mill stone to run? A. 180 to 200 revolutions per minute. 4. Will the above wheel run a three foot stone? A. Only about half its proper speed. 5. How many bushels of corn will such a wheel grind per hour? A. Probably not over 1½ bushels.

(5) G. R. asks for information regarding the process of reducing ore by Robertson's method. A. Consult Percy's Metallurgy.

(6) E. M. K. asks: Can you inform me where I can obtain receipts (in printed form) of the most modern and practical methods of nickel plating, as used by those making fine saddlery hardware? A. See SCIENTIFIC AMERICAN, No. 10, Vol. 43, p. 153.

(7) J. W. asks: How many pounds and what size wire should I use in the construction of a dynamo-electric machine, as described in SUPPLEMENT, No. 161, designed especially for practical silver plating? A. The sizes given in the article referred to will be right.

(8) J. J. D. asks for the name of some book on practical distilling and rectifying. A. Byrn's "Practical Distiller;" Duplais's "A Treatise on the Distillation of Alcoholic Liquors, etc." 2. Would a copper shell that could be pushed into the breech of a 32-lb. field cannon with the hands after the first shot is fired be too tight to be pushed in with the hands the second time? A. No. 3. What is used in dying pearl, such as buttons, to fasten the color so as not to polish off in buffing them on a wheel? A. Buff first with a cork and dilute oil of vitriol. Use the coal tar dyes.

(9) J. & J. T. ask for the best known means of preventing paint from lifting off the surface of iron plates. The trouble referred to apparently arises from the spots of rust which lie in the hollow spots on surface of the plates. It seems impossible to clean the hollows. A. Try a little alcoholic shellac before painting.

(10) N. B. writes: I have a smoke stack over my furnace, 20 inches diameter, 30 feet high. Could I get a better draught by letting steam escape through stack? If so, at what distance from the flues must I insert my escape pipe? A. Yes; insert the pipe just above the outlet of the flues, and put an elbow on the end so that the discharge may be directly upward in the center of the stack.

(11) W. J. writes: In looking over my paper of November 13, on page 315, query No. 17, C. D. A. asks where in Michigan an engineer can be examined to obtain a license? In answer, will say at Detroit, Port Huron, and Grand Haven.

(12) S. D. M. writes: 1. I have a small quantity of mercury which is amalgamated with zinc; can I distill it in an ordinary retort (glass)? If not, will you state the best and simplest way. A. No. Use an iron tube closed at the base, and bent so that the closed end may retain the mercury, while the other serves as the beak and condenser; wrap the latter with a wet cloth, which may extend into the basin of water in which the distilled metal will collect. 2. A friend and I have had a discussion and would like you to settle it. Which would be stronger: a sleeve button back hard soldered on a cup shape plate, and the plate soft soldered on the sleeve button, the edges of the plate only having solder; or the back hard soldered on a flat plate and soft soldered on the sleeve button? A. The soft soldered joint would be the strongest in the latter case. 3. What would be the best way of refining, say, 40 dwts. of 12 k. gold to get pure gold and at the same time to recover the silver and copper? A. Melt in a small black lead crucible with about an equal weight of silver (or copper), pour in a thin stream into cold water (to granulate), and boil in pure nitric acid until action ceases. The gold will be found undissolved at the bottom (a brownish black mass or powder). Decant the liquid, wash the residue, and fuse it in a crucible. Precipitate the silver from the liquid by addition of hydrochloric acid, gather it on a filter, wash with hot water, mix with a quantity of dilute sulphuric acid (acid 1, water 5), and add a few strips of zinc. The zinc will dissolve, and the silver be reduced to metallic form. Wash, dry, and fuse the silver sponge. The copper may be obtained from the liquid by adding zinc. As the zinc dissolves the copper is deposited in its place.

(13) J. A. asks: Is there any process known for making black sun prints except by the use of nitrate of silver, or is there any chemical like that used in the cyanotype or blue process that will produce a black instead of blue? A. We know of no simple and satisfactory process. See Vogel's "Chemistry of Light and Photography."

(14) J. P. McD. writes: I have constructed an armature containing about ten pounds of wire, somewhat like Siemens. I was compelled to wrap it tight in order to make the wire lie even. I afterwards varnished the whole with shellac, but I find when I connect the ends of wire to a battery that the circuit is closed no matter what ends are connected. I do not think that any of the wires make direct contact in the coils. The question is, does the current jump across? does it connect by induction? or have I actually wrapped them in contact? Please give me your opinion in the columns of your paper, and likewise inform me if such action will interfere with the working of the machine. Two cells of gravity battery were used in testing. A. It is probable that you have drawn the wire strands so tightly across the iron core as to cut the insulation of the copper wire and make a short circuit through the iron. You should place thick paper or cloth between the copper wire and the core of the armature to prevent accidents of this kind. Your armature is useless in its present state.

(15) R. S. writes: In the article on "Spurious Indian Relics," in the SCIENTIFIC AMERICAN of the 16th of October, you allude to an announcement by some Western journal, of the finding of a fine specimen of the discoidal stone, and you say you are inclined to believe of such stones, like Professor Cox of Indiana, that they are simply "a natural production, a piece of water worn rock, made smooth by continual rollings." I know of a number of these discoidal stones in this part of the country. I have had several, and new have two as fine specimens as I have seen, made of nearly white quartz, translucent, highly polished, smooth as glass, and seemingly as symmetrical and true as a piece of wood can be formed in the lathe of the present day. I have one or two unfinished ones, made of coarse granite, with no attempt at making them circular, but with saucer like cavities on both sides of the stone. I believe the most skeptical would be convinced on examining these discoids, that they are not "natural pro-

ductions," but are the product of skilled "human workmanship." There is no difficulty in perceiving a striking difference between a flint implement or arrow head and a splinter of quartz.

(16) H. C. W. asks: 1. If an engine of 100 horse power propels a boat 5 miles per hour, will an engine of 200 horse power double or quadruple the speed? A. The power required is as the cube of the speed. It would require 8 times the power for 10 miles per hour, that would be necessary for 5 miles. 2. If two cannon balls, one weighing 8 and the other 2 pounds, be fired with the same velocity, which will go the further? A. The larger one.

(17) W. E. writes: 1. I have a lot of grapes that I want to keep on the stems until the middle of the winter. How can I do it? A. Dip the ends of the stems in melted paraffine and pack the bunches in tight boxes, with or without a packing of cotton. 2. Can you refer me to any paper that has an article on hammering saws? A. See SCIENTIFIC AMERICAN, Vol. 36, page 259.

(18) T. B. asks: What is spelter composed of? Dictionary says, an impure zinc. Is that the same as the spelter commonly sold in the stores for brazing purposes? A. No. Spelter for brazing copper and iron is composed of copper 1 part, zinc 3 parts. Melt the copper, then add the zinc. When the alloy has cooled sufficiently to become solid, pulverize coarsely in an iron mortar.

(19) C. E. B. asks: 1. How can I put a hole through the bottom of a glass bottle? A. By means of a very hard drill wet with turpentine. 2. Will a wooden rod coated with shellac varnish make a good insulator? A. It will answer for some purposes, but is not so good as glass. 3. In making the resinous cake for an electrophorus I find the resin (when used alone) to be too brittle. Can you tell me of anything that I can mix with the resin so as to obviate the above difficulty? A. Use a mixture consisting of shellac 5 parts, wax 1 part, pitch 1 part. 4. In making a Leyden jar, what is the tin foil put on? A. Shellac varnish. 5. It is a very difficult matter to put the tin foil on the inside of a Leyden jar. Can you give me directions for anything else that I could put on with less difficulty? A. You may fill your jar half full of crumpled pieces of tin foil.

(20) J. H. S. writes: I am using a gelatine copying pad which I have made myself. I find it very useful, but experience some trouble in washing the ink off. Can you tell me of some method which will take the ink off easily? A. If you allow the ink to remain it will be absorbed in a few hours so that it will not print. This renders it unnecessary to wash the pad.

(21) F. H. S. asks: 1. Which has the most power, pressure of steam being equal and cylinder the same size, an oscillating or ordinary eccentric engine? A. Practically there is scarcely any difference. 2. Can you also refer me to any number of the SCIENTIFIC AMERICAN which contains plain directions for making either kind, that a good mechanic could follow? A. There are no such instructions published in the SCIENTIFIC AMERICAN, nor can you find them published, except perhaps scattered through a number of books.

(22) R. A. R. writes: I see mention made of graphite as a lubricant. Is it, as is claimed, far superior to oil as a lubricant and a remedy for hot journals, friction between wearing parts of a machine, etc.? Is it what it is claimed to be? A. Graphite, or black lead, has long been used with oil as a lubricant, in troublesome cases, but care must be taken that the graphite is clean and fine, otherwise it will not answer well.

(23) W. E. C. asks: Can you give me the rule to find the vertical height of a ball governor, the number of revolutions being given? I am thinking of making a different governor for our engine. The present one runs 56 revolutions, and the vertical height is 16 inches. According to the rule (188 / revolutions)^2 = height—the height is only 11 2/3 inches. I want to run the new one 78 revolutions, but this rule don't appear a safe one. A. Your rule appears to be correct. Another method is to calculate the number of vibrations of a pendulum of the given length, the revolutions of a governor will be half the number of vibrations.

(24) R. L. S. writes: In a late work on philosophy I notice the author makes a difference between "momentum" and "striking force." He says momentum "is equal to the weight of the body multiplied by its velocity per second expressed in feet," and that the "striking force of a body is equal to its weight multiplied by the square of its velocity." Example: A bullet weighing two ounces, fired with a velocity of 1,400 feet per second, would strike with a force of 245,000 pounds. Is there any difference between momentum and striking force? Please explain. A. Momentum means the mechanical effect which a body in motion will produce in a moment (second) of time, and is as the weight multiplied by its velocity. "Striking force,"—"Force of Impact," and "Vis Viva"—all these terms mean the same thing; the whole mechanical effect which a body in motion will produce in being brought to rest, no regard being had to the time in which the effect is produced, and is as the weight multiplied by the square of its velocity.

(25) A. D. asks: What sort of hose, rubber, cotton, linen, etc., is most durable for country use with lawn sprinklers, etc., the size being 1 1/4 inch? A. Cotton or linen; but it must be carefully drained and dried after use; but if this cannot be done, then "carbolic" rubber hose is to be preferred.

(26) C. M. D. writes: Yesterday I watched the engineer while boiler-cleaning, and find on the bottom of shell there had formed scale. This was broken up in small pieces and left the iron voluntarily. All did not come off, and the thickness varied. I have never tried any of the compounds advertised to prevent scale; have always been warned against them. Some say that potatoes are a preventive or loosener, some say crude oil. One remedy suggested by one of the best machinists in the city was to blow out, half way down,

twice a week. Now please give me your idea of the last-named preventive and such other information as you think will be beneficial. A. The blowing down is good; only instead of blowing half way down twice a week, blow down two inches once a day. Potatoes in small quantity are good, so also is a small quantity of crude petroleum oil.

(27) G. S. C. asks: Can you tell me the cause of the Indian summer haze, so frequently remarked? A. Mainly due to vapors rising from decaying (fermenting) leaves, recently fallen; partly to smoke from burning leaves, swamp grasses, prairie fires, etc.

(28) E. L. asks: 1. Can water through heavy pressure in a heater get above 212° Fah.? A. Yes. 2. How is the best tailor's chalk made? A. It is a natural mineral (talc).

(29) W. E. P. asks: 1. How fast should the teeth of a circular saw run in sawing hard wood into lumber, to get the best effect of the steam? A. 8,000 to 9,000 feet per minute. 2. How fast should a pair of 30 inch underrunner burrs run in grinding corn? A. About 260 revolutions per minute. 3. What is the practical difference between hemp and ring packing for cylinders? A. Ring or metallic packing has less friction and will keep tight much longer. 4. How are 2 1/2 inch engines packed? A. Best packed with metallic rings.

(30) J. S. N. asks: 1. What is the least depth that paddle wheels should be immersed in water to work well on a boat 20 inches deep? A. Should not dip less than 6 to 8 inches. 2. Should I have 4 or 6 buckets, if I make 100 revolutions per minute? A. Should have a sufficient number that at least one bucket has constantly full dip. You cannot work successfully at 100 revolutions per minute with a paddle-wheel.

(31) E. W. asks for a recipe for ebonizing wood. A. Apple, pear, and walnut, if fine grained, may be ebonized by the following process: Boil in a glazed or enameled iron vessel with water, 4 oz. of ground galls, 1 oz. of logwood chips, and 1/4 oz. each of green vitriol and crystals of verdigris. Filter while warm, and brush the wood over with this repeatedly. Dry and brush over with strong cold solution of acetate of iron and dry. Repeat this several times, and finally dry in an oven at a moderate temperature, and oil or varnish.

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

E. H.—Scales of mica and carbonate of lime.—W. W. A.—Not a petrifact—but partially altered hornblende.—C. H. C.—It is hornblende rock.—F. D. H.—Hornblende.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were

Granted in the Week Ending

November 2, 1880,

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.

Table listing inventions with patent numbers, including: Acid, apparatus for burning sulphur to produce sulphuric, H. Glover, 234,025; Advertising device, A. S. Wetmore, 233,958; Air compressor, H. C. Sergeant, 233,881; Aluminous cake, making, Bihn & Heerlein, 233,916; Animal trap, J. C. W. Boice, 233,917; Awning frame, E. C. Cook, 233,987, 233,988; Auger, post hole, M. M. Hubby, 233,931; Axle arm, vehicle, E. D. Ives, 233,932; Bag fastener, W. C. Joslin, 233,935; Bag fastening, C. Appleton, 233,906; Bag holder, L. A. Fish, 234,012; Bag lock, Conlan & O'Neil, 233,921; Bag tie, L. A. Fish, 234,011; Bails, machine for forming eyes on wire, J. Geiger, 234,022; Bale tie, J. G. Battelle, 233,913; Bed pan, W. M. Seaby, 234,076; Bedstead, wardrobe, M. Crosby, 233,991; Bell, electric call, M. L. Baxter, 233,834; Bench dog, P. Cook, 233,986; Birds, trap for catching, I. B. Dolley, 234,004; Blow-pipe, T. C. Stevens, 233,951; Blower or exhaust, L. S. Fithian, 234,014; Book cover protector, Wardwell & Lettenmayer, 234,006; Book holder, receipt, R. B. Dickey, 234,001; Book press, W. E. Waters, 234,097; Boot and shoe shank support and protector, Hadley & Joyce, 234,030; Boots and shoes, shave for making Scotch sole edges on, A. E. Johnson, 234,038; Bottle dropping, F. M. Dixon, 234,003; Bottle stopper, J. Q. Houts, 234,036; Box fastener, H. E. Clinton, 233,984; Brick machine, T. H. Andrews, 233,909; Brick machine, G. H. Williams, 234,101; Bridge gate, draw, T. J. Gray, 233,926; Bronze, producing aluminum, J. Webster, 233,900; Buttons or studs, manufacture of, H. B. Morris, 233,889; Buttons, producing designs on, C. L. Woolbridge, 234,106; Calculator, J. S. Duret, 233,840; Capsules, making, C. Cheswright, 233,980; Car brake, Gue & Field, 233,850; Car brake, atmospheric, L. P. Wendell, 233,957; Car coupling, J. N. Best, 233,971; Car coupling, D. Keethler, 234,111; Car coupling, L. C. Stonecker, 234,082; Car platform gate, J. S. Savage, 234,072; Car roof, I. H. Randall, 234,063; Car starter, Goodridge & Pope, 234,028; Car, stock, C. G. James, 234,036;

Table listing inventions with patent numbers, including: Car, stock, J. Kay, 233,866; Car wheel, J. H. Watt, 234,098; Car window cinder fender, G. W. Smith, 233,883; Carbureting apparatus, G. H. Burrows, 233,978; Carbureting apparatus, W. J. Ormsby, 234,055; Carbureting apparatus, J. Ruthven, 234,108; Carpet cleaning machine, W. McArthur, 234,049; Carpet sweeper, G. W. Gates, 234,021; Carriage bow, F. D. Parry, 233,873; Carriage, child's, C. E. Fosburgh, 234,016; Cartridge shot, S. W. Paine, 233,946; Celluloid collars, cuffs, etc., elastic die for pressing, A. A. Sanborn, 233,878; Celluloid, decorating, Hart & Bacon, 233,851; Chair legs, elastic tip for, W. B. Estabrooks, 233,843; Check roller, A. J. Simmons, 234,061; Chuck, drill, P. A. Reno, 234,066; Chuck, planer, J. H. Greenwood, 233,846; Churn, T. C. Cooper, 233,985; Churn dasher staff, L. T. Reid, 234,065; Clasp, E. M. Bear, 233,964; Coffee or rice mill, F. A. Gardner, 234,019; Collar, horse, J. B. Hampton, 233,929; Colters, machine for flattening and sharpening plow, J. T. Duff, 234,006; Commodore, etc., cover for, H. P. Stichter, 233,890; Cotton, process of and apparatus for separating trash from seed, W. P. Groom, 233,847; Counter and mat, bar, Groat & Burk, 234,028; Crocheting machine for making looped fabrics, C. Young (r), 9,447; Cuff holder, E. W. Wickersham, 234,100; Cultivator and cotton chopper, J. W. Gilbert, 234,023; Cultivator and seeder, combined, J. H. Jones, 233,934; Cultivator plow attachment, H. J. Potter, 234,060; Curtain fixture, G. L. Bailey, 233,961; Cut-off, rain water, D. Brady, 233,972; Cut-off, water, McLeod & Cormack, 233,943; Dental engine hand piece, J. W. Gilbert (r), 9,443; Disintegrating and decorticating fibrous plants, machine for, J. H. Brown, 233,976; Door hanger, C. W. Bullard, 233,836; Door spring, T. Crane, 233,837; Dust pan and brush holder, J. F. Houghton, 233,897; Dwelling, etc., ventilator, J. F. Baldwin, 233,962; Edge setting machine, J. Edson, 233,842; Electric machine, dynamo, H. S. Maxim, 233,942; Electric lighting circuits, system of, C. M. Ball, 233,831; Electrical switch board, S. Bergmann, 233,968; Envelope, H. S. Crooke, 233,923; Exhaust mechanism, J. D. Brown, 233,836; Eye protector, P. Johnson, 234,039; Fare register, J. B. Benton, 233,915; Faucet, lock, A. H. Parker, 233,872; Feeding cattle, apparatus for, D. A. Snell, 233,888; Fence barb and barbed wire cable, G. C. Baker, 233,832; Fence, barbed wire, T. Shuman, 234,080; Fence post, T. G. Orwig, 233,871; Fertilizer distributor, Sheldon & Peacock, 234,079; Fifth wheel, W. H. Thurber, 233,897; File and binder, J. A. Austin, 233,910; Filter, A. & E. Lister, 233,940; Finger ring, D. Untermyer, 234,093; Firearm, breech-loading, H. F. Wheeler, 233,901; Fire escape ladder, Cummings & Harrison, 233,998; Flax, hemp, etc., machinery for breaking and scutching, J. Shinn, 233,949; Flood gate for tile drains, E. M. Heafer, 233,853; Flour and meal chest, J. Fishero, 234,013; Flue cleaner, boiler, W. S. Levaque, 234,044; Folding chair, D. N. Selleg, 233,880; Folding machine, L. C. Crowell, 233,994 to 233,997; Food, an article for cattle, W. H. Smith, 233,856; Fruit in cans, siruping, J. A. Taylor, 233,895; Fuel, W. H. Smith, 233,884; Furnaces, lining, A. S. Dunning (r), 9,444; Gas generator, T. Van Kannel, 233,966; Gas, process of and apparatus for generating, E. J. Jerzmanowski, 233,860; Gas, process of and apparatus for making illuminating, E. J. Jerzmanowski, 233,862; Gelatine, manufacture and ornamentation of sheets of, W. V. Brigham, 233,973; Glass house pot, G. Zimmerman, 233,904; Glove fastening, H. W. Ducker, 234,005; Governor and safety appliance to elevators, G. Dryden, 233,841; Grain binder, J. H. Haughawout, 233,852; Grain separator, J. F. Hatfield, 234,034; Grain separator, magnetic, Cook & Thayer, 233,920; Grate bar, T. Matland, 234,047; Grinding and triturating apparatus, T. T. Morrell, 234,052; Hand drill, J. W. Burkholder, 234,109; Harvesters, head for compound cutter bars for, Mason & Groat, 233,866; Hat brims, cord edge for, J. S. Bancroft, 233,912; Hatchway guard, self-closing, E. G. Kendall, 234,012; Hay barrock, L. Gillig, 234,024; Hay elevator, A. H. Smith, 234,083; Heddle frame, S. Sewall, Jr., 234,077; Heel stiffeners, mechanism for the manufacture of, R. Glover, 233,848; Hinge, T. Fowler, 234,018; Hinge, lock, J. Broughton, 233,975; Hoe, tobacco, O. W. Goslee, 233,849; Hoisting engine, hydraulic, H. G. Morris, 234,053; Hoop and method of dressing and coiling hoops, barrel, J. Naylor, Jr., 233,870; Hose reel, J. Q. Crosby, 233,990; Hub, vehicle wheel, Gandy & Shugert, 234,020; Hydrogen, producing, E. J. Jerzmanowski, 233,861; Inhaling pad, vapor, C. S. Thompson, 233,954; Insulating telegraph wires, machine for, Berthoud & Borel, 233,970; Key, E. Parker, 234,057; King bolts, die for forming, W. Pearce, 234,059; Knob rose, J. F. Peacock, 234,058; Lamp, electric, C. W. Harrison, 234,032; Lamp fixture, extension, F. R. Seidensticker, 233,879; Lamp lighting mechanism, J. & J. Hinks, 233,855; Lamp shade and chimney, comb'd, G. A. Beidler, 233,966; Lamp stand, H. H. Clinton, 233,983; Lantern hanger, E. Lufkin, 234,045; Latch, T. F. McGrath, 233,867; Latch, gate, A. A. Treat, 234,092; Lead and crayon holder, C. Sneider, 234,064; Lead fumes, refining, Lewis & Bartlett (r), 9,442; Leather stripping machine, Wagg & Shaw, 234,094; Leg rest and reclining chair, M. E. Keiran, 234,041; Lifting jack, G. Wollet, 234,105; Liniment, F. E. Marcum, 234,048; Lock and key, C. C. Dickerman, 234,002; Loom, L. J. Knowles, 233,937; Loom heddle, S. Sewall, Jr. (r), 9,446; Loom shuttle, F. J. Freese, 233,925; Lumber, plow for cutting, D. R. Proctor, 234,062; Magneto-electric machine, E. Burtin (r), 9,438; Magnets, device for adjusting the armatures of electro, S. Bergmann, 233,967; Manure, mixed phosphatic, J. C. Perkins, 233,875; Marble or stone, manufacture of artificial, A. M. Richardson, 233,948;

Table listing inventions with patent numbers, including: Metal slotting apparatus, W. H. Taylor, 233,952, 233,953, 234,089; Metal working machine, compound, R. B. Jentsch, 234,087; Mill for reduction, E. P. Baugh, 233,833; Mining machine, coal, J. W. Harrison (r), 9,439; Mould board clamp, W. McNary, 233,868; Motion, device for converting, M. W. Clay, 233,962; Motor for working churns, etc., A. T. Powell, 234,061; Needle, dipping, J. Gardam, 234,110; Nose guard for steel grinders, magnetic, E. Stoddard, 233,891; Nut lock, G. Neilson, 234,054; Oatmeal machine, J. F. Fahs et al., 234,101; Ore grinding mill, R. C. Grant, 234,027; Ore leacher, Schuller & Russell, 234,073; Packer for oil wells, water, J. H. Williams, 234,102; Paper perforating machine, R. T. Smith, 233,882; Paper pulp, beating engine for, Dunn & Le Barron, 233,839; Parer, apple, G. N. Thompson, 233,955; Pen, stylographic fountain, C. H. Downes, 233,924; Permutation lock, H. W. Cverter, 233,922; Permutation lock, E. Stockwell, 233,950; Photographs, coloring and finishing, F. L. Mitchell, 233,944; Picket pointing machine, G. N. Thomas, 233,896; Picture nail, A. D. Judd (r), 9,440; Pin holder, T. J. Pairpoint, 233,874; Pipe and nut wrench, J. C. Stevens, 233,893; Planter, combined corn and cotton, H. H. Carter, 233,979; Planter, corn, T. T. Daniels, 233,999; Planters, check rower for corn, Grush & Lockhart, 233,927; Plow, H. F. Edey, 234,008; Plow, N. H. Foster, 234,017; Plow, sulky, J. Mangas, 234,046; Post office case, Crowder & Halle, 233,992; Press, S. J. Love, 233,941; Pressure regulator for air, etc., C. Moore, 234,051; Printers' leads, etc., machine for cutting, F. S. Taft, 233,894; Printing machine sheet delivery apparatus, L. C. Crowell, 233,993; Pump, J. E. Rogers, 234,069; Purse, coin, W. H. Ellery, 234,009; Railway switch, E. Witsell, 234,108; Railway track scraper, S. A. Otis (r), 9,445; Railway tracks, electro-magnetic switch apparatus for, T. S. Hall, 234,061; Razor, C. J. J. & P. C. Sadler, 234,070; Refrigerator building, J. G. Müller, 233,945; Sad iron and fluting device, combined, C. A. Babcock, 233,830; Sash fastener, A. V. Sanford, 234,071; Sash holder, P. P. Kuehorth, 234,043; Sash, window, T. Sharp, 234,078; Saw, drag, J. Augspurger, 233,907; Sawmill dog, W. J. Wickham, 234,099; Sawing machine, tenon, W. H. Clayton, 233,981; Sewing machines, attachment holder and adjuster for, G. W. Baker, 233,911; Shirt bosom supporter, L. Ruddick, 234,077; Shoes, instep holder for, M. J. Ferren, 233,844; Shutter bower, J. Broughton, 233,974; Shutter fastener, V. D. Dearborn, 234,000; Sifter, ash, J. T. Hastings, 234,033; Skate, roller, W. P. Gregg, 233,845; Sleigh, A. B. Webster, 234,104; Smelting furnace, ore, R. Hinvest, 233,854; Stave jointer, H. A. Crossley (r), 9,441; Stirrer and thermometer, combined, B. F. Adams, 233,906; Steam and heat conducting pipe, M. S. Foote, 234,105; Steam generators, circulating device for, D. Abell, 233,905; Steam trap, H. Wallace, 234,095; Steering gear of vessels, mechanism for controlling the, A. F. A. Petersen, 233,876; Stocking and the method of making, R. W. Scott, 234,074, 234,075; Stone and marble, artificial, W. H. Young, 233,960; Stove board, H. Rendtorff, 233,947; Stove, cooking, L. Kahn, 233,863; Stove grate, Liddle & Morris, 233,939; Stove, oil, A. C. Macalister, 233,865; Strength tester, A. W. Browne, 233,918; Suspenders, G. W. Gunning, 234,029; Swing, G. W. Bauer, 233,914; Telegraph apparatus, G. D'Inreville, 233,859; Telephone, electric, E. Berliner, 233,969; Telephone signal apparatus, T. A. Watson, 233,899; Tellurian, T. McDonough, 234,056; Thermometer tube, J. Barry, 233,963; Thill coupling, T. M. Richardson, 234,097; Thill support, L. F. Hutchins, 233,858; Thimbles from celluloid or other material, die for moulding, E. Villiers, 233,938; Thrashers, band cutting feeder for, B. T. Worthington, 233,959; Tire tightener, H. W. Sutton, 234,068; Tobacco cutter, J. B. Adt, 233,829; Tobacco cutter, A. Rippen, 234,068; Tongs, roofing, T. B. Beeson, 233,965; Truck, car, E. P. Cowles, 233,989; Truck, hand, J. Stewart, Jr. & G. Peene, Jr., 233,892; Truck, plow, H. C. Strong, 234,087; Umbrella and parasol, S. Heiter, 233,930; Valve, balanced, W. Johnson, 234,040; Valves, globe and other, J. G. Willard, 233,902; Vegetable products for use and transportation, preparing waste, W. H. Smith, 233,885; Vehicle top, E. P. Stedman, 233,899; Velocipede, B. Rieder, 234,064; Velocipede, T. B. Zeller, 233,963; Velocipede, marine, M. Coloney, 233,919; Wagon rack, W. E. Day, 233,888; Wagon seat support, H. M. Jacobs, 233,993; Wash board, H. Dunphy, 234,007; Washing machine, M. B. Atkinson, 234,107; Water closet, L. L. King, 233,864; Water conductor, rain, J. G. Lamont, 233,938; Water from pipes, mechanism for detecting waste of, B. L. Stowe, 234,086; Weaving suspender strap, webbing, W. F. Osborne, 234,056; Wick raiser for lamp stoves, J. H. Holmgreen, 233,856; Wind engine, Burrell & Wheeler, 233,977; Windmill, D. C. Harris, 233,928; Wrench, H. A. Thompson, 234,091; Wrist pin, adjustable, L. Thomas, 234,090;

DESIGNS.

Table listing designs with patent numbers: Carpet, J. B. Neil, 12,007; Glassware, A. H. Bagg, 12,006; Type, font of printing, A. Will, 12,008; Wall paper, E. Leissner, 12,009 to 12,014.

TRADE MARKS.

Table listing trade marks with patent numbers: Clock, H. J. Davies, 8,078; Coffee, Java, J. Stiner, 8,083; Desk and bench, school, J. L. Ayres, 8,080; Medicine, certain proprietary, H. G. Colman, 8,084; Soup package, vegetable, J. D. Warren, 8,079; Stove board, zinc, A. L. Griggs, 8,081; Tobacco and cigarettes, chewing and smoking, C. R. Messinger, 8,082.