

**Business and Personal.**

*The Charge for Insertion under this head is \$1 a Line.*

**Headley Portable Engines.** R. H. Allen & Co., New York, Sole Agents of this best of all patterns.

**Hotchkiss Air Spring Forge Hammer,** best in the market. Prices low. D. Frisbie & Co., New Haven, Ct.

**For Sale—Portable Engines,** second hand, 30, 12, 8, 5 Horse Power. Stationary Engines, Boilers, all sizes. A. C. Tully & Co., 55 Dey St., New York.

**Edward Wernick—Please send your address to Osterheld & Eickmeyer, Yonkers, N. Y.**

**Wanted—A gentleman capable of assuming the entire management of the American Engineer.** Address American Engineer, Baltimore, Md.

**B. K. D. Elevator—Send description to C. H. Smith, Madison, Ind.**

**Wanted—2nd hand Mather.** C. Devillbiss, Shellsburg, Iowa.

**Moulder Wanted—Must be fully competent to take charge of Foundry for general machinery castings—mostly engine and mill work.** References required. Apply to P. O. Box 89, Gait, Ontario, Canada.

**During the past seven years, we have been advertising constantly, and at times very largely, for Messrs. Geo. P. Rowell & Co., Advertising Agents, No. 41 Park Row, New York, and have found them prompt, reliable, and honorable in all their business transactions.** While looking out for the best interests of their advertising patrons, they are fair with publishers. Such firms succeed best in the end, as Messrs. Rowell & Co. have fully demonstrated.—(St. Cloud (Minn.) Journal.)

**Machine Tools, new and 2'd H'd, for Sale, good order:** New 25 1/2 ft. bed, 36 in. swing, engine Lathe, \$1,550; 12 ft. bed, 24 in. swing, \$425; 20 ft. bed, 36 in. swing, \$720; 2-6 ft. bed, 15 in. swing, \$230; 9 ft. x16 in., \$240; 8 ft. x17 in., 215; 16 ft. x24 in., \$240; 8 ft. x20 in., \$290; 3-16 ft., double headed Lathes, \$155 to \$350; 5 new speed Lat es, 6 ft. x12 in., \$75; 10 engine and speed Lathes, 4 to 8 ft. beds, \$35 to \$270; double drilling Lathe, \$35. 1 Putnam, 1 Warner & Whitney Gear Cutter, \$500 and \$220; 12 ft. Planer, \$632; \$800; 7 ft. Planer, 21 in. sq., \$500; Crank Planer, 14 in. stroke, 16 in. sq., \$345; New Milling Machine, \$387; 52 in. Upright Drill, \$325; 56 in. Upright Drill, \$250; Upright Spining Machine, \$90. 1 No. 2, 1 No. 3 Fowler Patent Press, \$215 and \$360; Power Bolt Cutter, \$170; Suction Blower, \$23; Japanning Oven, \$90; 16 in., 12 in., and 15 in. Westcott Chucks, \$25, \$42, and \$50; Power Trip Hammer, 7 ft. helve, \$150. For full descriptive lists, address Forsaith & Co., Manchester, N. H.

**Portable Engines, 2'd H'd, for Sale, good order, complete:** 2-35 h.p., \$1,600 and \$1,650; \$30 h.p., \$1,270; 3-25 h.p., 1,270, \$1,300, and \$1,475; 16 h.p., \$950; 10 h.p. (hoisting), \$610; 8 h.p., \$525; 6 h.p., \$475; 2-5 h.p., \$250 and \$275; 5 h.p., with hot shafting, etc., \$445. Stationary Engines and Boilers: One upright Chubbuck Engine, 50 h.p., \$1,400; 80 h.p. hor. Boiler, \$1,000; 45 h.p. hor. Boiler, \$700; 20 h.p. up. Boiler, \$225; 12 h.p. up. Boiler, \$100; 20 h.p. hor. Engine, with 30 h.p. up. Boiler, \$875; 25 h.p. hor. Engine, \$625; 2 1/2 h.p. hor. Engine and Boiler, \$200; 3 h.p. Roper or Hot Air Engine, \$250; 1 in. Judson Governor, \$19. For full descriptive list, address Forsaith & Co., Manchester, N. H.

**Wood-Working Machinery, 2'd hand, for Sale, good order:** 25 ft. Circular Saw Mill, set works, 3 saws, belt, complete, \$390; 25 ft. Circular Mill, Lane Set, \$310; very heavy 33 ft. Circular Mill, Belknap, Ely & Co. make, 3 saws, \$530; Up and Down Saw Mill, complete, with 2-24 in. Whitney Water Wheels, \$360; 26 in. heavy Planer, \$240; 24 in. Planer, \$170; 24 in. Planer, \$75; Rogers No. 2 Molder, \$325; No. 3, 24 in. Planer and Mather, \$400; New 24 in. Planer and Mather, Ball's, \$110; 2 Snaingle Mills and Jointers, \$155 and \$90; Iron frame, 3 saw Lath Machine, \$185; Upright Shaper, Ball's, new, No. 1, \$215; Sash and Blind Sticker, \$115; Blanchard Spoke Lathe, \$225; Fellow Machine, \$50; 16 ft. x16 in. Side Jointer, \$115; Daniel's Planer, 40 ft. x28 in., \$175; Stretching Machine, 3 chucks, \$75; Ball Hand Miter Machine, \$12; 2 Iron Screw Blocks, \$16 each; 49 in. Hoe inserted Tooth Saw, \$80; 49 in., 46 in., and 43 in. Saws, \$35, \$35, and \$20. Shoe Peg Machinery, Sawing and Heading Machine, Baldwin Pointer, Baldwin Splitter, Boring Lathe, Bleaching Furnace and Fan, Steam Dryer and Fixtures, Screens—all \$740. Sell separately, if desired. For full lists, address Forsaith & Co., Manchester, N. H.

**Grist Mill Machinery, 2'd hand, for Sale, good order:** 1-30 in. and 1-36 in. "Platt" Portable Grist Mill, both \$420; 1-26 "Olds" Portable Grist Mill, \$237; Power Corn Cob Cracker, \$50; 1 Run French Burrs, 4 ft., \$60; One Run Feed Stones, 4 1/2 ft., \$50. Address Forsaith & Co., Manchester, N. H.

**Miscellaneous Machinery, 2'd hand, for Sale:** No. 4 Blue Steam Pump, \$220; No. 2 Earle Steam Pump, \$100; 5 ft. Blue Water Wheel, shafting and gears, \$375; 5 ft. Whitney Water Wheel, shafting and gears, \$400; Wheeler, Melick & Co., Horse Power, with wood sawing attachment complete, \$165; Double Emery Arbor and Stand, complete, \$36; Scales, \$8; 450 ft. 3/8 Chain, 4c. per lb. Address Forsaith & Co., Manchester, N. H.

**Iron Pulleys, bored, turned, balanced, and set screwed, for Sale, per lb.:** 12 ft. x25 in., 4c.; 9 ft. x20 in., 1c. halves, 5c.; 6 1/2 ft. x20 in., 4 1/2c.; 5 ft. x12 in., 5c.; 5 ft. x25 in., 3 1/2c.; 4 ft. x10 1/2 in., 5c.; 3 1/2 ft. x22 1/2 in., 5c.; 4 ft. x10 in., 4 1/2c.; 3 ft. x17 in., 5c.; 2-3 ft. x12 in., 5c.; also, Four Binder Rolls, iron centers and rims, wood covered and leathered, excellent shape, with shafts and boxes; 1-56 in. x29 in., \$19; 25 in. x21 in., \$10; 2-22 in. x19 in., \$8 each. Address, for printed lists, Forsaith & Co., Manchester, N. H.

**Bolt Headers (both power and foot) and Power Hammers a specialty.** Forsaith & Co., Manchester, N. H.

**Entire Stock of Tools of a Foundry and Machine Shop for Sale.** List sent on application. Address P. O. Box 2132, New York City.

**A responsible American Firm, having a Branch Office in London, would accept the European Agency for saleable mechanical articles.** Address Machinery, Box 2620, New York Post Office.

**\$17 Foot Lathes.** Geo. F. Shedd, Waltham, Ms.

**A Self-Acting Trap, to rid out all Rat and Animal Creation.** Agents wanted. No trouble to sell. For Traps, &c., address John Dildine, Limestoneville, Montour Co., Pa.

**Scale in Boilers Removed—No pay till the work is done.** Send for 34 page pamphlet. George W. Lord, Philadelphia, Pa.

**1, 2, & 3 H.P. Engines.** Geo. F. Shedd, Waltham, Ms.

**For Sale, at Great Bargains—One 18x36 second hand Green's Patent Automatic Cut-off Engine, also one 18x36 Slide Valve; both in perfect order.** Apply to Todd & Rafferty Machine Company, 10 Barclay St., New York and Paterson, N. J.

**For Sale—Large lot second hand Machinists' Tools, cheap.** Send for list. L. H. Shearman, 45 Cortlandt Street, New York.

**Foot Lathes—Wm. E. Lewis, Cleveland, Ohio.**

See N. F. Burnham's Turbine Water Wheel advertisement, next week, on page 141.

**Speed Indicator—Every mechanic needs one;** can carry in vest pocket. Satisfaction guaranteed. By mail, \$2. Samuel Harris & Co., 45 Desplaines St., Chicago.

**For Tri-nitrolycerin, Mica Blasting Powder, Frictional Electric Batteries, Electric Fuses, Exploders, Gutta Percha Insulated Leading Wires, etc., etc.,** result of seven years' experience at Hoosac Tunnel, address Geo. M. Mowbray, North Adams, Mass.

**Wrought Iron Pipe—For water, gas, or steam.** Prices low. Send for list. Bailey, Farrell & Co., Pittsburgh, Pa.

**Hotchkiss & Ball, West Meriden, Conn., Foundrymen and Workers of Sheet Metal.** Will manufacture on royalty any Patented articles of merit.

**For best Bolt Cutter, at greatly reduced prices,** address H. B. Brown & Co., New Haven Conn.

**"Lehigh"—For information about Emery Wheels &c.,** address L. V. Emery Wheel Co., Weissport, Pa.

**American Metaline Co., 61 Warren St., N.Y. City.**

**Small Tools and Gear Wheels for Models.** List free. Goodnow & Wightman, 23 Cornhill, Boston, Mass.

**Peck's Patent Drop Press.** Still the best in use. Address Milo Peck, New Haven Conn.

**Faught's Patent Round Braided Belting—The best thing out—Manufactured only by C. W. Army, 301 & 303 Cherry St., Philadelphia, Pa.** Send for Circular.

**Three Second Hand Norris Locomotives, 18 tons each;** 4 ft. 8 1/2 inches gauge, for sale by N. O. & C. R. R. Co., New Orleans, La.

**Genuine Concord Axes—Brown, Fisherville, N.H. Temples and Oilcans.** Draper, Hopedale, Mass.

**Price only \$3.50.—The Tom Thumb Electric Telegraph.** A compact working Telegraph Apparatus, for sending messages, making magnets the electric light, giving alarms, and various other purposes. Can be put in operation by any lad. Includes battery, key, and wires. Neatly packed and sent to all parts of the world on receipt of price. F. C. Beach & Co., 246 Canal St., New York.

**For 13, 15, 16 and 18 inch Swing Engine Lathes,** address Star Tool Co., Providence, R. I.

**Spinning Rings of a Superior Quality—Whitinsville Spinning Ring Co., Whitinsville, Mass.**

**For best Presses, Dies, and Fruit Can Tools, Bliss & Williams, cor. of Plymouth and Jay, Brooklyn, N. Y.**

**For Solid Wrought-Iron Beams, etc., see advertisement.** Address Union Iron Mills, Pittsburgh, Pa. for lithograph, &c.

**All Fruit-can Tools, Ferracut W k's, Bridgton, N. J.** For Solid Emery Wheels and Machinery, send to the Union Stone Co., Boston, Mass., for circular.

**Hydraulic Presses and Jacks, new and second ad. Lathes and Machinery for Polishing and Buffing Metals.** E. Lyon, 470 Grand Street New York.

**Small Gray-iron castings made to order.** Hotchkiss & Ball, Foundrymen, West Meriden, Conn.

**Reciprocity! Wanted: Machinery to hull, clean and polish 500 or 400 lb. ce per hour in the best possible style.** State full particulars to E. Lindemann, Wallua, Sandwich Islands.

**Barry Capping Machine for Canning Establishments.** T. R. Bailey & Vall.

The "Scientific American" Office, New York, is fitted with the Miniature Electric Telegraph. By touching little buttons on the desks of the managers signals are sent to persons in the various departments of the establishment. Cheap and effective. Splendid for shops, offices, dwellings. Works for any distance. Price \$6. with good Battery. F. C. Beach & Co., 246 Canal St., New York, Makers. Send for free illustrated Catalogue.

**Notes & Queries**

O. K. will find descriptions of wire rope transportation on p. 370, vol. 31.—H. D. will find formulas for calculating the friction of water in pipes on p. 48, vol. 29.—J. D. will find full instructions for making acetic acid on p. 58, vol. 30, p. 75, vol. 31, and p. 106, vol. 32.—J. will find directions for getting rid of flesh worms on p. 233, vol. 31.—H. W. should consult a physician.—C. F. B. will find a recipe for birdlime on p. 347, vol. 28.—G. P. D. will find a recipe for blue black ink on p. 42, vol. 31.—P. E. D. will find a description of a pantograph on pp. 98, 179, vol. 28.—M. J. W. will find directions for filling walnut wood on p. 315, vol. 30.—B. W. will find directions for grinding and polishing glass specula on p. 276, vol. 30.—C. D. A. can mold rubber by the process described on p. 283, vol. 22.—L. G. G. will find a recipe for filling for fireproof safes on p. 75, vol. 32.—A. M. can preserve specimens of fruit by the process described on p. 42, vol. 33.—C. G. C. will find a description of the phosphorus lamp on p. 10, vol. 27.—J. O. R. will find directions for making potato starch on p. 315, vol. 31.—H. T. W. will find a recipe for a cement for glass on p. 379, vol. 31.—G. W. I. will find directions for obtaining sulphur from the ore on p. 295, vol. 31.—J. H. L. will find directions for cementing cellar floors on p. 50, vol. 32.—W. G. O. will find directions for polishing walnut on p. 315, vol. 30.—G. S. can make mica varnish by following the directions on p. 241, vol. 32.—J. E. W. should consult a physician.—N. B. W. should consult the "Text Book of Metals," by Bloxam.—E. A. R. will find a full description of the motion of a crank on p. 112, vol. 31.—J. R. can cement leather to rubber by using the preparation described on p. 119, vol. 28.—H. G. M. will find directions for tempering small steel articles on p. 235, vol. 32.—E. B. L. will find a recipe for fine blacking on p. 45, vol. 31. The proper length of a spring can be properly settled by experiment only.—E. J. can clean silver articles by the method described on p. 129, vol. 28.—N. E. B. should consult a physician.—J. L. B. will find full directions for hardening files on p. 212, vol. 26.—J. T. T. will find a recipe for bronzing on brass on p. 283, vol. 31.—C. A. P. G. will find a recipe for pomade on p. 347, vol. 32.

(1) R. B. asks: Can you tell me how to take broken glass stoppers out of bottles? A. Warm the neck of the bottle in a gas flame.

(2) C. H. asks: How can I make bone black suitable for sugar refiners' use? A. In the preparation of bone black, the bones are first boiled in water to remove all the adhering grease (which is otherwise utilized), or, what is perhaps a better

method, exhausting them of all grease, etc., by means of bisulphide of carbon. The bones are then thrown into a large retort and subjected to destructive distillation. At first there passes over a large quantity of a fetid gaseous matter, accompanied by a considerable quantity of carbonate of ammonia, and other volatile alkalis, formed on the type of ammonia. These gases and sublimates are passed through a large washer, which retains the ammonia and other salts accompanying the gas; after which the latter is conducted into the furnace and burned beneath the retort. As the distillation proceeds, a quantity of tarry matter and oil comes over. After the operation is finished, the residue remaining in the retort constitutes the animal charcoal. The washing apparatus may consist of a large iron tank, half filled with water, and having a tightly fitting cup through which two pipes pass, one of which—the one leading immediately from the retort—passes down below the surface of the water. The gas, in its passage through the retort, is thus caused to bubble up through the water, and thence it is conveyed by the second pipe into the furnace, where it is burned. The water in the washer may be used several times, or until it becomes nearly saturated with the salts; it should then be drawn off through faucets arranged in the side of the tank, and the salts crystallized out by evaporation, dried, and prepared for market. The tar and oily water remaining in the tank, which are used for the preparation of lamp black, may be drawn off in like manner.

(3) T. B. asks: Is it best to go to college and perfect oneself in architectural science, or enter an office at once, after graduating at an academy? There is a special course of architecture laid out at the college. A. Enter as a student into the office of an architect of large practice, where there is an extensive library of architectural and scientific works.

(4) T. P. asks: What is the cause of the fetid smell of perspiration, and is there any permanent cure for it? A. Do not try to prevent perspiration. It is one of the requirements of a healthy body. Closing up the pores of the skin by the use of certain washes or powders to prevent excessive perspiration is a dangerous experiment. "The perspiratory glands of the skin are scattered everywhere throughout the integument, being most abundant on the anterior portions of the body. They consist each of a slender tube, about 1/100 of an inch in diameter, lined with glandular epithelium, which penetrates nearly through the entire thickness of the skin, and terminates below in a globular coil, very similar in appearance to that of the ceruminous glands of the ear. These glands are very abundant in some parts. On the posterior portion of the trunk, the cheeks, and the skin of the thigh and leg, there are, according to Krause, about 500 to the square inch: on the anterior part of the trunk, the forehead, the fore arm, and the back of the hand and foot, 1,000 to the square inch: and on the sole of the foot and palm of the hand about 2,700 in the same space. The whole number of perspiratory glands is not less than 2,300,000, and the length of each tubular coil, when unraveled, about 1 1/2 of an inch. The entire length must be not less than 153,000 inches, or about two miles and a half. The fluid derived from this extensive apparatus is the perspiration. It is a clear, colorless, watery liquid, with a distinct acid reaction. Its constitution is as follows: Water 995.00, chloride of sodium 2.23, chloride of potassium 0.24, sulphate of soda and potassa 0.01, salts of organic acids with soda and potassa 2.02. Total, 1,000.00."—Dalton.

(5) F. L. B.—The scheme which you suggest for a convention of inventors, to be held during the Centennial year, is theoretically good; but such meetings have been proposed before, and whenever they have been held they have resulted in no practical benefit.

(6) O. W. I. says: I have a galvanic battery of my own construction; and as I do not understand the process of putting it in running order, I ask your advice as to charging the battery. It is composed of two zinc plates and one copper plate, and I want to ascertain the right amount of vitriol to be used. A. Use 1 part oil of vitriol and 15 parts water.

(7) W. N. W. asks: How can muslin be made waterproof without materially changing its color, or injuring its pliability? A. We know of nothing that will satisfactorily answer all your requirements.

(8) S. & C. say: We raised from the grave a few weeks ago the body of a man who had been buried 15 years, in a well cemented metallic coffin; and on removing the iron plate over the glass, we could see on the inside of the coffin (with the corpse) two living common bouse flies. The body was in a good state of preservation, and there was of course no opening in the coffin to admit the flies. How did they get in? A. We can give no explanation.

(9) O. R. says: It is claimed that a spark will cause gunpowder to explode, but that a flame will not. I claim that, by blowing a flame on it, gunpowder will be exploded. Which is right? A. The action of either a flame or spark upon gunpowder is to cause a slight decomposition of the saltpeter, and at the same time to ignite the combustible carbon and sulphur, which burn at the expense of the oxygen of the saltpeter.

(10) N. & G. ask: Is there such a thing as a magnetic rod, needle, or compass that will be attracted by gold or silver? A. The magnetic properties of these metals yet remain to be discovered. The so-called divining rod has never existed. It is a common way of imposing on the credulous.

(11) J. D. W. asks: 1. Is it true that the friction of a wheel or shaft does not increase with velocity, but only with pressure? A. Yes. 2. In a dynamometer, in which weight and speed are both taken into account to decide, by friction, the

power of a machine, if a spring were substituted for the weight, would not an increase of velocity affect the spring more? A. No. 3. Will a spiral spring be contorted or twisted more if it runs at a high than at a low speed? A. Yes. 4. Will a spring of steel or brass, working in steam of ordinary heat, lose its elasticity? A. Yes, in course of time.

(12) Y. E. says: 1. I have built an engine, 1 1/2 by 3 inches, and I want a light and strong boiler for it. Would a piece of 10 or 12 inch boiler flue, say 2 feet long, do to make a plain cylinder boiler of? A. Such a boiler as you speak of might answer, but you would not obtain very good results. 2. How can I make a furnace around it? A. The boiler must be set either in brick or some other suitable material, with the furnace beneath. 3. Would such an engine and boiler be large enough to propel a boat with stern wheel, said boat to be large enough to accommodate 4 or 5 persons? A. You do not give sufficient data. 4. Are ports 1/2 x 1/2 inch large enough for a 1 1/2 by 3 engine? A. The ports will answer, but it would be no harm to have them a little larger.

(13) J. G. L. says: I had an anvil of cast iron, 7 inches wide, 12 inches long, and 10 inches high, and tried to put a chilled face on it. The chill was 3/4 inches thick, and the face would not harden, remaining as soft as common iron. What was the cause of it? A. It was due to the quality of the iron.

(14) C. T. A. says: 1. If air is taken at atmospheric pressure and at any given temperature, and is compressed to any given pressure per square inch, what would be the resultant temperature? The following formulas are applicable to such cases, provided there is no loss of heat by radiation or conduction: T=absolute temperature of air before compression; t=absolute temperature of air after compression; V=volume of air before compression; v=volume of air after compression; P=pressure of air before compression; p=pressure of air after compression. Then  $\frac{t}{T} = \left(\frac{V}{v}\right)^{0.408} = \left(\frac{p}{P}\right)^{0.29}$ . This equation can be most readily solved by the use of logarithms, thus:  $\log\left(\frac{t}{T}\right) = 0.408 \times \log\left(\frac{p}{P}\right) = 0.29 \times \log\left(\frac{p}{P}\right)$  2. Does the pressure increase as the volume decreases? A. Yes.

(15) H. C. J. asks: 1. Will water coming with force through a large pipe have power to empty a waste water chamber at lower end of small tube placed concentrically with the large one? A. Yes, under certain conditions. That is, the force of the current through the large pipe must be graduated to the length of the small pipe. 2. Would the effect be assisted by making perforations below the nozzle of the small pipe to admit jets of water and force out air or water? A. No, this is unnecessary.

(16) J. L. asks: What is the best work on sawmills? A. There is no work that we know of devoted entirely to sawmill management. Any standard work on millwork will assist you, so that, with practical workmanship, you will be enabled to build any kind of a mill.

(17) J. C. L. says: I wish to color a shingle roof red, so as to resemble red slate. If I paint it, I am assured, the shingles will rot very soon, as the moisture that is drawn up by capillary attraction between the shingles will be prevented from escaping by the paint. Is there any wash, of the proper color and not more expensive than white lead paint, that will not be washed off by rain, and yet will allow the water absorbed by the shingles to dry out? A. Lime wash will preserve the shingles and can be colored any tint you desire by mixing dry color with it.

1. What causes the closet in which I keep woolen blankets to turn black? It is painted with white lead. A. The presence of light is more or less necessary to preserve the purity of white paint. But in your case the discoloration may arise from the escape of gas, either from a gas pipe or an ordinary waste pipe. 2. If I paint the aforesaid closet with white zinc, will the difficulty be remedied? A. It is not likely that it will.

(18) G. W. asks: Is there a substance which will intercept magnetic force when placed between the magnet and armature? A. No.

(19) G. R. McK. says: I wish to face a mill dam, 20 feet high, above and below with rough stone and brick, connecting the two faces with a tube of iron or brick through which the water will pass to the wheel. The abutment of the walls are to be 1 foot thick. How thick should the abutments be at the base to withstand the pressure of the earth between them? A. Six feet. 2. Would lime water answer to lay the stone in, and then plaster the faces exposed to the water with cement? A. No; cement should be used in the wall.

(20) L. W. H. asks: Will a double belt convey more power than a single one, and, if so, in what proportion? A. Yes, other things being equal.

(21) J. S. says: I have a large hollow apple tree which has been filled with large black ants for the last three or four years. How can I get rid of them? A. Try the application to the inside of the tree of a weak solution of chloride of lime. This may be applied expeditiously by means of a large syringe.

(22) E. R. K. says: In a recent issue, you give a formula for calculating the solidity of the frustum of a pyramid. Will the same formula apply to the calculation of earth excavation: in other words, given the two end areas and the perpendicular distance between, will the formula for the frustum of a pyramid give a correct result? If not, what method must be employed? A. It will only answer for special cases. Generally some other rules are employed. You will find them fully explained in any good treatise on the mensuration of earthwork.

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

A. J. H.—Package labelled No. 1 contained a quantity of fine sandstone, a crystal of carbonate of lime, calcite, and a specimen of marcasite or white iron pyrites. They are of little value. Package No. 2 has not been received.—M. J. D.—No. 1 is mica schist in sandstone. No. 2 is principally magnetite. No. 3 is agate imbedded in quartz. No. 4 is quartz. No. 5 is hematite. No. 6 is hornblende and mica. No. 7 is aragonite. No. 8 is fine white sandstone. No. 9 is sandstone. No. 10 is a variety of light colored shale. No. 11 is dark limestone. No. 12 is decomposed slate. No. 13 is sandstone. The Indian arrowhead is of flint.—S. D. M.—Your communication in regard to formations on specimens of coal sent by you will be answered in full shortly.—J. W. C.—These insects are not described in our works on entomology. We would require more of them for further investigation, as these were few in number and much mutilated.—N. B. W.—No. 1 does not contain silver; it consists chiefly of galena. No. 2 is principally marcasite. No. 3 is baric sulphate. No. 4. The amount of alumina is too large for it to rank with other analyses of kaolin. No. 5 is sulphide of iron.—G. B. McE.—They are of no value. The bright metallic appearance is due to mica.

E. P. says: I have a surveyor's steel chain, the links of which are not soldered or brazed. Can you inform me of the simplest method by which it can be done? C. B. L. asks: How can I color and polish the sections of walnuts to make them look like jet?

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects:

- On Apparitions. By J.
On Hammocks. By F. M. C.
On Steam Cars. By J. G. W.
On Vegetable Sponges. By W. H. C.
On Collegiate Races. By C.
On Mining Cables. By C. T. S.
On the Science of Geometry. By F. G. C.
On Modern Science. By H. B. C.
On Death by Strychnin. By S. J. P.
On the Grasshopper Plague. By G. P. Z.

Also inquiries and answers from the following: G. P.—N. C. Jr.—N. J. N.—A. E. B.—R. J. T.—S. K. O.—W. E. S.—J. R.—L. C. J.

HINTS TO CORRESPONDENTS.

Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Enquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

Hundreds of inquiries analogous to the following are sent: "Who sells aneroid barometers? Who sells steel, hard enough to cut glass? Who manufactures the so-called fish guano? Who publishes books on aeronautics?" All such personal inquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH Letters Patent of the United States were

Granted in the Week ending July 20, 1875,

AND EACH BEARING THAT DATE. (Those marked (r) are reissued patents.)

Table listing inventions and their patent numbers, including items like Air ship, Alarm, Auger, Baking stand, Barrel head, Bedlounge, Bell, Blower, Bobbin winder, Bolt work, Bosom form, Box dressing machine, Brake shoe, Bridle bit, Brush, Buckle, Butter-pail, Cigar box, Clock calendar, Cloth friezing machine, Clothes dryer, Clothes line reel, Coad hod, Cock, stop, T. Holland, Commode or stand, F. Mahler, Corn drill, J. Campbell, Corn sheller, E. C. Morgan, Cracker machine, J. W. & A. Ruger, Cracker, device for glazing, D. Foerster, Cribs, etc., screen supporter, H. B. Fairbanks, Crucible, J. Felix, Curtain roller, P. W. Phillips, Cutter head, S. P. Randolph, Cyclophore, R. C. Gwathmey, Dental forceps, N. A. Durham, Dental plugger, C. Bilharz, Dial sun, W. H. McCoy, Door, W. C. Hurd (r), Door check, J. H. McClymonds, Dredging box, Goodwin & Ives, Drill, expansion, M. C. Bullock, Drilling machine, Rook, J. W. Moyer, Dryer for paint, O. Russell, Egg tester, Henckler & Troegeler, Engine, governor, H. S. Maxim, Engine lubricator, steam, M. L. Waring, Engine lubricator, steam, J. Wheelock, Engine, rotary, W. Weyhe, Engine, steam, W. Read, Engines, carriage for portable, C. M. Miller, Engines, valve and gearing for steam, J. A. Prince, Envelope, document, J. Pritchard, Fare register, W. H. Hornum, Felly plate, T. Beatty, Fences, making tabs for wire, Doolittle & Ellis, Fences, tightening wire, P. S. Crawford (r), Fertilizer distributor, W. F. Wheeler, Fire arm, breech-loading, A. F. W. Tinner, Fire escape, A. J. Culbertson, Fishing and similar floats, W. T. Quinn, Floor, lint room, J. N. Stitt, Fountains, ornamental jet for, T. Galvin, Furnace grate, S. J. La Rue, Furnace, hot air, C. B. Chace, Furnace, steam boiler, C. D. Smith, Gage, taper, C. B. Hunt, Gas and water regulator, A. L. Smith, Gas, apparatus for purifying, O. Braun, Gas machines, pressure blower for, J. H. Bean, Gas retorts, supplying oil to, F. H. Elohbaum, Gases, apparatus for hydrating, B. H. Jenks, Gate, L. S. Cohn, Gate, automatic, L. N. Allendorf, Gate, farm, A. Callahan, Gate, farm, milder & Hillson, Gems, setting, T. W. Fry, Governor, steam, W. Mein, Grain tally, W. Schnebley, Graining roller, W. H. Burns, Hand rest, accountant's, W. D. Sloan, Harrow, Chamberlain & Seiple, Harrow, S. G. Jones, Harrow, W. H. Parlin, Hatters, sizing plank for, M. F. Johnson, Hay knife, R. Kellogg, Hay loader, E. R. Whitney, Heater, etc., for boilers, J. A. T. Overend, Heater for rollers, etc., T. S. Wiles, Hemp and flax machine, Herschaft & Lawrence, Hose spanner, J. Burke, Ice hook, D. C. Wood, Icepick and can opener, combined, T. Hagerty, Inhaler, pocket, T. E. Daniels, Injector, G. H. Little, Iron, compound for coating, Brownlow & Francis, Jack, lifting, D. Cilley, Journal bearings, heat indicator for, S. Alley, Key holder, F. W. Coleman, Klin, brick, J. G. Eberhart, Knife, hay, R. Kellogg, Lamp, J. B. Godwin, Lamp car, F. Rhind, Lamps, etc., extension fixture for, G. R. Lyon, Leather dressing, J. Miller, Leather, manufacturing, G. Herrick, Leather, tanning, G. W. Hatch, Lever, safety pinion, G. Bement, Lime klin, A. B. Weeks, Lime fastener, Brown & Peer, Liquid mixer, J. B. Meyers, Lock, time, J. Sargent, Loom shuttle, N. J. Willis, Looms, wire heddle for, D. C. Brown (r), Lubricator, Davis and Du Bois, Lubricator, Richter and Merckel, Lubricator, steam engine, M. L. Waring, Lubricator, steam engine, J. Wheelock, Mantel, iron, T. F. Baker, Metal bending machine, E. Devine, Milk strainer, F. L. Oliver, Mill, flour, A. Lenz, Mill, rolling, I. Hahn, Mirror, window, D. J. Kennedy, Molding machine, Frank and Spire, Molding machine, A. S. Gear, Motor, hydraulic, A. Schmid, Nail plate feeder, L. Soule, Newspaper forms, etc., imposing, W. D. Hughes, Nut lock, J. M. Whitmore, Ore stamp feeder, J. Tullock (r), Oven for firing pottery, T. M. Minton, Padlock, H. S. Lockwood, Paper bag machine, J. Hatfield, Paper barrel and box, B. Rhodes (r), Paper collar machine, C. H. Denison, Paper stock, grinding, J. M. Burghardt, Pavement, wood, J. J. Schroyer, Pavement, wood, H. M. Stow, Paving block, Von Versen and Bickel, Peg cutting machine, J. F. Smith, Pen and pencil case, J. U. Gerow, Photometer, O. Schuette, Pianoforte case, H. J. Baker, Piano, joiner's, J. Look, Picture frame, A. D. Judd, Picture holder, stereoscopic, J. D. Rice, Pipe stem, H. C. Fritz, Pipes, forming sockets on, H. B. Camp,

Table listing inventions and their patent numbers, including items like Carriage poles, Cart saddle, Chair and step ladder, Chair base, Chair, folding rocking, Chair spring attachment, Cheese cutter, Chisel for stone cutting, Chlorine, manufacture of, Churn rotary, Cigar box, Clock calendar, Cloth friezing machine, Clothes dryer, Clothes line reel, Coad hod, Cock, stop, T. Holland, Commode or stand, F. Mahler, Corn drill, J. Campbell, Corn sheller, E. C. Morgan, Cracker machine, J. W. & A. Ruger, Cracker, device for glazing, D. Foerster, Cribs, etc., screen supporter, H. B. Fairbanks, Crucible, J. Felix, Curtain roller, P. W. Phillips, Cutter head, S. P. Randolph, Cyclophore, R. C. Gwathmey, Dental forceps, N. A. Durham, Dental plugger, C. Bilharz, Dial sun, W. H. McCoy, Door, W. C. Hurd (r), Door check, J. H. McClymonds, Dredging box, Goodwin & Ives, Drill, expansion, M. C. Bullock, Drilling machine, Rook, J. W. Moyer, Dryer for paint, O. Russell, Egg tester, Henckler & Troegeler, Engine, governor, H. S. Maxim, Engine lubricator, steam, M. L. Waring, Engine lubricator, steam, J. Wheelock, Engine, rotary, W. Weyhe, Engine, steam, W. Read, Engines, carriage for portable, C. M. Miller, Engines, valve and gearing for steam, J. A. Prince, Envelope, document, J. Pritchard, Fare register, W. H. Hornum, Felly plate, T. Beatty, Fences, making tabs for wire, Doolittle & Ellis, Fences, tightening wire, P. S. Crawford (r), Fertilizer distributor, W. F. Wheeler, Fire arm, breech-loading, A. F. W. Tinner, Fire escape, A. J. Culbertson, Fishing and similar floats, W. T. Quinn, Floor, lint room, J. N. Stitt, Fountains, ornamental jet for, T. Galvin, Furnace grate, S. J. La Rue, Furnace, hot air, C. B. Chace, Furnace, steam boiler, C. D. Smith, Gage, taper, C. B. Hunt, Gas and water regulator, A. L. Smith, Gas, apparatus for purifying, O. Braun, Gas machines, pressure blower for, J. H. Bean, Gas retorts, supplying oil to, F. H. Elohbaum, Gases, apparatus for hydrating, B. H. Jenks, Gate, L. S. Cohn, Gate, automatic, L. N. Allendorf, Gate, farm, A. Callahan, Gate, farm, milder & Hillson, Gems, setting, T. W. Fry, Governor, steam, W. Mein, Grain tally, W. Schnebley, Graining roller, W. H. Burns, Hand rest, accountant's, W. D. Sloan, Harrow, Chamberlain & Seiple, Harrow, S. G. Jones, Harrow, W. H. Parlin, Hatters, sizing plank for, M. F. Johnson, Hay knife, R. Kellogg, Hay loader, E. R. Whitney, Heater, etc., for boilers, J. A. T. Overend, Heater for rollers, etc., T. S. Wiles, Hemp and flax machine, Herschaft & Lawrence, Hose spanner, J. Burke, Ice hook, D. C. Wood, Icepick and can opener, combined, T. Hagerty, Inhaler, pocket, T. E. Daniels, Injector, G. H. Little, Iron, compound for coating, Brownlow & Francis, Jack, lifting, D. Cilley, Journal bearings, heat indicator for, S. Alley, Key holder, F. W. Coleman, Klin, brick, J. G. Eberhart, Knife, hay, R. Kellogg, Lamp, J. B. Godwin, Lamp car, F. Rhind, Lamps, etc., extension fixture for, G. R. Lyon, Leather dressing, J. Miller, Leather, manufacturing, G. Herrick, Leather, tanning, G. W. Hatch, Lever, safety pinion, G. Bement, Lime klin, A. B. Weeks, Lime fastener, Brown & Peer, Liquid mixer, J. B. Meyers, Lock, time, J. Sargent, Loom shuttle, N. J. Willis, Looms, wire heddle for, D. C. Brown (r), Lubricator, Davis and Du Bois, Lubricator, Richter and Merckel, Lubricator, steam engine, M. L. Waring, Lubricator, steam engine, J. Wheelock, Mantel, iron, T. F. Baker, Metal bending machine, E. Devine, Milk strainer, F. L. Oliver, Mill, flour, A. Lenz, Mill, rolling, I. Hahn, Mirror, window, D. J. Kennedy, Molding machine, Frank and Spire, Molding machine, A. S. Gear, Motor, hydraulic, A. Schmid, Nail plate feeder, L. Soule, Newspaper forms, etc., imposing, W. D. Hughes, Nut lock, J. M. Whitmore, Ore stamp feeder, J. Tullock (r), Oven for firing pottery, T. M. Minton, Padlock, H. S. Lockwood, Paper bag machine, J. Hatfield, Paper barrel and box, B. Rhodes (r), Paper collar machine, C. H. Denison, Paper stock, grinding, J. M. Burghardt, Pavement, wood, J. J. Schroyer, Pavement, wood, H. M. Stow, Paving block, Von Versen and Bickel, Peg cutting machine, J. F. Smith, Pen and pencil case, J. U. Gerow, Photometer, O. Schuette, Pianoforte case, H. J. Baker, Piano, joiner's, J. Look, Picture frame, A. D. Judd, Picture holder, stereoscopic, J. D. Rice, Pipe stem, H. C. Fritz, Pipes, forming sockets on, H. B. Camp,

Table listing inventions and their patent numbers, including items like Plane, bench, C. Bridges, Plane, bench, H. Shogren, Planter, corn, G. W. Shepherd, Plow, W. K. Allen, Plow, J. R. Sample, Plow, O. P. Sanford, Plow, G. and T. Wiard, Plow, gang, E. P. Pulliam, Plow point, reversible, M. M. Bowers, Pocket book, C. Arms, Pocket book safety attachment, T. Potter, Press, hydraulic, J. F. Taylor, Printers' leads, cutting, J. A. T. Overend, Printing plates, numbering, T. Richards, Printing press, rotary, C. Kahler, Pulley for shafting, loose, C. H. Mellor, Pump, double-acting, C. Gordon, Punch, conductor's, Nye and Zapf, Railway, elevated, J. G. Wilson, Railway rail chair, R. C. Ludlow, Railway switch signal, W. W. Colley, Range, portable, Cox and Hopkin, Ranges, boiler for, J. A. Gibson, Refrigerator, ice cream, G. D. Adams, Refrigerator, show case, J. H. Hoffman, Register and ventilator, H. N. Creamer, Register, ventilating, H. Fritz, Retorts, apparatus for charging, W. Foulis, Rifles, sharpening, S. P. Doane, Roller, land, J. A. Keeler, Roof, metallic, E. Watson, Rule, registering board, W. M. Bullock, Sad iron, Harris and O'Neil, Sandpapering machine, O. Sawyer, Sash holder, P. Mullaney, Sash holder, O. Rock, Saw, drag, H. H. Miller, Sawing machine, hoop, E. Young, Sawing machine, scroll, J. H. Roberts, Scraper, rotary road, J. W. Wilson (r), Screw driver, W. F. Patterson, Sewing machine, J. Carter, Sewing machine, C. S. Cushman, Sewing machine, A. F. Johnson (r), Shafting, loose pulley for, C. H. Mellor, Sheet iron barrel, C. M. Wywell, Shingling gage, C. Schneider, Sketching and photographic case, T. J. Phillips, Slate, school, C. H. Meigs, Jr., Spark arrester, J. Dubois, Spark arrester, Wiser and Schmieders, Spoke-tensioning machine, W. H. Von Behren, Stone-cutting, chisel for, C. C. Simpson, Stove, coal, L. B. Sprout, Stove pipe joint, G. D. Umland, Stove polish, J. M. Watson, Strainer, milk, F. L. Oliver, Table, ironing, E. S. Heath, Table, ironing, J. N. Wunderlich, Telegraph, transmitter for music, E. Gray, Thermometer, G. Gano, Ticket stamp, L. J. Blades, Tile, illuminating, T. Hyatt, Time check, H. Greene, Tool, T. Hagerty, Transit, S. Holton, Tree protector, R. F. Williams, Trunks, etc., fastening, J. Hall, T-squares to boards, attaching, W. B. Stevenson, Valve gear, reversible, N. E. Nash, Valve relief, G. H. Clemens, Vessel for removing foul water, H. H. Vogeding, Vessels, making of irregular, B. Rhodes (r), Vessels, shoal indicator for, Wagner & Rumpus, Wagon jack, J. Sawyer, Wagon rack, J. F. Cass, Washing machine, T. A. Irick, Washing machine, M. Loughran, Washing machine, P. Markley, Washing machine, O. V. Roe, Watch, M. G. Cole, Watch escapement, J. R. Hopkins, Watch, stem-winding, J. D. Brez, Watches, barrel arbor for, J. R. Hopkins, Watchmaker's box, P. H. Wheeler, Watchmaker's eyeglass, M. W. Ward, Water meter, W. Helme, Wells, removing drifts from, B. Kent, Windmill, E. Dewald, Windmill, R. N. Rockwell, Wood, preserving, L. S. Robbins, Wrench, R. S. Battles, Wrench, pipe, L. Glynn, Wringer, M. A. Richardson, Yarn beam, J. A. Gould, Yarn to set the twist, treating, D. Wright,

Table listing inventions and their patent numbers, including items like 4,990.—W. H. McMillan, Philadelphia, Pa., U. S. Fire plug, July 15, 1875. 4,991.—C. R. Patterson, Pittston, Pa., U. S. Planing machine, July 15, 1875. 4,992.—E. Dailaire, St. Sebastien, P. Q. Auger boring machine, July 15, 1875. 4,993.—J. Matthews, Lyden, Ont. Pump plunger, July 15, 1875. 4,994.—G. Collins, Kingfield, Me., U. S. Saw buck, July 15, 1875. 4,995.—R. Cahuc, Toulouse, Haute Garonne France. Mining powder, July 15, 1875. 4,996.—A. Higley, Cleveland, Ohio, U. S. Car axle box, July 15, 1875. 4,997.—G. P. Farmer, Brooklyn, N. Y., U. S. Yarn bundle, July 15, 1875. 4,998.—J. James, Township Bosanquet, Ont. Bag holder, July 15, 1875. 4,999.—F. Doucet, Yarmouth, N. S. Knife cleaner, July 17, 1875. 5,000.—A. E. Mitchell, Sweetsburgh, P. Q. Churn, July 17, 1875. 5,001.—A. E. Peters, Moncton, N. B. Combination lock, July 17, 1875. 5,002.—R. W. Drew, Albany, N. Y., U. S., et al. Automatic lubricator, July 17, 1875. 5,003.—C. L. Holland et al., Ipswich, Mass., U. S. Laundry polish, July 20, 1875. 5,004.—E. Farnsworth, Punxatawney, Pa., U. S. Stump and stone elevator, July 20, 1875. 5,005.—W. H. Seaman, New York city, U. S. Testing the purity of dye in silk, July 20, 1875. 5,006.—H. A. Stearns, Lincoln, R. I., U. S. Churn dasher, July 22, 1875. 5,007.—F. S. Berry et al., New Sharon, Me., U. S. Thill loop, July 22, 1875. 5,008.—G. S. McConkey, Toronto, Ont. Cigar-stamping machine, July 22, 1875. 5,009.—L. Dague, Sherwood, Mich., U. S. Seeder, plaster sower, and harrow, July 22, 1875. 5,010.—P. H. Cowper et al., Montreal, P. Q. Belt-making machine, July 22, 1875. 5,011.—F. L. Pope, Elizabeth, N. J., U. S. Electric signals, July 22, 1875. 5,012.—W. G. Swartz, Fairview, Ill., U. S. Insect-gathering machine, July 24, 1875. 5,013.—W. H. Martin, Mobile, Ala., U. S. Toy gun, July 24, 1875. 5,014.—A. S. Chamberlin et al., Franklin, N. Y., U. S. Stove pipe sheet, July 24, 1875. 5,015.—J. V. Taylor, La Cygne, Kan., U. S. Bed bottom, July 24, 1875. 5,016.—J. Greenebaum, San Francisco, Cal., U. S. Pocket-fastened pants, July 24, 1875.

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