

Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion. If the Notice exceeds four lines, One Dollar and a Half per line will be charged.

Grasshopper Killer for sale.—State and County rights of Patent No. 187,855, Machine to kill Locust. Apply to Charles Hoos, Arago, Nebraska.

Silver Solder and small Tuhing. John Holland, Cincinnati, O.

For Sale.—Recently granted Patent on Toy Birds. Rapidly vibrating wings, accompanied by a suitable sound. Manufactured very cheaply from sheet metal or printed paper. Address S. Scholfield, Providence, R. I.

Situation wanted by a man who understands to plate hardware with bronze or brass, nickel on zinc, etc., etc. Address Box 330, Ansonia, Conn.

Financial Partner wanted in Inventions illustrated on first page; also parties to solicit contracts. Address J. J. Harlan, 83 West Van Buren St., Chicago, Ill.

Foot Lathes. W. E. Lewis, Cleveland, O.

The Western Manufacturer, of a recent date, says: "Rock Falls, Ill., is the largest manufacturing town of its age in the West."

Every possible advantage given to Manufacturers on the Water Power at Rock Falls, Ill., by A. P. Smith.

Brown's Patent Chandeliers and Bracket Lights, the only non-explosive lamp in existence, and warranted. Rights or lamps for sale. Send for circular to Wm. Brown, 16 Bromfield St., Newburyport, Mass.

Wanted.—Light Second-hand Rails for a 3½ miles' road. Address A. Moresi, Jeannerette, La.

A Havana merchant will accept the agency of first-class articles. Address Merchant, 15 Calle Tejaalillo, Havana, Cuba.

Common Sense Chairs and Rockers. Solid comfort all around the house. Send stamp for illustrated price list to F. A. Sinclair, Mottville, N. Y. For sale by the trade.

For Sale.—A valuable Patent. For further information, address Kelly & Ludwig, Philadelphia, Pa.

Patent Double Eccentric Cornice Brake, manufactured by Robinson & Co., successors to Thomas & Robinson, Cincinnati, O. Send for circulars.

Safety Linen Hose for Stores, Factories, Hotels and Steamboats, at best rates. Greene, Tweed & Co., 18 Park Place, N. Y.

Painters.—Send for new prices of Metallic Graining Tools, for "wiping out." J. J. Callow, Cleveland, O.

For the best Galvanized Iron Cornice Machinery for all kinds of work, apply to sole owners, Calvin Carr & Co., Cleveland, O.

For Sale.—Combined Punch and Shears, and Engine Lathes, new and second-hand. Address Lambertville Iron Works, Lambertville, N. J.

Hyatt & Co.'s Varnishes and Japans, as to price, color, purity, and durability, are cheap by comparison than any others extant. 246 Grand st., N. Y. Factory, Newark, N. J. Send for circular and descriptive price list.

Gas lighting by Electricity, applied to public and private buildings. For the best system, address A. L. Bogart, 702 Broadway, N. Y.

Catechism of the Locomotive. 600 pages, 250 engravings. \$2.50. Address M. N. Forney, 73 Broadway, N. Y.

Power & Foot Presses, Ferracute Co., Bridgeton, N. J.

Superior Lace Leather, all sizes, cheap. Hooks and Couplings for flat and round Belts. Send for catalogue. C. W. Army, 148 North 3d St., Philadelphia, Pa.

F. C. Beach & Co., makers of the Tom Thumb Telegraph and other electrical machines, have removed to 530 Water St., N. Y.

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

Lead Pipe, Sheet Lead, Bar Lead, and Gas Pipe. Send for prices. Bailey, Farrell & Co., Pittsburgh, Pa.

Hydraulic Presses and Jacks, new and second hand. Lathes and Machinery for Polishing and Buffing metals. E. Lyon, 470 Grand St., N. Y.

Solid Emery Vulcanite Wheels—The Solid Original Emery Wheel—other kinds imitations and inferior. Caution.—Our name is stamped in full on all our best Standard Belting, Packing, and Hose. Buy that only. The best is the cheapest. New York Belting and Packing Company, 37 and 38 Park Row, New York.

Steel Castings from one lb. to five thousand lbs. Invaluable for strength and durability. Circulars free. Pittsburgh Steel Casting Co., Pittsburgh, Pa.

Shingle Heading, and Stave Machine. See advertisement of Trevor & Co., Lockport, N. Y.

Cotton Belting, light and heavy, for Polishing and Carrying Belts. Greene, Tweed & Co., 18 Park Place, N. Y.

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

Skinner Portable Engine Improved, 2 1-2 to 10 H. P. Skinner & Wood, Erie, Pa.

Emery Grinders, Emery Wheels, Best and Cheapest. Awarded Medal and Diploma by Centennial Commission. Address American Twist Drill Co., Woonsocket, R. I.

To Clean Boiler Tubes—Use National Steel Tube Cleaner, tempered and strong. Chalmers Spence Co., N. Y.

Split-Pulleys and Split-Collars of same price, strength and appearance as Whole-Pulleys and Whole-Collars. Yocum & Son, Drinker st., below 147 North Second st., Philadelphia, Pa.



A. V. E. will find directions for mending rubber boots on p. 203, vol. 30.—M. F. will find directions for making a Daniell battery on p. 326, vol. 32.—J. H. V. H. will find a description of the process of photolithography on p. 272, vol. 32.—S. can remove marks tattooed on the skin with Indian ink by following the instructions on p. 331, vol. 30.—W. A. H. will find something on the results of the transit of Venus observations on p. 180, vol. 32.—E. will find a recipe for bay rum on p. 363, vol. 29.—J. S. D. will find directions for making paste for marking with stencil plates on p. 379, vol. 35.—J. E. L. will find a recipe for a depilatory on p. 186, vol. 34.—J. R. will find a recipe for aquarium cement on p. 202, vol. 28.—E. G. P. will find an article on

multiple telegraphy on p. 197, vol. 29.—C. H. H. will find on p. 187, vol. 32, directions for making battery carbons.—G. H. will find something on polishing woods on p. 315, vol. 30. For French polish, see p. 11, vol. 32.—J. H. B. will find on p. 21, vol. 36, directions for lining kettles with porcelain.—F. P. R. will find an explanation of the term "nominal horse power" on p. 33, vol. 33.—W. F. A. will find directions for bending timber of all kinds on p. 26, vol. 31.—A. M. P., B. N. R., S. W., F. C., J. B. M., W. H., C. P. G., R. F. W., N. K., and others, who ask us to recommend books on industrial and scientific subjects, should address the booksellers who advertise in our columns, all of whom are trustworthy firms, for catalogues.

(1) W. G. says: A is a movable wheel, moving around and gearing into a wheel of the same size. How many times will A turn on its axis in going once round B? A. Twice, under the conditions stated.

(2) D. M. says: 1. I use an upright 8 horse power engine to run my presses. The boiler is cast iron with about 10 small flues up through it. Is this dangerous? A. Your description is rather indefinite, and though we think that in general the use of cast iron in boiler construction is objectionable, we do not know that your boiler is especially dangerous. 2. I use rain water from a flat tin roof, painted. Stove coal is used in the building, and the soot settling on the roof causes the water to be dark colored. I have been told that the creosote in the soot will corrode or eat into the boiler and flues where it settles on the top of the water. Is this so? Will the paint on the roof injure the water? A. In regard to the water you use, we scarcely think that its action will be injurious to the boiler. This question can, however, in the absence of an analysis, be settled only by observation, and we advise you to inspect the boiler and connections carefully, at short intervals.

(3) R. E. asks: Can you give me a plain rule by which I can ascertain the horse power of 44 inches diameter by 10 feet stroke engine, and the percentage or useful effect of the engine in horse power spent in working a 20 inches diameter plunger pump, pumping water out of a perpendicular shaft through an 18 inches diameter by 288 inches discharge pipe? The receiving pipe is 20 inches diameter by 10 feet long, capacity of engine is 5 strokes per minute with a boiler pressure of 75 lbs. per square inch. We have in use eight 32 inches x 36 feet cylinder boilers. Distance of engine from boilers is 20 feet. A. The only method by which these facts could be determined with any degree of accuracy would be by experiment. From the data sent, we could not give you a reliable rule.

(4) C. H. R. says: I am anxious to get something that will blow a church organ. We could not use hydraulic motor. Has anything else been invented for the purpose? A. There are hot air, gas, and petroleum engines in the market, some one of which might answer your purpose.

(5) J. C. asks: 1. What degree of heat will steam indicate under a pressure of 100 lbs. to the square inch? A. About 338° Fah. 2. How much can the heat be increased by superheating? A. You can increase the temperature as much as desired by using proper apparatus.

(6) H. V. asks: I am building a boat 50 feet long over all, and of 13 feet beam. I am having two engines built of 7 inches diameter and 8 inches stroke. The boat is to draw 3 feet of water, and is to be of good model. I intend to put in twin propellers, one engine on each shaft. What diameter of propeller shall I use, and what speed can I expect from the above dimensions? A. Put in propellers of as large diameter as you can conveniently use. By using counterbalanced cranks or disk wheels, you can obviate all danger of catching on the center. With a good steaming boiler, you may expect to realize a speed of at least 7 or 8 miles an hour.

(7) A. C. asks: Does area of a cylinder mean the open surface? A. You probably refer to the volume of a cylinder, which is the space inclosed by it. It is improper to speak of the area of a cylinder. You can, however, speak of the area of the base and of the convex surface.

(8) F. A. L. asks: How much power do I require to raise water 60 feet through a 1½ inch pipe to my cistern in attic? A. It depends upon how fast you want to raise the water. It will be easy to raise it by means of a pump that a child can work, or you may use all the power that can be exerted by a horse.

(9) J. K. N. says: Can you explain the cause of the trouble with our cistern? It was built about 18 months ago, is under the house, and holds about 1,200 barrels. This winter it has proved to be leaky; and upon examination, we found that the cement in places, upon the sides and bottom, had puffed up in blisters of 3 or 4 square feet, and some smaller, leaving a hollow space beneath of from one to two inches. Of course, the cement had cracked and caused the leak. The walls of the cistern stand upon the solid rock; but the bottom does not go to the rock, but is plastered upon sand and gravel mixed, about 4 feet from the rock, with cement about an inch thick. There has been more or less water in it ever since it was built. No one hereabout seems to know the cause of it. A. At certain seasons, the water in the ground is more plentiful than at others, and rises to a higher level; if at such time the water in the cistern is drawn down to a lower level than that of the water in the ground, the latter will have the preponderance of pressure, and the upward movement of cistern bottoms is thereupon a very natural result. The remedy consists in constructing the bottom of the cistern arching—like an inverted dome—cementing the prepared gravel bottom, and then turning a brick arch upon it, laid in cement, to hold it down.

(10) W. H. C. says: 1. I have an engine of 6 inches stroke and 3 inches bore. How large a boiler do I want to make it run a small lathe for turning wood not over 6 inches in diameter? I have a boiler 2 feet long, 15 inches in diameter, and ½ inch thick. How much steam will it stand with 3 rods running through the center of the boiler? A. The boiler will probably answer, and you can carry 30 lbs. of steam. 2. I have a safety valve ½ inch in diameter, with a lever 4 inches long, 1½ inches from fulcrum to center of valve, and a weight of 1 lb.

How much steam can I get before it blows off when my ball is at the full length of the lever? A. The data in regard to your safety valve are not sufficient for a complete calculation; but when the ball is at the end of the lever, the pressure required to raise the valve will be between 40 and 50 lbs. per square inch.

(11) D. F. H. asks: Could not a steam boiler, that would be safe, be made by placing the heads on each end of shell and passing the tubes through the heads, to be fastened by nuts on the ends? A. Such boilers are frequently used on steam vessels. All the tubes are not secured by nuts, but several are made heavier than the others, and are fastened in this way.

(12) S. A. S. says: Can you give me a recipe for making a bright crimson dye, for the purpose of dyeing ordinary white muslin? A. Mordant the cloth with tin salt, and dye in a hot bath of madder extract or alizarine. There are numerous works on the art of dyeing, etc. See our advertising columns for names and addresses of publishers.

(13) T. C. P. says: I use 1 inch gas pipe for a heater and supply. I want to know if a 2 inch pipe in its place would be harder on the pump, as the pump has a 1½ inch plunger, and is run by eccentrics at 300 revolutions per minute. My object is to heat the water hotter. A. It will not.

(14) N. H. T. says: 1. I have a horizontal boiler 3 feet long and 20 inches diameter, with firebox 20 x 20 inches. The heat and smoke go to the front into a smoke box and come back through about 35 one inch tubes to the chimney. It has been tested to 150 lbs. per square inch. Is it large enough for a vertical launch engine 3½ x 5 inches? A. The boiler will probably answer very well. 2. How fast will this engine and boiler run a boat 25 feet long, built for the purpose? A. You may expect a speed of from 5 to 6 miles an hour in smooth water. 3. Can I get as much power with the same engine and boiler condensing in a vacuum, as I can using live steam? A. Yes, and more, other things being equal.

(15) J. Y. P. says: Please give me your opinion of the amount of power required in a machine for pulling pine stumps, and the kind and size of chain necessary, when used double? A. Without knowing what kind of a machine you have in view, we are unable to give you any information. So far as we know, a little giant powder, or some similar compound, forms the most efficient stump extractor that has yet been introduced.

(16) T. V. D. asks: How can I build a cistern? A. One of the first considerations is the nature of the soil in which the cistern is to be built. In some hard soils, an excavation is sometimes made carefully to the size required, the bank sprinkled with water, and then a coat of cement applied to it, without building a wall. In most cases, however, it is best to construct a cistern with brick walls, bottom and top. Let the form be cylindrical, the top arched in the form of a dome, and the bottom in the form of an inverted dome. If economy is an object, the walls may be 4 inches thick for 8 feet diameter or less—larger than this will require 8 inch walls—and all laid in cement. Plaster the interior throughout, together with the top of the crown, with a good coat of cement. Let the crown be 18 inches below the surface of the ground, and place a flat stone on the bottom, directly under the opening in the top.

(17) Y. A. asks: 1. What material or composition, other than lampblack, is successfully employed in the coloring of black mortar joints of brick face work? A. Coal dust and English drop black. 2. What should be the proportion of sand and lime in such mortar, and how should I mix the same? A. Prepare your pointing mortar first, and add color to suit, until the gray becomes black. 3. There is a material known as point black. Is it durable in color? A. We presume you refer to the drop black above referred to. It is the best in use for the purpose, and costs about \$2 to the thousand of front brick. We cannot say if it is much in use.

(18) M. W. D. says: 1. I have a recipe for tempering millpicks, by rubbing cyanide of potassa over the steel, heating to cherry red, and dipping in water. After a little experimenting, I was able to produce an excellent temper. But another time I failed. I used great caution not to overheat them; but out of several dozen I had not one that would not crumble like cast iron, and looked as if it were burnt. A. If the grain of your steel, after hardening, appeared coarse or granulated, it must have been overheated. 2. What will be best to temper them in that will not destroy the steel? A. Try heating them in molten lead, and using the cyanide of potassa as before.

(19) J. W. says: Your answer to G. E. C.'s question as to reversing a stationary engine is not correct. If the eccentric of an engine is turned halfway round, to reverse, the valve will be set wrong to twice the amount of the lap of the valve when the valve has no lead, and twice the lead in addition when it has. The position of the valve when the engine is on the center will be wrong by 1½ inches in an engine cutting off at ¾ stroke, with a 3 inch travel to the valve and no lead, when set by turning the eccentric halfway round. A. Our correspondent G. E. C. spoke of a valve without lap.

(20) T. W. says: We have a belt for polishing spokes, etc., which does not give satisfaction. Can you tell us how to construct a good belt? A. Use sand or quartz glued to a leather belt. Spread the sand on a board, make the glue well hot, coat the belt with glue, lay it glue side downwards on the sand and roll a heavy pulley on the back of the belt to press it into the sand.

(21) H. A. W. asks: 1. How fast should a lathe run while turning a piece of 1 inch bar iron? A. With a good tool, about 130 revolutions per minute. 2. How fast should it run to turn a piece of oak wood 2 inches in diameter? A. As fast as possible.

(22) S. N. says: I wish to heat small article of steel in a lead bath, for the purpose of hardening them by plunging in water after heating, but I find a difficulty from oxidation that takes place on the surface of the lead. What is the remedy? A. Cover the lead with powdered charcoal.

(23) T. S. R. says: 1. I am making a lathe to run by foot or hand power. What ought to be the size of the band wheel to go by hand, and what the size of the band wheel to go by treadle? A. To go by hand, 24 inches diameter. To go by foot, 30 inches. 2. What should be the diameter of the pulley? A. Six inches. 3. Shall I use a leather or rope band? A. Use a leather belt.

(24) J. P. L. asks: Is there any die in use for cutting screw threads on bolts, etc., so constructed that it may be opened at the end of the cut, and be run back without reversing the lathe or die holder? A. Die holders such as you require are made by nearly all the prominent bolt-cutting machine makers.

(25) T. H. B. asks: Why do cast iron kettles for melting metal crack on the bottom about two hours after the fire is started, or as soon as the metal is thoroughly melted? A. Because the bottoms are too thick. Try kettles with thinner bottoms.

(26) E. S. asks: What is the best way to solder wire cloth to a round iron hoop? Is there not a preparation that will cause the solder to adhere readily, and prevent rust? A. Use killed muriatic acid (muriate of zinc); then add 2 parts of water and a little sal ammoniac, determining the quantity by experiment.

(27) T. B. asks: What causes the hardening of saws that are gummed out with emery wheels? A. The spaces between the particles of emery fill up with steel (or whatever is being ground on them), creating a smooth in place of a rough surface; and the friction causes heat, heating the outer surface suddenly, and it cools equally suddenly when the emery wheel leaves it, and the outer shell of the steel hardens. To remove it, hack the wheel. This may be done with the corner of a worn-out file. Then go over the saw very lightly, and grind off the extreme outer surface which has been hardened. It is better to keep the emery wheel hacked and cut off only a little at a time, and go around the saw several times in gumming. It will really require no more time than to do it in the usual way of gumming each tooth clear down before commencing the next one. This is an important matter, as hundreds of saws are ruined for want of this knowledge.—J. E. E., of Pa.

(28) W. C. H. asks: How may copper be permanently colored or stained black? The coatings made by varnishes soon wear off, and a process is desired that will render the color durable. A. There is no coating for metals that can conveniently be applied better than that recommended to A. F., on p. 90, vol. 36. What is the method of silvering glass? A. See p. 35, vol. 35.

(29) S. G. asks: What can I use to color starch brown, for starching brown linens, cambrics, prints, etc.? A. Try a little soluble Bismarck brown.

(30) G. C., of Ballarat, Victoria, Australia, asks: 1. What do the blind manufacturers in America use to prevent the blistering of the paint on inside blinds? A. Paint is apt to blister when mixed with boiled oil. Use raw oil, and let the paint get dry and hard before exposing it to dampness or rain. 2. What are the ingredients used in the manufacture of green paint? A. Paris green is the principal ingredient used in the greens for painting blinds. The color is shaded by adding black. A bronze green is sometimes made by mixing black and chrome yellow.

(31) A. A. B. says: Please inform me of the cause of and remedy for granulated eyelids? A. The trouble is commonly caused by a weak and impure state of the blood. Use sulphur and iron tonics for the blood, and wash the eyes regularly, three times a day, with the following: Pure sulphate of zinc 3 grains, tincture of opium 10 drops, water 2 ozs.

What is the process of making emery wheels? A. They are usually made by kneading crude caoutchouc, softened by heat, with about half its weight of sulphur, and the proper quantity of fine emery, and vulcanizing the material by heat.

Can a person make a patent invention for his own individual use? A. No.

(32) J. J. says: Please give me a recipe for making vulcanite, to set artificial teeth in? A. The right to manufacture this material is secured by patents. It is made by kneading caoutchouc with about half its weight of sulphur and a little Indian red. It is vulcanized by heating for 4 hours, under pressure, at a temperature of 310° Fah.

(33) H. G. says: Please give a recipe for making bar soap? There is one offered for sale by peddlers, as follows: Take 5 gallons ley, 5 gallons water, 5 lbs. tallow, 1 lb. potash, 2 lbs. sal soda, ¼ lb. rosin, 1 pint salt, 1 pint washing fluid. Let boil half an hour, which is enough for 100 lbs. But I cannot make it work. It does not take up the grease, and it does not harden. A. Dissolve the potash and sal soda in the water (boiling), and add a few ozs. of caustic lime, stir and allow to settle. Pour off the ley thus formed, and boil this for several hours with the tallow and rosin. Then remove from the fire and add the salt (dissolved in hot water). Stir well, and allow to settle. Pour off the supernatant liquid, gather the precipitated flocculent soap on a cloth, and strain off the excess of liquor by pressure. When dry, this should give you about 12 lbs. hard soap.

(34) I. J. asks: 1. How many lbs. of coal will make a bushel of coke? A. On an average 50 lbs. of canal coal will yield a bushel of coke. 2. How many lbs. of coke are there in a bushel? A. A bushel of coke weighs about 35 lbs.

(35) H. E. N. asks: What will remove the stain of white paint, that has become hard and set on brown silk? A. Try good chloroform and ether, and then a little soap and water.

(36) T. S. says: I wish to make an intense light in one end of a hall from a single gas jet, the body of the hall being lighted with ordinary gas burners. I wish the light to last for two or three hours. How can I increase the intensity of gas? A. There is no source of brilliant illumination which approaches, in point of economy and controllability, the oxyhydrogen or lime light. Try large argand gas burners, provided with tall chimneys and good silvered reflectors.