## Business and Versonal.

## The Chargefor Insertion under this head is One Dollar a line for each insertion.

Everybody their own Nickel Plater; no battery. Send 3c. stamp to Wm. Munch & Co., Groton, Tompkins Co., N. Y.

Fast Boat Engine Castings for sale. Novel cut-off, perfect valve movement, simple and effective reversing gear. Price of Castings saved in building over the link motion. Duplicate Castings of the engine in the celebrated Steam Launch Flirt, the fastest boat of her size in the world, will be furnished complete with working drawings for \$25. Finished Engine, \$150. Address H. S. Maxim, M.E., Room 74, Coal and Iron Exchange, N.Y.

Illustrated description of the fast Steam Launch Flirt is contained in No. 81 of the Sci. Am. Supplement.

For Sale.-One English made Lathe, 28 in. swing, 16 ft. bed, compound rest; price \$150. The Bullard Machine Co., limited, 14 Dey St., N. Y.

For the best Bone Mill and Mineral Crushing Machines-five sizes, great variety of work-address Baugh & Sons, Philadelphia, Pa.

Wanted .- Second-hand Machinery to fit up Planing

Entire right for sale very cheap. Valuable No Chim-For Solid Wrought Iron Beams, etc., see advertise-ment. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

Wanted .- A Salable Article to Manufacture as a Specialty. Address 1,600 North Front St., Philadelphia, Pa.

lists. A. W. Morton, 104 John St., N. Y.

A situation wanted by an experienced Pattern Maker. Address H. A. Chase, Lee, Mass.

of Matches. Apply to J. H., P. O. Box 942, N. Y. city.

Canadian Patent For Sale.-Mey's Dryer for Grain, Malt, etc., has been in practical use for several years in Buffalo, N. Y. Address F. H. C. Mey, Buffalo, N. Y.

For a 15 in. Swing Lathe having 1% in. hole through Head Spindle, something new, address Star Tool Com- it 8 or 16-sided, putting a hole through the center and pany, Providence, R. I.

Carpenters.—Your Saws will cut straight by using my Jointer; the teeth will all be of an equal length. Sample by mail, 25 cts.; \$2 per doz. E. Roth, New Oxford, Pa. I.want agents.

2d Hand Iron Planer built by Smith of Salem, Plane 13 ft. x 30 in.; price \$375. A.C.Stebbins, Worcester, Mass.

Cornice Brakes. J. M. Robinson & Co., Cincinnati, O. Noise-Quieting Nozzles for Locomotives, Steamboats, etc. T. Shaw, 915 Ridge Ave., Philadelphia, Pa.

John T. Noye & Son, Buffalo, N. Y., are Manufacturers of Burr Mill Stones and Flour Mill Machinery of all kinds, and dealers in Dufour & Co.'s Bolting Cloth. Send for large illustrated catalogue

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

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 Pack-ing Commun. 27 or 420 Beach Bene V. M. ing Company, 37 and 38 Park Row, N. Y.

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

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

Hydraulic Presses and Jacks, new and second hand.

Shaw's Mercury Gauges, U. S. Standard of Pressure. 915 Ridge Ave., Philadelphia, Pa.

Improved Wood-working Machinery made by Walker Bros., 73 and 75 Laurel St., Philadelphia, Pa.

Vertical Scientific Grain Mills. A.W.Straub & Co., Phila. Corliss Engine Builders, with Wetherill's improvements, Engineers, Machinists, Iron Founders, and Boiler Robt. Wetherill & Co., Chester, Pa Makers

The Niles Tool Works, Hamilton, O., have second hand Machine Tools in first class order for sale.

Friction Clutches warranted to drive Circular Log Saws direct on the arbor; can be stopped instantly; also Upright Mill Spindles, Safety Elevators, and Hoisting Machinery. D. Frisbie & Co., New Haven, Conn.

Wanted.-Second-hand Gun Stocking, and other Gun Machinery. Address V. A. King, Lock Box 81, New Haven, Conn.

on hand about 200 bound volumes of the Scientific Amer- iron? A. For a short time probably 600° Fah. ican, which I will sell (singly or together) at \$1 each, to be sent by express. See advertisement on page 109. John Edwards, P. O. Box 773, N.Y.



## de oles de neries

(1) J. M. S. asks: Have chemists ever anmeric with turpentine oil  $(XC_5H_4)$ . Consult Watt's "Dictionary of Chemistry."

of the compass to point north and south, electricity or depends wholly on the structure and inclination of the magnetism? A. It is supposed to be caused by the cir- underlying strata—a point that can be settled by trial culation of electric currents around the earth in a direc- only tion about parallel with its equator, and the tendency of the needle to arrange itself at right angles to the direction of these currents. See also answer to S. B. G. Shall I proceed in the same manner to make an electrotype of a wooden medallion as I would in taking one from a plaster one? A. Yes.

(3) J. N. L. asks (1) for a recipe to promote the growth of the human hair? A. The health and Moulding Mill and Door Factory; give particulars. P. O. Box 3058, N. Y. city. the general vigor of the system. Brush the scalp well with a stiff brush daily (with care not to strain the hair) ney Lamp Burner. J. Engle, Jr., Sharon Springs, N. Y. and wash it with pure water, to which a little cologne water or tincture of cantharides may be added. Avoid the use of pomatums, oils, etc. 2. Also, one that will cause it to cease growing? A. See answer to R. E. F.

(4) T. J. H. writes: How can I remove the ialty. Address 1,600 North Front St., Philadelphia, Pa. rust off a nickel or silver plated surface, and make it For book on Lubricants, R. J. Chard, 134 M.Lane, N.Y. appear as good as new? A. By buffing or polishing un-Scroll Saw Designs. Send for illustrations and price til a new surface is obtained, which must then be replated.

(5) A. V. P. writes: 1. Can I coat an ordinary glass jar with tinfoil? A. Yes. 2. How can I For Sale.-Machinery and Compositions of all kinds fasten it to the glass? A. With shellac varnish. Then, in order to drive off all moisture from the inside of the jar, it is well to heat the jar to about 212°, and keep it at that heat for about one hour; then seal the jar air-tight, with sealing wax. 3. Can I make a plate machine by using thick window glass for the plate, cutting clasping it between wood disks on a wood shaft for turningit? A. Yes. 4. How thick should the glass be? A. Make it of crown glass  $\frac{1}{12}$  of an inch thick and 12 inches in diameter, 5. Would two thicknesses do best? A. Not for a small machine, 6. Can the collecting combs be connected directly with the jars? A. Yes. pale shellac, 4 ozs.; alcohol, 1 quart. See SUPPLEMENT 105, p. 1669. 7. Of what is it best to How can I melt gold dollars in a con make the cushions? A. Of chamois leather, and

stuffed with hair? I would like to know my best method for procuring oxygen gas, not too expensively, for trying a few ordinary experiments; using say 2 or 3 gallons at a time? A. Make a retort out of a piece of iron gas pipe 8 inches long and of about 1 inch bore; on one end of this have gas fitter screw on a cap airtight, and on the other end a reducer, connected airtight with about 2 feet of 14 inch gas pipe: now it would be well to place the retort in the fire, so as to burn off any oil that may be in it; then remove it from the fire, and when it is cool place in it a mixture of about equal parts of pulverized black oxide of manganese and chlorate of potash; then heat the retort gradually, and the oxygengas will escape atthe end of the 1/4 inch pipe, where it may be collected over water or by simply bending the 1/4 inch pipe into a glass jar, so that the oxygen gas (which is heavier than air) may settle in the glass jar. A little splinter of ignited charcoal held near the mouth of the jar will indicate(by burning brightly) when the jar is full.

Lathes and Machinery for Polishing and Buffing metals. while sweeping to lay the dust, and which will not in-E. Lyon & Co., 470 Grand St., N. Y. jure the carpets? A. Wet tea leaves.

> (7) In answer to J. S. H., who asks for a good recipe for vinegar made by chemicals, SUPPLEMENT 86, 326, 284, 156, and 123, vol. 37, SCIENTIFIC AMERICAN.

(8) R. E. F. asks for a safe and simple method or preparation that will permanently remove from the upper lip a slight down, which being dark is unpleasantly apparent? A. Böttger recommends the following: 1 part, by weight, pure crystallized sodium sulphydrate, and 3 parts of fine purified chalk; rub well together, moisten with water, and apply a layer the thickness of a knife blade. It should be allowed to remain in contact with the flesh not more than two or three minutes. If the materials are impure the skin may be stained.

(9) J. B. M. asks: At what degree of heat Haven, Conn. Bound Volumes of the Scientific American,—I have without coming in contact with fire or a heated wall or

tion, and traveling from east to west.

we should say that they could not be.

yes; as regards mean time, no

(10) S. B. G. writes: The magnetic needle A. The minerals or oresfrom which metallic aluminum is said to stand at right angles to a current of electric- may be economically extracted by methods in use at ity parallel to the equator. Then what is the cause of present are: Bauxite, found, in notable quantities, the variation of the magnetic needle or the current only in France-at Beaux and Revese, and cryolite, ocof electricity? A. Perhaps you will understand this if curring in abundance on the western coast of Greenyou bear in mind that the magnetic equator does not land and in the Ural Mountains, Russia. (See SCIENTIFIC

which would be at low tide? A. It would weigh heavier, during our late unpleasantness, and possibly you can of course, on the opposite side of the earth from the obtain what you want from a dealer in weapons of ofmoon, where it is less influenced by the attraction of the fense and defense. latter, and in a downward direction.

means of determining the matter, for the reason that About 5 or 6 miles an hour. (2) G. E. B. writes: What causes the needle the presence or absence of water, at different depths,

> (15) C. W. K. says: In the publisher's prospectus of Wm. Cullen Bryant's "History of the United inishing steam for running the engine at this speed, you States," it states that "Geologists have demonstrated that this is the oldest of the continents." He seems inclined to doubt this, and asks our opinion. A. Webelieve that the most prominent scientists all concede America to be the old world, geologically speaking. From our own reading on the subject we cannot think otherwise.

water in absorbing the water swells, and why, if it had been immersed in oil, although it absorbs the oil, yet it does not swell. I refer particularly to linseed oil. A. The paper originally consisted of exceedingly fine fibers mixed with water in the form of a pulp, to which there was added a small quantity of glue. When it is soaked in water the latter disintegrates it and causes the fibers : to separate and to again assume a semi-pulpy state; the paper can hardly be said to swell. Oils have not the property of causing such a disintegration any more than they have of dissolving certain things that are soluble in water.

use to make a freezing compound? A. Any of the following will answer the purpose: Snow or powdered ice 2 parts, common salt 1 part; snow or powdered ice 3 rise or fall in the tube, following the expanding or conparts, crystallized chloride of calcium 4 parts; or sul- tracting of the confined air. Mark the point at which phate of soda 6 parts, nitrate of ammonia 5 parts, dilute nitric acid 4 parts. The parts referred to are by weight.

(18) G. W. K. asks: Is soda injurious as a tooth powder? A. Yes.

How can I make japan for small castings (yellow japan)? A. Gamboge, 2 drachms; cape aloes, 3 drachms;

How can I melt gold dollars in a common blacksmith's forge? A. Gold coin may be readily melted in the heat of an ordinary blacksmith's forge. You will need a crucible, made either of graphite or French clay, in which to melt them.

ing the color of the hair, not instantly, but by gradual 157,310 power looms used in the manufacture of cotton process? A. Apply occasionally as a wash the expressed juice of the bark of green walnuts (Paulus agimeta).

(20) X. askse: What mineral or chemical substance would be best to deodorize the fumes of gasoline smoke? Could the fumes be precipitated or conducted through a chemical mixture and divested of the bad smell? If so, by what chemical substance? A. The trouble is due to the difficulty of securing complete combustion. The vapors may be condensed by passing through cold water, or thoroughly oxidized by conducting them through a column of granular potassium bichromate kept constantly moistened with strong suiphuric acid.

(21) L. A. asks how to cement a hard rub-(6) E. M. asks what can be put on carpets ber triangle, such as draughtsmen use? A. Melt toand press the parts firmly together until quite cold. If on fat so very fast that in 30 days' time she was ready properly applied, the lines will be only very slightly out to kill for beef, and good beef at that. This in all was of true.

> (22) R. W. S. asks: What can I use to cleanse and burnish my lamp burners to prevent their | hair I ever saw on an animal's back. We keep our smoking? I have tried various preparations, all to no advantage, and am obliged to throw them aside and get new ones, which only last a few weeks, until they smoke as bad as the old ones just laid aside. A. To clean unlacquered brass work use a stiff brush, plenty of hot soapsuds, and a little fine sand; dip in clean water and touch up with tripoli. It may be kept clean for a time by applying a light coating of shellac in alcohol the States and Canada? A. The compensation rewith a little dragon's blood to color. Lacquer may be removed by strong hot solution of borax.

(23) L. A. L. asks: 1. What is the price of aluminum in Europe? A. About \$1.30 per ounce. 2. Can it be had in amounts suitable for manufacturers' use? A. Yes. 3. Where is the metal mostly prepared? A. In France. 4. Is any made in America? A. Not commercially. 5. What are the best sources of supply?

(26) R. H. M. writes. 1. I want to build a (14) A. P. B. says: It is a well known fact steamboat 50 feet long, 12 feet beam, to draw not over that in some sections of our country water does not lie 16 inches, as the water is very shoal in places where I alyzed the juice of the India rubber tree ? What are its at the same depth, that is, a well may be sunk one hun- wish to run. She will be of fair model, but quite flat ingredients? A. Yes; the pure juice is essentially a mixture of a number of hydrocarbons isomeric and polythere any means by which these veins of water can be have? A. It will be better to use two screws, with a found or their depth determined? A. There can be no pitch of 41/2 to 5 feet. 3. What will be the speed? A.

> (27) G. W. writes: I have an engine  $2 \ge 2\frac{1}{2}$ inches; boiler, 9 square feet of heating surface, containing about two buckets of water, carrying 100 lbs. of steam and running 600 revolutions per minute. What power is developed? A. If the boiler is capable of furshould realize about 11/4 effective horse power.

(28) W. R. B., query No. 20, January 19, asks for a method to clean sponges used at the Aquarium. I would suggest in addition to your information that good clean sand be tried. The mode of operation is to work the sand into the sponge by a kneading process, and when sufficiently worked rinse in warm (not (16) C. M. R. asks why paper immersed in hot) water, which loosens and removes the dirt and slime, --J. W. C.

> (29) E. K. asks: What will take a stain of coal oil, about six feet in diameter, out of a dark Brussels carpet? A. Try heating the spot very hot before a fire for some time, to drive out the oil by evaporation. If that fails, probably wetting with purified benzine will effect the object.

(30) R. C. asks: What is the latest estimate of the zero of temperature, and upon what considera-tions is that estimate based? A. Assume a cylindrical tube, closed below and open above. Further assume (17) I. J. I. asks: What chemicals must I the air in the tube is confined by a piston which has no weight and moves without friction. As the temperature rises or falls, of courseour assumed piston would the piston falls at the temperature of freezing water, 0°, and the point to which it rises at the temperature of boiling water, 100°. Lastly, divide this piston into 100 equal parts, and continue the division of the same size above 100° and below 0°. It will be found that almost exactly 273 such divisions can be made before reaching the closed bottom of the tube. These divisions correspond to centigrade degrees, so that the absolute zero is 273° below the freezing point centigrade, or 459° below that of Fahrenheit.

(31) L. A. W. asks for the number of power looms in the United States and Europe? A. According to the compendium of the ninth census of the United States, issued at the Government printing office (19) A. H. C. asks for a recipe for darken- in Washington, D. C., there are in the United States goods, and 1,451 in the manufacture of carpets.

> (32) R. W. asks: Can an ice boat sail faster than the wind which blows it along? A. Yes. See SCIENTIFIC AMERICAN SUPPLEMENT Nos. 54 and 61, for full particulars.

> (33) With regard to destroying lice on cattle and not injure them, G. B. says: Take 1 pint fish oil, pour it on the animal gradually, from the back of the horns to the root of the tail. To cure the cow itch or scratches: Paint the pastern joint well with white lead and oil; any kind of vegetable or animal oil will answer. Keep the cow haltered so she cannot lick her feet or go into water for one week. One application of each remedy is sufficient. On using the oil for lice, I have seen a cow in seven days' time shed her coat, and in 14 30 days from the time she had been served with the dose of oil on her back. She had the prettiest coat of dogs well greased with tanner's oil, to kill fleas, and keep off flies in summer.

> (34) A. E. K. asks: What is the salary of a first class engraver, capable of doing work similar and the same as banknote, vignette and script lettering equal to banknote work, which is got up at present in ceived by first class banknote engravers varies a great deal, according to their abilities. Youmust apply to an engraving company, with specimens of your work, if you wish to obtain definite information.

> (35) F. C. writes for directions for making small magnetic engine, either upright or horizontal? A. You will find a fully illustrated descriptiononp, 301, SUPPLEMENT No. 19.

(36) F. D. H. asks (1) if there is such an  $ar^{-1}$ 

Self-Feeding pright Drilling Machine, of superior construction: drills holes from % to % inches in diameter. Pratt & Whitney Company, Hartford, Conn.

A Rare Opportunity .- A new Factory, with Engine, Boiler, Shafting, etc.; in a splendid location; suitable for manufacturing; will be sold for less than ½ of its original cost, or will be leased on easy terms. For particulars, address L. A. Lawton, Herkimer, N. Y.

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

More than twelve thousand crank shafts made by Chester Steel Castings Co. now running; 8 years' constant use proves them stronger and more durable than wrought iron. See advertisement, page 110.

Machine Cut Brass Gear Wheels for Models, etc. (New List.) D.Gilbert & Son., 212 Chester St., Phila., Pa

Galvanized Iron Cornice Machines .- The most Improved, Straight and Circular. Prices reduced. Calvin Carr, Cleveland, O., and Hewes Machine Works, Newark, N.J

Mill Stone Dressing Diamonds. Simple, effective, and durable. J. Dickinson, 64 Nassau St., N. Y.

Lansdell's Steam Siphon pumps sandy and gritty water as easily as clean. Leng & Ogden, 212 Pearl St., N. Y. Sun, or at right angles to the center line of attraction, A great many patents for such garments were taken out soda in hyposulphite solution,

coincide with the terrestrial. The former is a some- AMERICAN SUPPLEMENT No. 62, p. 990.) Most of the what sinuous line, not differing much from a great commercial aluminum is obtained from bauxite; that circle inclined to the horizon at an angle of 12°, and cutting it on two points almost exactly opposite each ICAN SUPPLEMENT, pp. 798 and 1213, and SCIENTIFIC other, one in the Atlantic and the other in the Pacific. AMERICAN, vol. 37, p. 153.) These points appear to be gradually moving their posi-

AMERICAN, vol. 1, new series, p. 38, you give a rule for (11) L. A. B. asks: Will a sun dial show constructing cone pulleys. Will you please explain how to multiply by the angles? I have tried it and I correct time the year round? A. As regards solar time, cannot get the same answer as you give. A. The article referred to does not give rules, but merely contains nigrosin.

(12) E. R. G. asks if our common red a few illustrative examples, the method of solving clover seed is used in this or foreign countries for the which is not explained. You will find simple methods purpose of coloring or making colors of any kind? A. described in "Wrinkles and Recipes."

We have never heard of their being used for such a (25) N. O. P. writes: Does such an article purpose; and, judging from their chemical composition, exist as a bullet-proof jacket, or has there yet been in- from chlorine, filter, add to the warm filtrate slight exvented a covering for a man's body capable of resist-(13) S. B. G. asks: Where will a body ing the action of pistol balls? If so, where can one be a short time filter. The precipitate, if any, consists of weighthe heavier by a spring balance at new moonpurchased. If not, what substance, metallic or other-barium sulphate; 100 parts by weight (washed with on the opposite side of the earth from the moon and wise, best resists the penetration of leaden bullets? A. hot water and dried) equal about 78 parts sulphate of

in an ordinary gun? A. No. 2. In the forcible discharge of a missile from a gun barrel, will not the sound waves be produced in a greater or less degree, no matter what the explosive employed? A. Yes.

(37) S. S. B. asks: How can I make and from cryolite is usually impure. (See SCIENTIFIC AMER- apply ink as used on ribbons of dating stamps, etc., either purple or some other color? A. The inks are made by dissolving the soluble aniline or other coal tar (24) J. K. S. writes: In the SCIENTIFIC dyes in hot glycerin diluted with about 2 its weight of water. For red, "rubine" extra or aurin with a few drops of ammonia; for blue, water blue BR, 5B, or 2B; for green, methyl green; for violet, methyl violet 5B. Hoffmann's violet 3B, or gentiana-violet B; for black,

> (38)<sup>2</sup> A. K. asks: How can I detect the presence of sulphate of soda in a solution of hyposulphite of soda? A. Heat the hyposulphite solution for some time with excess of dilute hydrochloric acid, free cess of solution of barium chloride, and after standing

(39) A. K. asks: What is the best temperat ture of water for scalding purposes (hogs, poultry, etc.)?

A. From 180° to 212° Fah. is generally recommended. Describe the method of extracting beeswax with bisulphide of carbon? A. Use a sufficient quantity of the sulphide (free from dissolved sulphur) to cover the body containing the wax; after a short time the wax will have been completely dissolved. Strain the solution into a suitable retort, provided with an ordinary condensing worm, and distill off the volatile sulphide by steam heat or hot water bath. The residue of wax should be fused to expel the tast traces of the sulphide.

(40) F. de C. asks: Has any astronomer investigated or explained why planets describe ellipses and not circles around their central sun? A. Yes; Newton (Princip, i, 17, i, 75) demonstrated that, under the influence of an attractive force mutually urging two spherical gravitating bodies toward each other, they will each, when moving in each other's neighborhood, be deflected into an orbit concave toward the other, and describe, one about the other regarded as fixed, or both round their common center of gravity, curves whose forms are limited to those figures known in geometry by the general name of conic sections. He has shown that, in any assigned case, it will depend upon the particular circumstances of velocity, distance, and direction, which of these curves shall be describedwhether an ellipse, a circle, a parabola, or a hyperbola; but one or the other it must be; and any one of any deg ee of eccentricity it may be, according to the circum stances of the case.

(41) R. M. B. asks how "Pepper's ghost" is produced? A. By the reflection on a sheet of clear glass in a dark room of an object strongly illuminated, and so placed as to be out of sight of the spectators.

(42) D. M. S. asks: Is there any power gained by taking a belt from the main shaft (on engine), on which is a 3 feet pulley, to an 8 feet band wheel (on a countershaft): then another belt from a 4 feet pulley on this countershaft to a 10 feet band wheelthis latter to be the motive power? Which is the better way, the above arrangement or to take belt direct from engine (3 feet pulley) to a 10 feet band wheel? A. The son's and Appleton's "New Cyclopedia," Patent Office latter arrangement is preferable.

(43) B.-If your cylinder is 4 inches bore, 23% inch stroke, and you use a two-bladed screw, 16 inches diameter and 24 inches pitch, and carry a high states has given good results: Take of best glue any pressure, you can run a 21 feet boat at about 7 miles known quantity, say 1 lb.; soak from 12 to 24 hours in per hour

(44) W. R. inquires: 1. Why is the slide to which a locomotive engine reverse lever clutches or rate all the water the glue absorbed, which can be told fastens made with irregular notches, that is, why is the reverse lever not always thrown clear over? A. The object of the intermediate notches is to allow the link to be placed in such a position that the steam can be worked expansively. 2. Is there any other reversing device than at three dollars a cord, or hard coal at six dollars a ton? the link motion considered perfect? A. There are A. The wood, at the price named, is a little the cheapother arrangements for reversing, but there are no seri- est. One ton of anthracite is considered equal to 1.75 ous objections to the link motion when well designed. cord of pine wood.

burr which runs from 300 to 400 revolutions per min- ism of an electro-magnet is contained in the core, I ute. I am troubled with corn coming out at the top of would like you to explain how the electricity affects the eye of the stone. The eye is 7 inches in diameter, the core when it is first covered with paper, and then feeding with a shoe; corn led well down into the stone wrapped with insulated wire. As the electricity cannot by a 4 inch tin tube. What is the matter? A. From escape through insulated wire, I fail to see how it Bo low the stones to become too dull.

(46) C. H. writes: If a bullet be shot upward in the air from a rifle or other gun, will the bullet when it returns to the point from whence it was shot have as much force or velocity as it had when shot from the gun? A. No.

James Watt, according to his observation. It is more city to be a vibration of the molecules of a conductor. than a horse does, on an average, in regular daily work.

(48) J. A. O. asks: Will two inter-friction drillings are of any value? A. They may be worked up pulleys run and do good work when of different sizesay one 3 feet and the other 9 feet? A. Plain friction pulleys arranged in this manner are not very efficient.

coiling a 2 inch iron pipe spirally with an outside diam- required. eter of 146 feet and a height of 246 feet? I propose also enveloping it in  $\frac{1}{2\pi}$  inch sheet iron, outside of which will be a perpendicular pipe connecting the ends of the coil and also the middle. In this perpendicular pipe I propose placing my injector, as I presume the down-ward current to be naturally in this pipe. The fire is shellac varnish.

mosphereof heat, will, if judiciously carried out, give

tionof dry steam, and durability of the boiler, as com-

any style of boiler mounting arrangement should of course be made for convenience of inspection as re-

duired by law, and by a proper arrangement of doors

phon pump will operate by the use of compressed air, the same as steam, and draw air through the suction pipes in the place of water? A. Yes. 2. Would funnel shaped suction pipes be the best for air? A. Yes.

(52) T. R. C. writes: The driving wheel on an engine is belted to a pulley 6 feet diameter on a shaft, and another pulley 5 feet diameter on the same shaft is belted to the machine. If I use pulleys half as large and run them twice as fast, can I use a smaller shaft? A. Yes.

(53) H. S. S. asks: If a cannon loaded with is a charge that will expel a ball at the rate of 60 miles per hour is placed on a train running at 60 miles per hour, and discharged in the opposite direction, will the gun leave the ball and the ball drop to the ground, or at what speed will the ball leave the gun, and how far will it go from the spot where it is fired from? I claim the powder simply stops the momentum of the ball and the gun runs away from it, and the ball will drop. p Some say that the ball will part with the gun at the rate of 120 miles. A. See p. 273. vol. 32, SCIENTIFIC tis AMERICAN.

(54) C. B. asks: What is the best method of burning coal slack or screenings for fuel? A. Use grate bars with narrow openings, and have a strong an

(55) T. F. W. asks: 1. What kind of barometers are used to record automatically? A. Mercurial, generally. 2. How is the recording effected? A. The general idea is to have a chart moved regularly by clockwork, on which a pen or pencil connected with the mercurial column traces a line in accordance with the variation in height.

What can be depended upon to stick labels onto glass test tubes permanently? The label can go clear around the tubes and lap sufficiently to stick to itself. L A. A mucilage of gum tragacanth answers very well.

(56) J. D. B. asks: Are there any books on starch manufacturing? A. Consult Wagner's "Chemical Technology," Muspratt's "New Chemistry," John-Reports,

(57) J. E. B., in answer to A. H. S., sends the following on making printers' rollers, which he cold water until the whole is fully swollen, then weigh

it and add as much heavy glycerin as the glue has absorbed water; then dissolve in a water bath and evapoby weighing. I clean my roller with spirits of turpentine.

(58) G. P. says: I would like to know which is the cheapest to burn in my boiler, pine wood

(45) G. W. K. writes: I have a 30-inch corn. (59) W. S. O. B. writes: 1. If the magnetur account we imagine that you feed too fast or al- comes in contact with the core. A. It is an effect called  $\frac{1}{100}$ induction, which is not thoroughly understood, but is Br nevertheless caused by the continuous passage of cur- Bu rents of electricity through a conductor in the neighborhood of, but insulated from, the iron core. 2. Take a core 2 inches long, 1/4 inch in diameter, and wrap it with uncovered copper wire-why will it not make an electro-magnet? A. It will, but as the electric current Ca (47) E. & S. write: What is a horse power? chooses the course of least resistance, it will pass di-We understand the rules for calculating the horse power rectly through the mass of copper wire, and the magof engines, use the 33,000 lbs., etc., but do not under netic effect will be as if only one short piece of wire Ca stand from what the latter is derived? A. The number were used as a conductor. 3. What is the reason that Ca 33,000 represents the number of lbs, that could be raised the finer the wire used in a magnet the more resistance. Ca 1 foot high in a minute by a good horse in the time of it has? A. It may be explained by supposing electri-

(60) G. M. S. asks whether wrought iron : Ca as scrap iron.

(61) L H. asks: What way of filing a cir- ich cular saw will enable me to cut 2-inch pine plank into Ch (49) I. B. M. writes: What do you think of 1/8 inch strips smoothly, so as to dispense with planing Ch the practicability of supplying a 2 x 4 inch cylinder, afterward? A. A circular saw will not cut smoothly with 75 lbs. of steam, with a boiler constructed by enough to dispense with planing if a smooth surface is

> (62) W. W. asks: How can I black wrought Co iron or steel rifle barrels? A. Colored varnish is often used. For a permanent color, apply a mixture of chloride of antimony and olive oil, polish, and coat with

(63) J. W. W. writes: A discussion in reto be built in the center of the coil and in direct contact with it. Of course the water will have to be right gard to the formation of ice having taken place, and vabove the fire surface, and a steam dome surmounting rious theories and reasons having been given. I would as the whole will undoubtedly be necessary. A. The weak your opinion upon the subject. On the Hudson river, Di point about this boiler would probably be the casing, after the ice forms, does it increase in thickness from which might require frequent renewal if the boiler were the bottom of the ice or from the top of the ice? A. forced. With a steam dome arranged for superheating, From the bottom. your boiler will not differ materially from some that are (64) D. W. P. asks: Is there any test, bein use at present. sides lime water, for carbonic di-oxide when mixed D (50) H. & T. write: Referring to the anwith oxygen or air? A. Solution of barium hydrate, Dr swer in your number of January 12, about arching boilwhen agitated in an atmosphere containing any considers completely with brick, will not the soot accumulate erable amount of carbonic acid, becomes clouded by over the top of the boiler and burn off, and thus injure separation of barium carbonate; blue litmus solution under similar circumstances becomes wine red. Mithe quality of the iron, especially if soft coal is burned? A. We have not heard of such a thing happening, and nute quantities, as occurring in atmospheric air, are best do not believe it likely to happen. In the mounting of determined by the increase in weight of absorption stationary boilers, whether upright or horizontal, the tubes (soda-lime or potash bulbs) by aspiration of large principle of distributing the heat from the furnace so quantities of the dried gas. that the boiler is almost entirely surrounded by an at-

(51) C. S. B. asks (1) whether a steam si- name the date of the paper and the page, or the number Furnace for lead, J. B. McCurdy .....



of the question. Correspondents whose inquiries fail to appear should	Furnace grate, Burritt & Ohl Furnace, hotair, C. W. Durham	198,96 199,04
repeat them. If not then published, they may conclude	Furnaces, Stillman & Webster Game counter, J. Whitelaw	199,11 199.19
address of the writer should always be given.	Gate hanger, W. S. Dangler Glassware manufacture. D. Challinor	199,03
Inquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published	Governor for steamengines, P. Grimm Grain dumping device, A. Smith	198,97
here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of	Grain separator, H. E. Geiss Grain separator, A. W. & C. T. Kendrick	198,97
our paper to print them all; but we generally take pleas- ure in answering briefly by mail if the writer's address	Grinding machine, G. Cowing (r) Hame, H. E. Cosgrave	8,03 199.08
is given.	Hame fastener, W. Moffatt Hammocks, A. B. Holmes	198,95 198,94
WANTS AND BUSINESS INQUIRIES.	Harrow, A. H. Ballagh Hide fleshing machine. Holcomb & Clay	199,01
ness nature especially, can be expeditiously obtained	Hoisting machine, P. C. Johnson Hoop machine, barrel, J. Greenwood	199,07 199.05
sonal," which is set apart for that purpose, subject to	Hoop making machine, J. Greenwood Horse power, E. Golucke	199,05 199.05
We have received this week the following inquiries-	Horseshoe, D. Alger House, portable, J. Boyd	198,92 198,92
ted from the writers by the insertion of a small adver-	Houses, construction of, R. P. &. C. G. Lindsay Hub, vehicle, G. P. Bennett	199,07 198,92
tisement in the colu n specified, by parties able to supply their wants:	Joist shoe, J. R. Payson Journal for shafts and axles, P. Sweeney	199,09 199,12
Who deal in aluminum? Who make and sell caloricengines, and of what power	Ladder, step, C. G. Udell Lamp burner, Hinrichs & Reistle	199,00 198,981
and at what price?	Lamp burner, H. C. Scott Lamp shade and chimney, S. W. Fowler	199,109 199,050
houses?	Lantern, signal, N. Lash Lime kiln, portable, H. H. Bourne	198,988 198,964
injector or force pump?	Lock and key, D. Border	199,023 199,048
OFFICIAL.	Lock, time, S. A. Little (r)	8,035 198,952
INDEX OF INVENTIONS	Metallic fastener, G. W. McGill Microscope, J. J. Bausch	199,085 199,015
FOR WHICH	Mill, grain, C. A. W. Jaquett	199,07( 199,062
Letters Patent of the United States were	Mill pick, W. B. Morris Millstone-balancing, J. P. Moore	198,996 199,088
January 8, 1878.	Music leaf turner, W. Liddell	198,990 199,099
AND EACH BEARING THAT DATE.	Nut lock, W. H. Sutton	199,120 198,936
[Those marked (r) are reissued patents.]	Organ stop action, H. R. Moore	199,090 199,129
A complete copy of any patent in the annexed list, including both the specifications and drawings, will be	Packing weted felt, I. Swope	199,183
furnished from this office for one dollar. In ordering,	Peg float, J. W. Fifield	199,049
and remit to Munn & Co., 37 Park Row, New York city.	Pipe joint, L. T. Scoffeld.	199,109
Acid, manufacture of tartaric, F. Dietrich 199,039 Advertising lantern, H. Sylvester	Planter, corn, J. D. Smith Plow attachment, J. McBride	199,113 199,082
Advertising medium, I. Randall	Plow, gang and sulky, J. R. McCormick	199,083 199,036
Apple corer, E. E. Orendorff	Plow. reversible, B. F. Morris	199,093 199,063
Bale tie, S. H. Gilman	Press, hay, F. B. Boalt.	199,080 199,021
Bee hive, G. W. Wageoner 199,005 Beez steak tenderer, H. R. Fuller 198,974	Printing, paper ruling, J. E. Taylor	199,003 199,126
Bellows, C. W. Dunn, Sr	Propelling boats, T. Featherston 1 Pruning knife, E. Hixson	198,933 199,065
Billiard bridge, C. F. Prentice	Pulverizing machine, H. B. Moore	198,994 199,131
Boot and shoe insole, G. H. Levis	Pump A. S. Wright	199,198 198,969 199,074
Bottle stopper, J. Klee (r)	Pumping fluids, W. F. Class (r)	8,026 199,060
Brick machine, W. H. Kain	Rake, horse hay, T. C. Lord	199,077 199,103
Buckles, guard for harness, T. P. Kemp 199,083 Buckles, guard for harness, T. P. Kemp 198,945	Rakes, metal, E. Sims	199,111 8,029
Can opener, C. M. Williams. 198,959 Can seaming machine, F. R. Bowie 198,955	Rubber roll, vulcanized, A. Spadone	199,011 199,116 198 955
Candlestick, J. Musgrove	Saddle bags, A. Hoff	199,067 199 064
Car coupling, W. Dunn	Sawing machine gauge, O. Bonney, Jr	198,963
Car, refrigerator, R. M. Birdsall	Screw driver, W. L. Gilchrist	198,935 198,945
Car seats, M. D. Brooks	Sewer trap, W. A. Pitt Sewing machine, G. Hancock (r)	199,100 8,028
Carbureters, G. L. Gray	Sewing machine, J. W. Corey	198,970 198,987
Casting metal, H. R. Benwell. 198,925 Contributed metal, H. R. Menwell. 198,925	Sheet metal endow, A. Syverson (7)	8,031 198,980 199 135
Chair, folding bracket, W. A. Brewster	Shingles, fireproof, G. B. Smith	199,001
Check rower and dropper, Black & Babcock 199,020 Cigarette, J. Gordon 198,977	Show stand, J. C. Eckardt	199,044 198,979
Clasp, A. Christey 198,929 Clevis, W. Kinney	Skate, roller, S. A. Allen	199,809 199,075
Cock, stop, G. C. Bailey (r)	Snuff package, B. F. Weyman 1 Soap, medicated, E. L. Moodie	199,128 199,087
Corset steel, C. Jordan	Springs, fastening for seat, Z. Cobb	199,040 198,9 <b>30</b> 199 016
Cultivator and seed drill, E. G. Matthews 199,081 Cultivator tongue, W. P. Brown	Spring equalizer, vehicle, D. C. Markham	198,948 199.057
Dam, water, H C. Herron 198,939 Desk, cabinet, J. A. Moore 199,089	Stove and furnace lining, A. S. Hodges 1 Stove ovens, E. Barrows	.98,940 199,018
Dish, covered butter, S. W. Babbitt	Stoves and ranges, E. Stumm	199,119 198,999
Ditching machine, J. W. Humphreys	Sugar, renning raw, G. A. Jusper	198,944 199,104 100 107
Door hanger, C. W. Pierce	Tanning leather, G. Goodwin	199,054 199.041
Draft equalizer, A. J. F. Ehrich	Telephone, T. A. Watson	199,007 199,046
Dredging bucket, T. Symonds	Thrashing machines, M. H. Joslyn	198,98( 198,99(
Engine, rotary, G. C. Hale	Time check, watchman's, W. E. Young	198,962 199,092
Fan, automatic, J. Hay	Tuyere, T. F. Witherbee (r)	199,184 8,036
Fence material, barbed, L. F. Betts	Valve, overnow, w. A. Pitt	199,079 199,079 190 001
Fertilizer distributer, W. M. Boon 199,022 File, bill, W. C. Bussey	Water wheel, D. L. Cross	199,029 199,029
Fire arm, breech loading, G. H. Fox 198,978 Fire arm, hammer for, E. A. F. Toepperwein 199,124	Water wheel, turbine, J. G. Thompson Windingmachinery, D. Smith	199,12 198,95
Fire back, G. W. J. Woltz. 198,960   Fire escape, C. & J. G. Brunner 199,026	Windmill, S. H. Smith Windmills, transmitting power of, J. S. Adams.	199,11 199,00
Fire escape, J. M. Chandler	W re-twisting machine. C. Shortau (r) Wool-combing machine, S. Metcalfe	8,03 198,95
Frue escape, E. Lumpert	[A copy of any of the above patents may be have a second s	ad by
	Vontraiter 1	1101

108

F MINERALS, ETC.-Specimens have been regood results, both as regards economy of fuel, produc- ceived from the following correspondents, and  $|\mathbf{F}|$ examined, with the results stated: ۱F pared with boilers mounted in such a manner that only

W. G. W .- It is nodular pyrites (iron sulphide), not a portion of their surface is acted upon by heat. In meteoric.-N.A. R.-Impure kaolin.

HINTS TO CORRESPONDENTS. We renew our request that correspondents, in referring it will be easy to prevent accumulations of soot or ashes. to former answers or articles, will be kind enough to Furnace for pyrites, J. Hughes...... 199