Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

The best results are obtained by the Imp. Eureka Turbine Wheel, and Barber's Pat, Pulverizing Mills. Send for descriptive pamphlets to Barber & Son, Allentown, Pa-Steam Tug Machinery, Engines, Boilers, Sugar Machinery. Atlantic Steam Engine Works, Brooklyn, N.Y. Fuller & Stillman, Chemical Engineers and Assayers, 40 Broadway, New York,

The New Economizer, the only Agricultural Engine with return flue holler in use. See adv. of Porter Mfg.

Holzner & Windstanley will sell two thirds interest of their right and title of the Coal Hod Improvement. Address Holzner & Windstanley, N. W. corner of Walnut and West Streets, Louisville. Ky

Philadelphia Hydraulic Works, Philadelphia. Pumps

Wanted for Cash.—A useful novelty or toy that can be sold through the mail for 25 cents. F. R. Avery, Chicago

I wish to purchase a patent for some good article of manufacture. George Cosper, Winton Place, Ohio.

The Electric Light in its Practical Application. By Higgs, Numerous Illustrations. \$3.50. Mail free. E. & F N. Spon, 446 Broome St., N. Y.

Wantel-Second hand 2 or 3,000 lb. Steam Hammer. Address Forging Company, Hamilton, Ont.

For Sale-The legs and feet of a Mastodon. Mounted on Walnut Stands, C. W. Williamson, Wapakoneta, O. The Asbestos Roofing is the only reliable substitute for tin, it costs only about one-half as much, is fully as durable, is fire-proof, and can be easily applied by any H. W Johns Manufacturing Company, 87 Maiden Lane, N. Y., are the sole manufacturers.

New 816 foot Boring and Turningfor sale cheap. A first class tool. Hilles & Jones, Wilmington, Del.

We want to make some heavy, patented machinery, on royalty or otherwise. Vulcan Works, Toledo, O.

Wright's Patent Steam Engine, with automatic cut-Wright, Manufacturer, Newburgh, N. Y.

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

H. Prentiss & Co., 14 Dey St., New York, Manufs. Taps, Dies, Screw Plates, Reamers, etc. Send for list.

For Screw Cutting Engine Lathes of 14, 15, 18, and 22 in. Swing. Address Star Tool Co., Providence, R. L. The Horton Lathe Chucks; prices reduced 30 per cent.

Address The E. Horton & Son Co., Windsor Locks, Conn. Lincoln's Milling Machines; 17 and 20 in. Screw Lathes. Phoenix Iron Works, Hartford, Conn.

A Cupola works best with forced blast from a Baker Blower. Wilbraham Bros., 2,318 Frankford Ave., Phila. Presses, Dies, and Tools for working Sheet Metal, etc. Fruit & other can tools. Bliss & Williams, B'klyn, N. Y.

Linen Hose.—Sizes: 11/2 in., 20c.; 2 in., 25c; 21/2 in. 29c. per foot, subject to large discount. For price lists of all sizes, also rubber lined linen hose, address Eureka Fire Hese Company, No. 13 Barclay St., New York.

Workshop Receipts for Manufacturers and Mechanics. Illustrated, \$2 00 E. & F. N. Spen, 446 Broome St., N. Y.

Nickel Plating.-A white deposit guaranteed by using ourmaterial. Condit, Hanson & Van Winkle, Newark, N.J.

The Lathes, Planers, Drills, and other Tools, new and second-hand, of the Wood & Light Machine Company, Worcester, are being sold out very low by the George Place Machinery Agency, 121 Chambers St., New York,

Hydraulic Presses and Jacks, new and second hand, Lathes and Machinery for Polishing and Butling Metals, E. Lyon & Co., 470 Grand St., N. Y.

Bradley's cushioned helve hammers. See illus. ad. p. 29 Partner wanted. See adv. on page 30.

Excelsior Steel Tube Cleaner, Schuvlkill Falls, Phila., Pa. Machine Diamonds, J. Dickinson, 64 Nassau St., N. Y. Band Saws a specialty. F. H. Clement. Rochester, N.Y. Sheet Metal Presses, Ferracute Co., Bridgeton, N. J.

Vertical Burr Mill. C. K. Bullock, Phila., Pa. Eclipse Portable Engine. See illustrated adv., p. 62.

Yacht Engines. F. C. & A. E. Rowland, N. Haven, Ct

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

Noise-Quieting Nozzles for Locomotives and Steamboats. 50 different varieties, adapted to every class of engine. T. Shaw, 915 Ridge Avenue, Philadelphia, Pa.

Stave, Barrel, Keg, and Hogshead Machinery a specialty, by E. & B. Holmes, Buffalo, 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. Bny that only. The best is the cheapest. New York Belting and Packing Company, 37 and 38 Park Row, N. Y.

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

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

Steam and Gas Fitters' Tools a specialty. Send for circulars. D. Saunders' Sons, Yonkers, N. Y.

Ornamental Penman's Pocketbook of Alphabets, 32 plates, 20c. Mail free. E. & F. N. Spon, 446 Broome St.,

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

Holly System of Water Supply and Fire Protection for Cities and Villages. See advertisement in SCIENTIFIC AMERICAN of this week.

Cutters shaped entirely by machinery for cutting teeth of gear wheels. Pratt & Whitney Co., Hartford, Conn.

Deoxidized Bronze. Patent for machine and engine ournals. Philadelphia Smelting Co., Phila., Pa.

Having enlarged our capacity to 96 crucibles 100 lb. each, we are prepared to make castings of 4 tons weight. Pittsburgh Steel Casting Co., Pittsburgh, Pa.

NEW BOOKS AND PUBLICATIONS.

LABORYTORY TEACHING. By Charles Loudon Bloxam. Fourth edition. Illustrated. Philadelphia: Lindsay & Blakiston. 12mo., pp. 261.

In the ten years since this useful manual was first published its fitness as a guide to the beginner in practical chemistry has been amply demonstrated. The present edition differs from the last chiefly in giving the formulæ for the compounds to be studied. The book is well printed and has a good index.

FOUNDATIONS AND FOUNDATION WALLS. George T. Powell. New York: Bicknell & Comstock.

A work for the house builder rather than the engineer strictly practical, and obviously of much value to all hav ing to do with foundation work.

ZEITSCHRIFT DES ARCHITECTEN UND INGE NIEUR VEREINS ZU HANNOVER. Edited by W. Keck. Band 25, No. 1 and 2. Hannover: Schmorl & von Seefeld. 1879.

A technical journal, edited under the auspices of the Architects and Engineers' Society at Hanover, and of a very high standing in Germany. The first two numbers of 1879 contain, among other scientific and technical information, a paper on driving spiles by means of a jet of water; a statistical table showing the different observations on this subject; plans and descriptions of the Point Bridge at Pittsburg and of the proposed East River Bridge at Blackwell's Island; a carefully prepared description of the great railroad repair shops at Hanover, and a new theory for the computation of the strains in joint arch bridges.

RESULTATE AUS DER THEORIE DES BRUCKEN BAUS. Von R. Krohn. Aachen: J. A. Mayer. 1879. (Results in the Theory of Bridge Building.)

In this work the author, Mr. R. Krohn, Civil Engineer and Professor at the Royal Rhenish Polytechnic School off. The best engine made. For prices, address William at Aachen (Aix la Chapelle) Germany, has collected and arranged the latest developments in the "Theory of Bridge Building," and has explained their application by numerous examples in an excellent manner. The work will be complete in two parts, the first of which has appeared and is now before us. It treats of iron truss bridges, their construction and calculation, the formulas, the derivation of the same, and the advantages of the several variations in the arrangement of the elements. The author has adopted the analytical and graphical method of calculation, and has based the computations of the strains on the experiments of Wohler and on the Daunhardt Weyrauch formulas. The distribution of the load and the strains arising therefrom are admirably demonstrated. The second part will treat of iron arched bridges and combination arched and truss bridges. The work is carefully illustrated and handsomely printed.



HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless ccompanied with the full name and address of the

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

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

Correspondents whose inquiries do not appear after reasonable time should repeat them.

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

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

(1) Olivia writes: We have a 10"x30" improved Allis Corliss engine, 95 revolutions per minute, and makes indicated h. p. as follows:

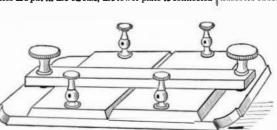
∴ 67'83 h. p. Actual h. p.

We are told that the engine will not develop over 30 h.p. by parties who claim to know. Have we figured correctly? If not, please correct us. A. Yes, if 60 lb. is the average pressure on the piston. But we suppose it is the pressure in the boiler. If so, there is your error.

- (2) C. W. W. asks if there is any difference between a plumb and perpendicular line; if so what. A. A plumb line is always a vertical line; a perpendicular line is one at right angles to some other line or surface, and may itself be vertical or horizontal, or at any angle with either.
- (3) W D. M. asks: 1. How many square nches are there in a safety valve 21/4 inches in diameter? A. 490 inches. 2. What pressure to the square inch would it require to raise a weight two feet from the center of valve and 234 inches from the center of the valve to the end attached to the outside of valve? A. ee reply to F. J. R., p. 267, volume 40.
- (4) J. L. C. asks: 1. Is it possible to be-

geometry? A. Possible, but a knowledge of geometry s very essential. 2. If so, what book or books would it he best to get on the subject, and where could I get them? A. "MacCord on Mechanical Drawing," for sale at this office. 3. Is it possible to get as good satisfaction in point of economy, out of a throttling slide valve engine, as you can from a cut off engine? A. No. 4. Which is best to do in cleaning out a boiler, to blow it out under pressure, or let the water run out after the pressure goes down? A. If there is time, let the boiler cool, the deposit will then be left comparatively soft.

(5) C A. P. asks (1) how to make an effectual lightning arrester to be used on a short line (400 feet) of telegraph. A. The engraving shows a common form of lightning arrester. It consists of two small brass plates mounted on a larger metallic plate and separated from it by a sheet of mica. The upper



with the ground wire. An overcharge of electricity passes through the mica and finds its way to the earth. 2. Do I infringe on any one's rights or break any law relating to patents when I make a pair of telephones like those (using horseshoe magnets) described in your Sup-PLEMENT, No. 142-would I be doing so if I sold them? A. See Rights of Investigators, p. 128, volume 39, of SCIENTIFIC AMERICAN.

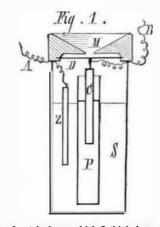
(6) C. E. B. says: I am using a small mpressed air boiler, and I am troubled with a few leaks at the hub on the side: will two or three coatings of lead on the inside check it? If not, what will? A. Stop the leaks by calking if possible. If you do not ucceed in this you may apply the white lead.

(7) W. H. R. writes: I have a cylinder, inches diameter and 1 inch long, filled with water at 100 lb. pressure per square inch. 1 How many tons, acting on the 6 inch piston that works in the cylinder. would be required to compress the water 1-16 incb? A. That is equivalent to 1-96 its bulk; no liquid is susceptible of that amount of compression, 2. Is there any other liquid less compressible than water that will not affect either iron or brass? Is mercury less compressible? A. Mercury is less compressible than water, and does not affect iron. It will, however, affect brass.

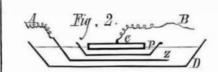
(8) A. B. J. asks how to use ultramarine blue for a wash blue, tbatwill not spot in hard water. A. We know of no practical way of overcoming this, as the blue does not form a true solution. For this purpose Nicholson's blue (blue aniline) is preferable to

(9) W. J. asks: What is the horse power of an engine required to ascend a grade of 7 (seven) inches to the foot on a cogged rail for center of track, cog wheel to fit in same not to exceed 12 inches diameter, the weight to be taken up exclusive of the engines, and boiler's weight about 35 hundred weight? A. You do not give the speed at which you wish to run, but assuming 4 miles per hour, the power required would be, with engine, weight, say 20,000 lb. and other weight 3,800 lb., total 23,800 lb., 151 horse power, and to this add 25 per cent for friction and other losses. If weight or speed be ineased, increase the power in proportion.

(10) H. W. F. writes: I have lately been making some interesting electrical experiments, and have arrived at very satisfactory results, some of which would like to make known. Fig. 1 represents the



section of a telephone, which I think has one novel feature, the production of the electric waves at the source of the electricity. S is an ordinary battery jar, filled with salt and water, in which the zinc, Z, is suspended. P is a porous cup filled with ordinary battery solution of bichromate of potash. In this is suspended a piece of carbon, attached to a vibrating diaphragm, D. The wire, B, extends from the upper part of the carbon.



When a sound is made in the mouth piece, M, the diaphragm vibrates, the carbon is alternately immersed and drawn out of the fluid, the result is a series of electric impulses which act on an ordinary telephone receiver. In this way I have been able to transmit articulate speech with distinctness. Fig. 2 shows a seccome a good mechanical draughtsman without studying tion of a very powerful and cheap battery. D is the of a cupellation furnace. If the ore is at all basic a few

containing vessel, either a pie or soup plate. Z is a iece of amalgamated sheet zinc, with the wire, A, attached. P is a flower pot saucer which takes the place of the porous cup. C is a flat piece of gas carbon with the wire, B, fastened on the upper side, so as not to be eaten off by the acid. The plate, D, is filled with salt and water; P, with battery fluid. This makes a very good battery for three reasons; first, it is powerful; econd, it is easily made; third, it is cheap.

(11) J. C. K. writes: I beg to differ from your answer to L. C. R. (36), in issue of 12th July. I remember that 45 years ago nails were made by hand and sold by count, and not by the pound-four penny at 4 pence per 100, sixpenny at 6 pence per 100, and so on through the different numbers; the term penny or number of pence was the retail price for 100. I notice the penny is pretty generally dropped now, and the simple plates are put in the circuit, the lower plate is connected numbers substituted, as 6's, 8's, 10's, etc., instead.

> (12) H.J.P. asks how strong a battery is necessary to show the repulsion of bismuth from the poles of a magnet. I intend to try it with three cells of Leclanche, but do not think that will be enough. A. Use a magnet about 4 inches long, and 4 cells of Bunsen battery.

> (13) A. Y. asks: 1. Is charcoal hammered No. 1 boiler plate always marked C. H. No. 1? A. For steamboat boilers, yes. 2. May plate not so marked be C. H. No. 1 iron to fill specification? A. No.

(14) H. J. C. asks for a detailed description of an "induction coil," suitable to be used with "Lyons transmitting telephone "which you described in Sup-PLEMENT, No. 163. Please give diameter of central core, diameter and length of coil. No. and length or weight of both primary and secondary wires. The whole to be used on a circuit, two miles long, with ground connections. A. The core consists of a bundle of No. 18 iron wire 41/2 inches long, 1/2 inch diameter. The spool upon which the primary and secondary wires are wound is as thin as it is possible to make it. Two layers of No. 18 silk covered copper wire are wound on the spool for the primary, and about eight layers of No. 36 silk covered wire are wound upon the primary, the several layers being separated by pieces of thin writing paper.

(15) W. A. M. asks how to prepare the socalled fish food used in fresh water aquaria, and what amount to use in an aquarium of about six gallons capacity, with from eight to twelve small fishes. A. We do not know to which preparation you refer. Seth Green says in relation to gold fish: " Feed them all they will eat and anything they will eat, worms, meat, fish wafer, or fish spawn, but take great care that you take all that they do not eat out of the aquarium."

(16) G. B. F. asks for the simplest and best process for estimating the amount of potassic iodide in a known quantity of co, fluid extract sarsaparilla. A. If the solution contains no chlorides, evaporate to dryness in a porcelain capsule, and heat cautiously to redness to destroy the carbonaceous matters. Moisten the residue thoroughly with silver nitrate dissolved in water, warm, throw on a tared filter, wash with water, dry in the dark, and weigh. One part of this is equivalent to 706 KI, nearly,

(17) W. M. asks: 1. Will a ten horse ower boiler run a ten horse power engine, or is the boiler of greater power then the engine? A. Usually the boiler is more than equal to the power at which the engine is rated. 2. What is the reason that a person weighs as much before as after eating? A. Try the experiment of weighing yourself before and after eating. If you find you do not weigh more after eating we would be pleased to know what kind of food you eat. 3 In speaking of perpetual motion, do you not mean a machine that will act the same as an engine, that is, to drive other machinery? A. Any machine or apparatus that would keep in motion without any external aid vould be called a perpetual motion.

(18) W. W. asks (1) how to make a small still on a cheap scale. A. You may use an ordinary iron retort capable of holding say 3 pints, and a small glass or block tin worm; place the worm in a tub or bucket. the lower end passing through a cork fitting a hole bored for its reception near the bottom of the vessel. Adjust the beak of the retort to the upper end of the worm. During the distillation conduct a stream of cold water to the bottom of the tub or bucket, and draw off the heated water near the top. See No. 110 of SCIENTIFIC AMERICAN SUPPLEMENT. 2. Please give a receipt for making a first class vinegar for family use. A. See p. 267, (19), volume 39, Scientific American.

(19) J. F. B. writes: 1. I have a 4x4 engine, and will 129 feet of 1/2 inch pipe give heating surface sufficient to run it; if not, how much more do I want? A. No, if your engine works up to 200 revolutions per minute, 1/2 inch pipe will be very likely to stop up; use the same length of 34 inch pipe. 2. Is there any patent on a simple coil boiler? A. No.

(20) W. E. P. asks for the dates on which Mars came to opposition in the years 1858,'60.'62,'64, and 67. A. About as follows: 1858, May 15; 1860, July 22; 1862, September 29; 1864, November 23; 1867, January 30.

(21) F. P. K. asks: 1. Where can the fine ed clay used in the manufacture of imitation lava ware be procured? A. Consult the report on "Clay and Clay Deposits of New Jersey," Professor George H. Cook, New Brunswick, N. J. 2. Is there any chemical that, by mixing with white clay, will in the burning turn it to a red color? A. Moisten it with strong aqueous solution of sulphate of iron, common copperas. 3. What can I mix with clay, to strengthen and toughen it? A. Try one or two per cent of fluorspar. The clay should be properly washed.

(22) G. A. F. asks: 1 How are scorification assays of gold and silver ores made? A. The powdered ore is mixed and covered with about ten times its weight of pure granulated lead in a small dish of refractory clay (scorifier) and introduced into the muffle

fragments of anhydrous borax (borax glass) are added the contents of the scorifier. As soon as the lead has melted the door of the muffle is opened and the scorification proceeds until the ring of slag closes over the lead button. The scorifier is then removed and poured into a smoked iron mould. If, after breaking away the slag, the button is found to be small enough, it is immediately cupelled; if not it must be returned to the scorifier and reduced in size by scorification. The cupellation is the same as with the crucible beads. 2. I inclose clipping from an exchange which does not correspond with processes given in your paper from time to time for the manufacture of nitroglycerine; who is correct? A. The statement that nitroglycerine is a compound of glycerine and prussic acid, is incorrect.

(23) S. E. asks: For what is realgar used. and what is it worth? Is there a good market for it? A. It is used in the manufacture of certain pyrotechnic preparations, such as Bengal lights (niter 27, sulphur 7. realgar 2); also in the manufacture of orpiment and other arsenical compounds. It is quoted at 20 cents

(24) W. H. C. writes: 1. I have finished the two sections of the secondary coil of an induction coil, 1/2 size of that given in Supplement, No. 160. Connecting one Watson cell I find no result from the secondary wire, no spark or feeling when I touch the terminals with my tongue. The fine wire broke three times by accident; each time I soldered, using muriatic acid as a flux. I should think that, though I have no insulating medium between the two sections, I would have some results. A. Use battery enough to vibrate the interrupter strongly. Two cells of Grenet would answer. If you do not then get a spark you should examine the connections and test the insulation. Possibly your condenser may be at fault. 2. Ought not one Watson cell to be enough? A. One Watson cell is not enough. Use at least four.

(25) H. P. asks: What are the proportions given to the air chamber of a pump? A. From 4 to 8 times the capacity of the pump.

(26) A. D. writes: Referring to the phonograph described in Scientific American Supplement, No. 133, will you give more definite instructions re garding the construction of this little wooden spring, size, force, and kind of wood? A. The accompanying

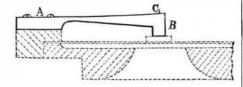


diagram gives the exact size and proportion, A being the portion attached to the mouth piece, B the portion that rests upon the diaphragm, and C the needle. The width should be about 3-16 inch and the end, B, should rest with some pressure on the small soft rubber block placed against the diaphragm. Any wood that springs well will answer. Holly is perhaps as good as any-

(27) H. S. W. writes: 1. I contemplate building a small stern wheel steamer, dimensions: length, 50 feet, beam 9 feet, deck 12 feet, between decks 6 feet, height of cabin 7 feet, center 8 feet. She will be sharp forward instead of round, as our larger vessels are. boiler is 42 inches diameter, height 7 feet, engines 6 inches diameter, 24 inches in length. Are my proportions right? Is my boiler large enough for the boat? A. Your boiler is ample to drive the boat, and having about 180 feet surface should supply the eugines. 2. Are my cylinders too large or small? A. Cylinders not too large; you might make them 614 inches. 3. Would it be possible for such a boat to make the trip from New Orleans to the Suwanee River, in Florida? A. Yeswith care and prudence

(28) C. C. W. writes: I have a clinker built boat, 18 feet long, beam 4 feet 6 inches, draught at stern 18 inches; about 12 inches of this is extra keel. I have two high pressure engines, plain valves, set on the quarter; cylinders 2 inches by 4 inches working in 1/4 expansion, carry 40 lb. steam, revolutions of engines 125. What would be the correct size of screw to run in shallow streams, and what would be a correct pitch of screw? A. 24 inches diameter and 2 feet 8 inches pitch. 2 I wish to know on what principle does the boiler injectors and inspirators work, or rather, how can an injector feed a boiler under 80 lb. steam, as they have to inject water into boiler against a pressure of 80 lb., and have only the same force to do the work? A. We caunot explain clearly the principle of the injector within the limits of "Notes and Queries." Consult some good book on engineering; that it does feed boilers with their own pressure there is no doubt.

(29) M. W. C. asks: 1. What knowledge of mechanics or machinery is requisite to the obtaining of an engineer's certificate to run a steam launch 20 or feet long? A Sufficient theoretical to understand th principle of operation of the steam engine and sufficient knowledge of the use of tools to be able properly to adjust the parts. 2. Is it necessary that a pilot license should be had to run such a lauuch? If so, what requisites are necessary to the obtaining of the same? Can one person take out both licenses? Are such licenses necessary for running a steam canoe such as was described in the AMERICAN a short time since? A. For reply to your other queries apply to the steam boat inspectors in your city.

(30) E. P. asks (1) for a cheap method of waterproofing cotton factory cloth suitable for a tent. A. See Scientific American, volume 39, p. 331 (9). 2. In the sentence "port the helm," does it mean to put the tiller to the port side? A. Tiller to port side.

(31) G. F. P. asks: 1. In the improved C forms of dynamo-electric machines now made for producing the electric light, is the same current that supplies the carbons made use of to excite the fixed electro-magnets or is it usual to have two series of armature coils? A. Usually, but not always. 2. Would a resistance of five ohms introduced in the working circuit of such a machine, by causing the current to traverse a L

considerable length of wire in the coils of the fixed electro-magnets before reaching the carbons, impair to any extent the brilliancy of the light with a machine capable of consuming rods % inch square? A. Of course the jutroduction of resistance into the circuit will impair the light, and the greater the resistance the more will the light suffer.

(32) F. & Co. ask: Can you give us any information of a way of bleaching resin? A gentleman informs us that proto-chloride of tiu will doso. Is there anything injurious in iutroducing it into soap, it being first dissolved in water? A. Brown resin may be converted into yellow resin by simply boiling it with water for about 10 minutes. Its appearance may be somewhat improved by adding to the water about one per cent of stannous chloride. The trace of the latter adhering to the resin, after washing, will not prove injurious in

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

A. J.-Mr. M. von Lill, of Vienna, has lately analyzed some wolfram steel, generally known as Mushet's special steel, and has found it to contain: Iron, 87.120; manganese, 1.043; copper, a trace; wolfram or tungsten, 9 9888; carbon, 1.239; silica, 0.330; phosphorus, 0.039; sulphur, 0.008; total 99,767.-H. A. F.-The rock contains no precious metals, lead, or copper. It has no

COMMUNICATIONS RECEIVED.

On Small Propellers. By P. H. W. On Alum Baking Powder. By E. B. F., Jr On the Microphone without a Battery. By A. C. R.

[OFFICIAL]

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July 1, 1879,

AND EACH BEARING THAT DATE.

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betts Carriage springs, manufacture of, H. M. Went- worth	216,989
betts	216,989 217,045
betts	216,989 217,045 217,115
betts	216,989 217,045 217,115 217,261
betts	216,989 217,045 217,115 217,261 217,172
betts	216,989 217,045 217,115 217,261 217,172 217,111
betts	216,989 217,045 217,115 217,261 217,172 217,111 217,091
betts	216,989 217,045 217,115 217,261 217,172 217,111 217,091 217,009 216,980
betts	216,989 217,045 217,115 217,261 217,172 217,111 217,091 217,009 216,980 216,969
betts	216,989 217,045 217,115 217,261 217,172 217,111 217,091 217,009 216,980 216,969
betts	216,989 217,045 217,115 217,261 217,172 217,172 217,111 217,091 216,969 216,969 217,062
betts Carriage springs, manufacture of, H. M. Wentworth Cartridge case forming machine, H. H. Barnard. Cartridge, pyrotechnic, E. D. Kendall Caster, J. H. Schlott	216,989 217,045 217,115 217,172 217,172 217,171 217,079 216,980 216,969 217,062 217,062 217,065 217,168
betts	216,989 217,045 217,115 217,1261 217,172 217,111 217,099 216,969 217,068 217,062 217,065 217,165 217,168 216,998
betts Carriage springs, manufacture of, H. M. Wentworth Cartridge case forming machine, H. H. Barnard. Cartridge, pyrotechnic, E. D. Kendall Caster, J. H. Schlott 217,160, Casters, top plate for, W. H. Tucker Celluloid or pyroxyline, manufacture of moulding, etc., from, R. A. Johnson Chain and rope tightener, W. L. Gracey Chandelier hook, A. D. Judd Channeling tool, E. F. Stevens Chisel rolling machine, G. Parr Chuck attachment, lathe, Bielefeld et al Chuck attachment, lathe, G. T. Chattaway. Churn, J. Cochran, Jr Churn, J. E. Taylor Clippers, hair, C. Carlton Cloth shearing machine, D. C. Summer	216,989 217,045 217,115 217,261 217,172 217,111 217,099 216,980 216,969 217,062 217,065 217,065 217,168 216,984
betts Carriage springs, manufacture of, H. M. Wentworth Cartridge case forming machine, H. H. Barnard. Cartridge, pyrotechnic, E. D. Kendall Caster, J. H. Schlott	216,989 217,045 217,115 217,261 217,172 217,172 217,111 217,009 216,969 217,065 217,065 217,168 216,998 216,998 217,105
betts Carriage springs, manufacture of, H. M. Wentworth. Cartridge case forming machine, H. H. Barnard. Cartridge, pyrotechnic, E. D. Kendall Caster, J. H. Schlott	216,989 217,045 217,115 217,261 217,172 217,111 217,091 216,980 216,989 217,062 217,065 217,065 217,168 216,984 217,102 217,103
betts Carriage springs, manufacture of, H. M. Wentworth Cartridge case forming machine, H. H. Barnard. Cartridge, pyrotechnic, E. D. Kendall Caster, J. H. Schlott 217,160, Casters, top plate for, W. H. Tucker Celluloid or pyroxyline, manufacture of moulding, etc., from, R. A. Johnson Chain and rope tightener, W. L. Gracey Chandelier hook, A. D. Judd Channeling tool, E. F. Stevens Chisel rolling machine, G. Parr Chuck attachment, lathe, Bielefeld et al Chuck attachment, lathe, G. T. Chattaway Churn, J. Cochran, Jr Churn, J. E. Taylor Clippers, hair, C. Carlton Cloth shearing machine, D. C. Summer Clothes drying machine, R. F. Hatfield Clotch and brake, reversing friction, T. A. Weston	216,989 217,045 217,15 217,261 217,172 217,172 217,111 217,091 216,980 216,969 217,048 217,065 217,168 216,989 216,989 216,982 217,103 217,103 217,103 217,103
betts	216,989 217,045 217,115 217,1261 217,1261 217,172 217,111 217,091 217,092 217,065 217,065 217,065 217,168 216,998 216,998 217,168 216,998 217,163 217,163
betts Carriage springs, manufacture of, H. M. Wentworth. Cartridge case forming machine, H. H. Barnard. Cartridge, pyrotechnic, E. D. Kendall Caster, J. H. Schlott	216,989 217,045 217,115 217,261 217,172 217,172 217,111 217,091 216,980 216,969 217,062 217,062 217,062 217,168 216,984 217,162 217,152 217,153 217,153 217,153
betts	216,989 217,045 217,115 217,1261 217,172 217,171 217,091 217,099 216,989 217,062 217,065 217,065 217,168 216,984 217,163 217,153 217,163 217,165 217,165 217,165 217,165 217,165 217,165 217,165 217,165 217,165 217,165 217,165 217,165 217,165 217,165 217,165 217,165
betts Carriage springs, manufacture of, H. M. Wentworth Cartridge case forming machine, H. H. Barnard. Cartridge, pyrotechnic, E. D. Kendall Caster, J. H. Schlott	216,989 217,045 217,115 217,261 217,172 217,111 217,001 216,980 216,980 217,062 217,062 217,062 217,062 217,163 217,163 217,163 217,163 217,163 217,163 217,163 217,163
betts Carriage springs, manufacture of, H. M. Wentworth Cartridge case forming machine, H. H. Barnard. Cartridge, pyrotechnic, E. D. Kendall Caster, J. H. Schlott Calluloid or pyroxyline, manufacture of moulding, etc., from, R. A. Johnson Chain and rope tightener, W. L. Gracey Chandelier hook, A. D. Judd Channeling tool, E. F. Stevens Chisel rolling machine, G. Parr. Chuck attachment, lathe, Bielefeld et al Chuck attachment, lathe, G. T. Chattaway Churn, J. E. Taylor Clippers, hair, C. Carlton Clothes drying machine, R. F. Hatfield Clothes pounder, C. D. Roberts Clutch and brake, reversing friction, T. A. Weston Coal from slate, etc., apparatus for separating, D. Clark. Coat and blanket, combined, C. A. Hodgman Collar and hames, combined, A. Rutherford Collar and hames, combined horse, F. Hartman Coltensen. P. A. Bagwell	216,989 217,045 217,115 217,261 217,172 217,111 217,091 216,980 216,980 217,062 217,062 217,065 217,168 217,168 216,984 217,102 217,153 217,102 217,153 217,102 217,153
betts Carriage springs, manufacture of, H. M. Wentworth Cartridge case forming machine, H. H. Barnard. Cartridge, pyrotechnic, E. D. Kendall Caster, J. H. Schlott	216,989 217,045 217,115 217,1261 217,172 217,171 217,091 217,099 216,969 217,062 217,062 217,062 217,168 216,984 216,984 217,106 217,163 217,163 217,164 217,162 217,163 217,164 217,164 217,164 217,164 217,164 217,164 217,164 217,0
betts Carriage springs, manufacture of, H. M. Wentworth Cartridge case forming machine, H. H. Barnard. Cartridge, pyrotechnic, E. D. Kendall Caster, J. H. Schlott	216,989 217,045 217,115 217,261 217,172 217,117 217,091 216,980 216,980 217,062 217,062 217,062 217,168 217,168 217,102 217,153 217,102 217,102 217,103 217,104 217,107 217,107 217,109 217,109 217,109 217,099 217,043 217,015 216,995
betts Carriage springs, manufacture of, H. M. Wentworth Cartridge case forming machine, H. H. Barnard. Cartridge, pyrotechnic, E. D. Kendall Caster, J. H. Schlott 217,160, Casters, top plate for, W. H. Tucker Celluloid or pyroxyline, manufacture of moulding, etc., from, R. A. Johnson Chain and rope tightener, W. L. Gracey Chandelier hook, A. D. Judd Channeling tool, E. F. Stevens Chisel rolling machine, G. Parr Chuck attachment, lathe, Bielefeld et al Chuck attachment, lathe, G. T. Chattaway Churn, J. Cochran, Jr Churn, J. E. Taylor Clippers, hair, C. Carlton Cloth shearing machine, R. F. Hatfield Clothes drying machine, D. C. Summer Clothand brake, reversing friction, T. A. Weston Coal from slate, etc., apparatus for separating, D. Clark Coat and blanket, combined, C. A. Hodgman Collar and hames, combined horse, F. Hartman Collar and hames, combined horse, F. Hartman Collar stener. P. A. Bagwell Compass, mariner's, S. Longfellow	216,989 217,045 217,115 217,1261 217,172 217,111 217,091 216,969 217,062 217,062 217,062 217,062 217,165 217,1
betts Carriage springs, manufacture of, H. M. Wentworth Cartridge case forming machine, H. H. Barnard. Cartridge, pyrotechnic, E. D. Kendall Caster, J. H. Schlott 217,160, Casters, top plate for, W. H. Tucker Celluloid or pyroxyline, manufacture of moulding, etc., from, R. A. Johnson. Chain and rope tightener, W. L. Gracey Chandelier hook, A. D. Judd Channeling tool, E. F. Stevens Chisel rolling machine, G. Parr Chuck attachment, lathe, Bielefeld et al Chuck attachment, lathe, G. T. Chattaway Churn, J. Cochran, Jr Churn, J. E. Taylor Clippers, hair, C. Carlton Clothes shearing machine, R. F. Hattield Clothes drying machine, R. F. Hattield Clothes pounder, C. D. Roberts Clutch and brake, reversing friction, T. A. Weston Coal from slate, etc., apparatus for separating, D. Clark. Coat and blanket, combined, C. A. Hodgman Collar and hames, combined horse, F. Hartman Collar fastener. P. A. Bagwell Compass, mariner's, S. Longfellow 217,014, Copying press, H. J. Baldwin Cork, machine for splitting for slicing, D. S. Yeoman Crozing machine, O. J. Pennell	216,989 217,045 217,115 217,1261 217,172 217,111 217,009 216,969 217,062 217,065 217,062 217,062 217,162 217,162 217,162 217,162 217,162 217,162 217,162 217,162 217,164 217,109 217,109 217,108 217,099 217,043 217,043 217,043 217,043 217,043 217,043
betts Carriage springs, manufacture of, H. M. Wentworth Cartridge case forming machine, H. H. Barnard. Cartridge, pyrotechnic, E. D. Kendall Caster, J. H. Schlott 217,160, Casters, top plate for, W. H. Tucker Celluloid or pyroxyline, manufacture of moulding, etc., from, R. A. Johnson. Chain and rope tightener, W. L. Gracey Chandelier hook, A. D. Judd Channeling tool, E. F. Stevens Chisel rolling machine, G. Parr Chuck attachment, lathe, Bielefeld et al Chuck attachment, lathe, G. T. Chattaway Churn, J. Cochran, Jr Churn, J. E. Taylor Clippers, hair, C. Carlton Cloth shearing machine, R. F. Hatfield Clothes drying machine, R. F. Hatfield Cloth and brake, reversing friction, T. A. Weston Coal from slate, etc., apparatus for separating, D. Clark Coat and blanket, combined, C. A. Hodgman Collar and hames, combined horse, F. Hartman Collar fastener. P. A. Bagwell Compass, mariner's, S. Longfellow	216,989 217,045 217,115 217,1261 217,172 217,171 217,099 216,989 216,989 217,065 217,065 217,065 217,168 216,988 216,988 216,988 217,102 217,153 217,102 217,153 217,064 217,105 217,105 217,105 217,105 217,105 217,105 217,105 217,105 217,105 217,105 217,105 217,105 217,105 217,105 217,105 217,105 217,105 217,105 217,005 217,105 217,005 217,005 217,005 217,005 217,005 217,005 217,005 217,005 217,005 217,005 217,005
betts Carriage springs, manufacture of, H. M. Wentworth Cartridge case forming machine, H. H. Barnard. Cartridge, pyrotechnic, E. D. Kendall Caster, J. H. Schlott 217,160, Casters, top plate for, W. H. Tucker Celluloid or pyroxyline, manufacture of moulding, etc., from, R. A. Johnson. Chain and rope tightener, W. L. Gracey Chandelier hook, A. D. Judd Channeling tool, E. F. Stevens Chisel rolling machine, G. Parr Chuck attachment, lathe, Bielefeld et al Chuck attachment, lathe, G. T. Chattaway Churn, J. Cochran, Jr Churn, J. E. Taylor Clippers, hair, C. Carlton Clothes drying machine, R. F. Hatfield Coat and brake, reversing friction, T. A. Weston Coal from slate, etc., apparatus for separating, D. Clark Coat and hames, combined, A. Rutherford Collar and hames, combined horse, k. Hartman Colter fastener. P. A. Bagwell Compass, mariner's, S. Longfellow 217,014, Copying press, H. J. Baldwin Cork, machine for splitting for slicing, D. S. Yeoman Crushing and pulverizing mill, J. T. Davis Cuffholder, D. A. Johnson Diamond cutting machine, A. Hessels	216,989 217,045 217,115 217,1261 217,172 217,171 217,091 217,092 217,062 217,065 217,065 217,065 217,065 217,168 216,989 217,165 217,162 217,153 217,162 217,153 217,164 217,164 217,164 217,164 217,165 217,165 217,164 217,165 217,164 217,165 217,165 217,164 217,165 217,075 217,075
betts Carriage springs, manufacture of, H. M. Wentworth Cartridge case forming machine, H. H. Barnard. Cartridge, pyrotechnic, E. D. Kendall Caster, J. H. Schlott Caster, J. H. Schlott Celluloid or pyroxyline, manufacture of moulding, etc., from, R. A. Johnson Chain and rope tightener, W. L. Gracey Chandelier hook, A. D. Judd Channeling tool, E. F. Stevens Chisel rolling machine, G. Parr Chuck attachment, lathe, Bielefeld et al Chuck attachment, lathe, G. T. Chattaway. Churn, J. Cochran, Jr Churn, J. E. Taylor Clippers, hair, C. Carlton Clothes drying machine, D. C. Summer Clothes drying machine, R. F. Hatfield Clothes pounder, C. D. Roberts Clutch and brake, reversing friction, T. A. Weston Coal from slate, etc., apparatus for separating, D. Clark Coat and blanket, combined, C. A. Hodgman Collar and hames, combined, A. Rutherford Collar and hames, combined horse, F. Hartman Cotter fastener. P. A. Bagwell Cork, machine for splitting for slicing, D. S. Yeoman Crozing machine, O. J. Pennell Crosing machine, O. J. Pennell Crushing and pulverizing mill, J. T. Davis Ditching machine, J. L. Custer	216,989 217,045 217,115 217,261 217,172 217,111 217,001 216,980 216,980 217,062 217,062 217,062 217,062 217,062 217,153 217,153 217,162 217,162 217,162 217,163 217,16
betts	216,989 217,045 217,115 217,1261 217,1261 217,172 217,109 217,009 216,969 217,062 217,062 217,062 217,062 217,165 217,162 217,163 217,163 217,163 217,163 217,163 217,164 217,165 217,162 217,153 217,162 217,163 217,163 217,164 217,165 217,165 217,162 217,163 217,163 217,163 217,073 217,073 217,073 217,073 217,073 217,073 217,073
betts Carriage springs, manufacture of, H. M. Wentworth Cartridge case forming machine, H. H. Barnard. Cartridge, pyrotechnic, E. D. Kendall Caster, J. H. Schlott Caster, J. H. Schlott Celluloid or pyroxyline, manufacture of moulding, etc., from, R. A. Johnson Chain and rope tightener, W. L. Gracey Chandelier hook, A. D. Judd Channeling tool, E. F. Stevens Chisel rolling machine, G. Parr Chuck attachment, lathe, Bielefeld et al Chuck attachment, lathe, G. T. Chattaway. Churn, J. Cochran, Jr Churn, J. E. Taylor Clippers, hair, C. Carlton Clothes drying machine, D. C. Summer Clothes drying machine, R. F. Hatfield Clothes pounder, C. D. Roberts Clutch and brake, reversing friction, T. A. Weston Coal from slate, etc., apparatus for separating, D. Clark Coat and blanket, combined, C. A. Hodgman Collar and hames, combined, A. Rutherford Collar and hames, combined horse, F. Hartman Cotter fastener. P. A. Bagwell Cork, machine for splitting for slicing, D. S. Yeoman Crozing machine, O. J. Pennell Crosing machine, O. J. Pennell Crushing and pulverizing mill, J. T. Davis Ditching machine, J. L. Custer	216,989 217,045 217,115 217,1261 217,1261 217,172 217,109 217,009 216,969 217,062 217,062 217,062 217,062 217,165 217,162 217,163 217,163 217,163 217,163 217,163 217,164 217,165 217,162 217,153 217,162 217,163 217,163 217,164 217,165 217,165 217,162 217,163 217,163 217,163 217,073 217,073 217,073 217,073 217,073 217,073 217,073

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Fuel, device for decomposing water for, M. W.		02 02
■ ■ Tazleton	216,154	8
Pas meter, E. Haas	218,093	2
Flazier's point setter, W. B. Fenton	216,950	1
Flove and other fastening, E. Atkins	217,139	1
Frain testing device, J. N. Stacy	217,166	1
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Iay loader, D. C. Jewett	217,054	Ţ
Hinge, spring, L. Bommer	217,103	7
Hog cholera compound, E. Twomley	217,029	7
thenoses of, O. A. Essig		7
A. Weston. Horse detacher and brake, combined, Kaplan &		7
Illowy	217,047	7
Iose, universal joint forfire engine, B.Holland, Jr Iub attaching device, G. Finkbeiner	217,006 217,086	7
Hydrocarbon burning apparatus, S. C. Salisbury. ce cream freezer, J. McAnespey	217,130	7
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oom temple bracket, J. B. Stamour	216,943	C
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Payton & Bourne	217,072	F
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Christopher & Squireile guide, M. Parkslane, bench, J. Siegley	216,970	8
Planter, corn, C. E. Beckwith	217,046 217,083	8
Planter, potato, M. BockmanPlanter, seed, W. E. Kelley	217,113	S
Cost office box, L. Yale, Jr. (r)	217,000	V
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Wind Wind Wind Wind Wire Wood in Wren	wheel, J A. Creasey
Wind Wind Wind Wind Wire Wood in Wren	wheel, J. A. Creasey
Wind Wind Wind Wind Wire Wood in Wren Butte Certa Cigar	wheel, J A. Creasey. 217,070 wheel, C Lohnes. 217,125 mill, E. N. Cowdery 217,127 mill, J. J. Reed 217,147 mill, W. A. Wheeler. 217,028 cutting and bending die, F. Irwin 217,028 cor lumber, process and apparatus for treat-g I.s. S. Robbins 217,022 ch, W. B. Killough 217,117 TRADE MARKS. r, P. H. Van Riper & Co. 7,461 in medicinal preparations, H. H. Warner 7,467 s, cigarettes, and smoking tobacco, Straiton &
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