Ice Making Machines and Machines for Cooling Breweries, etc. Pictet Artificial Ice Co. (Limited), 142 Greenwich Street. P. O. Box 3083, New York city.

Presses & Dies. Ferracute Mach. Co., Bridgeton. N.J. Machinery for Light Manufacturing, on hand and built to order. E. E. Garvin & Co., 139 Center St., N. Y.

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Fossil Meal Composition, the leading non-conducting covering for boilers, pipes, etc. See adv., p. 268.

Drop Forgings. Billings & Spencer Co. See adv., p. 189 Woodwork'g Mach'y. Rollstone Mach. Co. Adv., p. 222.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 221.

Lightning Screw Plates, Labor-saving Tools, p. 220. Steam Pumps. See adv. Smith, Vaile & Co., p. 237. Spy Glasses, Telescopes, Opera Glasses, Field Glasses Send for catalogue. Queen & Co., Pbiladelphia.



#### MINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

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

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

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

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

Any numbers of the Scientific American Supple-MENT referred to in these columns may be had at the office Price 10 cents each.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identi-

- (1) C. L. P. asks how to lacquer polished brassat home? If it can be heated on common oven, and about how hot? What to apply and how to apply it and how to prepare it? How bot the article should be, and howlong it should be left before using after lacquering.

  A. The brass must be perfectly clean; it must be boiled caustic lye if necessary. Many lacquers are med; half a pound of red lac dissolved in half a pint of a countil moderately heated and then varnish it, keeping it chalk. hot. Then dry it by heat.
- (2) L. M. asks how to clean and polish cows horns. A. Rasp the horn with a file to bring it to a smooth, even surface, then scrape with glass in the same manner as a shoemaker scrapes the soles of boots. This if carefully done will leave a fine, clean surface. Then rub with a piece of cloth and electro-silicon wet to a paste with water. Then polish with a cloth and oxide of tin wet with water to a paste. Sometimes the horn is rubbed down for a final polish with French polish instead of the oxide of tin. Whiting and chalk in water
- (3) C. & Sons write: We are running a 5 horse power engine and using only about one-half horse power ordinarily. Would it be practicable to have an air compressor and reservoir, so as not to run our engine everyday? If so, please state the most economical kind of air compressing engine and reservoir. A. It is practicable, but we do not think it would "pay:" it would be more advantageous, if you make a change, to substitute a good caloric engine and sell your present engine and boiler, unless you have use for steam for other
- (4) A. A. J. writes: If a tubular boiler be set with side walls kept clear away from the shell, say 6 inches, and arched over the top so as to leave a blank. In fact, it is a very difficult mechanical probjacket space all round the boiler, allowing the heat to lem to make a tap match the rise from the farnace to the top, and the back end closed above the back arch, so that the draught will be directed properly to the flues, will the heat above the water line be too intense? Will it be injurious to copper a red or variegated appearance, such as is somethe shell? Is it better to close in at the sides as is usually done? A It is better and safer to close in at the sides say two or three inches below water line.
- (5) F. A. C. asks: 1. Would three eighths of an inch be thick enough for a 4x6 engine, that is, thickness of cylinder? A. Yes. 2. What size ports | should I have for a 4x6 engine with double slide valve? preparation to use in covering the floor of a photo A Steam 4 inch by 3 inch, exhaust 34 inch by 3 inches. 3. Is there a patent on the double slide valve engine? A. No. 4. What will be the power of a double slide staining the ceiling below? A. Nail a narrow strip of valve engine 4x6 with 100 pounds of steam and 300 revolutions per minute? A. About 5 horse power.
- (6) S. M. H. asks: Could a small boiler, say one horse power, be fed from a reservoir of sufficient elevation so that the hydraulic pressure from the reservoir would overbalance the steam pressure required from the boiler? If so, what height would the reser-

to M. C. Bullock Mfg. Co., 80 to 88 Market St., Chicago, Ill., in pipes and the resistance of the check valve. About ing on wire cable is not practicable. It has occurred if it is of any value, Mineral paints are not rure and are

- (7) W. J. W. writes: A locomotive with a six foot driver and a 22 inch cylinder, and a locomotive with same cylinder and "5 foot 8" driver—how much more space would the six foot driver cover than the "5 foot 8," both going at their full capacity? A. Assuming that the boiler was the same in both cases. and just sufficient, the 6 foot driver should cover a trifle more space; but if the boiler was of ample capacity, the space covered would be directly as the diameter of the wheels; this is supposing the same number of revolutions made in each case.
- (8) H. W. P. writes: I am using in my business a good deal of tea lead, which I buy from junk men; and my object in now writing to you, is to ask if you can give a good recipe for melting and separating the paper from the tea lead. A. To separate the tea lead from the paper, condense the mass of lead in an iron kettle. Put a layer of powdered charcoal over the and allow it to remain until the paper is carbonized and the lead is melted, then stir the mass with a dry stick and the lead will go to the bottom.
- (9) H. J. B. writes: I am desirous of obtaining a license to run stationary engines. Can you ined for the same? Would the inspector that examines steamboat engineers be the proper one to apply to? amines steamboat engineers.
- (10) W. D. P. asks: Dees the size of wheel of a vehicle vary the amount of power required to start a vehicle? If so, please state how. A. It is generally economy. For small steamers, yachts, etc., the screw conceded that the larger the wheels the easier the running for vehicles within certain limits as to weight and smoothuess of track. As a general practice, large wheels for rough roads are considered the best, as they give a longer tread or bearing.
- (11) T. H. B. asks (1) if it were possible to run a train of cars through a vacuum, and to let drop a stone or feather from a window while the train was in motion, would the object reach the ground directly under the place where the window was when it was let fall. or would it be carried forward with equal velocity as train? A. The object would receive an impulse from the motion of the train which would carry it forward with velocity equal to the velocity of the train, while the action of gravity would give it simultaneously a downward motion. Therefore, when it reaches the ground, it will be directly under the window from which it was projected. 2. Is there any more or less water on the earth and in the surrounding atmosphere at the present time than there ever was? What is evaporation? Is it possible to totally destroy water? A. The quantity of water has not changed within a reasonable geological period. In the early geological ages there was more water in the atmosphere as clouds than now, and of course less upon the air or atmosphere. Water can be destroyed by converting it into its primary elements, hydrogen and
- (12) W. W. A. writes: Please give formula for a dry paste for cleaning gold, silver, and jewelry without scouring. A. Polish with whiting and ammonia. It is risky to use any silver soaps or cleaning pastes, as they may contain mercury, which injures the silver permanently. Try a quarter of a pound of hol is a good one. Put the article on the top of a stove | jeweler's rouge, three-quarters of a pound precipitated of the formula for finding the horse power both nominal
  - (13) J. J. B. asks how to put a surface on soft sponge leather. A. Mastic varnish, rubber varnish, wax, size or glue, and calendering, or polishing with burnishers, are all used for smoothing soft leathers.
  - (14) S. H. B. asks: What is the difference between "quarter" and "bastard" sawed lumber? A. Bastard sawed lumber has the annual rings parallel with the surface in some part of the board or plank, and is the ordinary method of sawing. Quartering is sawing the log into 4 parts across the center, and then sawing the quarters so that the annual rings will run out to the surface. It is not economical for the lumber producer. Quartered lumber may be made from bastard by culling and sawing out the bastard centers.
  - (15) W. O. S. writes: I wish to cut with a that shall have 100 cogs on the circumference. What must be the circumference of the wheel before cutting the cogs? A. The diameter of the pitch line should be  $1_{1000}^{581}$  inch diameter, to which add five one-hundred ths inch for the outside or diameter of the blank. This will represent a proper wheel gear of 100 threads with a pitch of one-twentieth incb. As your tap will not commence cutting upon the pitch line, you will have to use the pitch line diameter for the diameter of the a teath in Cutting a wheel
  - (16) O. A. G. writes: Will you please incopper a red or variegated appearance, such as is sometimes seen on the ingots of the metal? I want it for ornamental purposes. A. The colors you see on copper ingots are due to oxidation of the metal by the air while the metal is hot. Try heating and evaporating drops of nitric acid on its surface and then heating.
  - (17) L. W. C. asks: Can you tell me what graphic dark room that will fill the cracks and render it water tight to prevent the slops from going through and wood around the corners of floor and put down a single sheet of oil cloth that exactly covers the floor. The strips are intended to bend up the edges of the oil cloth to prevent escape of liquid.
- (18) E. D. C. writes: I have three presses run by a small engine which I consider good for four horse power under 45 pounds pressure. I do not convoir have to be to insure 100 pounds steam pressure? sider it economical to use steam, and have been trying A, The hydraulic pressure must not only be equal to to secure power from a mill about twelve rods distant,

to me that I might lay a pipe, connect it with the boiler, and use compressed air. Would such a plan be feasible? Would the apparatus be reliable? Can compressors be purchased in market? What size pipe would be needed? A. The use of compressed air would. we think, not prove economical or satisfactory. Cannot you bring the water to your place in a pipe and by it run a small turbine? If so, this will be the best arrangement.

- (19) D. S. C. asks: What gives the lamp shades used on drop lights the light or white color? Are they glass or porcelain? If glass, what gives the glass the opaque or white color? Is it the peculiar kind of sand used? A. The lamp shades you refer to are of glass; glass is rendered opaque by various ingredients oxide of tin will produce this effect.
- (20) T. J. asks: What is the process of making fine shot of lead and copper? A. By pouring the metal when melted through a strainer of perforated surface of the lead and cover the kettle as nearly air iron, allowing the metal to drop into water at a considtight as possible. Place the kettle over a strong fire erable height. Shot for ammunition is poured in shot towers and falls from 40 to 60 feet. The new way is to drive cold air up the shaft, which cools the shot with a short fall of 20 to 30 feet.
- (21) H. E. B. writes, inquiring about the economy of using a side wheel steamer as compared inform me to whom I must apply in order to be exam- with a screw propeller. I claim that the fastest time that has ever been made on rough and smooth water has been made with a screw propeller, and it did not A. For your license apply to the inspector who ex- take any more coal to propel it than a side wheel steamer. The other party claimed that a side wheel steamer made the fastest time on smooth water and used less coal. A. For large boat of light draught, side wheel boats have made the best speed with greatest has given the greatest speed, but with an enormous power and large consumption of fuel.
  - (22) H. C. S. writes: Please let me know if there is anything I can wash an iron mould with to belp make the iron come out smooth, as the mould is small and the iron chills before the mould fills up; or is there anything I can put in the iron to make it thinner, so the iron will run more freely? A. The iron used in casting the celebrated Berlin ware, consisting of ornaments, charms, chains, and other jewelry, is said to be alloyed with arsenic, but as arsenic is very volatile and dangerous to manage except by chemists, we do not recommend its use. Tin will make the iron more fluid. Use No. 1 iron in a crucible and add when melted 2 to 5 per cent of tin. Use powdered charcoal to keep the iron from decarbonizing. Smoke the iron moulds and heat to about the temperature of melted lead. This may make the casting comparatively smooth. but will not prevent entirely the chilling of the iron. Casting in an iron mould has never been cousidered very feasible except for chill purposes. Finer surfaces can be had from sand moulds.
- (23) F. M. L. writes: Can the business of the earth. Evaporation is the absorption of water by carpentering, etc., be learned without a practical instructor? If so, what books are necessary for a beginner-the most comprehensive and practical? What will a set of drawing tools cost that are not fine, yet will answerall purposes? A. By studying ". Appleton's Cyclopedia of Drawing" you will be able to learn architectural drawing without a teacher. Do not buy cheap drawing tools; better get along with a few and have them good.
  - (24) C.G.H. writes: Can you kindly inform me and actual of the ordinary locomotive and return flue boiler? In both cases hard wood is the fuel used, and there is a natural draught through a smoke stack 60 feet high. A. To obtain the nominal horse power of a locomotive boiler: Take the whole surface of the inside of the fire box and two-thirds of the internal surface of the tubes in square feet, add them, and divide by 14,14 being considered the amount of effective surface equivalent to one horse power. The same also for cylindrical tubular and flue boilers with the fire under the shell and returning through the flues or tubes. The whole surface of the under half of shell and two-thirds of tube or flue surface as above. For the actual horse power: The quantity of water evaporated in dry steam per hour indicates one horse power per cubic foot.
- (25) E. H. A. writes: I read in one of the scientific papers about an oil for lubricating made with 20thread V tap, Brown and Sharp gauge, a cog wheel, lead and olive oil; now I want to know if cotton seed oil could not be used, and how long should it stand; and if it becomes too thick, what should be used to thin it? A. Corton seed oil will answer. If it becomes too thick. thin it with kerosene oil.
  - (26) J. G. L. writes: 1. Would you please let me know how telephone wire is made, and what it is made of? A. Any iron or copper wire, or copper coated iron wire will answer for a telephone wire. The standard conductor for telephones. 2. Is any wire of Cleaner. See Cotton cleaner. iron or steel with a thick coat of copper used for tele. Clock and watch spring, G. P. Ganster............. 286,417 put on? A. The copper coating you mention is deposited on the wire by the galvanic process.
  - described in the Scientific American Supplement. No. 142, do the binding screws, a, project through the flange, E, and connect with the diaphragm in any way? A. The binding posts are not connected with the diaphragm, but with the terminals of the bobbin. 2. How much wire should be wound around the spool, D? A. No 3xed amount. Fill the spool with No. 36.
  - (23) T. McK. writes: Please give me the temperature of the water in a boiler when there is 25 lb. steam pressure; also give me the temperature of the water at 75 lb.? A. Twenty-five lb. pressure above atmosphere, 2,665°; and 75 lb., 320°.

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

some value in the manufacture of fire clay articles. It

Latest Improved Diamond Drills. Send for circular the pressure, but enough more to overcome the friction which is run by water. The location is such that shaft- maybe called silicious clay.—W. W.-It is doubtful low priced .- H. W .- The clay is of very good quality and might be used as fire or potter's clay in the manufacture of common chinaware.- J. W. V .- Probably of little or no value. Analysis of the three, \$1500 for iron only.-E. S. B.-The names of the specimens you sent are as follows: 7. Galenite and pyrite. 8. Pyrite. 9. Galenite. 10. Mispickel. 11. Pyrite.- W. L. B.-No. 1. Iron pyrites. No. 2, ditto in clay nodule. Probably of little value .- D. A. R .- The sample is infusorial earth, composed principally of silica. It is of little use except as a polishing powder or as fuller's earth.

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Glass lampfonts or bowls, ornamenting, W. Somerville		Puzzle, mechanical, W. J. Decker	286.212	sky Vault cover orgrating tile and surfaces made of	
Glass to a backing, securing, Hyatt & Lockwood Glycerine, apparatus for the manufacture of, O.	· i	Rag cutting machine, L. Baumann	286,268	the same, illuminating, T. Hyatt Vehicle seat. F. A. Comstock	286,178
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Grate, fireplace. A. Chase Grinding machine. J. M. Haigis.	286,176	Register. See Passenger register. Register and alarm, combined J. G. Lettelier	!	Vehicle wheel, W. Notley	286.476
Grinding mill rollers, machine for dressing, F. Messer:		Registering apparatus, autographic, J. C. Shoup Regulator. See Gas regulator.		Ventilating screen for windows, E. W. Philbrook	
Gun, breech-loading bomb, E. Pierce (r)	286,513 10,392	Rock breaker, L. Radovich		Vise, G. Thorp	
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Thrashing machine derrick table and feeder, M.		Γ
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Tool, combination, C. E. Marshall	286,458	
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D. Stockbridge		
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Vapor burner, O. B. Peck Varnish, apparatus for manufacturing, B. Borow-	286,328	
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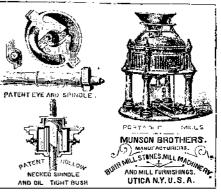
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