

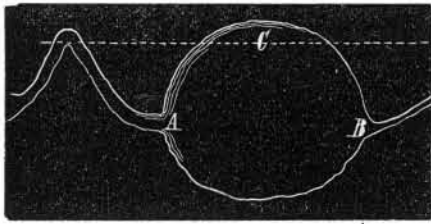
(27) J. F. R. says: I am building an icebox 8 feet deep, 8 feet high, and 5 feet wide, ice being suspended in a grate. There is an air chamber inches wide all round it. Is ventilation necessary? A. A certain amount of ventilation is necessary. We would suggest an opening 3 inches in diameter upon one side at the bottom, and a like opening upon the opposite side at the top, these openings should be covered with wire cloth. The openings should communicate with the interior and not with the 2 1/2 inch space.

(28) D. P. W. asks: If a tuba mirabilis stop in an organ be weighted 18 inches water gage pressure of wind, what will be the relative pressure on a steam gage? A. About 0.65 lb. per square inch.

(29) A. C. C. asks: Does the friction increase with the diameter of the journal, the weight and the velocity remaining constant? A. Under these circumstances the friction would not vary.

(30) J. E. D. asks: 1. Will quicksilver remove the lead from gun barrels? A. Yes, but the black lead (carbon) and oil with which the bullets are covered, and the percentage of arsenic with which the metal is alloyed, often renders this method unsuccessful. 2. If so, how can the lead be separated from the quicksilver so that the latter can be used again? A. Heat the alloy in a suitable iron retort, the beak of which, or its connection, must dip beneath the surface of a quantity of water. The mercury will distil over and condense beneath the water, while the lead will remain behind.

(31) J. S. O. says: The generally accepted theory of intermittent springs is that a cavity in the earth has two water channels, one leading into it, the other out, the former being the smaller, as in the engraving, which represents the section of an intermittent spring. Let A be the outlet, 2



inches in diameter, and B the inlet. If water flows in through this channel, it will rise to the level, C, and instead of filling the channel, A, which is necessary to create a siphon, it will flow out in a steady stream as long as water flows in at B. Can any one give another theory to take the place of the long accepted but evidently incorrect one? A. In accounts of several intermittent springs which we have seen, it is stated that the water first issues with great velocity, and runs for some time with a continually decreasing velocity. It would not be difficult, therefore, to believe that the cavern might be so supplied as to be full at times, the supply being sometimes greater than the discharge and sometimes less. Perhaps some of our readers have devoted more attention to the subject than we have, and will send us their views.

(32) W. F. T. asks: 1. How high will an hydraulic ram raise water? A. In general, it should not be more than 15 times the head under which the ram works. 2. If I attempt to raise all the water that runs from my spring with an hydraulic ram, what proportion of the water will the ram raise? A. It may raise from 1/3 to 1/4 the whole amount. 3. Can an hydraulic ram of any size be made to work, or is there a limit to the size at which it can be made to operate successfully? A. As a general thing, the size of a ram is approximately fixed by the conditions under which it has to work. You will find the whole matter fully explained on p. 259, vol. 31.

(33) B. W. S. says: The head of a horse rake, being green when manufactured, has warped in drying. How can I remedy the defect? A. Possibly by steaming the wood, and securing it in the proper position, you may give it the original shape.

(34) M. W. H. asks: At what angle should a rifle be held to throw a ball to the greatest distance over level ground? A. A general value would be difficult to ascertain. In practice, the angle will probably be between 30° and 40°.

Can a horse do more work walking at 30 or at 60 yards per minute, in both cases pulling his best for the space of one minute? A. He could probably do more, for a short time, at the greater speed.

What steam pressure would a vat (made of grooved and matched 2 inch oak plank, of 10 feet high and 8 feet diameter, sustain, being bound with nine 1/4 x 2 inches iron hoops? A. Between 30 and 40 lbs. per square inch.

(35) R. H.—If, as we understand you, the thrashing machine runs with sufficient steadiness at present, we do not see that any advantage would be derived by using a heavier cylinder.

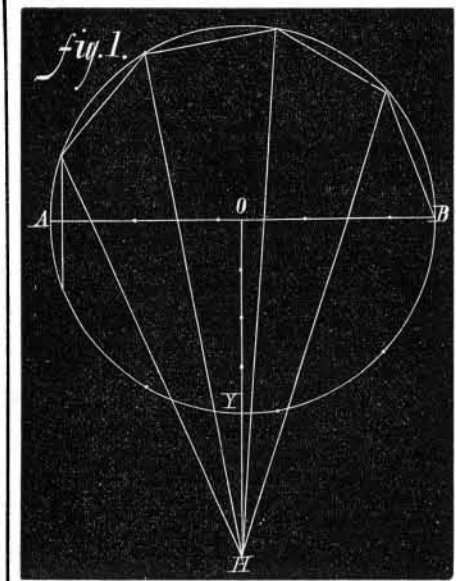
(36) C. W. C. asks: 1. Is a screw steamer, of 1,000 horse power, faster or slower than a side wheeler of the same power? A. In still water the screw would have no great advantage; but in the case of adverse winds and heavy seas, its superiority over the side wheel is very decided. 2. Is a two-bladed screw more powerful than one with more blades, other things being equal? A. Experiments seem to show that screws with two blades are not as efficient as those having three or four, other things being equal.

(37) I. J. H. asks: Can I cover steel-pointed poles with any preparation that will prevent their attracting lightning? I want to use those I have to make a garden fence, but am half afraid to do so. A. Metals do not attract lightning. The idea that they do is a popular delusion.

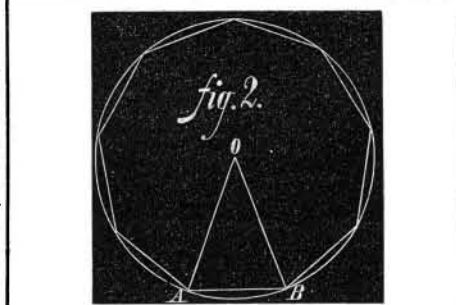
(38) F. A. S. asks: Can you inform me what is the best contrivance for grinding centers in a lathe? A. A revolving emery wheel.

(39) F. N. W. asks: In connecting a tank in the top of a building with the standpipe from the pump, will there be any difference in the pressure on the pipe whether it be connected at the bottom or at the top of the tank? A. If the tank is kept full, there will be no difference. This also answers S. F.'s plumbing question.

(40) S. C. says: I offer the following as an easy method of dividing circles. In a given circle (Fig. 1) divide the diameter, A B, into as many equal parts as you wish the figure to have sides;



erect the perpendicular; O H, divide the radius into 4 equal parts, and set off 3 of these parts from Y to H; draw lines from H to each division on diameter, and produce them to cut the circumference. Join any two of the points by a chord, and it will be the side of required polygon. When the polygon is to have an even number of sides, divide diameter in half the number and draw from H through each division. Join any two points where they cut the circumference, and the chord so drawn will be the side. To do the same (Fig. 2) when each side is to be a definite length: Divide 360° by the number of sides in polygon, deduct the

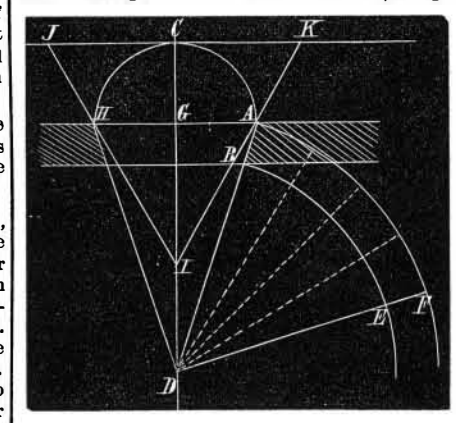


quotient from 150°, the remainder will be the number of degrees in each polygon; at the points, A and B, one inch or whatever length you wish for a side apart make the angles, O A B or O B A, each equal to half the angle of the polygon; from O as a center, with O A or O B as radius, describe circle, in which place A B continually.

(41) M. D. asks: Can you inform me what colors or combinations of ingredients I must use to produce a silver color, like silver leaf, on leather? A. Try the bisulphide of tin. Apply with a hot iron.

(42) W. C. asks: Will dry steam, taken from a generator, at 100 lbs. pressure, passing into water in a closed boiler, the blow-off valve being set at 80 lbs., evaporate that water, or will the steam from generator condense and increase the quantity in closed boiler? A. After the water is heated up to the temperature due to the pressure, the steam would merely escape through the blow-off valve.

(43) S. S. H. says: 1. I have a window, the head of which is circular, and the inside casing is on the splay. Is there a rule by which I could cut out a board to bend around it, and make the marks across it so that I can saw-kerf it? A. We presume you have reference to the splayed soffit of your jamb instead of the casing. Let A B be the width and splay of the jamb, and CD a line drawn through the middle of the window, at right



angles to the direction of the wall. Prolong A B to intersect C D at D. With D A for radius, draw the arc, A F, and with D B for radius draw the arc, B E. With G H for radius, draw the semicircle, H C A. Make H I and A I each equal to H A, and from I, through A and through H, draw the lines, I J and I K. Make A F equal to J K, and join F and D. Then A F E B will be the shape of the soffit required. 2. What is a transom? Is it what is called the fanlight over the door, or is it the rail across the head of the door? A. The latter.

(44) F. S. B. asks: Please give me a recipe for cleaning white rubber coats. A. Try rubbing the coat with a little benzine, but do not allow it to remain too long in contact with the rubber. You fail to state with what the material has become stained.

(45) I. H. W., of Ouchy, Switzerland, says: Why is it that many (perhaps all) liquids will percolate more rapidly through two than one thickness of filtering paper? My theory is that, with one thickness, the paper, becoming saturated, adheres to the funnel sides, and checks the circulation of air, whereas, when two thicknesses are used, a circulation is established between the papers themselves. Am I correct? A. Yes.

(46) C. F. M. asks: What is the strongest and best kind of alkali for bleaching oil? A. Use a strong solution of caustic potassa or soda in water.

(47) M. asks: What is a good plan for compressing air on a small scale? A. Try a small air pump or bellows.

(48) W. B. W. asks: What acid will do to bite figures, etc., in mica? A. Try a mixture of strong sulphuric and hydrofluoric acid.

(49) W. L. asks: In casting gun metal or hard brass upon a smooth iron surface, or chill, what is the best coating or parting to put on the iron in order that the gun metal may form a smooth surface in close contact to the iron, without any blow holes? A. Use plumbago for a parting and dry the mold.

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

F. W. R.—It is decomposed granite, and the shining scales are small pieces of weathered mica. —H. A. B. Jr.—You are mistaken in supposing the specimen is an ore. It is composed of quartz, mica, and the black portion of hornblende, which is a silicate of alumina, lime, etc., and some oxide of iron.—A. W. S.—No. 1 is siliceous alumina, and a small percentage of hydrated oxide of iron. No. 2 is earth containing scales of mica. No. 3 is siliceous alumina with oxide of iron. The percentage is so small that they are not to be considered as iron ores.—T. L.—No. 1 is graphite (black lead). No. 2 is mostly iron pyrites, but you should send a larger piece and have it assayed.—G. C. R.—It is the American holly (Ilex opaca). The deep green foliage is less glossy than that of the European holly.—R. W. B.—It is Epsom salts, as you have stated. The discovery is of the greatest interest and value.—B. M. R.—It is a small fragment of fossil, with clay and oxide of iron.—G. S. M.—It consists mostly of siliceous alumina, magnesia, and alumina. It is not of much value.

COMMUNICATIONS RECEIVED.

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

- On Footprints in the Carboniferous Sandstone By J. L. G.
On a Day's Work. By E. L.
On Saving Life. By M. P.
On Supply and Demand. By W. L.
On the Newfoundland Railway. By H. A. C.
On Machinery and Labor. By W. P.
On Type-Setting Machines. By T. E. A.
Also inquiries and answers from the following:
J. P. S.—P. D.—A. H. L.—W. T. H.—R. L. D.—B. B.—F. H. W.—O. N. S.—B. B.—W. A. R.—W. S. T.—W. E. F.—H.—W. S. G.

HINTS TO CORRESPONDENTS.

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

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

Hundreds of inquiries analogous to the following are sent: "Who makes toughened glass? Who sells machinery for manufacturing starch? Who sells incubators? Who sells hydraulic rams? Who makes the machines used in the manufacture of friction matches?" All such personal inquiries are printed, as will be observed in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH Letters Patent of the United States were Granted in the Week Ending March 28, 1876,

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

- A complete copy of any patent in the annexed list, including both the specification and drawings, will be furnished from this office for one dollar. In ordering, please state the number and date of the patent desired and remit to Munn & Co., 37 Park Row, New York city.
Animalpoke, H. Ames..... 175,394
Annunciator, elevator, J. R. Creighton..... 175,338
Annunciator, pneumatic, D. Morris..... 175,486
Anvil bed, A. Hitchcock..... 175,284
Apron, J. Malozzo..... 175,362

Table of inventions with names and patent numbers, including items like Armpit shield, Auger, W. H. C. Smith, Bale tie, W. Carson, Barrel washer, A. Zoller, Barrels, drip pan for, D. M. Haight, Bed bottom, Smidt & Hupfeld, Belt fastening, A. D. Power, Belt gearing, C. Underwood, Belting, J. Neumann, Billiard register, J. P. Miller, Billiard register, J. F. Miller, Billiard table, H. Pottin, Binder, temporary, B. J. Beck, Boiler injector, steam, W. T. Messinger, Boilers, furnace for steam, J. Q. C. Searle, Bolt blanks, machine for sawing, G. B. Hill, Book, scrap, B. J. Beck, Boot and shoe, A. Burke, Boot and shoe, R. S. Manning, Boot-burnishing machine, G. E. Burgess, Boot heels, finishing, C. E. Ramlose, Boot-nailing machine, McKay & Fairfield, Boot and shoe seam, C. F. Glanville, Breakwater, J. G. Bruggeman, Bronzing machine, F. J. Emmerich, Buckle, reversible, Wallace, Furness, & Wales, Buckle, harness, W. G. Bunker, Bung extractor, W. Heinle, Burial cases, etc., preserving, A. T. Bleyley, Burner reflector, gas, W. H. R. Toy, Can-filling apparatus, Merrill & Soule, Canal boats, propelling, Dolch & Hayden, Canister, E. Norton, Car axle journal box, W. M. Watson, Car brake, Bennett & Gangwer, Car coupling, G. W. Burnett, Car coupling, J. H. Lands, Car coupling, D. J. Martin, Car coupling, R. D. Thomson, Car coupling, B. W. Thurman, Car pusher, C. A. R. L. Verginius, Car truck and wheel, P. Banning, Carpet, C. A. Read, Carpet stretcher, W. S. Hamlin, Carriage, child's, C. H. Wentworth, Carriage rug and pocket, combined, J. Milwain, Carriage top, E. Marsh, Carriage top, folding, C. W. Blackman, Carriages, ventilating, E. Marsh, Cartridge, metallic, J. Merwin, Cartridge shells, loading, C. W. Parks, Cartridge, shot, T. Wilkinson, Chair fan, rocking, L. A. Winters, Chair, opera, W. Hyland, Chair, tilting, A. S. Cushing, Chill for mold boards, G. K. Smith, Churn, W. H. Conver, Churn, R. Evans, Churn, E. W. Shephard, Clasp, Church and Eames, Clocks, lighting alarm, F. Fischlein, Clothes pin, S. W. Derham, Clothes pin, J. H. Marshall, Clothes pounder, F. G. Clarke, Clutch device, Wheeler and House, Clutch, friction, E. F. Williams, Coal hod, N. Hawkins, Coffee pot, M. H. Curtis, Cooker, steam, F. J. Shinn, Cooler and strainer, milk, C. Weineis, Cooler, liquid, J. Downing, Cooler, milk, J. B. Marquis, Cotton batting, folding, C. H. Prescott, Cotton gin, O. W. Massey, Cows, stock for milk, J. Page, Cultivator, A. B. Reeves, Cultivator, L. P. Thompson, Curtain fixture, M. Haughey, Damper, G. Merrill, Dental rubber dam punch, Rix and Smith, Desks, F. J. Rennekamp, Diamond-cutting machine, H. D. Stover, Diamonds, etc., polishing, H. D. Stover, Ditching machine, F. L. Delfer, Door hanger, R. L. Glenn, Drippan for barrels, D. M. Haight, Electric machine, T. W. Livingston, Elevator bucket, O. W. Clark, Elevator, hydraulic, C. W. Baldwin, Engines, expansion joint for, H. M. Durphy, Equalizer, draft, C. C. Hewitt, Equalizer, draft, A. Melharry, Fan, K. Robison, Fare register, H. Pottin, Feather renovator, A. Carbonow, Fence, portable, Cuykendall and Kellogg, Filter, B. Schieffelin, Fire arm, breech-loading, W. R. Pape, Fire arm, revolving, E. T. Starr, Flock-cutting knife, W. H. Swan, Forge, portable, J. Bayliss, Fork, carving, R. Richmond, Fork, potato, R. W. Trussell, Fork, weft, C. H. Warfield, Fruit crate, S. Hughes, Fruit jar, J. Haines, Furnace for pulverulent fuel, M. Perret, Furnace for steam boilers, J. Q. C. Searle, Furnace heater regulator, A. C. Norcross, Furniture tip, Lloyd and Coogan, Game apparatus, C. Oberly, Gas, making, Weber, Herzog, and Schuessler, Gas generator, carbonic acid, H. W. Dopp, Gas lighter, Faloon and Iseninger, Gas purifier and regulator, L. E. Fish, Gas regulator, M. Toulmin, Gate, automatic, W. A. Baker, Gear, friction, F. Simmons, Glass, rolling plate, Cassidy, Ford, and Snead, Grain scourer, brush, H. A. Barnard, Grater, nutmeg, S. W. Gear, Hame tug and buckle, G. W. Haslam, Hammer, tack, W. C. Avery, Hammers, die for making, H. W. Kip, Harness, J. Fischer, Harness pad, E. F. Beck, Harvester, A. Hart, Jr., Harvester, cotton, W. H. Pedrick, Harvester dropper, J. A. Coulter, Harvester rake, H. J. Silvernate, Harvester rake, E. Wilcox, Heater and purifier, water, J. L. Winston, Hook, mousing, N. E. Johnsen, Hoop poles, splitting, G. B. Selden, Horse-hitching device, A. E. Francis, Horse power, W. Deering, Horseshoe, H. Gourdier