

and add 1/4 gallon of the spirit to the sediment and treat as before.

(40) J. S. M. says: I wish to paint on porcelain or earthenware. Shall I use water colors or oil? Also by what method is the finish obtained that causes it to withstand washing, etc.?

(41) J. H. M. asks how to make a gold solution for battery gilding, such as is used by carriage platers? A. You had better gild in the hot bath.

(42) S. B. H. asks. 1. Are north, south, east, and west relative or absolute terms? A. Relative.

(43) J. E. S. asks how bright crimson writing fluid is made? A. Powdered cochineal, 1 oz.; hot water, 1/2 pint.

(44) G. M. W. asks how to make a good article of yellow soap? A. Tallow and sal soda of each 1 1/4 lbs.; resin, 56 lbs.; stone lime, 28 lbs.; palm oil, 8 ozs.;

(45) K. H. R. asks what laundrymen use use besides starch to give a smooth glossy appearance to starched goods?

(46) C. S. R. says: 1. If I bore a piece of 2 inch round bar iron 7 inches long, lengthways through the center, with 3/8 inch drill, and previously plug the ends of bore, what internal pressure will the tube resist?

(47) C. B. L. says: I have two flywheels, each 1,000 lbs., running at the rate of 50 revolutions per minute; one is 10 feet in diameter and the other is 20 feet in diameter.

(48) E. C. H. says: 1. Of two engines less than 2 horse power, running at 300 revolutions, and steam pressure 80 lbs., one engine having stroke the same as diameter of cylinder, and the other having a stroke twice the diameter of cylinder, which uses steam most economically, both engines cutting off at 1/4 stroke?

(49) J. D. W. asks: What is the heating surface of a boiler 28 feet long, 42 inches in diameter, with five 8 inch flues?

(50) I. L. L. asks: What sized boat would be required for an engine 2 inch bore, 6 inch stroke, with an upright boiler 4 feet high and 2 feet in diameter and what sized screw?

(51) E. A. B. asks: 1. What are ocean steam boilers made of? A. Wrought iron. 2. Are they upright and tubular?

(52) F. H. R. asks: Is the pressure of a steam gauge diminished if it be located 20 feet from the boiler, the boiler being three horse capacity? A. Ordinarily, no, if properly located.

(53) F. H. says: 1. Can you give me a rule to find out how much packing is necessary to cover a pipe 105 feet long, diameter of pipe 3 inches, with a covering 3 inches thick; the material weighing 4 lbs. to the square foot?

What is meant by cold short iron? A. Iron that is brittle when cold.

(54) H. A. P. asks: 1. How can I ascertain the horse power of a punching machine, to which steam cannot be applied for the purpose? A. Some form of transmitting dynamometer must be employed.

ings? A. Cast iron toughened by the admixture of wrought iron scrap.

(55) J. C. wants to know how to drive several tilt hammers off the same driving shafts at varying speeds? Each hammer must be independent of the others, and the speed easily and immediately alterable to suit the heat being worked.

(56) W. T. B. asks: Are there any schools teaching mechanical engineering, and if so, where is the best one, considering expenses? A. There are so many schools of this character that we do not feel inclined to make a comparison.

(57) N. W. H. asks: Which of the two engines below noted will develop the greatest power? One is 8 inch cylinder, 12 inch stroke, 100 revolutions with 30 lbs. boiler pressure.

(58) A. C. asks: What power can be got from a current wheel? The channel is 50 feet wide and 24 inches deep, with a fall of 24 inches in forty rods.

(59) W. F. S. asks if moonshine has the same effect on fish to spoil them as sunshine? A. The influence of the moon is restricted to lovers, dogs, and the tides.

In our last week's issue the answer to No. 22 of the inquiry column, 3,300 should be 33,000.

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

M. S.—It is zinc blende, and of good quality. Judging from the sample, this ore should yield 40 per cent of zinc. It contains cadmium.—E. A. S.—The substance cannot economically be purified as suggested.

COMMUNICATIONS RECEIVED.

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

- On the Tides. By U. H.
On Petroleum. By W. S. R.
On a New Galvanic Battery. By E. G. A.
On Matter. By W. B.
On Mica Bronze. By R. S. V.

HINTS TO CORRESPONDENTS.

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 fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Inquiries 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, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

WANTS AND BUSINESS INQUIRIES.

Almost any desired information, and that of a business nature especially, can be expeditiously obtained by advertising in the column of "Business and Personal," which is set apart for that purpose subject to the charge mentioned at its head.

We have received this week the following inquiries, particulars, etc., regarding which can probably be elicited from the writers by the insertion of a small advertisement in the column specified, by parties able to supply the wants:

- Who makes Hyatt's patent sidewalk tiling?
Who sells grape sugar?
Who makes tile machinery?

OFFICIAL.

INDEX OF INVENTIONS FOR WHICH Letters Patent of the United States were Granted in the Week Ending October 30, 1877, AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.] A complete copy of any patent in the annexed list including both the specifications and drawings, will be furnished from this office for one dollar.

Advertising device, A. H. Dean ..... 196,639
Animal trap, J. C. Ambrose ..... 196,649
Annunciator, automatic time table, L. Dart ..... 196,637
Arithmetic, teaching, R. W. Kavanaugh ..... 196,583

Table listing various inventions and their patent numbers, including items like Baby-walker, Bale tie, Barrel hoop, Bed bottom, Billiard bridge, Boiler tube cleaner, Boot and shoe seam, Bottle stopper, Bottlestopperfastener, Broom rack, Bunk, Guenther & Hoepfner, Bung extractor, Burglar alarm, Butter and lard packages, Butter mould, Cages, cup for animal, Canal lock gate, Cane and umbrella, Car coupling, Car coupling, C. P. Byrd, Car coupling, J. R. Mateer, Car coupling, R. G. Rankin, Cartridge-loading machine, Caster for trunks, Chair, folding, Check rower, Chimney, sectional, Cigar, Babcock & Upton, Cigar bundle, Cigar machine, Clipping device, Clock pendulum, Coffee pot, Coffee roaster, Coking coal, Combustion, promoting, Corset, T. F. Hamilton, Corset, J. M. Van Orden, Cuff, E. K. Betts, Cultivator, Curtain cord holder, Door sill, Drawer pull, Dredging apparatus, Dredging machine, Dredging machine, hydraulic, Dress elevator, Earth auger, Educational appliance, Evaporator, Excavating machine, Faucet, registering, Feed cooker, Fence, portable, Fence post, Chandler & Deering, Fences, iron post, Ferryboat, File, letter, Fire escape, Fire extinguisher, Fire extinguisher, J. Dillon, Fire extinguisher, J. H. Connelly, Fire-extinguishing apparatus, Fire kindler, Fish hook, Fuel, artificial, Fur, separating, Gate, F. Gordon, Gate, I. Yoet, Glassware, A. Harcum, Grain binder, Grain drill, Grain tally, Grate, W. M. Shanks, Grinding machine, Gums, waterproof, Hame eye, Harness, check rein support, Harrow and cultivator, Harvester, S. & M. Dyer, Harvester, sugarcane, Hats, die for shaping, Heating furnace, Horsecollar, Horse detacher, Horseshoe, D. W. Copeland, Horseshoe, J. N. Schuldt, Horseshoe nail machine, Hydrant valve, Ice surfaces, Iron and steel, Kitchen cabinet, Ladder and step, Ladder, step, Lamp, H. L. Ives, Lamp, fishing and wharf, Lamp fount, Lantern, L. G. Huntington, Latch, gate, Lathe chuck, Lathe for turning paper mill rolls, Lathes, cutter for, Leather, sample, Lighting device, Lightning conductor, Liquor shaker and strainer, Loom, E. Oldfield, Loom heddle, Loom stop motion, Lubricator, Match safe, Measuring device, Milking stool, Mosquito bar and clothes drier, Musical instrument, Napkin holder, Napkin ring and holder, Necktie retainer, Nursing apparatus, Nursing shield, Oil wells, bailer for, Oil wells, machine for drilling, Ordinance, compound, Ordinance, vent stopper, Ore washer, Overalls, D. Neustadter, Overalls and jumper, Packing for blower cylinders, Paint mixer, Paper lining and packing, Paper machine, Paper, machine for finishing printed, Paper, manufacture of thick, Paper pulp, manufacturing, Pattern chart dress, Pencil holder and sharpener, Photographic camera, Photographic chair, Piano, hammer, Planter, corn, Planter, corn, L. Deffenbaugh

Table listing various inventions and their patent numbers, including items like Planter, walking, Planters, attachment for corn, Plaster of Paris, Plow, gang, Pulverizer, soil, Pump for fire service, Pump, oscillating, Punching or shearing, Railroad frog, Railroad rail joint, Railway switch signal, Refrigerating medium, Refrigerator, Rock drill, Rudder chuck for vessels, Safe, Urban & Berkmeier, Safe, fireproof, Sash fastener, Sash fastener, A. Cummings, Sash fastener, W. E. Hammond, Sash holder, Sash lift and lock, Saw mill head block, Sawing machine, circular, Scale beam, D. L. Columbia, Scale beam, C. M. Rider, Scraping tool, Screw threads, forming female, Screw threads, cutting, Sewer trap, Sewing machine, button hole, Shafting, clutch coupling, Shoe fastener, Shutter, Shutter fastener, Shutter fastener and bower, Shutter, revolving, Sieve, G. W. Ketcham, Skewer puller, Skins, treating, Speculum, Speed and distance recorder, Spoon handle, Stamp, branding, Stamp, cancelling, Stamp, perforating, Stave sawing machine, Steam boiler, duplex, Steam generator, Steering apparatus, Stove and furnace, Stove, cooking, Stove leg fastening, Sucker rod adjuster, Sundial, Suspender ends, Tablet, rolling clock, Thill coupling, Thill coupling, spring for, Tobacco pouch, Toilet case, Toy bird, Toy buzz, Umbrella runner, Vehicle axle, Vehicle axles, splicing bar for, Vehicle spring brace, Ventilating passage, regulator for, Vise, Henson & Osborn, Watch case spring, Watches, dial fastening for, Water closet, Well boring apparatus, Wind wheel, Windmill, Window screen

DESIGNS PATENTED.

- 10,286 and 10,287.—CASSIMERES.—A. Carmichel, Wesley R. I.
10,288.—ORNAMENTAL SCROLL WORK FOR JEWELRY.—L. Heckmann, Plainville, Mass.
10,289.—ORNAMENTAL CHAIN LINKS.—K. F. Heckmann, Wrentham, Mass.

[A copy of any of the above patents may be had by remitting one dollar to MUNN & Co., 37 Park Row, New York city.]

THE Scientific American.

The Most Popular Scientific Paper in the World. THIRTY-SECOND YEAR.

Only \$3.20 a Year including Postage. Weekly. 52 Numbers a Year.

This widely circulated and splendidly illustrated paper is published weekly. Every number contains sixteen pages of useful information, and a large number of original engravings of new inventions and discoveries, representing Engineering Works, Steam Machinery, New Inventions, Novelties in Mechanics, Manufactures, Chemistry, Electricity, Telegraphy, Photography, Architecture, Agriculture, Horticulture, Natural History, etc.

All Classes of Readers find in THE SCIENTIFIC AMERICAN a popular resume of the best scientific information of the day; and it is the aim of the publishers to present it in an attractive form, avoiding as much as possible abstruse terms. To every intelligent mind, this journal affords a constant supply of instructive reading. It is promotive of knowledge and progress in every community where it circulates.

Terms of Subscription.—One copy of THE SCIENTIFIC AMERICAN will be sent for one year—52 numbers—postage prepaid, to any subscriber in the United States or Canada, on receipt of three dollars and twenty cents by the publishers; six months, \$1.60; three months, \$1.00.

Clubs.—One extra copy of THE SCIENTIFIC AMERICAN will be supplied gratis for every club of five subscribers at \$3.20 each; additional copies at same proportionate rate. Postage prepaid.

One copy of THE SCIENTIFIC AMERICAN and one copy of THE SCIENTIFIC AMERICAN SUPPLEMENT will be sent for one year, postage prepaid, to any subscriber in the United States or Canada, on receipt of seven dollars by the publishers.

The safest way to remit is by Postal Order, Draft, or Express. Money carefully placed inside of envelopes, securely sealed, and correctly addressed, seldom goes astray but is at the sender's risk. Address all letters, and make all orders, drafts, etc., payable to

MUNN & CO., 37 Park Row, New York.