

(9) H. S. asks: 1. Please let me know through the SCIENTIFIC AMERICAN what mineral wax is used for and what is it worth? A. It is chiefly valued for the paraffine which it yields, and its value depends upon the percent of this substance which it contains. Refined paraffine is quoted at 20 cents per lb. 2 and 3. And what does a machine for making pins cost? How many different sizes of machines are there in a pin factory? A. Address dealers in such machinery who advertise in the SCIENTIFIC AMERICAN. See Knight's New Mechanical Dictionary for descriptions, etc.

(10) A. P. R. asks: What is the horse power of a boiler of the following dimensions: fire box 4 feet long, 3 1/2 feet wide, and 3 3/4 feet high, with 113 tubes, 1 1/2 inch, and 11 feet 10 inches long? A. Your boiler is out of proportion, except for forced combustion; too little grate for the tube surface. It would be about 50 horse power.

(11) R. W. asks: 1. In making a cistern, is it necessary that the coat of cement should be permitted to get perfectly hard and dry before fitting the cistern? A. No, if the cement be a hydraulic cement. 2. If water be permitted to fill a cistern, with the cement still moist, will the water be pressed through the coat of cement, and thus spoil it; or will the cement grow hard and made a good cistern, notwithstanding the pressure of the water? A. Not if properly cemented. It will grow hard, but it is better to let it harden before the water is put in. 3. Can you give us the title of a book from which we could derive the necessary knowledge for building good cisterns? A. We know of no book which treats on the subject specially; "Beckwith's Hydraulic Lime and Teal" will give you general information respecting the use of hydraulic limes.

(12) C. O. S. asks how to soften sheet cork so as to make it pliable and easily shaped in an oval shape. A. Steam it thoroughly, or boil it in water for an hour or so.

(13) F. N. asks how to make a gas that will inflate small balloons in country towns where there is no ordinary burning gas. A. Place a quantity of zinc scraps in a bottle, pour over them a mixture of sulphuric acid and water, and hydrogen gas will be rapidly evolved. Convey this gas through a wash bottle to your balloon. This experiment should not be performed in the vicinity of a light or fire.

(14) G. A. H. asks: 1. What is the most constant galvanic battery now made; how long will it remain active by one charging; and how many cells are required of such to produce the electric light (moderately powerful)? A. The gravity or Daniell. They remain in order from 6 to 9 months. It would require 100 cells to produce a small light. 2. Why is graphite not suitable for the carbons? A. Because of its inferior conductivity. 3. Can mica be colored like stained glass, and if so, by what process? A. Apply lacquer tinted with aniline or other transparent colors.

(15) W. S. D. says: This morning, as engine 865 on the B. & O. R. R. was about five miles from here, the fireman went out on the front to put the head light out; but when he opened the door of the head light the wind seemed to fan the flame, and in an instant the whole thing was afire. He returned to the car for water, which seemed to have no effect on the burning oil. The engineer was compelled to stop his train and open his cocks on it after they had taken it down. A. The body of the oil in some way, doubtless, became heated above the inflaming point.

(16) E. S. asks: 1. What is the difference between a cape and a chipping chisel in shape and average width of cutting edge? A. A cape chisel is a narrow edged chisel, the cutting edge being from one-eighth inch to three-eighths inch wide. A chipping chisel is for work on surfaces, and is generally from three-quarters of an inch to one and a quarter inch wide. 2. Are cold chisels and chipping chisels the same, or is there a difference? A. Same thing. 3. What is a good width for the cutting edge of a scraper? A. Depends upon the kind of work. 4. Is ten or eleven feet per minute a proper speed for drilling wrought and cast iron, both of good quality? A. Ten to fifteen feet, depending upon the kind of drill and character of the metal.

(17) C. D. A. asks: 1. Is it of any advantage to an engine to reverse it every six months or year; that is, let it run six months in one direction, then six months in the other? A. It would equalize the wear. 2. How do you tell the condition of boiler iron with a hammer, or by giving it what is called the hammer test? A. By the sound. 3. Where, in Michigan, can an engineer be examined to obtain a license? A. At Detroit, and, we believe, at Port Huron.

(18) "Student" asks: 1. If three pine logs, twenty-five feet long, fifteen inches diameter at small end, would have buoyant capacity enough to hold a boat's crew weighing about 700 lb.? A. Yes, if white pine. 2. Would one inch iron bolts be heavy enough to hold them together, if bolted to heavy cross pieces? A. Yes.

(19) P. J. M. asks: 1. What power is required to work a Cornish pump, 20 inch stroke, 8 inch discharge pipe, situated in a mine the shaft of which is 70 feet deep? A. If the pump makes 12 strokes per minute, 6 horse power, and for any other speed in proportion. 2. What power is requisite to hoist 800 lb. 70 feet per minute, that is from the same shaft? A. 17 horse power. To these powers should be added at least 25 percent for friction. 3. What size engine and boiler would be required to perform both these duties at the same time? A. An engine of 30 horse power.

(20) D. H. writes: 1. I have a hull, 35 feet long, 10 feet beam, draws 36 inches. Now, what size engine do I need? A. Engine 8 inches diameter by 8 inch stroke. 2. What size propeller? A. Propeller 42 inches diameter.

(21) G. H. C. asks: If a vessel is filled with steam at 60 lb. pressure per square inch, then placed in a furnace of 1,000° temperature; supposing that the vessel is absolutely steam tight, will the pressure in vessel rise as the temperature rises, and what will be

the pressure in said vessel per square inch when raised to 1,000°? A. Yes; it will increase in pressure about 1/10 for every degree of increased temperature; in other words, an increase of 480 degrees would double the pressure.

(22) C. W. S. writes: I have a telephone line 1,200 feet long, and have for alarm vibrating bells to be worked by six cells of Leclanche battery. What are the proper connections and switches? I wish to use one wire, with ground connections at each end. A. To use a single wire for your purpose you will have to divide your battery and place three cells at each end of the line. For calling use at each end of the line a key that grounds the line when raised, and connects the line with the battery when depressed. Now, your bells being in the ground wire outside of the keys, pressing the key at one end of the line will ring the bell at the other end of the line, and vice versa. Connect your telephone with the ground wire, and arrange a switch that will cut the battery and bell out of the line, and at the same time direct the battery current to the transmitter, and the secondary current of the induction coil to the line. The receiving telephone should be connected with the secondary wire of the induction coil, between the latter and the switch which connects it with the line.

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

J. S.—Galena—lead sulphide.—G. W. K.—Sulphide of iron.

COMMUNICATIONS RECEIVED.

On Science and Revelation. By P. S. H. On Cause of Diseases. By L. H. K.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending October 12, 1880, AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1865, 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. We also furnish copies of patents granted prior to 1865; but at increased cost, as the specifications not being printed, must be copied by hand.

Table listing various inventions and their patent numbers, including items like Air cooling apparatus, Air engine, Alarm lock, Album clasp, Amusement and instruction device, Animal trap, Annunciator, Axle bearing, Axle box, Axle ends, Axle carriage, Barber's chair, Barrel cover, Lacoock, Barrel filler, Bathing apparatus, Bobbin winding machine, Boiler furnace, Boot and shoe, Boot and shoe finishing machinery, Boot and shoe soles, Crocker, Boot treening machine, Bottle filler, Bottle stopper, Box, Box fastener, Bracelet, Bridle bit, Bucket, Bullet, Butter package, Butter trifier, Button, Cans, Car coupling, Car coupling, Car stock, Car wheel, Card screen, Carding machine, Carpet sweeper, Carriage curtain fastening, Carriage wheel, Cartridge shells, Cartridge shells machine for feeding, Cartridge shells machine for feeding, Chain drive, Chromotrope, Chuck, Churn power, Churn, rotary, Clasp, Clothes drier, Clothes sprinkler, Collar stay fastening, Cooker, Corn machine for making food from hulled, Corn shellers, Cotton gin carding attachment, Cracker packing machine, Cultivator shovels, Cutter head, Dental engine, Desk, cabinet, Distilling apparatus, Egg beater, Ejector, Electric light, Electrical switch board, Elevator, End gate, Envelope opener, Evaporating furnace, Feed water regulator, Fence post, Ferrule for awl handles, Fifth wheels, Wilcox, Firearm, breech-loading, Firearm, breech-loading, Firearm lock, Fire extinguisher, Fire shield, Form, adjustable dress, Form, dress, Form for garments, Fruit and vegetable drier, Fruit drier, Fruit drier, Gas or vapour burner, Gem setting, Governor engine, Grain binder, Grain binder, Grain drier, Grain drill, Grain grading and scouring apparatus, Grain register, Graining machine, Grinder, Grinding mill, Hame fastener, Hay rake, Hedge, Heel trimmer, Hinge blanks, A. Beers, Hog cholera remedy, Hoisting apparatus, Horse blanket, Horse power, Horse rake, Horseshoe, Hot air and steam engine, Hydraulic elevator, Hydrocarbon burner, Hydrocarbon burner for steam boilers, Injector, Ironing machine, Kettle, steam jacket, Kiln for burning pottery, Knitting machine, Lamp, electric, Lamp, electric, Lamp, electric, Lantern, Laps, arrangement of apparatus for and process of forming, Lasting jack, Log canter, Loom for weaving tufted fabrics, Loom let-off mechanism, Loom, needle, Lounge and bath, Lubricating composition, Magneto-electric machine, Measure and register, Medicinal compound, Metal objects ornamented with incrustations of celluloid, rubber, horn, etc., Millstone dress, Millstones on their spindles, Mining machine, Mower and reaper knives, Mower and reaper knives, Musical instrument, Nursery chair, Ordnance, Ordnance lock, Ordnance primer, Ore crusher and pulverizer, Paint, Glatemper, Paper cutting machine, Paper, manufacture of wood pulp for, Paper pulp from wood, Paper waxing machine, Pen, stylographic, Pen, stylographic fountain, Pianocase, Pianoforte action, Pipes, securing certain parts of subterranean, Piston, Piston spring, Plow, H. Gollyer, Pocket knife, Preserving fruits and other articles, Press, Boomer & Boschert, Printing machine, Propeller for boats, Propelling vessels, Pulley, friction, Pulp engine, Pump, lift, Pump, oil, Gaskill & Benton, Railway draw bar, Railway switch, Reaper, Refrigerator, Rein holder, Roofing, thatched, Rotary engine, Rubber cloth, enameled, Rubber with metal coating, Ruler and pencil case, Sand band, Sash cord guide, Sawing machine, Scraper, chopper, and dirter, Seeding machine, Sewing machine, Shaft coupling, Sheet metal vessel, Ship, buoyant propeller, Show case, Show case, Sink trap, Skate fastener, Skipping rope, Slate cleaner, Sleigh, T. Buckingham, Smoke consuming furnace, Spark arrester, Spark arrester, locomotive, Spittoon and table or tray holder, Spoon support, Spoon, medicine, Springs, apparatus for tempering, Stamp, hand, Starching machine, Steam boiler, Steam engine, direct acting, Steam generator, Steam generator, sectional, Steamboat staging, Steamer, feed, Stone dressing machine, Stove board, Stove, gas, Stovepipe thimble, Syringe, double acting pump, Tablet, writing, Taxidermy, ichthyological, Telegraph, fire alarm, Telegraph lines, terminal for underground, Telegraph relay and sounder, Telegraphy, Telephone, J. H. Irwin, Telephone, acoustic, Theatrical and gymnastic performances, Theatrical performances, Thill coupling, Threads, machine for cleaning and smoothing silk and other, Time piece, railway, Time signal, Tinned plates by heat and pressure, Tobacco cutting machine, Torch, Toy, Travelling bag, Truck, hand, Truck, plow, Trunk fastener, Type case, Type writer, Vacuum brake ejectors, Valve, gate, Valve gear, steam hammer, Valve motion, Valve, steam engine, Vehicle, side spring, Vehicle wheel, Vulcanite fiber cutter, Wagon, spring, Wall paper, machine for bronzing, Water closet, Water tanks, water column for railway, Water tube boiler, Weather strip, Weaving gauze, Welt trimmer, Whiffle tree clip bolt, Windmill, Windmill, G. M. Beard, Windmill, W. Forbes, Windmill, A. W. Heag, Wire cables, machine for making barbed, Wire looping and cutting machine, Wool and other fibers, apparatus for opening and loosening.

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DESIGNS.

Table listing various designs and their numbers, including items like Fountain, Gimp, Knit fabric, Type, font of printing.

TRADE MARKS.

Table listing various trade marks and their numbers, including items like Bluing, Cigars, Cigars, cigarettes, Coffee, Flour, Medicinal preparation, Piano, Soap.

English Patents Issued to Americans.

Table listing various English patents issued to Americans, including items like Carcoupler, Carpet lining, Caster, Conveying materials, Core metal, Electric signaling apparatus, Firearm, Hat band, Horseshoe, Horseshoe nail machinery, Neck yoke, Ore smelting apparatus, Printers' metal furniture, Pump, Rope machinery, Screw threading machine, Sewing machine, Steam engine, Steering apparatus for vessels, Stone dressing machinery, Syringe, Velocipede, Water, apparatus for supplying, Water, checking waste of, Wire, process for saving the gas generated in cleaning, Wood, preservation of.