

(71) W. & R. ask : What is a good and cheap ointment or varnish to prevent rust on polished iron and steel exposed to dampness, or to a sea voyage? A. Tallow and white lead. A. Is there known a process which facilitates the union of steel to iron cast around it, that obviates the necessity of pouring the iron very hot and in large quantities, as now generally done, to the frequent injury of the steel? A. Dry the mold and cast endways.

(72) J. H. W. says: A drop of turpentine on a grain of chlorate of potash, with the addition of a drop of strong sulphuric acid, produces immediate combustion. Can I obtain similar results by the mixture of any solids? A. Sugar may be made to replace the turpentine in this experiment; but there is nothing that will replace the oil of vitriol, unless it be the anhydrous sulphuric acid, and this is not a pleasant substance to handle.

I. Ganot's "Physics" states: "For physiological or chemical effects, the wires on the bobbins (of a magneto-electrical machine) should be fine, and each from 500 to 800 yards long. For physical effects, on the contrary, they should be thick, and only from 25 to 35 yards in length." I want to produce the longest spark; which arrangement, other portions of the machine being similar, will accomplish my object? A. The fine wire will produce a current of the highest tension, and consequently the longest spark. 2. Can I increase the spark by passing the induced current of one of the above machines (constructed for medicinal purposes) through an induction coil, or would such an arrangement only add to the resistance? A. It is requisite that the inducing current in a Ruhmkorff coil should be one of quantity; and as the current referred to in the preceding question does not possess this essential attribute, it is useless for this purpose.

1. Does mercury evaporate? A. Yes. 2. Which would be more durable as a valve seal, subject only to climatic changes of temperature, mercury or glycerin, the seal being in a position difficult of access for adjustment or inspection? A. Although both have objectionable features, the mercury would probably answer your purpose best.

I wish to construct a small but powerful battery, to be placed in a position difficult of access, but arranged with cord and pulley in such a way that I can lift the electrodes out of solution when not in use, and produce strong electric action immediately on replacing them. Under such conditions, I wish to employ such materials as will be most constant. The battery will not be used more than five or six times in a day, and then for only a few seconds. What form would best answer the purpose? A. Arrange a number of large plates of zinc and carbon alternately, and connect for quantity, that is, all the zincs together to form one pole, and all the carbons to form the other. Place in a lead-lined wooden trough, containing a cooled solution consisting of one part by weight of bi-ohromate of potash in ten parts of hot water and five parts of oil of vitriol. The plates are readily arranged so as to be lifted together out of the solution.

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

E. B.—It is clay with yellow ochre; it contains oxide of iron, but only in small quantity.—A. L. H.—All the specimens are oxide of iron, except No. 2, which is asphalt.—P. D.—They are cubical crystals of iron pyrites.—J. T. W.—Silver was not detected in the sample forwarded. It would be necessary to take a larger sample to subject it to careful assay.—F. H. D.—Quartz.—J. M. R.—It is slate, with a small percentage of bituminous matter. Not valuable.—F. H. F.—It is wulferite or molybdate of lead, and contains 51 per cent lead and 39 per cent molybdic acid.—D. L.—No. 1 is a rock containing sand, clay, and oxide of iron. No. 2 and 3 are dolomite, No. 2 containing some clay.—C. H. W. Jr.—No. 1 is quartz with carbonate of copper. No. 2 is galena.—E. F. R.—The water holds a considerable amount of oxide of iron in solution, which on contact with the air is separated, and gives the iron stains shown on your paper. It is probable that the water is impregnated with matter from a cesspool, as it contains a large amount of organic matter.

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 Use of Superphosphates. By T. B. S.
On the Altitude of Thunderclouds. By —
On the Grasshopper Plague. By J. S.
On Astronomy. By J. R.
On the Potato Bug. By J. C. B.
On a Cold Water Engine. By R. J. W.

Also inquiries and answers from the following : A. F. K.—N. H. W.—J. C. T.—R. J.—N. F. R.—A. N.—J. T. B.—R. H. S.—J. F. W.

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, 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.

Hundreds of inquiries analogous to the following are sent: "Who sells sundials? Where can salicylic acid be obtained? Where are small printing presses sold? Whose is the best paint for ship's bottoms?" 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 June 15, 1875, AND EACH BEARING THAT DATE. (Those marked (r) are reissued patents.)

Table listing various inventions and their patent numbers, including Alarm register, Auger, Bag, Band, Bank check, Barrel, Bars, Bath tub, Beams and girders, Bedstead, Belting, Bit, Blackboard eraser, Blind slate, Blind stop, Bolter, Broom, Brush, Brushes, Buckle, Burlap, Burner, Burner spring, Bustle, Camphor, Can, Candle holder, Cap, Car coupling, Car mover, Car starter, Car wheel, Car window, Carbureter, Card, Carding, Carriage wheel, Chain, Chair, Chemise, Churn, Churn, Churn, Cloth-tentering machine, Clothes pin, Cock, Coffee steeper, Cooler, Cooling apparatus, Crochet machine, Cultivator, Cultivator, Curtain, Curtain roller, Dentifrice, Doll, Drawing and spinning, Drill, Drill, Drill, Eaves trough, Elevator, Engine, Exercising machine, Eyeletting machine, Fabric, Faucet, Faucet, Feed water regulator, Fence, Fence, Fence, Fertilizer, Fertilizer distributor, Fifth wheel, Fire brick, Flour sieve, Forge, Furnace, Furnace, Gate, Gate, Generators, Glass, Glove, Grain drill, Grate, Grates, Grinding machine, Hair-weaving loom, Haider, Hammer, Harrow, Harvester, Harvester, Hat bodies, Head light, Heel polishing machine, Hinge, Hinge, Hive, Hoisting machine, Honey extractor, Horse, Horse power, Hub borer, Hydrant, Insect-destroying composition, Ironing apparatus, Kettle, Knit fabric, Knit fabric, Ladder, Lamp shade, Lamps, Lap board, Lathe beds, Leather washers, Lighter, Lighting and heating houses, Lime, Liquor tester, Lock, Loom, Loom shuttle, Mail bag, Mask cap, Measure rotary, Mechanical movement, Motor, Nut, Nut, Oiler, Ordnance, Organ, Organ stop, Organ valve, Paint compound, Palate, Pan-forming machine, Paper bag, Paper bag, Paper bag machine, Paper box, Paper feeding machine, Paper-making cylinder, Pencil case, Pencil sharpener, Photographs, Piling, Pins and dowels, Pipe tongs, Planer wood-holding device, Planter, Plow, Plow, Plumber's joint, Polishing, Potato bug, Press, Printer, Printing, Printing, Pruning shears, Pump, Pump and check valve, Pyrophore, Radiator, Ralls, Railway axle box, Railway rail chair, Railway rail joint, Railway switch, Railway time signal, Rake, Range boiler stand, Range, Relishing machine, Roll for welding, Rooms, Roof, Sad iron heater, Sash fastener, Sash fastener, Sausage machine, Saw buck, Saw frame, Saw sharpening machine, Scrapper, Screw cutting die, Sewing machine, Sewing machine motor, Sewing machine shuttle, Shafts, Shearing machine, Sheet metal, Ships, Shirt collar, Shoe sole edge trimmer, Shoe tip, Shutter, Shutter, Shutter worker, Sidewalks, Siding, Sign, Signaling apparatus, Slag, Soap-cutting machine, Soap, Spark arrester, Spinning, Spinning regulator, Spinning ring, Spinning, Stool, Stove, Stove, Stove reservoir, Stove, Sugar-cutting machine, Switch rod, Table, Table, Tank regulator, Target, Tiling, Time-recording instrument, Tool receptacle, Toy pistol, Toy wagon, Treadle, Tubing, Valve gear, Walls of buildings, Wash bench, Washing machine, Washing machine, Water filter, Water wheel, Weatherboard, Weather strip, Weather threshold, Wells, Whiffletree, Wind wheel, Windmill, Wooden planing machine, Wrench.

Table listing various inventions and their patent numbers, including Walls of buildings, Wash bench, Washing machine, Water filter, Water wheel, Weatherboard, Weather strip, Weather threshold, Wells, Whiffletree, Wind wheel, Windmill, Wooden planing machine, Wrench.

DESIGNS PATENTED.

Table listing various designs and their patent numbers, including 8,386.—HAT BLOCK, 8,387.—GLASSWARE, 8,388.—MEDAL, 8,389.—KNIFE HANDLE, 8,390.—MUGS, 8,391.—HEAD LIGHT, 8,392.—DRINKING FOUNTAIN, 8,393.—RANGE PLATE, 8,394.—RANGE, 8,395.—COFFIN HANDLES, 8,396 & 8,397.—CHAIN PUMP CURB, 8,398.—GAME BOARD, 8,399 to 8,403.—OIL CLOTHS, 8,404 & 8,405.—CARPETS.

SCHEDULE OF PATENT FEES.

Table listing patent fees: On each Caveat, On each Trade mark, On filing each application for a Patent (7 Years), On issuing each original Patent, On appeal to Examiners-in-Chief, On appeal to Commissioner of Patents, On application for Reissue, On filing a Disclaimer, On an application for Design (5 1/2 years), On application for Design (7 years), On application for Design (14 years).

CANADIAN PATENTS.

LIST OF PATENTS GRANTED IN CANADA, June 15, 1875.

Table listing Canadian patents granted in 1875, including 4,837.—S. T. Gustin, 4,838.—E. A. Kitzmiller, 4,839.—J. H. Myers, 4,840.—J. L. Clark, 4,841.—A. A. Wilson, 4,842.—J. A. Eglington, 4,843.—J. C. Ramsden, 4,844.—H. W. Murdoch, 4,845.—T. Foster, 4,846.—R. Taylor, 4,847.—J. L. Bond, 4,848.—W. C. Barker, 4,849.—E. J. Brooks, 4,850.—C. E. Patric, 4,851.—G. B. Peters, 4,852.—W. F. Wheeler, 4,853.—E. R. Stockwell, 4,854.—J. F. Donoghue, 4,855.—W. Griffith, 4,856.—J. L. Gregory, 4,857.—A. Taplin, 4,858.—H. W. Merrill, 4,859.—A. Tolton, 4,860.—D. Lister, 4,861.—L. Brush, 4,862.—E. McMullen, 4,863.—W. N. Whiteley.

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