

(30) W. McC. writes: I intend to make a battery consisting of zinc around the inside of a stone jar (1 foot deep), in which is a solution of common salt, and a flower pot containing copper and sulphate of copper, inside of zinc. Would a battery thus made be powerful enough to produce an electric light equal to one gas burner, or if not, how many would I need? A. It would require from 75 to 100 such cells to produce an electric light.

(31) C. F. asks what power expressed in fractions of a horse power it takes to run a sewing machine, a foot lathe, and heat 1,000 cubic feet of a reasonably tight country house. A. With an engine capable of developing half a horse power, and a boiler of suitable size for the engine, you could run the machinery, and heat the space to which you refer.

(32) C. A. writes: A friend and myself had lately a discussion as to the apparent situation of the sun to a man standing directly on the north pole. He maintained that the sun would seem to rise in a straight line from about March 21 to June 21, and then descend. My opinion is, that the sun would appear to whirl around the horizon, making one revolution each day, commencing to appear on the 21st of March and screwing up till the 21st of June, to the height of the horizon given by the angle of the polar axis to the sun, and then descending in the same manner. I maintained that although standing on the axis, the observer would be turned around by the motion of the earth on its axis, and would see the sun every 6 hours one quarter of a turn removed. A. You are right.

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

O. D. R.—It consists of carbonate of lime, carbonate of magnesia, carbonate of iron and silica. P. P. P.—It is sulphide of iron—of little value. M. S.—No. 1 is black oxide of manganese—of some value if found in sufficient quantity. No. 2 is lead sulphide or galena—a valuable ore of lead. It probably contains a little silver. D. R.—They are garnets of different colors and varieties—sometimes used in jewelry. M. H. F.—Send your specimens. J. F.—No. 1 is hepatic pyrites. No. 2 iron pyrites containing a little mispickel. F. S. P.—The specimen contains some magnetic oxide of iron disseminated through a quartzose matrix, but no appreciable quantity of silver. M. F.—The little scales are kaolinite—a hydrous aluminum silicate. R. W. F.—The galena contains 87 per cent of lead. C. F. K.—No. 1 is banded argillite or clay rock. No. 2 is micaceous oxide of iron. No. 3 is actinolite—a silicate of magnesia and lime. J. W. S.—The fine sand might advantageously be used in the preparation of silicate of soda and for some grinding and polishing purposes. It is hardly sharp enough for sand paper. N. O. D. H.—The samples of supposed native brass from Sierra county, Cal., according to an analysis by Dr. Stillman, have the following composition: Copper, 85.02; zinc, 11.02; antimony, 3.82; iron, .09; total, 99.95. Another sample was assayed for silver and gold, but neither of these metals was found. The probability is that the alloy was an artificial one. P. E. W.—No. 1 is very fine silica containing a little alumina and oxide of iron. It appears to have been of igneous origin. No. 2, the clay contains much fine silica. No. 3, similar to No. 1, but contains more alumina. I. H. P.—Shale containing a small amount of carbonaceous matters and much iron sulphide. T. J. H.—They are quartz crystals—sometimes used to imitate diamonds in cheap jewelry.

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COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges with much pleasure the receipt of original papers and contributions on the following subjects: New Mechanical Movement. By L. Haase. Human Knowledge. By G. V. On the Electric Light. By D. H. D. On the Formation of Streams, Springs, and Lakes. By A. R.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH Letters Patent of the United States were Granted in the Week Ending December 17, 1878, 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. In ordering, please state the number and date of the patent desired, and remit to Munn & Co., 37 Park Row, New York city.

Table listing inventions with patent numbers and names, including Addressing machine, J. Piner; Aging, etc., distilled liquors, M. Lansburgh; Air and forcing beer, compressing, Harvey & Seal; Air compressor, T. G. Springer; Annunciator, F. W. Mallett; Bag holder, D. Arndt; Ball ear, bucket and pail, G. C. Naphers; Bale tie, W. Silvester; Ballot box, registering, A. B. Roney; Barrel head, H. Schwarzwalder; Battery, galvanic, F. C. Bartlett; Bed bottom, I. S. Bunnell; Bed bottom, W. M. Willoughby; Bee hive, Petty & Mobley; Bell, alarm, C. H. Smith; Bell ringer, steam, G. N. Osgood; Bending machine, metal, W. T. Nichols; Binder, temporary, W. Byrne; Bit stock, H. L. Pratt; Blind, inside, L. D. Benner; Blower, steam, R. Atherton; Boat raiser and lowerer, M. Bourke; Bobbin, O. E. Wait; Bolters, electric alarm for steam, P. Grimm et al.; Boiler injector, steam, Minich & Godley.

Table listing inventions with patent numbers and names, including Book binder, metallic, D. R. Reynolds; Boot and shoe stiffener mould, S. W. Record; Bottle stopper and fastener, Deming & Baecher; Brick machine, C. S. Bigler; Brick, etc., treating fire, A. R. Reynolds; Bridges, testing, L. Laubscher; Brush block borer, C. A. Mahle; Button, M. Lowenstein; Cake machine, soft, E. A. Coles; Can, metallic, G. L. Harrison, Jr.; Can, metallic, Perkins & Brown; Can opener, J. G. Wiggins; Cans, case for supporting, Perkins & Brown; Cane shaving machine, C. L. Jones et al.; Car starter, R. Hermance; Car starter, H. P. Holt; Car starter, C. H. Nye; Car, stock, Whitham & Schneider; Car, street, T. Sharer; Car pipe coupling, railway, E. L. Brady; Carbon motive power, bisulphide of, R. Creuzbaur; Chair, folding, R. Dick; Clamp, C. M. Hyatt; Closet or commode, portable, H. A. Clum; Clutch, J. E. Hunter; Coal scuttle, S. Smith; Combs, cleaner for, C. S. Westcott; Cooking apparatus, J. F. Roberts; Copper, welding, J. Burns; Corset, galvanic, S. W. Geery; Cotton opener and cleaner, H. Ellis; Counter and heel protector, Hughes & Dyer; Cracker machine, J. W. & A. Ruger; Cream raising apparatus, J. W. Powers; Culinary vessel, J. L. Follett; Cultivator, A. Canfield; Cultivator, Knowlton & Rutledge; Cultivator, F. W. Tolley; Curtains, frame for drying, H. F. Marsh; Distance measurer, A. Feldin; Drill chuck, E. S. Pierce; Drill, grain, Smith & Richey; Drill, rock, T. B. & T. R. Jordan; Drill, seed, E. Ruhlmann; Drop light, J. Brown; Eccentric, anti-friction, M. Scharberg; Electric bell polarized armature, T. A. Watson; Electric motor controller, C. A. Hussey; Engine, compound hydraulic, O. C. Carpenter; Engine, traction, G. Rogers (r); Engines, bed plate for paper pulp, J. H. Horne; Envelope, metallic postal, H. G. Pearson; Fabric stretcher, C. A. Luther; Face canopy, M. Bourke; Faucet, beer, Rowe, J., & Knight; Feed water heater, S. A. Goodwin; Feed water heater, G. H. Rheutan; Feed water heater, steam boiler, B. Ford; Feed water regulator, Dinkel & Roehow; Fence, J. A. Tornwall; Field roller and planter, Relcherts & Tipton; Firearm, J. Royal; Firearm, breech-loading, J. Bluemel; Fire escape, W. Duryea; Fire detector and extinguisher, W. H. Johnstone; Flour bolt, Lewis & Baker, Jr.; Flue cleaner, steam, R. Atherton; Fluting machine, Shepard & Adams, Jr.; Fringe, A. Moll; Fruit box, W. A. Williams; Furnace, T. W. Williams; Game board, H. B. Dennison; Gas lighter, electric, Pintsch & Schulke; Gate, W. H. Hubbard; Glassware, manufacture of, D. Bennett; Governor, W. H. Fruen; Grain binder, W. Lottridge; Grain binder, J. S. Marsh; Grate, D. Smith; Gun, air, W. Montstorm; Harness, plow, J. W. Blyth; Harrow, E. M. Dunbar; Hatchway door mechanism, T. J. Close; Hat and cap sweat band brims, T. W. Bracher; Heater, fireplace, J. R. Lancaster; Heater, fireplace, A. R. Morgan; Hides, bandler for, C. Stienmann; Hoisting machine, L. H. Hall; Horse clipper, W. 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