

(30) J. L. L. writes: I have an item here which I think is worth space in your columns. I refer to a heat I took off in the Manhattan Foundry yesterday. It was a small heat of 6,000 pounds, which was taken off in one hour and twenty minutes, and was melted with 600 pounds of coke, which you will see was ten to one, and which is the best I have ever done or ever heard of being done, and I have worked at the business now almost seventeen years with good success. Our engine is a small donkey, which runs at 75 revolutions, while the fan runs 8,000 per minute. The fan is a No. 6 Sturtevant, and the furnace is only a 30 inch, with two tuyeres 2 1/2 by 7 inches, and our iron is all old scrap, and some of it has been melted a great many times. The amount of castings obtained from the heat was 5,526 1/2 pounds, which, I think, taking all into consideration, is worth notice. A. This is an excellent result, far above the average. But we have known (on a test) 13 pounds iron brought down to one pound anthracite coal. If coke had been mixed with the coal, or coke only used, a still better result could have been obtained. But this was from a cupola about 42 inches diameter.

(31) E. J. R. asks: What is pepsin, and how is it prepared? A. Pepsin is a nitrogenous substance existing in the gastric juice, and as a viscid matter in the peptic gland and on the walls of the stomachs of animals. The mucous membrane of the stomach (of the hog, sheep, or calf, killed fasting) is scraped, and macerated in cold water for twelve hours; the pepsin in the strained liquid is then precipitated by acetate of lead, the deposit washed once or twice by decantation, sulphureted hydrogen passed through the mixture of the deposit with a little water to remove the whole of the lead, and the filtered liquid evaporated to dryness at a temperature not exceeding 105° Fah. As met with in pharmacy the strength of pepsin varies greatly. It is often prepared by simply mixing with starch the thick liquid obtained on macerating the scraped stomach with water, and evaporating to dryness. The composition of pepsin is not positively known.

(32) J. M. asks how to proceed to ascertain the average rainfall. A. Take a quart bottle of uniform diameter, and graduate its liquid contents by a scale of tenths of an inch accurately engraved on the side; fit into the neck of the bottle a 40° funnel, the diameter (in inches) at the rim or widest part of which has been accurately ascertained; then diameter square x 0.7854 = area in inches of the base of the inverted cone. Suspend the rain gauge in an upright and exposed position. Then, number of inches of rain collected in the bottle ÷ time of exposure = average rainfall in inches. The gauge should of course be out of the reach of splashing water from surrounding objects, and in order to avoid great error through the splashing of the water from the funnel, the angle of the sides of the latter should not be greater than 40°. The neck of the funnel should be narrow, and due allowance must be made for evaporation. Readings should be taken if possible before as well as after a rainfall. The indications of this simple instrument are sufficiently accurate for all ordinary purposes.

(33) E. D. asks how to discover lead poison in water. A. Evaporate by gentle heat a small sample of the water nearly to dryness in a clean porcelain cup, moisten the residue with acetic acid, and add to a portion of it a few drops of strong hydrosulphuric acid—pure water saturated with the gas evolved by the action of dilute sulphuric acid on iron mono-sulphide; a black precipitate indicates lead. Add to another portion of the dilute acetic acid solution a little pure hydrochloric acid; a white precipitate, which redissolves on diluting with boiling water indicates lead. To the remainder of the solution add a few drops of dilute sulphuric acid, and let it stand for a time; a white heavy precipitate indicates lead.

(34) W. M. C. asks: Which will afford most power or do the most grinding, a twenty foot overshot wheel, or one twelve feet (overshot), if the same water be used on each per hour of running time? If any difference, state what. A. With the same quantity of water and same velocity, the power of the two wheels will be nearly directly in proportion to their diameter.

(35) H. S. writes: In your issue of the SCIENTIFIC AMERICAN, No. 6, vol. xiv., August 6, in your description of the sea lamprey, you state that it was and is now used for food. Will you please state in your paper what part of the lamprey issued for food and how it is dressed? A. The only part of the lamprey not used is the head. Lampreys are cooked in the same styles as the common eel, namely, fried, stewed, potted, deviled, and chowdered with potatoes and fat pork. A large part of the famous London eel pies are composed of the lamprey eel, and the substitute is considered by judges as a great improvement over that of the common eel. Lamprey eels cannot be smoked, as they contain so small a quantity of fatty material, but are excellent when pickled in salt or vinegar.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated: D. G.—No. 1. The powder consists chiefly of oxide and sulphide of iron. The latter probably carries a little silver and gold—it would require an assay to determine this. No. 2. Quartzose rock containing basic sulphides of copper and iron carbonate and silicate of copper and lead sulphide, (galena). Would probably assay high in silver. No. 3. Quartz with sulphides of iron, copper, and zinc—probably carries both gold and silver. No. 4. Silver-bearing quartz.—E. S. M.—Bituminous coal.—A. A. W.—It is ammonium nitrate.—S. G. S.—Fine white silicious and—used in the manufacture of glass and pottery, soluble glass, cements, and enamels, and for scouring purposes.—H. B. M.—A fragment of sandstone.—D. W.—Iron pyrites—iron sulphide.—J. B. S.—Ferruginous micaceous quartz rock containing a little hornblende.—W. H. B.—Partially decomposed feldspathic rock—of little value.—R. E. P.—An argillaceous limestone—might make a good cement.—B. G. U.—1. Red jasper. 2 and 3. Flint.—4. Lime carbonate. 5 and 7. Limonite—oxide of iron. 6. Limestone.

COMMUNICATIONS RECEIVED.

On the Electrical Theory of Comets, by C. S. B.

INDEX OF INVENTIONS FOR WHICH Letters Patent of the United States were Granted in the Week Ending September 13, 1881. 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 1836, will be furnished from this office for 25 cents. 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 1836; but at increased cost, as the specifications not being printed, must be copied by hand.

Table listing inventions such as Aeronautic apparatus and regulator, Air for motive power, Air or liquid cooling apparatus, Ammonium sulphate, Antimal trap, Anti-friction box, Auger handle, Axle, Axle crank, Axle straightener, Baling press, Baling press, C. W. Minear, Bar, Bark for transportation, Battery, Bearing, anti-friction, J. B. Benedict, Bearing, anti-friction, C. W. Hunt, Belting and lacing, J. Paton, Belt shipper, S. Strunz, Beverages, apparatus for charging portable fountains with aerated, J. Matthews, Bicycle, O. H. Venner, Billiard cue tip, M. Trunk, Bit stock, O. Peck, Board, See Bosom board, Boiler furnace, G. Criner, Boiler furnace, J. Mailer, Boot and shoe heels, machine for preparing, E. Fisher, Boot rubber, W. G. Vermilye, Bosom board, N. Scholl, Bottle packing box, S. Cary, Box, See Anti-friction box, Mail box, Bottle packing box, Brace, See Surgical brace, Bracelet, Boniface & Rice, Brake, See Steam railway brake, Train brake, Stovepipe brake, Breastpin, etc., R. S. Cutting, Brick kiln, A. S. Burry & Hutchison, Brush and case, tooth, Arment & Scott, Brush, broom, E. S. Chandler, Brush, tooth, L. Chevallier, Buffing or polishing wheel, A. Levett, Burner, See Vapor burner, Buttons to garments, setting instrument for attaching, Farnsworth & Barnes, Calendar, J. Bath, Can, Harris & Thoenl, Can coupling, G. C. Martin, Car door, Susemihl & Hewitt, Car door, grain, L. Mancy, Car, freight, T. Lee, Car heating apparatus, freight, W. E. Eastman et al, Car, railway, W. H. Ward, Car wheel, W. H. Ward, Car wheels, device for cleaning, P. H. Griffin, Carbon conductors, manufacturing, H. S. Maxim, Carbons, manufacturing, H. S. Maxim, Carbonating apparatus, J. Matthews, Card game, M. Bradley, Carriage apron, S. A. Harvey, Carriage step, F. A. Sawyer, 2d, Cartridge capping and uncapping implement, L. T. Cornell, Carving fork, J. Gerard, Chair, See Oscillating chair, Chalk holder, A. N. Rouech, Chandelier for electric lamps, H. S. Maxim, Cheese hoop, E. Laass, Chuck, drill, C. Gage, Churn, reciprocating, F. M. Wright, Cigar wrapper cutting machine, J. E. Schmalz, Clay reducer and disintegrator, J. C. Anderson, Clothes pounder, J. C. Lampman, Coast defense, subterranean system of, T. R. Timby, Coffee roaster, J. H. Beidler, Coke from ashes and cinders, apparatus for separating, O. A. Lodwick, Commode, D. C. Hartman, Concentrator and amalgamator, W. L. Inlay, Cooler, See Water cooler, Cooler and filter, combined, L. Scharff, Cornstalk splitting and breaking machine, J. Behringer et al, Corset steel fastening, G. H. Colley, Cotton for transportation, preparing, W. H. Smith, Coupling, See Car coupling, Thill coupling, Crane, hydraulic, J. Hartmann, Cup, See Oil cup, Sponge cup, Cut-off, E. G. West, Cut-off valve gear, J. H. Blake, Cutter, See Paper cutter, Cutter, swell body, C. R. Wilson, Damper regulator, W. E. Kelly, Dampener, stove, E. W. Anthony, Dental plugger, T. D. Shumway, Direct acting engine, J. H. Haagan, Dish washer, B. J. Howe, Distillation of ammonia, apparatus for the continuous, Gräbeberg & Gareis, Door spring, D. G. Smith, Door spring, F. W. Smith, Drier, See Paint drier, Drill, See Rock drill, Stone drill, Drinking flask, J. Hall, Dummy head, R. H. Wettr, Electric light, E. R. Knowles, Electrical communication, system of, W. W. Jacques, Electrical purposes, manufacture of coils for, M. & R. P. Manly, Elevator, See Hydraulic elevator, Water elevator, Elevator gate, automatic, T. Scholey, Elevator safety attachment, E. B. Bishop, Elevator safety device, J. H. McCarren, Engine, See Direct acting engine, Epaulet and shoulder strap holder, J. Starkey, Fan, E. W. Hoefde, Fan operating apparatus, D. L. Richards, Farm gate, M. D. Allen

Table listing inventions such as Farm gate, W. B. Miller, Farm gate, Miller & Bell, Feed mill, Field & Magee, Feed water purifier, E. Roat, Fence, barbed, M. S. Chapman, File, newspaper, H. F. Childers, Firearm, revolving, H. M. Caldwell, Fire escape, A. T. Cwerdinski, Fire extinguisher, C. M. Martin, Fire extinguishers, friable vessel for containing chemicals in, C. M. Martin, Fire extinguishers, generating gases in, C. M. Martin, Flask, See Drinking flask, Floodgate, W. W. Edwards, Flower pots, machine for drilling holes in, G. C. Walters, Fork, See Carving fork, Furnace, See Boiler furnace, Muffle furnace, Gauge, See Sewing machine steam gauge, Galvanic battery, T. J. Howell, Gas, apparatus for producing illuminating, P. W. Mackenzie, Gas from petroleum, process of and apparatus for generating, A. I. Ambler, Gas, generator for generating illuminating, P. W. Mackenzie, Gas, making illuminating, P. W. Mackenzie, Gas, manufacturing illuminating, P. W. Mackenzie, Gas, process of and apparatus for manufacturing water, J. D. Averell, Gate, See Elevator gate, Farm gate, Flood gate, Gate, J. C. Mendenhall, Generator, See Hot water generator, Steam generator, Glass, forming screws in articles of, S. Oakman, Glass press plunger, E. H. Peck, Gold washing machine, M. Benner, Grader, road, L. C. Sutton, Grain gathering and binding implement, J. B. Lamb, Grain separator, J. L. & J. T. Metcalf, Grate bar, A. Rodgers, Grinding mill, Z. C. Phillips, Gymnastic theatrical performances, producing, D. F. Turner, Halter, C. H. Trott, Handle, See Auger handle, Hanger for suspending beams, L. M. Ham, Harness catch and cockeye for whiffletrees, J. D. Anally, Hats, etc., pouncing wheel for, W. H. Wilhelm, Hay rack, W. W. Rollins, Heating water by exhaust steam, J. Müller, Hedge training machine, E. J. Downing, Hoisting machine, power driven, H. B. Larzere, Holder, See Chalk holder, Pen holder, Sash holder, Paper machine cutter holder, Hoop, See Cheese hoop, Horse tail tie, C. D. Jaques, Horseshoe, H. L. Watts, Hot water generator, W. W. Goodwin, Hydraulic elevator and hoist, Tommasi & Heurtebise, Ice cutting machine, C. A. Sager, Interlocking switch and signal apparatus, M. N. Forney, Kiln, See Brick kiln, Knob, door, B. D. Stevens, Lacing hooks, manufacture of, E. Maynz, Lamp, S. Russell, Lamp chimneys, adjustable cap for, A. Harcum, Lamp, electric, Nichols & Latimer, Lamp, incandescent electric, H. S. Maxim, Lamps, circuit breaker for electric, C. G. Perkins, Lamps, spring switch for electric, C. G. Perkins, Lard, manufacture of, J. F. Williams, Lathe, metal turning, T. G. Morse, Lead and crayon holder, C. W. Livermore, Leather, seam and welt for uniting pieces of, C. F. Glanville, Leather whitening machine, Clement & Enos, Light, See Electric light, Lock, See Seal lock, Locomotive, C. Raub, Lubricating compound, W. A. Strother, Lunch box, satchel, G. C. Dressel, Mail box, E. R. Meeker, Manometer, L. Perrier, Metal high in phosphorus and carbon and low in silicon, producing a, J. Reese, Meter connection, A. Mackey, Middlings purifier, W. Crye, Mill, See Feed mill, Stamp mill, Grinding mill, Windmill, Motor, See Spray motor, Motor, W. F. Mills, Motor for operating churns or washing machines, D. I. Kuhn, Mowing machine, C. T. Corning, Muffle furnace, M. J. Butzel, Musical instrument, mechanical, M. J. Matthews, Musical instrument, mechanical, E. P. Needham, Nut cleaning, polishing, and assorting machine, R. C. Koerber, Nut lock, A. F. Martell, Nut lock, T. T. Overshiner, Octave coupler, G. W. Ingalls, Oil cup, G. C. Herrich, Organ bellows, feeder for, K. Nicholls, Organ, reed, E. P. Carpenter, Organs, valve tremolo for reed, L. B. Norton, Oscillating chair, folding, J. T. Mitchell, Paint drier, A. H. Everett, Paper clippings, waste, etc., repulping, C. Coon, Paper cutter, rotary, W. D. Turner, Paper cutting machine cutter holder, J. C. Marshall, Paper pulp from wood, making, R. B. Lane, Pen holder, P. Schrag, Photo-reliefs, manufacturing, W. H. Guillebaud, Piano, bell, C. G. Buttkeleit, Pin, See Breastpin, Pipe wrench, J. F. Phillips, Planter, hand cane, corn, and bean, F. A. Nolan, Plow, A. Richard, Plow pulverizing attachment, T. B. Maddux, Plowshares, device for sharpening, D. F. Spangler, Poke, animal, C. R. Wills, Polishing composition, A. Levett, Powder distributor, J. S. Smith, Press, See Baling press, Pressure plate for apple grinders, R. E. Boschert, Pressure regulator, steam, B. Holly, Printing machine, J. H. Holmes, Protector, See Shore protector, Pruning implement, N. D. Stanley, Pump, R. Bean, Pump, double acting, R. Bean, Pump, hand, A. Hamilton, Pyroxyline, treatment of, C. S. Lockwood

Table listing inventions such as Quarrying slate and other rock, machine for, A. R. Reese, Rack, See Hay rack, Railway tie, G. A. Jones, Ratchet bar and bracket shelving, C. Eggleston, Reamer, J. M. Huber, Reaping machine, G. Beatty, Refrigerating apparatus, G. W. Deitzler, Refrigerating device, W. Flagg, Refrigerating process and apparatus, W. H. Scudder, Refrigerator, J. Angus, Regulator, See Damper regulator, Pressure regulator, Reversing mechanism, automatic, G. L. Shorey, Rivet, E. Maynz, Roaster, See Coffee roaster, Rock drill, J. C. Githens, Rock drill, hand, W. P. Stevenson, Rock drilling machine, M. C. Bullock, Salt washing apparatus, J. M. Duncan, Sash cord fastener, Dunne & Rath, Sash fastener, C. L. L. Emery, Sash holder, G. H. Barb, Saw set, E. Senn, Saw sharpening machine, cotton gin, J. D. Hall, Sawing machine, hand, M. Kurtzman, Scale, automatic grain and liquid weighing, H. A. McLaughlin, Scraper, G. D. Matcham, Screw blanks, machine for feeding, S. L. Worsley, Seal lock, J. Chapman, Seat, See Vehicle seat, Seeding machine, force feed, H. P. Tenant, Separator, See Grain separator, Sewing machine, J. Hoefler, Sewing machine, T. Lanston, Sewing machine braid guide, J. W. Carter, Sewing machine presser foot and guide, E. Pitman, Sewing machine seam gauge, W. P. Brosius, Sewing machine trimming attachment, L. H. Allen, Shaft bearing, anti-friction, J. Graves, Shelving and bracket support, D. Gerow, Shore protector and beach builder, H. F. Knapp, Show box cover, W. M. Ducker, Small arm, breech-loading, A. H. Hebbard, Soap, B. M. Wilkerson, Soda water, etc., apparatus for dispensing, J. Matthews, Sole edge finisher, M. Dudley, Sole, in, I. E. Williams, Spark arrester, M. Zeck, Spinning frame top roll, A. F. Crichton, Sponge cup, G. W. Fisher, Spray motor, R. H. Atwell, Spring, See Door spring, Stamp mill, ore crushing, C. H. Baker, Staple, P. W. Doherty, Steam generator, J. S. Woolsey, Steam railway brake, W. H. Ward, Steel, manufacturing, P. Aube, Steps, removable wooden tread for stone, H. T. Pratt, Stone, etc., apparatus for hatching, ruling, and drawing on, C. Huber, Stone drill or reamer, J. Greek, Stove, E. D. Weston, Stove, oil, M. C. Armour, Stovepipe brake, G. Hipwell, Stoves, parlor and other heating, E. W. Anthony, Stump extractor, D. Cornelius, Sugar cane, etc., obtaining pure juice from, W. A. Martin, Sugar skimmer and copler, A. B. Larler, Surgical brace, C. F. Stillman, Suspenders, E. A. Robbins, Switch, See Interlocking switch, Syringe bulb and valve, J. T. Woods, Tack strips, machine for making, Woodward & Brock, Teeth, apparatus for manufacturing metallic plates for artificial, E. Telschow, Telegraph cable, P. B. Delany, Telegraph, car, W. W. Smith, Thill coupling, W. C. Shipperd, Tie, See Horse tail tie, Railway tie, Tires from wheels, apparatus for pulling, D. F. Spangler, Tobacco, treating, C. S. Phillips, Torpedoes, exploding and tamping weight for, J. E. Gallagher, Toy pistol, G. W. Eddy, Toys and other movable figures, joint for, A. E. Cooke, Train brake for railway cars, W. H. Ward, Turbine wheel, J. L. Rodgers, Type writer, G. Herrington, Type writer, J. F. Lindgren, Valve, balanced, W. R. Gluyas, Valve, steam engine relief, J. Aitchison, Vapor burner, R. Seeger, Vehicle dash boards, rail for, W. H. Phelps, Vehicle running gear, J. Schmidlapp, Vehicle seat, T. Kresen, Velocipede, G. Lowden, Ventilating apparatus for white lead stacks, J. B. Pollock, Ventilating package, F. G. Johnson, Violin, M. B. Rogers, Vise, toe calk, D. F. Spangler, Voltaic battery, J. C. Chambers, Waste pipe cover for sinks, J. Persson, Water cooler and refrigerator, combined, G. W. Deitzler, Water elevator, J. C. Richardson, Wheel, See Buffing and polishing wheel, Car wheel, Whip socket, A. Searls, Winding machine, silk, H. H. Bartlett, Windmill, I. A. Purper, Wood, composition for filling the pores of, C. H. Kuhn, Wrench, See Pipe wrench, DESIGNS, Badge, C. M. Lamson, Carpet, H. Christie, Carpet, W. J. Gadsby, Carpet, A. L. Halliday, Carpet, H. Horan, Carpet, W. L. Jacobs, Carpet, D. McNair, Lacing hook head, E. Maynz, Oil cloth, C. T. & V. E. Meyer, Organ case, E. P. Carpenter, Stove, cooking, E. W. Anthony, Type, font of printing, J. M. Conner, TRADE MARKS, Axes, hatchets, adzes, and analogous tools with cutting edges, G. T. Lane, Beverages, certain aerated, Zoedone Company, Biscuits or wafers, Holmes & Coutts