(40) G. E. asks how to melt old rubber belting and scraps of rubber, such as hose and doormats, over again and make it elastic so that it can be used in making the moulds for plaster casts. A. Old rubber cannot be melted as you suggest—it suffers partial decomposition in heating and does not again assume its original properties. Such moulds can be made from the gum rubber, as described on pp. 35 and 105, vol. 38, SCIENTIFIC AMERICAN, but they are too costly.

(41) H. N. D. asks how to make steel run sharp when poured in moulds. A. It is only necessary to use a suitable quality of steel to insure this result.

(42) G. D. H. asks for the method of manufacturing oakum. A. By picking old hempen rope into fibers.

(43) C. A. H. asks: Is there any work published giving a history of the success reached in attempts at utilizing anthracite coal dust or culm for the purposes of fuel, or which explains the peculiarities of coal dust and the impediments in the way of its utilization? A. There is some valuable information on this subject in Bourne's "Steam, Gas, and Air Engines."

(44) W. H. C. asks for a simple method of electroplating. What shall I use to remove the fatty particles entirely from the work? A. For silver plating the bath consists of potassium-silver cyanide, prepared by precipitating solution of silver nitrate with potassium cynide, and redissolving the washed precipitate in excess of potassium cyanide solution—potassium cyanide, 12 oz.; water, 1 gallon; silver cyanide, about 1 troy oz. Filter and use in a porcelain or glazed vessel. For the whitening bath dissolve 1 lb. potassium cyanide in 1 gallon of water, add one quarter oz. troy of silver cyanide, and filter the solution. The baths are provided with silver feeding plates for anodes proportioned in size to the surface of the work to be plated. These are connected with the positive pole of the battery. The cleaned articles are connected by a copper wire with the zinc pole of the battery, dipped for a minute or two in the whitening bath, and when uniformly coated with a white film of silver transferred to the plating bath, under similar conditions. 2 or 4 Smee cells with plates 10x4 inches will generally suffice for the plating bath, and 4 or 5 similar cells for the whitening bath; 20 to 30 minutes in the plating bath is usually sufficient to plate the work properly. Articles of copper, brass, or German silver, to be plated should first be cleaned by boiling them for a few minutes in strong potash water to free them from traces of oil or grease, and, after rinsing, in dilute nitric acid to remove any oxide, and again thoroughly rinsed. It must not be touched by the hand after cleaning. Just before putting the work into the bath, dip it momentarily in strong nitric, or a mixture of equal parts nitric and sulphuric acids and rinse quickly. After this treatment it is sometimes dipped for a moment in dilute aqueous mercurous nitrate solution, and rinsed again. This has the effect of coating the clean metal with a film of mercury, which secures a perfect adhesion of the deposited silver. For nickel plating see article on p. 209, vol. 38.

(45) J. S. L. asks: Of what material are the printer's inking rollers made? A. Usually of glue and molasses, glue and glycerin, or glue, glycerin and oil. Those of glue and glycerin are prepared as follows: Glue is melted in water by the aid of a salt water bath into a very thick paste, to which undiluted glycerin is added in quantity by weight the same as that of the dry glue. The mixture is then thoroughly stirred and further heated to evaporate the excess of water. It is cast over a mandrel in iron or copper mould well oiled, and allowed to cool slowly and thoroughly before being removed.

(46) W. B. K. asks: Can you tell me about the sized boiler and fly wheel for a cylinder 1 inch bore and 2½ inches stroke? A. Boiler 15 inches diameter, 30 inches high. Fly wheel, 6 to 8 inches in diameter.

(47) M. J. W.—See Schuman's "Manual of Heating and Ventilation."

(48) J. E. P.—A gravity battery should be used on a closed circuit, and it must not be moved about.

(49) E. asks: How can I become a mechanical draughtsman? A. Study lessons in mechanical drawing contained in the SCIENTIFIC AMERICAN SUPPLEMENT.

(50) F. J. H. writes: I wish to cast a cannon having brass and copper. I would like to have a receipt for a good composition, for I wish the gun to look nice and be strong. A. For a large gun, copper, 90; tin, 10. For a small gun, copper, 93; tin, 7.

(51) A. G. R. asks: Is there any invention for conveniently unloading hay in barns by removing the whole load at once from the wagon to the mow? A. Yes, but there is room for improvement.

(52) J. J. J. asks: 1. Can you refer me to a good book on draughting? A. See Prof. MacCord's drawing lessons in SCIENTIFIC AMERICAN SUPPLEMENT. 2. Where can I get good draughting tools? A. Consult our advertising columns. 3. How can I make a cheap invisible ink? A. See SCIENTIFIC AMERICAN SUPPLEMENT No. 157.

(53) A. C. B. asks: What power is cheapest and most convenient for a small shop requiring 4 or 6 horse power? A. A portable or stationary steam engine.

(54) T. B. asks: What is allowed for shrinkage of iron in bridge building? A. An allowance of one-eighth inch in 1,500 feet for each change in temperature of 1° Fah. is ample.

(55) F. W. Peirce asks if there is not a point in the periphery of a wagon wheel that stops for an instant as it comes into contact with the ground. A. Yes.

(56) M. A. R.—For full description of induction coil, see SCIENTIFIC AMERICAN SUPPLEMENT No. 160.

(57) G. I. T. asks: Would you recommend the use of galvanized iron tea kettles? A. No.

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

Carl.—It is arsenopyrite or mispickel, containing a little cobalt and a trace of nickel. It contains about 45 per cent of arsenic.—F. M. M.—I_2 is an excellent quality of bituminous coal, suitable for gas making. C_2 calcite—lime carbonate. A_2 chlorite schist. B_2 contains sand, clay, mica, iron, oxide, and peaty matter. D_2, orthoclase. F_2, quartz. H_2, anhydrite.—J. S. G.—The mica (biotite) has little commercial value. Those varieties containing a high per cent of potash are sometimes utilized for fertilizing purposes. G. F. M.—It is kaolin, containing about 10 per cent of quartz sand. If properly washed it may be utilized for the manufacture of pottery, porcelain goods, etc. Fine English kaolin brings in New York from $15 to $17 per ton (barreled). A.A. G—It is ferropyrite or crystallized bisulphide of iron (iron 46·7, sulphur 53·3) associated with quartz. When free from arsenic it is sometimes used as a source of sulphur in the manufacture of sulphuric acid and of sulphurous acid for bleaching. The mineral is commonly called fool's gold. See p. 7, vol. 36. J. D S.—The large piece is fibrous talc. The smaller fragment is a clay containing undecomposed orthoclase.—C. L.—No. 1, trap rock. Nos. 2 and 3, gneiss and mica schist—the dark mica is biotite. No. 4, principally orthoclase.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at this office. Price 10 cents each.

COMMUNICATIONS RECEIVED.

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

Heating and Pounding of Crank Pin Journals. By J. R.
On the Gyroscope. By N. D.
On Mine Water in Fish Streams. By C. Smith.
A Biography. By W. B. C.
On Middlings Purifier Controversy By R. J. A.
On Shorthand. By H. H.
On the Sun's Rays. By B. B.
On What Congress Ought to Do. By G. H. K.

[OFFICIAL.

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending

January 14, 1879,

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.

Abdominal supporter, galvanic, G. W. Carpender. 211,319
Air cooler. G. F. Meyer ... 211,417
Amalgamator, J R. Abbe ... 211,365
Bale tie, J. Johnson ... 211,331
Bale tie, J. M. Van Derzee ... 211,443
Barrel maker, S. P Hodgen ... 211,330
Basket, L. Stevens ... 211,353
Billiard bridge, J N. McIntire ... 211,416
Boot and shoe, W. H. Wood ... 211,362
Boot and shoe laster, Copeland & Raymond, 2d ... 211,294
Bottle, etc., filler and corker, A. MacDoneli ... 211,413
Brick machine, G. Martin ... 211,304
Brush, F. Sprower ... 211,431
Buckle, H. S. Woodruff (r) ... 8,541
Butter box, knockdown, E. M. Burchard ... 211,318
Calendar, W. F. Erther ... 211,391
Car brake, Hickey & McNeill ... 211,328
Car coupling H. F. W. Koehler ... 211,410
Car coupling, W. H. Maple ... 211,415
Car coupling, G. A. Neal ... 211,341
Car coupling, J. B. Safford ... 211,428
Car pusher, J. W. Fessenden ... 211,324
Card, wrapping, R. A. Hope ... 211,403
Caster, piano, W. V. Wallace ... 211,360
Cart, self-loading, F. W. Schulz ... 211,429
Chain, halter, G. Kampf ... 211,408
Charcoal, etc., manufacture of, H. L. Brooke ... 211,376
Chimney block, A. H. Thorp ... 211,437
Chimney cowl, C. O. G. Kennel ... 211,333
Churn, J. Wright ... 211,451
Cloak, J. D. Rogers ... 211,426
Clocks, earth battery for electric, D. Drawbaugh. 211,322
Cloth polisher, enameled, O. Currier ... 211,296
Cocks, locker for stop, Harlin & Yule ... 211,400
Coin package, O. A. Dennis ... 211,321
Collar, J. W. A. Cluett ... 211,380
Cork fastener former, Graf & Madlener ... 211,395
Corn husker, H. W. Price ... 211,345
Corn husking machine, J. Webber, Jr. ... 211,447
Corn, holder for hot, G. H. Dyer ... 211,388
Crusher and grinder, grain, W. Braun ... 211,292
Culinary implement. H. Turner ... 211,357
Cultivator, Baird & Gale ... 211,314
Cultivator, J. C. Guy ... 211,397
Curtain, adjustable window, J. G. Mitchell ... 211,339
Curtain roller and bracket, Park & Gleason ... 211,343
Dental impression cup, M. E. Toomey ... 211,438
Disintegrating mill, L. J. Bennett ... 211,316
Door mat, J. S. Sargent ... 211,348
Egg, nest, O. F. Woodward ... 211,363
Electric machine, dynamo, E. Weston ... 211,311
Electro-magnetic motor, C. A. Hussey ... 211,404
Evaporating pan, E. T. Gennert ... 211,325
Faucet, basin, J. Graves ... 211,298
Feed water heater, H. C. De Torres ... 211,439
Feed water, purifying, S. J. Hayes *et al.* ... 211,326
Fence, barbed, T. Shuman ... 211,349
Fence post, iron, J. Vacaro ... 211,442
Fluid exhauster and forcer, H. F. L. W. De Romilly 211,347
Fruit jar, L. Tozer ... 211,440
Funnel, measuring, G. B. Smith ... 211,352
Furnace and stove grate, T. J. March ... 211,336
Gas apparatus, hydrocarbon. A. Alexander ... 211,312
Gas lighter, electric, Cutler & Sandford ... 211,384
Gate, W. Vogan ... 211,435
Governor and cut-off, automatic, L. H. Watson ... 211,309
Governor, engine, C. S. Locke ... 211,335
Grain binder, O. L. Castle ... 211,293
Grain binder, J. F. Steward ... 211,354
Grain conveyer, Smith & Abshagen ... 211,351
Grain, etc., drier, Roberts & Worrell ... 211,432
Grinding mill, C. Custer ... 211,383
Harvester cutter, J. O. Brown ... 211,377
Hat, adjustable stiff, M. McGlone ... 211,338
Hatchet, J. R. Bailey ... 211,371
Hay and straw cutter, W. A. Yeatts ... 211,452
Hay conveyer, L. A. Greely ... 211,396
Hay elevator, G. Van Sickle ... 211,358
Hay loader, C. Pool ... 211,424
Heating apparatus, G. Kelly ... 211,332
Hog trap, J. & G. L. Thatcher ... 211,434
Hop culture, S. Cummings ... 211,295
Hub, carriage wheel, J. Kritch (r) ... 8,540
Inkstand, W. F. Redding ... 211,307
Ladder step, portable, S. Ellicott ... 211,389
Lamps, etc., shade holder for, W. O. Lincoln ... 211,412
Lantern, H. L. Coe ... 211,320
Lantern, J. H. Irwin ... 211,405
Lathe and planer tool post, G. W. Cogswell ... 211,378
Lift pipe and spark arrester, J. D. Akley ... 211,366
Lightning rod coupling, E. S. Turner ... 211,441
Liniment, J. H. Ellis ... 211,390
Lock, W. H. Bramble ... 211,374
Measure, rotary, Heberline & Boss ... 211,327
Mop wringer, C. Pennington ... 211,344
Musical instrument sounder, Marx & Taubald ... 211,337
Newel post, H. H. Beach ... 211,291
Ore mill, J. R. Abbe ... 211,364
Oyster shucker, R. Wells ... 211,449
Paper machines, J. Robertson (r) ... 8,542
Paper machine wire cloth, C. Van Houten ... 211,444
Paper maker's size, stock for, W. Adamson 211,367, 211,368
Pavement, asphaltic, W. W. Averell ... 211,313
Pavement, wood, S. L. Shellenberger ... 211,430
Pen, pneumatic stencil, J. W. Breckenridge ... 211,375
Pick handle socket, A. P. Miller ... 211,419
Planter, corn, H. Bagley ... 211,370
Planter, corn, B. A. Welds ... 211,448
Plow and stalk cutter, grub, R. J. Talley ... 211,433
Plow, sulky, J. Price ... 211,425
Plow, sulky gang, O. Barr ... 211,372
Plunger for drawing tubular articles, J. S. Palmer 211,342
Poke and hobble, animal, D. K. Hawley ... 211,402
Potato digger, P. A. Wise ... 211,450
Pressure gauge, R. C. Blake ... 211,317
Pulley, expanding, D. Thomas *et al.* ... 21,356
Pulleys to shafts, attaching, J. H. La Ment ... 211,411
Pump, D. P. Manrose ... 211,414
Railway signal, J. W. Percival ... 211,423
Sash fastener, G. H. Kervin ... 211,334
Saw, Robbins & Bumpus ... 211,346
Scales, check rod for platform, F. Fairbanks ... 211,392
Sewing machine button holer, L. Thomas ... 211,435
Sewing machine gatherer, etc., L. Onderdonk ... 211,422
Sewing machine take-up, etc., J. B. Sulgrove ... 211,355
Sheetmetal cutter, drawer, etc., E. Jordan ... 211,407
Shoe shaper, S. Ross, Jr. ... 211,427
Shoe sole buffer, J. W. Rogers ... 211,308
Skiving machine, J. K. Krieg ... 211,300
Spinning frame spindle, J. E. Atwood (r) ... 8,539
Spoon holder, W. J. Doyle ... 211,386
Steam boiler, J. M. Simpson ... 211,350
Stove leg base, J. M. Harper ... 211,401
Stove oil, E. R. Walker ... 211,359
Stove pipe joint, C. L. Driesslein ... 211,387
Stuffing box, steam engine, C. C. Jerome ... 211,299
Tackle block, J. W. Norcross ... 211,421
Thermostat for carbureters, W. Pierce ... 211,306
Thill coupling, J. Jacoby ... 211,406
Thill coupling, D. C. Pierce ... 211,305
Thread washer and beater, E. Charlon ... 211,379
Tile for covering vaults, etc., W. Dale ... 211,297
Time lock, P. F. King ... 211,409
Tobacco, package of plug, L. J. Gordon ... 211,394
Tobacco presser, S. P. Hodgen ... 211,329
Torpedo boat, J. L. Lay ... 211,301, 211,302, 211,303
Torpedo for oil wells, J. Douglass ... 211,385
Toy, candy, R. H. Moses ... 211,420
Umbrella runner, T. Widdowson ... 211,361
Valve, vulcanized india-rubber, J. Murphy ... 211,340
Vapor fuel generator, A. I. Ambler ... 211,369
Veneer cutter, C. W. Thompson ... 211,436
Washing machine, J. M. Curtice ... 211,381
Washing machine, C. A. Dodge ... 211,382
Washing machine, W Haas ... 211,398
Washing machine gearing, L. H. Watson ... 211,310
Watch keys, manufacture of, D. & F. L. Ellis ... 211,323
Weather strip, R. P Baldwin ... 211,315
Weather strip, Millard & Chase ... 211,418
Wheelbarrow, metallic, J. Bean ... 211,373
Whiffletree, A. Hance ... 211,399
Windmill, W. Frazier ... 211,393
Window screen, Wakeman & Bataille ... 211,446

TRADE MARKS.

Axle grease or lubricator, J. Davis ... 6,944
Baking powder, Steele & Emery ... 6,952
Canned or preserved edibles, W. Numsen & Sons, 6,950, 6,951
Cigars, J. S. Bowman & Co ... 6,943
Cutlery, F. Ward & Co. ... 6,953
Medicinal preparation, Keasbey & Mattison ... 6,949
Spices and mustard, Jewett & Sherman Co. 6,946 to 6,948
Toilet preparations, hair and head, W. E. Jervey ... 6,945

DESIGNS.

Inkstand holder, A. Patitz ... 10,963
Parasol, W. A. Drown, Jr. ... 10,982
Telegraph insulators, J. M. Brookfield ... 10,981

English Patents Issued to Americans.

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