

and the water flows into the air chamber in a steady stream. J. M. may not be able to run at 200, but I think he can go over that. I think the supply pipe is large enough. I hope J. M. will tell through your paper how he succeeds. A. Your hints are practical, and will be of great value to some readers. The air chamber in the supply pipe, however, is not the universal panacea for sulky pumps that you seem to consider it. Still, no one who puts in such an air chamber will have cause to regret it.

(29) E. L. F. says, in reply to F. S. M. & Co.'s query as to sesquioxide of manganese: The sesquioxide of manganese is found in its anhydrous state as braunite, and in an hydrated state as manganite. It may be obtained by passing chlorine through manganous carbonate, placed in water, and afterwards applying diluted nitric acid to remove the excess of the carbonate.

(30) E. L. F. says, in reply to W. H. R., who asked how to make the muriatic salts of nickel: Pure nickel has a great similarity to iron, both in its external appearance and its combinations, and is regarded as a tetrad, although it forms but one chloride, in which it is bivalent. Nickel chloride (Ni Cl₂) may be prepared by dissolving the oxide or carbonate of nickel in hydrochloric acid. By a simple process, the nickel carbonate may be prepared from the oxide species. Any good work on chemistry explains the method.

COMMUNICATIONS RECEIVED.

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

- On Vegetable Fibers. By J. W.
On Hydrocarbons of Iron and Steel. By L. P.
On Solids Floating on Liquids. By A. R.
On Popular Dental Science. By C. S. S.
On a Flying Machine. By C. H. C.
On Boiler Explosions. By R. B.
On Oyster Culture. By O. C.
On Suet Butter. By J. L.
On a New Projectile. By W. L. A.

Also enquiries and answers from the following:
J. G. G.—S. W. R.—E. W. H.—G. A. P.—X. Y. Z.—
L. N. K.—W. J. R.—J. W. D.—W. D. D.—F. R. D.—
M. L. 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Enquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here.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 enquiries analogous to the following are sent: "Who erects wire tramways? Who buys broken window glass? Who builds engines and boilers for small boats? Where can spectroscopic apparatus be bought? Who sells photographic chemicals that can be relied on for quick work?" All such personal enquiries are printed, as will be observed, in the column of "Business and Personal," which is especially 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

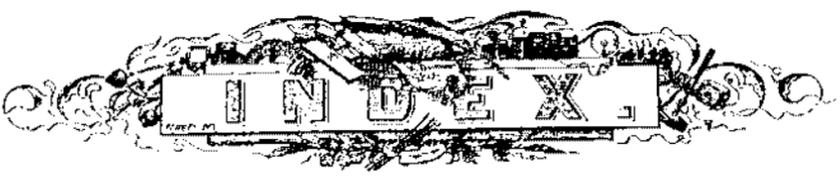
FOR WHICH
Letters Patent of the United States were
Granted in the Week ending
November 24, 1874,
AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]
Alarm, grist, Hason & Wright..... 157,174
Alphabet case, Baade & Sangster..... 157,118
Bale tie, S. J. Leach..... 157,206

Table of inventions with names and numbers, including Bale tie, Beehive, Beer faucet ventilator, Beer with gas, charging, Bitstock, Blind, folding, A. Le Roy, Boiler, J. R. Lamb, Boiler, steam, S. Bickerstaff, Boilers, injector for steam, W. Randall, Boiler water circulator, N. Ward, Bolting machine, Martin & Lytle, Brick mold, J. Treadway, Broom hanger, G. Yinger, Brush, A. Thomson, Brush, shoe, C. O. & I. N. Kelly, Brush trimming machine, J. Pickering, Buggy seat, J. B. Wells, Bullet, patched, F. O. Scholze, Bung and faucet, closing, Darozir et al., Buttersaiting scales, A. A. Skinner, Can, sprinkling, J. W. Gesaman, Car brake, hydraulic, W. M. Henderson, Car coupling, H. C. Chapman, Car coupling, D. W. Deal, Car coupling, L. Dill, Car coupling, B. R. Webber, Car, safety, H. B. Myer, Carriage top support, Z. C. Brown, Chair, adjustable reclining, A. Rapp, Chopper, meat, Edwards & Morlan, Chopper, meat, A. Nittinger, Jr., Clock keys, manufacture of, G. D. Clark, Clocks, spring barrel for, G. H. Blakesley, Clothes mangle, W. Tinsley, Clothes wringing machine, M. & F. Way, Clutch, friction, Burwell & Bates, Coffee, cooling, J. Burns (r), Cooler, milk, R. Smith, Copies, producing facsimile, E. De Zuccato, Corn coverer and cultivator, J. Copeland, Corset, J. Bowers (r), Cradle, L. H. Stellmann, Cranberry picker, W. Crowell, Cross head gib, W. A. Rideout, Cultivator, Graham & Wallace, Dental amalgam, S. S. Southworth, Derrick, C. Lidren, Dividers, W. Smith, Door, sash, L. W. Tatum, Doors, rail for sliding, J. D. Skeer, Draw frame stop, D. W. Hayden (r), Drawframe stop, A. A. Sweet, Dredging machine, R. R. Osgood, Drill for drilling metal, hand, D. D. Mackay, Drill, rock, C. S. Pattison, Elevator, H. H. Blake, Elevator, bucket, H. Port, Elevator, hydraulic, A. Granville, Engine crank, W. B. Boggs, Envelope, A. C. Fletcher, Explosive compound, C. W. Volney, Faucet, tool for finishing, H. Sofe, Feather renovator, J. C. West, Fence, portable, J. M. Overpeck, Fence, wire, J. F. Gilden, Fire escape, J. B. De Boucherville, Fire extinguisher, T. D. Pennington, Fire extinguisher, chemical, Holzner & Lauer, Food, preserving, D. Snedeker, Fork, hook, shovel, and hoe, G. H. Perkins, Fruit protector, A. S. Dymann, Furling machine, C. Ackerman, Game apparatus, W. C. Wingfield, Glassware, stemmed, J. Oesterling (r), Grain drill, W. Henigst, Grate bar, A. F. Crowell, Halter, pastern, J. C. Ford, Harness, A. W. Lawton, Harness attachment, J. D. Truss, Harness saddle, F. W. Maldeis, Harvester, A. Gray, Harvester cutter, G. Sweet, Harvester knives, grinding, E. W. Phelps, Harvester rake, Peckenpaugh & Miller, Heel shave, M. A. Tyler, Hemp brake, T. Jones, Hook, detaching, Stone and Mansfield, Horseshoe, J. Jorey, Indexing wheel, H. H. Edwards, Indicator, low water, R. R. Carpenter, Ironing board, A. H. Swain, Jack, lifting, D. T. Welch, Kiln, brick, W. S. Colwell, Ladder, step, Brown & Sweet, Ladder, step, T. F. Kiff, Lamp lighting apparatus, M. A. Lynch, Latch, locking, J. W. Williamson, Leather, scrubbing and cleaning, S. Branaugh, Lines, taking up slack of, H. Douglas, Liquid measure, S. C. Redgrave, Locomotive exhaust mechanism, A. O. Denlo, Lubricating compound, W. C. Tilton, Lubricating cup, J. E. Lonergan, Lubricator, spindle, Stauts & Rigby, Mills, conductor for rolling, J. Gearing (r), Nozzle, exhaust, G. Sewell, Nozzle for steam cylinders, G. Sewell, Packing of condenser tube, etc., W. A. Lighthall, Padlock, permutation, J. L. Willbur, Paint, fireproof, J. C. Smith, Paper pulp, filling fiber in, H. Duemling, Paper with emery, etc., coating, R. J. Edwards, Pawl and ratchet, J. Corbett (r), Peg cutter, A. Whittemore, Pen and pencil case, C. H. Downes, Philosophical estimator, F. M. Staff, Planoforte metal frame, J. E. Atwood, Pipe, water, J. A. Calantarients, Plane, bench, Duncan & Talbot, Plane handle, F. Goodnow, Planter, corn, S. Wright, Plow, A. B. Kellogg, Plow, A. Smith, Plow, side hill, M. Ellis, Plow, side hill, L. L. Iverson, Plow, sulky, E. Derwent, Jr., Polishing machine, W. S. Wood, Pottery spring punch, A. H. Hews, Press, H. K. Burnett, Press, cotton, J. Koehl, Press, cotton, J. C. Stokes, Press, cotton, W. H. Walker, Pulley, expanding, C. A. Brand, Pump bucket, chain, S. C. Hamlin, Pump, plenum and vacuum, D. L. Cameron, Punch, registering ticket, J. Corbett (r), Furnier, middlings, A. Fulton, Raft, life, C. Parker, Railroad crossing gate, O. Gasset, Railroad, elevated, J. M. Hannahs (r), Railroad gate, J. T. Ketchledge, Railroad rail joint, Bryson & Pugh, Rake, horse hay, J. D. Jones, Regulator, exhaust, C. C. Gregory, Retort cap cover, P. Munzinger, Rivet, M. Bray, Rolling iron straps, machine for, J. Jensen, Rooftruss, U. G. Spofford, Roofs, metallic cap for, P. B. Laddlaw, Sash dovetailing machine, Pennell & Zimmer, Sash fastener, W. C. Alden, Saw mill dog, G. W. Baker, Saw mill dog, J. A. Fordon, Saw mill dog, L. P. Gilbert, Saw mill dog, N. Hunt, Saw tooth swage, A. G. Rouse, Scaffold clamp, W. Smith, Screw driver, I. Allard, Screw driver, W. F. Patterson, Seeder, plaster sower, and harrow, L. Dague, Seeding machine, A. C. Evans, Separator, ore, Campfield & Hornbeck, Sewing machine attachment holder, J. H. Bean, Sewing machine ruffler, L. Schultz, Sewing machine table, E. R. Adams, Sheep shearing devices, E. Chaquette, Shutter and window fastener, J. C. Ryckman, Sleeve, metallic, C. B. Porter, Sleeve adjuster, A. Perego, Snow plow, hand, C. A. and G. R. Parker, Soap frame, J. H. Keller, Soda water cooler, M. S. Andrews, Splittoon filter and holder, N. K. Ellsworth, Stove, base heating, V. Vermilye, Stove, heating, J. W. Elliot, Stove, reservoir cooking, J. F. Quimby (r), Stoves, oven door for cooking, E. W. Harvey, Street sweeping machine, E. A. Smith (r), Stripping, peeling, and splitting, S. Kuh, Switch, J. A. Duggan, Table for undertakers, C. B. Simmons, Thimble skeins, setting, E. F. Edwards, Tinner's machine clamp, W. H. Burnett, Tobacco cutter, S. Rodgers, Toy, G. W. Hawk, Toy pistol, S. Tomlinson, Toy pistol, J. T. Trowbridge, Trace fastener, R. Whiting, Umbrella, A. and I. Herzberg, Umbrella and parasol, W. M. Henderson, Valve, globe, J. Arthur, Valve, globe, J. Broughton, Vehicle wheel, W. Beers, Vehicle wheel, H. C. Hubbell, Velocipede, J. F. McClure, Ventilator, T. W. Bracher, Vessels, construction of iron, D. W. Zantinger, Vessels, propelling, E. Raynale, Wagon brake, G. Seeger, Washing machine, I. D. Buck, Washing machine, A. Cook, Washing machine, Spangler & Reich

Table of inventions with names and numbers, including Watch balance, E. Chapin, Watch barrel, E. Chapin, Watch guard attachment, A. S. Potter, Watch plate, E. Chapin, Water closet apparatus, A. McGilchrist, Water wheel, M. E. Washburn, Water wheel, turbine, C. Healy, Whipsocket, W. W. Richardson (r), Windmill, H. J. Wolcott, Window blind, screen, J. P. Clark, Jr., Window casing, W. J. Ross, Wrench, H. D. Rouse, Wrench ratchet, J. Bowers, Watch balance, E. Chapin, Watch barrel, E. Chapin, Watch guard attachment, A. S. Potter, Watch plate, E. Chapin, Water closet apparatus, A. McGilchrist, Water wheel, M. E. Washburn, Water wheel, turbine, C. Healy, Whipsocket, W. W. Richardson (r), Windmill, H. J. Wolcott, Window blind, screen, J. P. Clark, Jr., Window casing, W. J. Ross, Wrench, H. D. Rouse, Wrench ratchet, J. Bowers, Applications have been duly filed and are now pending for the extension of the following letters patent. Hearings upon the respective applications are appointed for the days hereinafter mentioned:
31,443.—FELLY MACHINERY.—C. H. Denison. Feb. 3.
31,445.—LIME KILN.—R. Donaldson. Feb. 3.
31,502.—COAL BREAKER.—R. A. Wilder. Feb. 3.
31,533.—WEIGHING APPARATUS.—A. B. Davis. Feb. 10.
31,534.—SCALE BEAM.—A. B. Davis. Feb. 10.
31,566.—DRYING TUNNELS.—F. H. Smith. Feb. 10.
31,579.—CORN PLANTER.—F. B. Preston. Feb. 10.
EXTENSIONS GRANTED.
30,633.—FIRE ESCAPE.—E. B. Larcher.
30,651.—HARVESTER.—S. W. Tyler.
30,685.—SEED DRILL.—H. Moore.
30,691.—CASTING FLOWSHADES.—F. F. Smith.
30,691.—FLOW.—F. F. Smith.
30,719.—PAPER FOLDER.—C. Chambers, Jr.
30,745.—CULTIVATOR.—N. Messenger.
DISCLAIMERS FILED.
102,462.—COOK STOVE.—J. B. Wilkinson, Troy, N. Y.
155,534.—DRESS PROTECTOR.—H. M. Macdonald, Lowell, Ms.
DESIGNS PATENTED.
7,855 to 7,858.—CARPETS.—R. Allan, Yonkers, N. Y.
7,859 to 7,862.—CUTLERY.—J. D. Frary, New Britain, Conn.
7,863.—COOKING STOVE.—G. G. Richmond, Providence, R. I.
7,864.—BOTTLE.—S. C. Upham, Philadelphia, Pa.
7,865 to 7,869.—SILVER WARE.—G. Wilkinson, Providence, R. I.
7,870.—WINDOW SCREEN.—G. Shatswell, Waukegan, Ill.
7,871.—INKSTAND COVER.—H. C. Wilcox, W. Meriden, Ct.
7,872.—MONUMENT.—H. C. Borgner, Lebanon, Pa.
7,873.—ORGAN CASE.—G. E. Carhart et al., Washington, D. C.
7,874 to 7,876.—CARPETS.—F. W. Green, Orange, N. J.
7,877 to 7,884.—CARPETS.—H. Horan, East Orange, N. J.
7,885.—PARLOR HEATER.—A. T. Jones, Stamford, Conn.
7,886.—HOT CLOSET RANGE.—A. T. Jones, Stamford, Ct.
7,887.—CARPET.—L. G. Malkin, New York city.
7,888.—WRITING PAPER.—C. D. Myers et al., N. Y. city.
7,889.—CARPET.—H. Nordmann, New York city.
7,890 & 7,891.—BUTTONS.—H. E. Bostwick, New Milford, Ct.
7,892 to 7,901.—EMBROIDERY.—E. Crisand, New Haven, Ct.
7,902.—FORK HANDLE.—C. Osborne, N. Attleborough, Ms.
7,903.—STATUETTE.—T. J. Palpoint, Providence, R. I.
7,904.—OILCLOTH.—C. T. & V. E. Meyer, Bergen, N. J.
TRADE MARKS REGISTERED.
2,072.—CHEWING TOBACCO.—Allan et al., Cincinnati, O.
2,073.—STOVE POLISH.—H. A. Bartlett & Co., Phila, Pa.
2,074.—STOVE DRESSING.—B. F. Brown & Co., Boston, Ms.
2,075.—GROOMING BRUSH.—New York city.
2,076.—SHIRTIRINGS.—Neumkear Steam Co., Salem, Mass.
2,077.—COOK STOVE, ETC.—G. G. Richmond, Providence, R. I.
2,078.—HEALING SALVE.—Stapleton & Co., Springfield, Ms.
2,079.—MEDICINE.—G. Steloff, Cincinnati, O.
2,080.—PERFUMERY, ETC.—J. & E. Atkinson, London, Eng.
2,081 & 2,082.—CORSETS.—L. Coleman & Co., Boston, Mass.
2,083.—CORSET.—Ottenthaler & Co., New York city.
2,084.—SOAP.—Reed & Co., Pittsburgh, Pa.
2,085 to 2,088.—SALT.—Union Pacific Salt Co., S. F. Cisco, Cal.
2,089.—TOBACCO.—Frischmuth & Co., Philadelphia, Pa.
2,090.—FILE REMEDY.—C. Maync, New York city.
2,091.—MEDICINE.—Dr. J. Simms & Son, Wilmington, Del.
2,092.—PICKLES, ETC.—C. G. Summers & Co., Baltimore, Md.
2,093.—SALUBRITY.—J. M. Taylor, New York city.
2,094.—SUGAR, ETC.—DeCastro & Donner Co., N. Y. city.
2,095 to 2,097.—WOOLEN GOODS.—Wash. Mills, Lawrence, Ms.
2,098.—GROCERIES.—N. W. Burchell, Washington, D. C.
SCHEDULE OF PATENT FEES.
On each caveat..... \$10
On each Trade mark..... \$25
On filing each application for a Patent (17 years)..... \$15
On issuing each original Patent..... \$20
On appeal to Examiners-in-Chief..... \$10
On appeal to Commissioner of Patents..... \$20
On application for Reissue..... \$30
On filing a Disclaimer..... \$10
On an application for Design (3 1/2 years)..... \$10
On application for Design (7 years)..... \$15
On application for Design (14 years)..... \$30

Table of inventions with names and numbers, including Encyclopaedia, Engine and boiler, Engine compound, Engine horizontal compound, Engine portable, Engine rotary, Exposition buildings, Face plate, sliding, Faucet, improved, Feed water heater, Ferris and hook for whiffletrees, Starting, Filter, a cheap, Fire engine, floating, Merryweather's, Fire governor, automatic, Slide's, Flycatcher, Davidson's, Fly catching plant, the, Flying machine, proposed, Encyclopaedia altensteinii, the, Engine and boiler, Hill and Massey's, Engine compound, Davenport's, Engine horizontal compound, Hawthorn's, Engine portable, Montel & Co.'s, Engine portable, the Shapley, Engine rotary, Myers', Exposition buildings, Chili, Face plate, sliding, Whitmore's, Faucet, improved, Webster's, Feed water heater, Ferris and hook for whiffletrees, Starting, Filter, a cheap, Fire engine, floating, Merryweather's, Fire governor, automatic, Slide's, Flycatcher, Davidson's, Fly catching plant, the, Flying machine, proposed, Fountain Cave, Va., views in, Friction brake, Gill's, Furnace, Fairbairn's, Furnace for melting brass, Bush's, Furnace, safety, Shand and Mason's, Galls, oak, Gardena, the lemon-scented, Gear-cutting attachment, Hopkins', Glass, crystallization of, Governor, cut-off, Ord's, Governors, pendulum, Grain, machine for unloading, Granby at Bristol, England, Grapple, Toisel's, Grappling tools, Dexter's, Gun, the new French army, Gyroscope, the, Hammer, air spring, Hotchkiss', Hammer, the monster—The furnace



ILLUSTRATIONS.

Table of illustrations with names and numbers, including Air ship, Ehone's, Air, the effects of compressed, Bert's apparatus, Aquarium at Southampton, England, Arrow heads, feathering, Axles, machine for turning carriage, Aram's, Baird, James, Gartsherrie, Scotland, Balloon, hot air, Mebler's, Balloon, sectional, Hartness', Balloon, Sivel's, Barrow in Furness iron shipbuilding works, Battery, thermo-electric, Clamond's, Bearing, alarm for hot, Bear pits at Philadelphia, the, Blinder, horse, Kennedy's, Blood, the transfusion of, Blow-off, surface, Waugh's, Bolckow, Mr. H. W. F., Boiler covering, Irons and Clay-ton's, Boiler explosion at Dubuque, Iowa, Boiler explosion at Geddes, N. Y., Boiler, steam, Harvey's, Boiler, vertical, Hill's, Bouquet of grasses and flowers, a June, Brake, friction, Brake, the Westinghouse, Brick press, hydraulic, Badmer's, Brick press, Whitehead's, Bricks, universal angle, Billings', Bridge over the Allegheny at Keokuk, Iowa, Bridge over the Po, Italy, Bridge, railway, New York, Eng., Bridge, rolling, at St. Malo, France

Table of illustrations with names and numbers, including Bridge, the Comba Scura, Bridle, horse, Sanborn's, Bullets impacted in the air, Cannon, the Krupp 10-inch, Cap of Liberty, the, Yellowstone region, Carrier pigeons, Car, section of railroad, Castalls, the twin steamer, Cattle, Guernsey, Centrolinead, McCord's, Clamp, adjustable, Hammer & Co.'s, Coal cutter, hand, Jones', Coal screen, Leach's, Compass, gravitation, Lord Cathness', Condenser, compound engine, Hawthorn's, Conservatory at Southampton, Eng., Conservatory at Sundridge Park, Kent, Cooling air, various methods, Cow milker, automatic, Cranes, safety catch for, Crow bar, tamping, Wright and Tew's, Cupressus cornuta, cones of the, Cutting and punching machine, Reynolds', Deer's head, four-antlered, Dickson's antarctica, the, Disintegrator, Davis', Diving bell, Tosell's, Docks at Portsmouth, England, the new, Dough kneader and cutter, Mocke's, Dogs' teeth, biting, Dovetailing machine, miter, Davis', Drill, hand crank, New York Engine Co.'s, Ear trumpet, a simple, Encyclopaedia altensteinii, the, Engine and boiler, Hill and Massey's, Engine compound, Davenport's, Engine horizontal compound, Hawthorn's, Engine portable, Montel & Co.'s, Engine portable, the Shapley, Engine rotary, Myers', Exposition buildings, Chili, Face plate, sliding, Whitmore's, Faucet, improved, Webster's, Feed water heater, Ferris and hook for whiffletrees, Starting, Filter, a cheap, Fire engine, floating, Merryweather's, Fire governor, automatic, Slide's, Flycatcher, Davidson's, Fly catching plant, the, Flying machine, proposed, Fountain Cave, Va., views in, Friction brake, Gill's, Furnace, Fairbairn's, Furnace for melting brass, Bush's, Furnace, safety, Shand and Mason's, Galls, oak, Gardena, the lemon-scented, Gear-cutting attachment, Hopkins', Glass, crystallization of, Governor, cut-off, Ord's, Governors, pendulum, Grain, machine for unloading, Granby at Bristol, England, Grapple, Toisel's, Grappling tools, Dexter's, Gun, the new French army, Gyroscope, the, Hammer, air spring, Hotchkiss', Hammer, the monster—The furnace

Table of illustrations with names and numbers, including Encyclopaedia altensteinii, the, Engine and boiler, Hill and Massey's, Engine compound, Davenport's, Engine horizontal compound, Hawthorn's, Engine portable, Montel & Co.'s, Engine portable, the Shapley, Engine rotary, Myers', Exposition buildings, Chili, Face plate, sliding, Whitmore's, Faucet, improved, Webster's, Feed water heater, Ferris and hook for whiffletrees, Starting, Filter, a cheap, Fire engine, floating, Merryweather's, Fire governor, automatic, Slide's, Flycatcher, Davidson's, Fly catching plant, the, Flying machine, proposed, Fountain Cave, Va., views in, Friction brake, Gill's, Furnace, Fairbairn's, Furnace for melting brass, Bush's, Furnace, safety, Shand and Mason's, Galls, oak, Gardena, the lemon-scented, Gear-cutting attachment, Hopkins', Glass, crystallization of, Governor, cut-off, Ord's, Governors, pendulum, Grain, machine for unloading, Granby at Bristol, England, Grapple, Toisel's, Grappling tools, Dexter's, Gun, the new French army, Gyroscope, the, Hammer, air spring, Hotchkiss', Hammer, the monster—The furnace

Table of illustrations with names and numbers, including Fountain Cave, Va., views in, Friction brake, Gill's, Furnace, Fairbairn's, Furnace for melting brass, Bush's, Furnace, safety, Shand and Mason's, Galls, oak, Gardena, the lemon-scented, Gear-cutting attachment, Hopkins', Glass, crystallization of, Governor, cut-off, Ord's, Governors, pendulum, Grain, machine for unloading, Granby at Bristol, England, Grapple, Toisel's, Grappling tools, Dexter's, Gun, the new French army, Gyroscope, the, Hammer, air spring, Hotchkiss', Hammer, the monster—The furnace

Table of illustrations with names and numbers, including Fountain Cave, Va., views in, Friction brake, Gill's, Furnace, Fairbairn's, Furnace for melting brass, Bush's, Furnace, safety, Shand and Mason's, Galls, oak, Gardena, the lemon-scented, Gear-cutting attachment, Hopkins', Glass, crystallization of, Governor, cut-off, Ord's, Governors, pendulum, Grain, machine for unloading, Granby at Bristol, England, Grapple, Toisel's, Grappling tools, Dexter's, Gun, the new French army, Gyroscope, the, Hammer, air spring, Hotchkiss', Hammer, the monster—The furnace

Table of illustrations with names and numbers, including Fountain Cave, Va., views in, Friction brake, Gill's, Furnace, Fairbairn's, Furnace for melting brass, Bush's, Furnace, safety, Shand and Mason's, Galls, oak, Gardena, the lemon-scented, Gear-cutting attachment, Hopkins', Glass, crystallization of, Governor, cut-off, Ord's, Governors, pendulum, Grain, machine for unloading, Granby at Bristol, England, Grapple, Toisel's, Grappling tools, Dexter's, Gun, the new French army, Gyroscope, the, Hammer, air spring, Hotchkiss', Hammer, the monster—The furnace