

there is vertical but no horizontal parallax, all which is due to the position of the eyes. Elevation ought to be more accurately estimated with the eyes in a vertical plane, &c. with the observer lying on his side. But this again is offset by habit.

(4214) A. D. T. asks: 1. Will the same dynamo or the same electricity that produces an arc light produce an incandescent light? A. Many of the regular arc light circuits include incandescent lamps adapted to these circuits. Such lamps are used in series with the arc lights, and are each provided with a cut-out which automatically completes the circuit should the carbon filament break. It is common also to use arc lights of special construction in incandescent circuits. 2. Will the dynamo used for operating an electric street railroad produce an arc light? A. Yes.

(4215) F. O. B. writes: An experimenter would like to know if there is any kind of glue that will retain its cohesive qualities after being subjected to a continuous heat not exceeding three hundred degrees of heat, or is there any way to make a cheap combustible glue, something in the form of mucilage? A. Possibly a mixture of 9 parts glue and 1 part glycerine would answer your purpose. Sodium silicate (water glass) is somewhat adhesive and resists high temperatures.

(4216) W. P. S. writes: I have some gun cotton (soluble) which does not dissolve in alcohol or ether, and I would like to have you tell me through the columns of your paper what is the reason and how can I dissolve it? A. The trouble may be in the solvents. The alcohol may contain too much water. The alcohol and ether should be mixed.

(4217) E. A. asks whether there is any metal or composition that is softer than pure lead and is at the same time not very expensive. A. We cannot suggest any substitute for the purest lead, from the points of view of ductility and cheapness.

(4218) H. J. says: Would you please be kind enough to let me know through your valuable paper what the seven modern wonders of the world are? A. The wonders of this age or century are but faintly represented by the number seven, if you mean the wonders derived from science and engineering. Foremost stands the steam engine and its wondrous work in developing power. The development of electric power, light, and transmission of language in the telegraph, the telephone, the phonograph. Then the opening of celestial space by the great telescopes. The diving into the infinitesimal by the modern microscope. And as works of engineering, the Mont Cenis Tunnel, the Menai Bridge, the New York and Brooklyn Bridge, the St. Louis Bridge, the ocean telegraph lines, modern ordnance, the Atlantic racers, the transcontinental railways, and a long list of lesser works of note.

(4219) C. L. R. asks: What is understood by the term cellulose wool? A. We presume you mean the rough fibrous cellulose prepared from coconut husks and used for packing ships to prevent sinking when penetrated by shells. The fiber expands when wet and thus closes the hole.

(4220) W. E. T. asks: 1. I have a one-eighth horse power electric motor with a Siemens H armature, the fields wound with 2 pounds No. 16 wire, the armature 1/2 pound No. 18 wire; can I, by doubling the wire on the armature and winding in this way, make a plating dynamo? If not, what changes would be made? A. Connect the two arms of your field magnet in parallel and wind two No. 14 wires on the armature in parallel. 2. How are connections made in a dynamo so that current may be regulated with common switch, also to vary speed when used as a motor? A. There are two ways of doing this. According to one method, the field magnet is wound in sections and the switch cuts the current in or out. According to the other, a variable resistance is placed in the field magnet circuit, so as to introduce more or less resistance. 3. How is a dynamo constructed so as to give an alternating current? A. The coils of the armature are arranged to be brought under the field magnet poles of different name in alternation. Collecting rings are used instead of a commutator. 4. In an induction coil how are connections made so that a single cell runs the coil and any number of cells can be thrown in circuit? A. The cells are connected in series or in parallel according to the requirements of the coil, and a switch is provided which throws one or all of the cells into the circuit of the primary. 5. How is a rapid and slow vibrator for an induction coil constructed and connected with coil? A. A rapid vibrator is merely an ordinary vibrating armature like that of a vibratory electric bell. The slow moving interrupter is constructed on the same general principle, but the vibrating arm is made heavy, and the electrical contact is made by means of a mercury cup and a platinum wire attached to the vibrator. 6. How is frosting done on plated ware? A. It is generally done by means of a brush formed of swinging sharp-pointed needles rotated in a lathe, the needles being brought into contact with the work by centrifugal action.

F. W. A. asks for an incombustible ink.—V. H. L. says: Will you please give simple directions for etching on copper?—R. M. C. says: Can you inform me of the method of making gelatin sheets?—G. M. F. asks for a receipt for liquid gutta percha.—B. S. asks for the general method of making perfumes and for reliable formulas for the various odors.—C. H. C. says: Can you give briefly some of the methods by which the dreaded phylloxera are destroyed?—S. M. W. says: Will you please give me the various synonyms of alcohol and ammonia?—J. G. S. says: Can you inform me where I can obtain tables for converting United States and metric measures?—H. B. R. says: Will you please give through the columns of Notes and Queries the formula for ground glass varnish used by photographers?—H. K. B. says: Can you tell me what soy is?—J. J. H. says: Have you a rule or table by which I can convert the readings of the Centigrade or Reaumur scale to the customary or Fahrenheit scale?—J. C. V. wants to know of what lithofracteur is composed.—O. D. E. says: How can I convert degrees Twaddell to specific gravity?—C. B. D. says: Can you inform me through your valuable paper of a cheap method of fireproofing timber?—E. H. V. R. would like to know the ingredients of material known as com-

pose, used in place of plaster of Paris in casting center pieces and ornaments.—W. W. S. asks: Can prints or engravings be made on paper with printer's ink from a print or engraving on an ordinary newspaper?—L. B. C. would like to find a composition to cement wood to celluloid.—E. N. asks for a receipt for making skeleton leaves?

Answers to all of the above queries will be found in the "Scientific American Cyclopaedia of Receipts, Notes and Queries," to which our correspondents are referred. The advertisement of this book is printed in another column. A new circular is now ready.

Replies to Enquiries.

The following replies relate to enquiries recently published in SCIENTIFIC AMERICAN, and to the number therein given:

(3980) H. McFarlen, Chicago, says: In the January 30 number of SCIENTIFIC AMERICAN, page 75, I find a question of inquiry, art. (3980), in which your inquirer asks if there is a machine for casting sash weights? Also, if it is practical to melt iron with petroleum. To both these questions I answer yes. I have at my establishment now a machine with moulds in which to cast sash weights. I have also tested in a small but practical way the melting of iron with fuel oil, and found it quite satisfactory.

(4092) W. M. B. in query No. 4092 asks for information in regard to black specks on silver prints. I have had some experience with them, and found their cause to be iron filings, probably introduced into the silver bath from the clothing after having been at the mechanic's work bench. Small particles of iron or steel make black specks, while brass makes a pale greenspeck somewhat larger and more nearly round than the black ones.—J. A. McCLINTOCK.

TO INVENTORS.

An experience of forty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequalled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted March 29, 1892.

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Table listing inventions with names and dates. Includes: Adhesive fabrics, producing, B. Hochman; Air brake, H. McNulta; Air compressor motor, Burdon & Houston; Alarm, See Fire alarm; Anemometer cup, H. J. Green; Animal trap, W. Stone & Palmer; Annunciator electrical, N. M. Watson; Auger, earth, M. S. Franks; Axle box, car, I. H. Plummer; Axle boxes, dust guard for, H. M. Goodman; Axles, manufacture of, C. O. Hall; Bale tie, H. C. Tully; Ball bats, cushion tip for, G. W. Hancock; Bar, See Car draw bar; Fire bar; Barbers, combination case for, R. V. Russell; Barrels, mechanism used in the manufacture of, S. Wright; Battery, See Galvanic battery; Secondary battery; Battery plate and making the same, storage, Donaldson & Macrae; Bed bottom, H. Reinhold; Beds, adjustable head section for, L. H. Steffey; Bustead, T. B. Chambers; Bell, E. D. Hookway; Beverage, W. M. Myers; Beer, T. O'Brien; Bicycle, S. Vale; Bicycle brake, W. T. Lewis; Bicycle handle, F. E. Youngs; Bicycle saddle, O. Hanson; Bicycle seat, Steers & Hunt; Binder, temporary, G. A. Piper; Bit, See Bridle bit; Blinds, sash, etc., attachment for, W. H. Boyle; Block, See Snatch block; Blotter, Betts & Herbert; Bodkin, E. A. Willard; Boiler, See Wash boiler; Boiler furnace, M. A. Foster; Boiler furnace, J. Leede; Boilers, supplementary heater for range, T. W. Reed; Book, J. E. Spears; Bookbinding machine, J. W. Clark; Book cover protector, adjustable, C. F. Morgan; Book, main fold copying, K. O. St. John; Bottle stopper, E. Ketterlinus; Box, See Letter box; Bracket, See Scaffold bracket; Brake, See Air brake; Bicycle brake; Car brake; Brake shoe, M. A. Penney; Brick kiln, J. C. Kinzel; Brick machine, H. W. Mead; Bricks, process of and composition for manufacturing sand, E. H. Lewis; Bridge gate, N. Busmann; Bridge pit, N. Stucker; Brush fiber clamp, W. H. Gates; Brushing machine for the manufacture of, G. Shaw; Burner, See Gas burner; Hydrocarbon burner; Oil or gas burner; Vapor burner; Button, R. Suro; Buttonhole cutter, M. Carmony; Calliper machine, automatic, F. Kammerer; Camera, See Photograph camera; Cameras, magazine for, M. B. Feeney; Can, See Tin can; Can, W. H. Atkinson; Can opener, A. B. Schofield; Can opener and painter's tool, combined, W. W. Hilde; Candle, ornamented, T. V. Forster; Candles, machine for marking or ornamenting, C. Forster; Car brake, W. B. Flinn; Car brake, railway, R. C. Sayer; Car coupling, J. Dixon; Car coupling, G. W. Gardner; Car coupling, W. McConway; Car coupling, C. A. Pooley; Car coupling, J. W. Stout; Car coupling, F. L. Wells; Car coupling, Young & Moskowitz; Car coupling, automatic, A. J. Cleland; Car draw bar, T. Baril; Car heating apparatus, steam heater for railway, E. A. Leland; Car passenger, C. L. Pullman; Car ventilator, J. Morton; Cars, running gear for street, S. Robertson; Cars, safety attachment for cable or electric, A. Baynal.

Table listing inventions with names and dates. Includes: Cars, switching attachment for street, O. W. Brenizer; Cars, trap door for railway, Snyder & McMahon; Carbureting apparatus, L. J. Phelps; Carpet or oil cloth protector, Shrum & Howarth; Carriage, See Railway rail chair; Cartridge, explosive, Butterfield & Batchelor; Case, See Package case; Casings for cavities, C. Vetter; Casket handle, T. McGovern; Chair, See Railway rail chair; Casting and dressing machine, type, J. G. Payer; Channelling machine, Z. Lasser; Checkrein, overdraw, J. McKenney; Cheese bandager, C. D. Hadcock; Cheese cutter, Gibson & Cameron; Chuck, lathe, J. F. Rouston; Churn, See Butter churn; Clamp, See Brush fiber clamp; Wood clamp; Cleaner, See Grain or coffee cleaner; Clothes wringer, C. Wheeler, Jr.; Clutch, S. B. Williams; Clutch mechanism for power presses, N. C. Stiles; Coasting machine, R. Whitaker; Coin freed or actuated machine, H. A. Burt; Coin receptacle and register, G. K. Cooke; Cooking oven, H. Ekelund; Collar, horse, M. T. Burke; Combination table, T. J. Fearn; Corn and cob crusher and grinder, F. S. Rich; Corn popper, A. H. Gleason; Corner iron, inside, C. E. Hart; Cornmeal leaves trough brake machine, Brown & Boggs; Corset, A. Bouchard; Coupling, See Car coupling; Hose coupling; Thill coupling; Crane, hoisting, J. O. Richmond; Cramping machine, R. Whitaker; Crusher, See Corn and cob crusher; Cultivator, C. E. Booi; Cup, See Anemometer cup; Current motor, J. C. Neal; Curtain fixture, W. Doulin; Curved, See Bathtub cutter; Cheese cutter; Dampers, stovepipe, E. A. Hofer; Dental disk holder, E. E. Park; Dental engine, Miller & Wells; Dental tool, Sweet & Parker; Developing dish, O. Francke; Diamido-diphenylmethane bases, making, E. Von Gerichten; Diffusion apparatus, E. Geschwind; Digger, See Post hole digger; Disinfecting apparatus, N. M. Dyer; Disinfecting device, N. M. Dyer; Ditching machine, S. Starr; Dock, permanent dry, W. E. Simps; Door, electrically controlled trap, F. C. Callahan; Door hanger track, J. G. Lane et al.; Door or window screen, M. J. Tenney; Drainer, F. A. Strater; Drawers, B. Walker; Dyeing machine, B. Honok; Eaves or roof gutter, E. R. Denmore; Eaves trough hanger, W. C. Berger; Electric cut-out, automatic, E. A. Manship; Electric generator or motor, dynamo, C. W. & L. B. Atkinson; Electric light support, J. J. Walsh; Electric lock, J. G. Thompson; Electric machine or motor, dynamo, Gooden & Atkinson; Electric motors or dynamo-electric machines, See Electric motor; Electric switch, H. Hubbell; Electric switch, C. G. Perkins; Electric telegraph apparatus, M. W. Hassan; Electric wire joint, R. H. Smith; Electric wires, pole for supporting, J. H. Hunt; Electrode, electro-therapeutic, H. Bonis; Electrode, secondary battery, C. F. Winkler; Elevator, J. A. Dean; Elevator safety device, E. W. Naylor; Embroidering machines, fabric holding frame for, J. Ingh; Endless apron carriers, driving mechanism for, J. Dick; Endoscopic instrument, J. W. Dally; Engine, See Dental engine; Rotary engine; Steam engine; Envelope for mailing packages, H. G. Mackinney; Excavator, C. A. Warren; Exhibitor, merchandise, F. E. Bush; Extension table, F. P. Cobham; Eyeglass holder, G. Maier, Jr.; F. N. means for operating rock, R. Wehrle; Faucet, C. Ruchel; Faucet, beer, G. H. Walker; Feed trough, W. A. Leech; Fence, J. E. Lusang; Fence machine, C. H. Kellogg; Fence post, automatic, M. L. Jones; Fence strands, machine for making wire, E. F. Hatha way; Fence, wire and picket, J. Speakman; Fertilizer distributor, C. W. Nicholson; Fifth wheel, T. L. Bosart; File, roller, H. W. Walk; File, roller, H. W. Walk; File, prescription, G. L. Goodman; Filter, L. N. Blessing; Filter, W. M. Deutsch; Filter press, plate for, J. P. Boetiger; Fire alarm, See Electric fire; Woolley; Firearm, breech-loading, S. Sifuntz; Fire bar, movable, Heider & Schuscha; Fireproof construction, W. Orr; Fish hook, C. A. Haviland; Flue dust, apparatus for condensing, H. W. Hickson; Flushing and H. H. Craigie; Frame, See Slate frame; Fuel, storage tank for liquid, C. A. King; Furnace, See Boiler furnace; Hot air furnace; Ventilating furnace; Furnace door and boiler, front, J. Fea; Gaiter, See Hose; Burnley; Game, H. A. Doty; Game apparatus, G. B. Nichols; Game counter, A. J. Youlin; Gas burner, F. Leibman; Gas burner safety attachment, G. L. Thunen; Gas pressure regulator, automatic, J. G. Strub; Gas, process of and apparatus for making, J. Leede; Gate, See Bridge gate; Safety gate; Gate, H. Barker; Gate, J. Block; Gate, J. Block; Gearing, See Gear; Gear; Gold, silver, etc., machine for separating, J. B. Freeman; Governor, marine engine, E. F. Wallgren; Grafting, method of and device for, W. M. Rowland; Grain binder, C. A. Rand; Grain elevating and measuring machine, S. P. Ford; Grain or coffee cleaner, T. A. Seip; Grate, ventilating, S. Shaw; Grater, E. J. Bucher; W. H. Perry; Grease, See Grease; Grease; Gun, moistener, A. Gartner; Gun, automatic magazine, J. M. & M. S. Browning; Gun, machine, J. M. & M. S. Browning; Handle, See Bicycle handle; Casket handle; Hanger, See Eaves trough hanger; Harness girth, I. B. Ingle; Harrow, F. C. Merrill; Harvester bundle carrier, B. F. Stewart; Harvester, corn, W. G. Atwood; Harvester, corn, J. W. Parker; Hat rounding machine, C. H. Reid; Head rest, horse, W. H. Reaves; Head rest for beds, C. V. Reaves; Heater, See Vehicle heater; Heater and shade, combined, F. Busch; Heating apparatus, C. A. Sawin; Heating, J. G. Leland; Hoisting machine, C. G. Mowbray; Holder, See Dental disk holder; Eyeglass holder; Pen holder; Pipe holder; Hones, composition for dressing, C. A. Praray; Hook, See Fish hook; Whiffletree hook; Hose, C. E. Howard; Hose coupling, F. W. Wright; Hot air furnace, A. Brake; Hot air register, J. W. Collins; Hydrocarbon burner, H. T. Russell; Ice making machine, D. L. Holden; Indicator, See Station indicator; Indicator lock, L. T. Crabtree; Insect exterminator, L. G. Tuttle; Insulated electric conductor, J. B. Williams; Iron, See Corner iron; Iron or steel, determining the temper of, C. A. Jar fastener, G. B. Valentine; Joint, See Electric wire joint; Rod joint.

Table listing inventions with names and dates. Includes: Joint mould, J. C. Raymond; Kiln, See Brick kiln; Knife, Walker & Peifer; Knitting machine feeding mechanism, S. L. Otis; Knitting machine, straight, A. Fielder; Knitting machine, W. F. & W. M. Morton; Lamp, W. S. McLewee; Lamp filler, T. Hipwell; Lamp, pocket, R. G. Speir; Lamp support, electric, C. J. Klein; Lamps, bracket for incandescent electric, J. H. Gocht; Lamps, manufacture for incandescent electric, F. S. Smith; Lamps, mast-arm switch for electric, T. Dillon; Land roller, Mallery & Youngs; Lathe, Loveland & Henn; Lathe tool, R. A. Berger; Leaching solutions, purifying hyposulphite, E. R. Holden; Lead, making white, Waller & Sniffin; Letter box, house door, A. H. Van Pelt; Letter box, house door, S. Witherell; Liquid dispensing apparatus, Mayrhofer; Lock, See Electric lock; Indicator lock; Nut lock; Oak lock; Whip lock; Lock, A. Arens; Loom for weaving pile fabrics, Terry & Rawnsley; Loom, swivel, J. C. Brooks; Lubricating machine, F. S. Farwell; Lumber sorter, F. Farr; Mashing machines, adjusting device for, C. Kaestner; Measuring caddy, Jones & Agate; Meat tendering implement, P. A. Hause; Mechanical movement, C. B. Cottrell; Mechanical movement, J. G. Young, Jr.; Metal foil packages, putting up, J. H. J. Haines; Metallic facing for buildings, L. L. Sagendorph; Milk cooler, Healings, Jr. & Evans; Milk cooler, O. Leonard; Miner candle, K. Muenger; Mould, See Joint mould; Monument, F. M. Hawkins; Motion, device for transmitting, G. S. Strong; Motor, See Air compressor motor; Churn motor; Current motor; Spring motor; Mowers, cutter bar for, A. Noel; Music, extension key for transposing, J. Bracken; Musical instrument, mechanical, C. Kretschmar; Musical tones by electro-magnetism, method of and apparatus for producing, E. C. Ohmart; Nail filler, M. Coffin; Nut lock, A. M. Krone; Nut lock, M. D. C. Terry; Nut lock, M. D. C. Terry; Nut lock, safety, A. M. Krone; Oak lock, G. H. Haslop; Oil or grease burner, E. S. Sanford; Oils, refining, Drakos; Ores, apparatus for desulfurizing, J. Leede; Ores, apparatus for treating refractory, J. Leede; Ores, treating refractory, J. Leede; Overalls, J. E. Hertz; Package case, W. F. Farwell; Packages, sliding for, F. Hohorst; Packing, ring, E. H. Stone; Paint, E. W. Grafton; Paper box machine, J. G. Young, Jr.; Paper fruit basket, W. Moran; Paper making machine, J. G. Young, Jr.; Paper pairs, hot pressing machine for, Hull & McEwan; Paper reel, W. R. Farnsworth; Paper slot machine, toilet, F. E. Housh; Pencil sharpener, W. Lachenmeyer; Pen holder, F. W. Wells; Perforating device, paper, W. F. Wells; Photograph camera, G. Whitney; Photographic film package, G. Whitney; Photographic shutter, Low & Shakespear, Jr.; Piano action, J. Herrburger; Pipe, C. Schickel; Pipe connection or coupling, R. Parish; Pipe elbow, sheet metal, W. H. Noble; Pipe holder, T. E. Brink; Planter and cultivator, combined, Horne & Asbell; Planter, seed, C. F. Yarrow; Planter, tobacco, A. F. Shuler; Plow, T. J. Fariss; Plow, D. C. Turner; Plow, H. G. Webb; Plows, weed cutter for cultivator, J. Rosencrans; Poison distributor, S. M. Coulson; Poison distributor, C. H. Pickering; Post hole digger, T. A. Cross; Pottery machine, C. Breitschwerth; Powder puff, E. A. Hally; Power saw, J. Devold; Press, See Printing press; Press, S. D. Tucker; Printing press, plate, S. Steen, Jr.; Propeller, G. K. Sacrett; Propeller, screw, F. Stauch, Jr.; Protectors, See Cover protector; Carpet or oil cloth protector; Puller, See Nail puller; Stamp puller; Pump, steam, D. F. Lepley; Pump, well, T. J. Sayre; Pumps, means for operating, Brown & Berger; Puzzle, J. A. McDougall; Pyrotechnic, C. Del Grande; Rack, F. E. Nutting; Rails to main line rails, means for securing guard, H. H. Spomenberg; Railway, See Railway; Railway, See Railway; Railway rail chair, G. H. Gusham; Railway rail dressing device, D. W. Jones; Railway tie, metallic, Westmacott & Hutchinson; Railway track fastening, Westmacott & Hutchinson; Railway track wrench, ratchet, Wever & Blount; Rake, See Hay rake; Reaping and mowing machines, finger bar for, Lydon & Stacy; Recorder, See Time recorder; Reel, See Paper reel; Refrigerator, See Refrigerator; Register, See Hot air register; Regulator, See Gas pressure regulator; Rein support, K. M. Dean; Ridger, pulverizer, seed planter, and fertilizer distributor, combined, F. F. Ferguson; Rod joint and bearing, connecting, M. A. Clelland; Roller, See Land roller; Rolling machine, metal, F. W. Wood; Roofer's bending tool, W. L. & H. Heberling; Rotary engine, W. Fogler; Rug and cloak combined, J. A. Shelton; Ruling apparatus, knockdown state, E. S. Cross; Sack fastener, J. H. Shaw; Saddle, gig, L. Duff; Safety gate, C. H. & G. D. Westover; Sash reefing, Newcomb & Wiley; Sash fastener, B. Hurd; Sash, window, S. C. Young; Saw setting machine, J. E. Ivey; Saw, tree felling, G. E. Desmond; Sawmill carriages, indicator for, I. Burlingame; Scaffold bracket for painters, J. F. Shoop; Scraper, road, C. A. McAlpine; Screen, See Door or window screen; Seat, See Bicycle seat; Secondary battery, C. F. Winkler; Sewing machine needle, E. J. Hall; Shaft bearing, turbine, J. Gulden; Shawl strap, W. J. Acheson; Shelf, portable, S. Mosbacher; Shingle, metallic, H. H. Bohm; Shipping can, self-sealing, Lisk & Brown; Shirt, J. Gillner; Sight feed lubricator, W. S. Ashton; Signal, See Switch signal; Signal transmitting system, H. A. Chase; Slate for the blind, E. Streshley; Slate frame, H. S. Semmel; Sled and roller coaster, combined, F. W. Horstmannshoff; Smoke consumer, J. Hadley; Smoke consumer, R. & R. Rogerson; Snap switch, reciprocating, J. Gibbs; Snatch block, A. Uren; Soap, manufacturing, W. A. Grant; Spike, J. W. Todd; Spinning apparatus, L. W. Huyok; Spirits or other liquors, apparatus for maturing, J. McKinley; Spout, pouring, E. R. Deverall; Spring motor, A. S. Parker; Square, bevel, G. R. Richardson; Stallion shield, Palmer & Daniel; Starch refining and separating machine, centrifugal, G. A. Kerr; Starching machine, J. McKay; Station indicator, W. S. Mallard; Stay, garment, H. W. Geel; Steam engine, W. A. Pitt; Steam engine, G. H. Rindell; Stereotype form, machine for trimming segmental cylindrical, J. J. Clausen.

**Advertisements.**

Stopper. See Bottlestopper.  
Stoves, freckle for, Hatfield & Bennett..... 471,547  
Strap. See Shawl strap.  
Street sweeper, Jones & Gillies..... 471,642  
Stump puller, E. M. Morris..... 471,745  
Sucker rod socket, L. R. Hitchcock..... 471,975  
Sulky, J. V. Upington..... 471,916  
Swing, O. Strickland..... 471,700  
Switch. See Electric switch.  
Switch signal torpedo, F. C. Leimbert et al..... 471,980  
Syringe and speculum, combined, A. E. Magoris..... 471,647  
Table. See Combination table. Extension table.  
Table, J. H. Martin..... 471,676  
Tank. See Flushing tank.  
Tap, screw, A. Cameron..... 471,948  
Telegraph poles, foot support for, E. A. Streeter..... 471,620  
Telephone, J. H. Howard..... 471,745  
Telephone attachment, J. E. Hills..... 471,549  
Telephone receiver, Christy & Baldwin..... 471,535  
Telescope, A. Rudall..... 471,708  
Tension device, H. D. Robinson..... 471,571  
Tent, J. W. Ormsby..... 471,848  
Tentering machines, sprocket wheel for, D. Babcock..... 471,529  
Thermometer attachment for ovens, A. B. Strickler..... 471,654  
Thill coupling, O. T. Welch..... 471,690  
Ticket, railway, R. K. Metheny..... 471,876  
Tie. See Railway tie.  
Tiles, manufacture of, H. Baggeley..... 471,740  
Time recorder, workman's, Johnson & Egan..... 471,733  
Tin can, W. Pratt..... 471,736  
Tire for bicycles, rubber, E. R. De Wolfe..... 471,813  
Tire heating apparatus, J. Harris..... 471,704  
Tires, heater for cementing rubber, J. Parkinson..... 471,803  
Tobacco cutting device, P. Hill..... 471,859  
Tobacco stick or hanger, J. H. Cain..... 471,532  
Torpedo plunger, L. Sennett..... 471,984  
Toy cannon, J. B. Kibler..... 471,558  
Track cleaning apparatus, Dowd & Long..... 471,834  
Trap. See Animal trap.  
Tricycle, A. B. Miller..... 471,770  
Trough. See Feed trough.  
Trousers stretcher and hanger, G. E. Hamlin..... 471,770  
Tro sers, waistband for, L. Frank..... 471,770  
Trousers, waistband for, N. J. Schloss..... 471,830  
Truck, car, S. D. King..... 471,912  
Truck, car, Taylor..... 471,912  
Truck, house moving, J. C. Bressler et al..... 471,899  
Trunk, H. W. Rountree..... 471,788  
Trunk, convertible, J. Dwyer..... 471,678  
Tube expander, O. Fagan..... 471,678  
Tubes or rods, tool for raising casing, W. Richards..... 471,896  
Tug, shaft, S. H. Haas..... 471,818  
Typewriting machine, L. F. Clark..... 471,785  
Typewriting machine, E. F. Estes..... 471,964  
Typewriting machine, W. P. Kidder..... 471,794  
Typewriting machine, G. B. Webb..... 471,710  
Typewriting machine attachment, G. F. Lear..... 471,872  
Typewriting machine attachment, T. H. Stackhouse..... 471,832  
Vaginal instrument, W. A. Howard..... 471,865  
Valve, combined starting and blow-off, S. M. Vauclain..... 471,836  
Valve, engine, A. La Chaux..... 471,842  
Valve controller, Nash & Eddy..... 471,959  
Valve for engines, steam-actuated, A. A. Nanney..... 471,882  
Valve for gas compressors, P. Dieter..... 471,787  
Vapor burner, C. V. Best..... 471,596  
Vehicle heater, A. E. Jones..... 471,866  
Vehicle wheel, Arbin & Johnson..... 471,933  
Vehicle wheel, Dempsey & Folk..... 471,980  
Vehicle wheel, G. G. Ward..... 471,781  
Velocipede, E. G. Latta..... 471,798  
Velocipede, ice, L. Dart..... 471,959  
Velocipede pedal, T. A. Watson..... 471,770  
Velocipede saddle, J. A. Hunt..... 471,885  
Vending or other purposes, coin-actuated device for, Bacon & Hill..... 471,712  
Veneer, ornamental wood, N. A. Hull..... 471,552  
Ventilating furnace, L. J. Treacy..... 471,701  
Ventilator. See Car ventilator.  
Vise, pipe, A. W. Cash..... 472,010  
Wagon body hoist, J. W. Sandy..... 471,900  
Wall paper hanging machine, E. M. Graham..... 471,958  
Wall paper pasting machine, E. H. Danforth..... 471,958  
Wash boiler, C. C. P. Nourse..... 471,565  
Washing machine, F. Foster..... 471,541  
Washing machine, Hornby & Co..... 471,583  
Water conduct against fires, safety, N. Simin..... 471,699  
Water wheel, J. H. Choate, Jr..... 471,951  
Well drilling apparatus, deep, W. Webber..... 471,580  
Wheel. See Fifth wheel. Vehicle wheel. Water wheel.  
Wheel, Ames C. Herrmann..... 471,711  
Whetting and sharpening the cutting edges of edge tools, etc., apparatus for, C. Spruce..... 471,679  
Whiffletree, J. B. McCallum..... 471,880  
Whiffletree hook, G. Carlson..... 471,949  
Whip lock and socket, combined, H. J. Saxton..... 471,652  
Whip socket, R. M. Johnson..... 471,555  
Window, C. A. Anderson..... 471,729  
Wire tightener, W. D. Hoyt..... 471,551  
Wood clamp, E. L. Still..... 471,909  
Wood surfaces, method of and apparatus for graining, J. Shannon..... 471,638  
Wrecking frog, W. H. Wilmore..... 471,927  
Wrench. See Railway track wrench.  
Wrench, J. S. Everitt..... 471,539  
Wrench, G. W. Ginger..... 471,855  
Wringing. See Clothes wringer.  
Writing, device for holding and guiding the fingers in, A. D. Lilly..... 471,556  
Yarns, machine for printing, Marchetti & Crossley..... 471,561  
Yeast, apparatus for and method of separating and assorting, G. Sobotka..... 471,689  
Yeast, separating and assorting, G. Sobotka..... 471,688  
Yoke neck, J. F. Kellogg..... 471,645

TRADE MARKS.

Apples, Robyn Bros..... 20,914  
Armit shields, Brooklyn Shield Co..... 20,911  
Baking powder, Thomson & Taylor Spice Company..... 20,900  
Belting for machinery, leather, C. A. Schieren & Co..... 20,915  
Bitters, C. Kr edelbach..... 20,989  
Bitters, peach, H. Klus..... 20,899  
Bitters, stomach, A. H. F. Gollatz..... 20,897  
Books of fiction, history, biography, travel, and poetry, Butler Brothers..... 20,904  
Cigars, C. Alvarez..... 20,902  
Coffee, H. A. Fry & Co..... 20,913  
Collars and cuffs waterproof, Arlington Collar and Cuff Company..... 20,901  
Confectionery for coughs and colds, Smith Brothers..... 20,907  
Extracts for food, flavoring, Thomson & Taylor Spice Company..... 20,917  
Gold and silver plated flat and table ware and jewelry, W. B. Kerr & Co..... 20,912  
Hosiery, J. Smalley & Co..... 20,906  
Insulated wires, insulated electric cables, and insulating material, Indiana Rubber and Insulated Wire Company..... 20,916  
Medicine for coughs, bronchitis, asthma, and like diseases, J. G. Lavolette..... 20,910  
Neckties made of medicinal substances, to be worn by infants, F. Korn..... 20,98  
Paste, dry, Diamond Paste Company..... 20,905  
Pianos, D. H. Baldwin & Co..... 20,903  
Plushes, L. C. Chase & Co..... 20,896  
Remedy for rheumatism, liquid, Hafertepen Bros..... 20,908  
Spices, ground, Thomson & Taylor Spice Company..... 20,918  
Varnishes, G. L. Wood & Son..... 20,919

DESIGNS.

Bath tub, E. Seyler..... 21,436  
Gas retorts, mouthpiece for, C. L. Rowland..... 21,435  
Hammock, I. E. Palmer..... 21,439  
Insulator bracket, C. Wirt..... 21,439  
Lamp fount, W. C. Homan..... 21,429  
Metal, ornamentation of, J. J. Sweeney..... 21,437  
Monument, W. H. Perry..... 21,433  
Siding plate, W. C. Berker..... 21,428  
Spoon, etc., F. Wierze..... 21,441  
Stove, heating, C. F. Walther..... 21,440  
Stove, lamp, C. H. Boeck..... 21,427  
Toy gun, E. R. Ives..... 21,431  
Type, font of printing, H. Ihlenburg..... 21,430  
Water closet seat and back, H. Sievert..... 21,438  
Wick tube and burner plate, W. H. Clemes..... 21,442

A printed copy of the specification and drawing of any patent in the foregoing list, or any patent in print, issued since 1863, will be furnished from this office for 25 cents. In ordering please state the name and number of the patent desired, and remit to Munn & Co., 361 Broadway, New York.

Canadian patents may now be obtained by the inventors for any of the inventions named in the foregoing list, provided they are simple, at a cost of \$40 each. If complicated the cost will be a little more. For full instructions address Munn & Co., 361 Broadway, New York. Other foreign patents may also be obtained.

**Advertisements.**

Inside Page, each insertion -- 75 cents a line  
Back Page, each insertion - - - \$1.00 a line

The above are charges per agate line—about eight words per line. This notice shows the width of the line, and is set in agate type. Engravings may head advertisements at the same rate per agate line, by measurement, as the letter press. Advertisements must be received at Publication Office as early as Thursday morning to appear in the following week's issue.

**ADAMANT WALL PLASTER**  
BEST PLASTERING MATERIAL KNOWN.  
No experiment. Its success has been phenomenal. Thirty factories in this and other countries.  
ADAMANT MFG. CO., SYRACUSE, N. Y.

**Patent Foot Power Machinery**  
Complete Outfits.  
Wood or Metal workers without steam power, can successfully compete with the large shops, by using our New **LABOR SAVING** Machinery, latest and most improved for practical shop use, also for Industrial Schools, Home Training, etc. Catalogue free.  
**Seneca Falls Mfg. Co.**  
636 Water Street, Seneca Falls, N. Y.

**T. A. C.** MARCH 1st to OCTOBER 1st.  
Sales of a patented specialty over two millions. Manufactured on royalty. Inventors, write us.  
**THE TUSCARORA ADVERTISING CO., COSHOCTON, O.**

**FOR LEASE—THE MIDDLEBROOK GRANITE**  
Quarries, at Middlebrook, Mo., operated for the past 10 years by the Syenite Granite Co., of this State, will be leased for ten years from June 10th, 1892. They are the largest and finest quarries in the West, containing the well-known red granite so extensively used in many of the finest buildings, monuments, bridges, etc., in the country. Sealed proposals will be received and opened at noon, on June 1st next, for a ten year lease of the property. This Company reserves the right to reject any and all bids. You are cordially invited to inspect the property.  
**IRON MOUNTAIN CO., Gay Building, St. Louis, Mo.**

**THE GIBBS PATENT DUST PROTECTOR.**  
For protecting the nose and mouth from inhalations of dust of every character. Invaluable in mills and factories. Perfect protection with perfect ventilation. Dust inhaled to the nose and lungs results in Catarrh and Consumption. Nickel plated protector sent postpaid on receipt of \$1.  
**Gibbs Respirator Co.,**  
36 S. La Salle St., Chicago.

**WANTED.**—A good second-hand band saw, to cut boards 22 inches wide; state lowest price for cash. Address **WEDD & M. PIANO ORGAN CO.,** Washington, Warren County, N. J.

**WOOD WORKING MACHINERY**  
For Veneer, Fruit Package and Barrel Works.  
Handle, Spoke and Turning Factories.  
**I. E. Merritt Machinery Co., Lockport, N. Y.**

**ELECTRIC POWER APPARATUS,**  
FOR EVERY VARIETY OF MECHANICAL WORK.  
**SAFE, SURE, RELIABLE.**  
ESTIMATES FURNISHED. SEND FOR CATALOGUES.  
**THOMSON-HOUSTON MOTOR CO.,**  
620 ATLANTIC AVENUE, BOSTON, MASS.

**Shepard's New \$60 Screw-Cutting Foot Lathe**  
Foot and Power Lathes, Drill Presses, Scroll Saw Attachments, Chucks, Mandrels, Twist Drills, Dogs, Callipers, etc. Lathes on trial. Lathes on payment.  
Send for catalogue of Outfits for Amateurs or Artisans. Address **H. J. SHEPARD, AGENT,**  
141 West 2d Street, Cincinnati, Ohio.

**FRET SAW or BRACKET WOODS**  
Planned Ready for Use. Books of Design.  
Send stamp for catalogue.

**CABINET WOODS AND VENEERS.**  
**THE E. D. ALBRO CO.,**  
Eastern Branch, 200 Lewis St., New York, U. S. A.  
H. T. Bartlett, Mgr. F. W. Honerkamp, Ass't Mgr.  
Mills, Cincinnati, Ohio.

**RIFE'S AUTOMATIC HYDRAULIC ENGINE OR RAM**  
SUPPLYING WATER FOR Irrigation, Small Towns, Railroad Tanks, Factories, Steam Mills, Dairies, Country Residences, Stock Yards, etc. Automatic, Efficient, Durable, and Inexpensive. Send for fully illus. catalogue.  
See illustrated notice in Sci. Am., p. 6, July 5, '90.  
**Rife's Hydraulic Engine Mfg. Co., Knoxville, Va.**

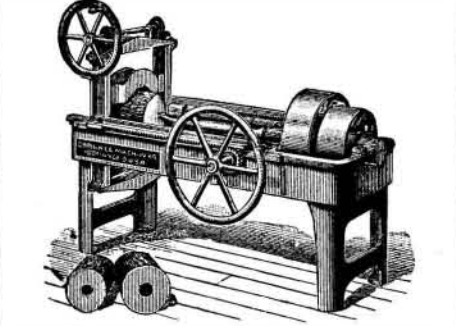
**WINANS' ANTI INCRUSTATION POWDER**  
OR **BULLER COMPOUND** FOR REMOVING SCALING AND CORROSION FROM BOILERS.  
PEERLESS VALVE ROSE PACKING.  
MAGNOLIA ANTI-FRICTION METAL.  
STAMPING ELECTRIC DAMPER REGULATOR  
**J. C. WINANS 220 FREMONT ST. SAN FRANCISCO, CAL.**

**Improved Screw Cutting LATHES**  
Foot and Power.  
Drill Presses, Shapers, Band, Circular, and Scroll Saws. Machinists' Tools and Supplies. Lathes on trial. Catalogue mailed on application.  
**SEBASTIAN LATHE COMPANY,**  
44-46 Central Ave., Cincinnati, O.

**The Sebastian-May Co.**  
Improved Screw Cutting Foot and Power **LATHES** \$60  
Drill Presses, Chucks, Drills, Dogs, and Machinists' and Amateurs' Outfits. Lathes on trial. Catalogues mailed on application.  
165 to 167 Highland Ave., SIDNEY, OHIO.

**BEATTY** Pianos, \$175. Organs, \$48. Want Agents. Cat'g free. Dan'l F. Beatty, Wash'ton, N. J.

ESTABLISHED 1850.  
**DEFIANCE MACHINE WORKS**  
DEFIANCE, OHIO, U. S. A.,  
BUILDERS OF  
**HUB, SPOKE, WHEEL, BENDING, WAGON AND CARRIAGE MACHINERY.**



No. 1, HEAVY HUB BORING MACHINE.  
**Chucks** The NATIONAL. INDEPENDENT. UNIVERSAL. COMBINATION.

Strongest. Easiest to change. Best Finish. Reversible Jaws (patented) giving 5 changes including every possible desired position.  
NEW CATALOGUE, illustrated, sent free. Liberal discounts. Prompt shipment. Address **The Nat'l Chuck Mfg. Co., Mt. Vernon, N. Y.**

**NOISELESS ROTARY FANS.**  
These fans can be fastened to ceiling, and driven by a round belt directly from a Backus Water Motor, Steam Engine, or other power. By changing angle of blades amount of air can be regulated. Two or more fans can be connected on ceiling. The Backus Patent Fans are noiseless, and found invaluable in meat markets, restaurants, dining rooms, bakeries, hotels, etc. They will keep your place cool and free from flies. Write for special circular to  
**Backus Water Motor Co., Newark, N. J., U.S.A.**

**IRON TANKS CHEAP.** 4 iron tanks built capacity 900 gals. Rust proof. Cost \$350. Will not refuse any reasonable offer. Address **G. W. Presbrey, Palmer's Theatre, New York.**

**MAGIC LANTERNS**  
AND STEREOPTICONS FOR SCHOOLS & PUBLIC ENTERTAINMENTS  
LANTERN SLIDES COLORED & UNCOLORED  
SEND FOR CATALOGUE  
PHILA. PA.

**ICE-HOUSE AND COLD ROOM.—BY R. G. Hatfield.** With directions for construction. Four engravings. Contained in **SCIENTIFIC AMERICAN SUPPLEMENT, 59.** Price 10 cents. To be had at this office and of all newsdealers.

**THIS ANNOUNCEMENT** is to give notice that Charles M. Duke, of Clearwater, Neb., the county right of Douglas and Lancaster counties, Neb., paying for the same the sums of \$375 and \$425 respectively, for the right to manufacture and sell the Sheffield Kettle Tilter Lifter. He should be able to clear the \$800 by having a good supply at the State and County Fairs. O. W. Carpenter, of Dedham, Iowa, has been appointed general agent for the State of Illinois.

**OVER 1200 BICYCLES**  
in stock. New and second-hand. Cash or time.  
**A. W. GUMP & CO. DAYTON, OHIO.**  
Send for list.  
**AGENTS WANTED.**  
BICYCLES, GUNS and TYPEWRITERS TAKEN IN EXCHANGE.

**SCIENTIFIC AMERICAN SUPPLEMENT.** Any desired back number of the SCIENTIFIC AMERICAN SUPPLEMENT can be had at this office for 10 cents. Also to be had of newsdealers in all parts of the country.

**STEVENS PATENT RELIABLE DIVIDER. No. 60**  
Forged from heavy stock. Operated with a right and left hand screw. Made with two tension screws, removing any back lash.  
5 inches, price per pair.....\$1.50  
Ideal and Leader Spring Calipers and Dividers. Ideal Surface Gauges. Depth Gauges, and Fine Machinists' Tools.  
Illustrated catalogue free to all.  
**J. STEVENS ARMS & TOOL CO.,**  
P. O. Box 280, Chicopee Falls, Mass.

**BUILDERS OF HIGH GRADE BOATS.**

We Build Everything, from a Canoe to a Steam Yacht. Complete Stock Oars, Sweeps and Boat Trimmings. We Make all Sizes Pipe Boilers and Engines. Cedar Row Boats from \$25 upward. Vapor and Steam Launches from \$300 upward.  
SEND 10c. FOR COMPLETE CATALOGUE.  
**DAVIS BOAT AND OAR CO., DETROIT, MICH., U. S. A.**

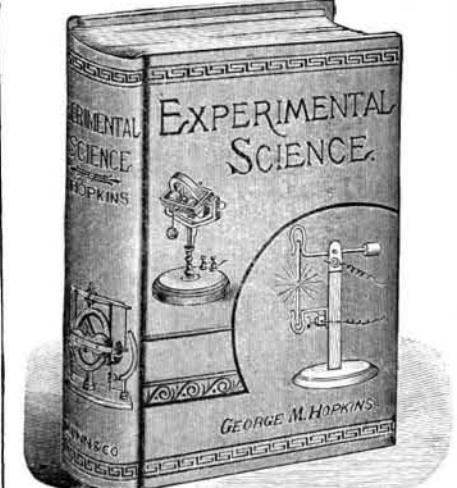
**PORTER**  
AUTOMATIC ENGINE.  
CENTRAL CRANK.  
ECONOMY PERFECT REGULATION OF SPEED.  
ABSENCE OF ALL PARTS REQUIRING FREQUENT ATTENTION.

**THE WORLD'S MAGAZINE OF SPORT AND PASTIME**  
THE ONLY ILLUSTRATED MAGAZINE OF ITS KIND  
STORIES OF TRAVEL AND ADVENTURE  
GUNNING CAMPING  
FISHING KENNEL  
CYCLING ATHLETICS  
DRIVING RIDING  
YACHTING CANOEING  
BOATING LAWN TENNIS  
And all Winter and Summer Sports.  
TERMS: \$3.00 YEARLY. 25 CENTS PER COPY.  
Send for specimen copy, mentioning this paper.

**THE OUTING COMPANY, "LTD.,"**  
239 FIFTH AVENUE, NEW YORK.

HAVE YOU READ **Experimental Science?**

This new book, by Geo. M. Hopkins, is just what you need to give you a good general knowledge of Physical Science. No one having the spirit of the times can afford to be without the kind of scientific information contained in this book. It is not only instructive, but entertaining.



Over 700 pages; 680 fine cuts; substantially and beautifully bound. Price by mail, \$4.00.

Send for illustrated circular.  
**MUNN & CO., Publishers,**  
Office of the SCIENTIFIC AMERICAN,  
361 BROADWAY, NEW YORK.

**Mining and Electrical ENGINEER, Alfred Guillaume,**  
ELECTRICAL AND MINING Machinery a Specialty.  
Electric Lamps for Miners.  
Room 1107, Owings Building,  
215 DEARBORN STREET, CHICAGO.  
Ask for Guillaume's Revolving Dryer.

**ASTRONOMER'S WORK** in a Modern Observatory.—By Dr. David Gill. A very interesting paper by the astronomer at the Cape of Good Hope observatory, giving the routine of the modern astronomer's work, and the results obtained through recent processes of investigation. Contained in **SCIENTIFIC AMERICAN SUPPLEMENT, No. 833.** Price 10 cents. To be had at this office and from all newsdealers.

**WOODEN TANKS** FOR RAILROADS, WATER WORKS, MILLS, FARMS, ETC. COMPLETE STOCK OF PLANS & A SPECIALTY. SPECIFICATIONS FURNISHED FOR FOUNDATIONS, STOWERS.  
**W. E. CALDWELL & CO.**  
No. 217 E. MAIN ST. LOUISVILLE, KY.

**Van Duzen's Pat. Loose Pulley Oiler**  
Highest Indorsements, Envyable Reputation, Scientific Pedigree.  
A two years' test by conservative manufacturers of national reputation has shown it to be the only perfect Lubricator for Loose Pulleys in use. Prices very reasonable. Send for our "Catalogue Number 55."  
**VAN DUZEN & TIFT, Cincinnati, O.**

**World Injectors**  
operated entirely by a single handle and therefore the simplest to operate. Single turn of the handle is all that is required. Always to be depended upon and consequently the safest and best. If you use, or are likely to use Boiler Feeders, Ejectors, Jet Pumps, etc., send for Catalogue. It contains valuable information and tables for engineers, etc. A **Scientific American Injector Co., C. 177 Larned St., Detroit, Mich.**

**PORTER MFG. CO. LIMITED**  
BUILDERS OF SYRACUSE, N. Y.  
ALSO INSTRUCTORS OF TANKS, STAND PIPES, BOILERS AND STONE CRUSHERS.  
SPECIFICATIONS SOLICITED. ESTIMATES GIVEN.