

RECENTLY PATENTED INVENTIONS.

Engineering.

CONDENSER.—Cary S. Cox, Spottiswood, Cal. To quickly condense the exhaust steam and prevent back pressure in the engine, this condenser comprises a shell through which air circulates, there being within the shell a drum having a steam inlet pipe and a water outlet pipe, a series of tubes connecting the heads of the drum with each other, each tube lined on its inner surface with a water-evaporating fabric, while a water sprinkler is arranged within the shell above the upper head of the drum. The construction is simple and durable.

Railway Appliances.

REFRIGERATOR CAR.—Ferdinand E. Canada, New York City. This invention provides for a novel combination of central and outer braces with insulating linings secured to them, adapted to form three independent air-tight chambers, whereby a maximum carrying capacity with a minimum of dead weight is obtained, the insulated condition being maintained for an indefinite period, so that fresh meats, fruits, and other perishable articles may be safely transported for long distances with an economical consumption of ice.

SWITCH.—Henry H. Matt, Long Island City, N. Y. This is an improvement in switches adapted to be operated from a moving car. A switch point is pivoted on a bed plate beneath which is a chamber where a horizontally tilting lever is fulcrumed and connected at one end with the switch point, a guide plate with parallel grooves and with a rail section being arranged adjacent to the switch point, while a lever fulcrumed in the guide plate projects into the grooves, a connecting rod extending from the lever to the lever of the switch point.

SWITCH OPERATING DEVICE.—William F. Dermody, Brooklyn, N. Y. This is a device to be operated from a car in motion, the invention also providing means for automatically resetting the switch point after a car has passed. A shifting arm is attached to the pivot of the switch point, there being a locking bar normally in engagement with the arm and counterbalance weights connected with opposite sides of the bar, while a shifting bar adapted to be operated by a passing car is connected with the locking bar between the weights. There is a lever at the opposite side of the switch point to the shifting lever of the locking bar, the second lever being connected with the shifting arm of the switch point.

TROLLEY STAND.—Eleazer F. A. Heastings, Avalon, Pa. This is an improvement in devices mounted on the cars of electric railways to support the trolley pole, and comprises a flat-topped base on which a bracket is journaled to turn horizontally, and with arms between which is pivoted a second bracket carrying the trolley pole, bow springs clamped to the lower bracket having their upper ends pivoted to opposite ends of the second bracket. The device presses the trolley wheel firmly against the wire, but is so flexible that the wheel easily follows the wire through its different elevations.

CAR FENDER.—Marguerite Maidhof and Victor F. Maidhof, New York City. This improvement comprises a scoop-like fender consisting of a platform and a back, pivotally connected with each other and covered by a solid top or suitable netting. Near the front end of the platform portion of the fender are wheels or rollers traveling on the track rails, and the fender is pivotally suspended from the car by a pivot extending centrally from its vertical back portion through a pivot plate on the under side of the car. The head of the pivot is pressed on by a spring to permit of an up and down movement with the jolting of the car.

SAFETY GUARD FOR CARS.—Joseph W. Betz, Brooklyn, N. Y. A fender frame is, according to this invention, hinged by its rear end upon the car below the car body, there being rollers on the lower side of the frame, a spring-pressed latch slidable from the platform, and a retractile spring engaging the car and fender frame. When not needed for service the front end of the fender is held up from the track, under the car body, but it may be instantly released to drop into position to catch a person struck by the car, inclining forwardly and downwardly.

Mechanical.

TIRE BOLT WRENCH.—Joseph E. Campbell, Fairfax Station, Va. This tool consists of a pair of pivoted jaws, one of the jaws carrying two swiveling wrench heads connected by gears and the other jaw slotted and having at opposite ends bearings for a turning crank, while a sliding frame with a clutch screw is arranged to be adjusted in line with either wrench head, and a detachable turning crank has its end adapted to pass through either of the bearings and be seated in one of the wrench heads. It is a simple and practical tool for quickly and conveniently removing the nuts and bolts which fasten the tires to the felloes of vehicle wheels, even when they become rusted together.

MAKING METALLIC BODIES.—Hartley C. Wolfe, Bethlehem, Pa. This inventor has devised means for making pipes, cylinders, etc., in such way as to avoid welding flaws and render the mass very homogeneous. It comprises the use of a horizontal revoluble mould through which extends an adjustable mandrel, while a receptacle is adapted to receive the surplus molten metal from the mould. The metal rotates with the mould, while the axis of the mandrel is stationary, the metal being subjected to compression as the mould rotates.

Miscellaneous.

JOINT FOR ELECTRIC WIRES.—James H. Curry, Wilkesburg, Pa. This is an automatic safety joint consisting of a box or support having two insulated anchorage pins, and two arms connected with the pins by a loose slotted connection with supporting seats for sustaining the arms when under tension, a bridge connecting the arms, and means for holding them out of electrical contact when they fall away from the bridge. The improvement is designed to prevent accidents when live

wires become broken or detached and fall in the street, the brake then automatically cutting off the current from the ends of the wire. The joint may also be used as a substitute for the bell-shaped supports now used on overhead electric lines.

WHEEL FOR BICYCLES.—George W. Smiley and Forest W. Dunlap, London, England. This wheel has a pneumatic cushion between its hub and rim, and the tire is connected with the cushion by thrust spokes movable radially independently of the wheel rim, but guided by the wheel rim, so that while the wheel will be laterally and radially stiff, the elastic cushion, by which resiliency of tread is obtained, is transferred from the external tire to a point intermediate of the rim and hub, where it is not exposed to injury.

COFFEE DRYING APPARATUS.—Richard P. Hocking, Mayaguez, Porto Rico. For drying coffee after the red shell has been removed from the berry, this inventor has devised a simple and inexpensive apparatus whereby the berry may be subjected to constantly recurring currents of heated air, the air then finding ready exit from the apparatus, but this exit being under complete control. As the drying chamber or cylinders revolved the berries are constantly changing position, every portion of their surface being presented to the drying agent.

ICE CREEPER.—James R. Russell, Hopewell Hill, Canada. A flat metallic plate bent in U form to encircle the edge of the heel has two forward and a central rear calk, the plate being attached to a moccasin or shoe heel by screws. When the creeper is not needed, a block of leather, wood or other material, is formed with recesses for engagement with the calks, this block being held in place by a clamping bar to cover up the calks and form a heel with smooth bottom.

GATE.—Emil Neuhauser, Gridley, Ill. This inventor has made an improvement in gates to be raised or lowered by levers at opposite sides, the opening and closing mechanism being adjustable to balance a long or a short, a heavy or a light gate, and the operating mechanism making it impossible for the gate to remain on a center. When the lever is operated to open the gate the latch is disengaged from its keeper, the gate being automatically latched on closing. The construction is simple and inexpensive, and the mechanism is not likely to be interfered with by rain, snow or ice.

DOOR CHECK.—Jacob Suter, New York City. This device consists of two rigid, pivotally connected arms, one pivoted to the door jamb and the other adapted for detachable pivotal connection with the door. From the latter arm a bar is projected adjacent to the door, and adapted to form a brace for the arm, there being means for locking the bar to the door. It is a simple device for locking the door partly open for ventilation, etc., or for locking it closed.

EXTENSION TABLE.—Joseph Bohr, Westphalia, Mich. This table when closed is very compact, but it may be easily opened or extended, and its construction is designed to be very simple and inexpensive. The supporting frame has recesses in its upper edge, and a leaf is adapted to slide beneath the table top, while there are supporting arms secured to the leaf and projections on the arms which lie upon the top of the supporting frame.

CIGAR PIERCER.—John W. Miller, Dayton, Ohio. This is a little machine for cutting lengthwise slits in cigar tips, instead of cutting off their ends, to facilitate smoking. It has a depending slotted socket, with depressible top, in which the cigar end is placed, when the depression of the socket actuates a pair of blades to push them into the socket and into the tip on each side, the parts returning to normal position as the cigar is removed.

FISHING APPARATUS.—Peter S. and Alfred J. Downie, Marinette, Wis. This is an improvement in apparatus for what is known as pound fishing, extremely strong wire nets being used, so arranged that they may fold one upon another, and be dropped to the bottom to escape drifting, winds, etc. The sections of the nets are connected with each other and with the supporting stakes in such manner that they are freely suspended. Before winter sets in the stakes are cut off beneath the ice line, and are spliced when spring opens.

GRAVE SIGNAL.—Hubert Deveau, New York City. This is a device to be applied to a coffin in which a person is buried, and connected with an air pipe extending to the top of the ground, where it enters a signal casing so arranged as to indicate the fact should the buried person revive and move in the coffin.

DESIGN FOR A BOTTLE.—Carlton H. Lee, Boston, Mass. The body of this bottle has in general the configuration of a human skull, and on the bottom is a representation of cross bones.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

NEW BOOKS AND PUBLICATIONS.

THE DIATOM. By C. L. Peticolas. Richmond, Va. 24 page pamphlet. Price 10 cents.

Mr. Peticolas is well known as a microscopist and preparator of excellent slides of the Diatomaceae. This little pamphlet contains some accounts of the Virginia and New Jersey fossil deposits, with a catalogue of about 400 slides. The articles are reprinted from various microscopical journals.

LOCOMOTIVE MECHANISM FOR ENGINEERING. By H. C. Reagan, Jr. First edition, first thousand. New York: John Wiley & Sons. 1894. Pp. x, 296. Price \$2.

The author of this book, who is a locomotive engineer, has above all endeavored to make his book thoroughly practical. It is liberally illustrated and is arranged to a great extent on the following system: In the opening part of a chapter the consecutive text relating to the subject is given, and the chapter closes with a series of questions and answers. Numerous illustrations of engines

are given, as well as of their parts. The work appears to be thoroughly up to date and should be very well received.

THE STEAM ENGINE AND OTHER HEAT ENGINES. By J. A. Ewing. Cambridge: At the University Press. 1894. Pp. xiv, 400. Price \$3.75.

This volume is an amplification of the author's Encyclopaedia Britannica article on the steam engine. In the preface he states that it was written to serve as a university text book. It represents, from the standpoint of instruction as well as from that of theory, a thoroughly advanced and up to date treatise on the subject. Air, gas, and oil engines are included in its scope, although naturally the steam engine is the principal subject.

GAS LIGHTING AND GAS FITTING. By William Paul Gerhard. New York: D. Van Nostrand Co. 1894. Pp. 190. Price 50 cents.

Mr. Gerhard, the well known sanitary engineer, has here produced a very practical little work, written largely from the common sense standpoint and one which will prove of quite extended use. It is a book which may be read with benefit by the gas fitter and the private consumer.

A STUDENT'S TEXT BOOK OF BOTANY. By Sydney H. Vines. First half. London: Swan Sonnenschein & Co. New York: Macmillan & Co. Pp. x, 430. Price \$2.

This volume is the first part of a systematic treatise on botany for the use of students. It is devoted largely to morphology and the intimate structure of plants. The classification, however, occupying the second half of the work. In illustration, printing, and paper it leaves nothing to be desired, and when the second half is accessible, the student world will have at their command a most attractive treatment of the subject. The absence of an index in this volume, it is to be hoped, merely means that the complete index will appear in the second volume.

SCIENTIFIC AMERICAN BUILDING EDITION.

JULY, 1894.—(No. 105.)

TABLE OF CONTENTS.

- 1. An elegant plate in colors showing a half stone and half frame summer cottage erected at a cost of \$4,500. Perspective views and floor plans. Mr. H. Howard, architect, New York City. An attractive design.
2. Plate in colors showing a Queen Anne dwelling at Melrose, Pa., recently erected for W. H. Miller, Esq. Perspective elevation and floor plans. Cost \$8,500. Mr. A. M. Walkup, architect, Philadelphia, Pa.
3. Full page engraving of Nonsuch Palace.
4. A half-timbered house at Rosemont, Pa., recently erected for John H. Converse, Esq., at a cost of \$11,000. Perspective elevation and floor plans. Mr. T. P. Chandler, Jr., architect, Philadelphia, Pa. A handsome design.
5. Engravings and floor plans of a cottage at Jamaica, L. I., recently completed for B. S. Waters, Esq. A popular design of American style. Cost \$5,800 complete. Messrs. Daus & Osborne, architects, Brooklyn, N. Y.
6. Residence at Yonkers, N. Y., recently erected for Cheever N. Ely, Esq. Perspective elevations and floor plans. Mr. Augustus Howe, architect, New York. A pleasing design.
7. A dwelling at Hackensack, N. J., recently erected for Mrs. Maria Bogart. Perspective elevations and floor plans. Mr. W. L. Stoddard, architect, Tenafly, N. J. A model design.
8. A colonial cottage at Hartford, Conn., erected for W. F. Goody, Esq. An attractive design. Floor plans and perspective elevations. Cost \$4,750 complete. Mr. Henry D. Hooker, architect, New York City.
9. A residence at Edgewater, Ill., recently erected for G. F. Lange, Esq. Perspective elevations and floor plans. A pleasing design.
10. A residence at Bryn Mawr, Pa., recently erected for Prof. Herbert W. Smyth. Three perspective elevations and floor plans. Cost complete, \$6,500. Mr. J. C. Worthington, architect, Philadelphia, Pa.
11. A picturesque country cottage at Greenwich, Conn. Perspective elevations and floor plans. Messrs. A. H. Throp & W. S. Knowles, architects, New York City. An attractive design.
12. Design for a stairway.
13. Miscellaneous Contents: The passing of the carpet, illustrated.—Why not remodel the old home? illustrated.—Mott's "Sunray" steam boiler, illustrated.—Modern brick machinery.—The "Ideal" sash pulley, illustrated.—Improved wood working machinery, illustrated.—Elevators for the New Commercial building, Philadelphia.—Architectural wood turning, illustrated.—The Beverage cooker, illustrated.—The Variety wood worker, illustrated.—The "Monarch" fireproof partition, illustrated.—View of the Hotel Phoenix, Winston, N. C.

The Scientific American Architects and Builders Edition is issued monthly. \$2.50 a year. Single copies, 25 cents. Forty large quarto pages, equal to about two hundred ordinary book pages; forming, practically, a large and splendid MAGAZINE OF ARCHITECTURE, richly adorned with elegant plates in colors and with fine engravings, illustrating the most interesting examples of Modern Architectural Construction and allied subjects.

The Fullness, Richness, Cheapness, and Convenience of this work have won for it the LARGEST CIRCULATION of any Architectural Publication in the world. Sold by all newsdealers. MUNN & CO., PUBLISHERS, 361 Broadway, New York.

Business and Personal.

The charge for insertion under this head is One Dollar a line for each insertion: about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in the following week's issue.

"U. S." metal polish. Indianapolis. Samples free. Best Handle Mach'y. Trevor Mfg. Co., Lockport, N. Y. Wanted, a Coffee Pulper or Huller for plantation use. P. O. Box 136, Huntington, Mass.

Air compressors for every possible duty. Clayton Air Compressor Works, 26 Cortlandt Street, New York. Screw machines, milling machines, and drill presses. The Garvin Mach. Co., Light and Canal Sts., New York.

Centrifugal Pumps for paper and pulp mills. Irrigating and sand pumping plants. Irvin Van Wic, Syracuse, N. Y. Emerson, Smith & Co., Ltd., Beaver Falls, Pa., will send Sawyer's Hand Book on Circulars and Band Saws free to any address.

Split Pulleys at Low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works, Drinker St., Philadelphia, Pa.

The Carter Pressure Water Filter and Purifier, for hotels, factories, etc. See illustrated adv., page 335. Field Force Pump Co., Lockport, N. Y.

The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$4; Munn & Co., publishers, 361 Broadway, N. Y.

Competent persons who desire agencies for a new popular book, of ready sale, with handsome profit, may apply to Munn & Co., Scientific American office, 361 Broadway, New York.

Patent Electric Vise. What is claimed, is time saving. No turning of handle to bring jaws to the work, simply one sliding movement. Capital Mach. Tool Co., Auburn, N. Y.

Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway, New York. Free on application.

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information and not for publication. References to former articles or answers should give date of paper and page or number of question. Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and though we endeavor to reply to all either by letter or in this department, each must take his turn. Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same. Special Written Information on matters of personal rather than general interest cannot be expected without remuneration. Scientific American Supplements referred to may be had at the office. Price 10 cents each. Books referred to promptly supplied on receipt of price. Minerals sent for examination should be distinctly marked or labeled.

(6150) L. T. V. asks (1) how to find the amperage of lamps (16 candle power), 30 amperes at 110 volts being output of dynamo. A. The voltage of the dynamo fixes the voltage of the lamps as 110 volts. Then allowing 50 watts to 16 candle power, we have 50-110 or 0.45 ampere for the amperage of a lamp. Allowing for the loss in the wiring, it is safe to allow 60 lamps to the dynamo. 2. What is meant by ampere hour? A. One ampere of current flowing for one hour, or two amperes for half an hour, or half an ampere for two hours, and so on. 3. Can 110 volt lamp be used on a 50 volt circuit and 50 volt lamp on 110 volt circuit? A. No. The low potential lamps would have their filaments destroyed by the intensity of current due to so high a voltage, while high potential lamps on a low potential circuit would not become hot enough to give light.

(6151) E. F. C. writes: I have made a battery by placing a ring of electric light carbons around a rod of zinc. The carbons are all connected by a copper wire passing through them. I use sal-ammoniac solution. In a short time a bluish creeping salt forms upon the tops of the carbons and upon the wire and eats it off. The wire is above the board which holds the carbons. Will you tell me the name of this substance and how to prevent its eating the wire? A. You should have dissolved off the copper from the immersed portions of the carbon and then have coated the upper ends with paraffin applied hot. The green substance is a compound of copper, a basic oxychloride probably. It may be necessary to coat your connecting wires near the carbons also. Be careful not to destroy the contact between wires and carbon.

(6152) W. C. P. — Aluminum has but little more than one-half the strength of iron. The pressure that a cylinder will bear depends upon its thickness. Additional weight by air compression is one pound for each 13 cubic feet of free air compressed in the cylinder.

Communications Received.

"On Herr Dowe's Bullet-Proof Cuirass." By S. M. M. "On University of New York Building." By S. V.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

July 3, 1894,

AND EACH BEARING THAT DATE.

(See note at end of list about copies of these patents.)

- Abdominal supporter, B. F. Golding..... 522,366
Abdominal supporter, M. A. Woods..... 522,394
Advertising device, aerostatic, N. Burgess..... 522,505
Alarm. See Fire alarm.
Alfalfa track cleaner, Harris & Allen..... 522,205
Analagator, E. J. Powell..... 522,438
Armonia, apparatus for obtaining, L. Sternberg..... 522,357
Axle, vehicle, W. H. Bustin..... 522,402

Bag, See Mesh proof bag, 522,208
 Baling press attachment, J. J. Hiser, 522,210
 Ball and socket joint, M. Walker, 522,230
 Band cutter and feeder, C. Van Riesen, 522,230
 Battery, See Galvanic battery, 522,230
 Bearing, for connecting rods or links, adjustable, W. & F. Brockhausen, 522,335
 Bearings with loose rollers, guide for, J. W. Hyatt, 522,214
 Bed, hospital, A. Helander, 522,342
 Bed, portable folding, S. C. Wherry, 522,560
 Bicycle, S. 522,342
 Bicycle gear, A. D. Anthony, 522,541
 Bicycle traveling case, E. Andrews, 522,186
 Billiard cue tip fastener, A. Schneider, 522,305
 Bimetallic plates, manufacture of, E. Martin, 522,347
 Bin, See Drainage bin, 522,347
 Bit, See Bridge bit, 522,347
 Block, See Derrailing block, 522,432
 Blotter, ink, Rudge & Doolittle, 522,432
 Boiler, See Sectional boiler, Steam boiler, Water tube boiler, 522,393
 Boiler feed, H. J. Weisser, 522,393
 Boiler feeder, H. J. Lange, 522,474
 Boiler furnace, smokeless, E. Healey et al, 522,380
 Boiler furnace, smokeless, J. Myerscough, 522,380
 Boiler heads, machine for making, I. B. Davis, 522,139
 Boiler setting, regenerative, G. S. Strong, 522,331
 Boilers, oil injector for steam, G. J. Nopper, 522,539
 Bolt lock, H. P. Brown, 522,287
 Bolts with threaded or gimlet points, machine for providing, W. R. Wilbur, 522,246
 Bookbinder, temporary, T. Maus, 522,247
 Bookbinding strips, machine for applying, J. I. Knight, 522,423
 Books and carbon sheets, holder for manifold, J. S. McDonald, 522,27
 Boss or shank, means for attaching India rubber, etc., to the sole of, H. Menier, 522,477
 Bottle stopper, valve, Gault & Schrader, 522,203
 Bottles, device to prevent fraudulent filling of, Cranall & Russell, 522,405
 Box, See Hat box, 522,354
 Box strap, H. Schmelz, 522,354
 Braiding machine, J. McCabey, 522,481
 Brille bit, W. C. Wittmann, 522,572
 Brush, J. A. Sampson, 522,535
 Burglar alarms, window spring for, J. Steiner, 522,277
 Button, Shibley & Hyde, Jr, 522,259
 Calumet, street vendors, M. P. Pierson, 522,456
 Calender, roller, G. Fouse, 522,251
 Can, See Oil can, 522,261
 Can body forming machine, Leavitt & Hodgson, 522,270
 Can heading machine, Norton & Hodgson, 522,270
 Can opener, C. A. & W. Hult, 522,213
 Can testing machine, J. G. Hodgson, 522,259
 Car coupling, G. A. Theobald, 522,439
 Car fender, A. L. Clarke, 522,194
 Car fender, W. V. Cleary, 522,449
 Car fender and brake, H. Maass, 522,530
 Car fender, safety, Harding & Fitzhugh, 522,412
 Car hand, T. Talbot, 522,434
 Car motor, G. H. Burrows, 522,574
 Car motor, G. H. Burrows, 522,574
 Car motor, M. W. Iles, 522,418
 Carburators, air supplying apparatus for, G. H. Burrows, 522,573
 Card frame or mount, J. P. Odgers, 522,484
 Carpet sweeper, E. H. Redden, 522,476
 Carriage tops, lock prop joint for, L. G. Mayer, 522,476
 Carriage wheel, M. V. Wencher, 522,348
 Cartridge, E. D. Brainard, 522,313
 Case, See Bicycle traveling case, File case, 522,389
 Cash register and indicator, C. Price, 522,389
 Casks, machinery for manufacturing, Stevens & Baker, 522,537
 Channeling machine, H. C. Sergeant, 522,236
 Charring tool for ornamenting wood, etc., J. F. Krueger, 522,328
 Chisel, J. A. Artbur, 522,292
 Chisel, mortising, J. A. Artbur, 522,292
 Chisel, mortising, R. E. Redden, 522,548
 Chutes of coal or ore chocks, counterbalance mechanism for, R. W. Ericson, 522,519
 Circuit breaker, electric automatic, C. W. Larson, 522,527
 Clock sash, A. M. Lane, 522,298
 Cloth napping machine, H. S. & T. H. Greene, 522,560
 Cloth napping machine, E. Schwemmelich, 522,497
 Clutch coupling, B. A. Stone, 522,515
 Cock, self-lubricating stop, E. M. Dart, 522,218
 Coffin lid hinge and fastener, W. C. Langenau, 522,218
 Coin holder, F. E. Armitage, 522,311
 Coin sorting and packaging device, F. E. Armitage, 522,311
 Combustion fuel, smokeless, M. M. Armstrong, 522,187
 Cooler, steam, W. E. Beveridge, 522,310
 Cooling or condensing apparatus, G. A. Barnard, 522,363
 Coping, J. D. Davis, 522,320
 Cotton press, W. S. Liddell, 522,320
 Coupling, See Car coupling, Clutch coupling, 522,379
 Crane, M. J. Roberts, M. & S. B. Meedy, 522,379
 Crate, shipping, J. Z. Taylor, 522,538
 Cream separator, centrifugal, G. M. Andersson, 522,280
 Current motor, alternating, J. F. Kelly, 522,344
 Current motor, alternating, W. Sanley, Jr, 522,364
 Currents, producing continuous motion by alternating, 522,345
 Cutter, See Band cutter, Expansive cutter, Ice cutter, Meat cutter, 522,262
 Cutter sleeve, rotary, Loomer & Belmer, 522,262
 Hammer, R. M. Hermance, 522,521
 Decanting material, P. M. Heerwagen, 522,309
 Dental abrader, J. H. How, W. S. How, 522,300
 Dental apparatus, W. Wright, 522,300
 Dental articulator, G. K. Bagby, 522,188
 Dental bite plate, W. S. How, 522,212
 Dental engine angle attachment, C. H. Davis, 522,201
 Dental engines, adjustable bracket for, A. W. Browne, 522,552
 Deoxidizing or oxidizing apparatus, Kittsen & Browne, 522,422
 Derrailing block, M. Mitchell, 522,300
 Dish cleaner, McCarten & Dickson, 522,565
 Doubling frame stop motion, Richards & Lucas, 522,495
 Drainage bin and chute, T. Craney, 522,496
 Drum or radiator, heating, J. L. Reid, 522,534
 Electric circuits, distributing board for, R. Herman, 522,370
 Electric converter, Burton & Angell, 522,507
 Electric machine, alternating current dynamo, E. Thomson, 522,241
 Electric machine, dynamo, C. E. Scribner, 522,274
 Electric machine of motor, dynamo, C. S. Bradley, 522,286
 Electric machine regulator, dynamo, C. E. Scribner, 522,275
 Electric switch, J. Van Vleck, 522,332
 Electric wires, self-locking cleat for, E. Nashold, 522,302
 Electrode, secondary battery, W. Morrison, 522,479
 Electrotype or stereotypes for printing, making curves, J. H. Terry, 522,319
 Elevator, See Portable elevator, 522,429
 Elevator guide sheave, N. P. Otis, 522,429
 Elevator safety device, W. P. Kiefer, 522,297
 Engine, See Rotary steam engine, 522,544
 Engines, starting appliance for compound, D. A. Wrightman, 522,544
 Eraser, blackboard, J. D. Kiouss, 522,449
 Expansive cutter, J. H. Calkins, 522,403
 Fabric, See Woven fabric, 522,409
 Fats, making cable, J. H. Filbert, 522,375
 Fence, wire, J. J. Ives, 522,375
 Fence, wire, J. J. Shalvey, 522,355
 Fence, wire, F. Schellberger, 522,398
 Fender, See Car fender, 522,561
 Fertilizer, mineral, E. Gulick, 522,237
 Filter, Cummings & Field, 522,407
 Filter, water, A. F. Cook, 522,512
 Fire alarm, automatic, C. A. Mann, 522,434
 Fire alarm system, auxiliary, J. Sachs, 522,231
 Fire apparatus, door opener for, D. H. Burke, 522,315
 Fire kindler, automatic, H. H. Sanner, 522,353
 Fireproof construction, W. L. Caldwell, 522,193
 Fisherman's reel, F. V. De Bem, 522,503
 Fishing apparatus, electrical, E. Poppowitsch, 522,352
 Fishing reel, J. S. Freese, 522,325
 Flanging or hemming edges of tin plates, etc., machine for, J. G. Hodgson, 522,254
 Floor and floor block, T. A. Lee, 522,425
 Floor construction, fireproof, T. A. Lee, 522,426
 Flour bolt, rotary, L. Hertzer, 522,532
 Flour holder for dens' use, S. M. Flint, 522,431
 Fruit gatherer, H. M. Rabun, 522,492
 Fumigator, poultry, B. Coddington, 522,337
 Furnace, See Boiler furnace, Hot air furnace, 522,340
 Furnace, A. Jay, 522,215
 Furnace, automatic device for feeding megass, W. P. Adell, 522,445
 Furnaces, forehearth for smelting, M. W. Iles, 522,417
 Fuse, electric safety, J. Sachs, 522,232
 Gauge, C. B. Bosworth, 522,351
 Galvanic battery, F. Fullner, 522,351
 Garbage receptacle, J. D. Houseman, Jr, 522,235
 Gas burner, automatic, H. Lueder, 522,430
 Gas burner, automatic, J. J. Myers, 522,430
 Gas making apparatus, J. W. Kenevel, 522,325
 Gases with liquids, apparatus for mixing, C. & F. Bartlett, 522,395
 Gate and registering mechanism, S. Brown, 522,191
 Generator, See Steam generator, 522,293
 Glove fastener, B. H. Dewee, 522,293
 Gold and silver, from their solutions in potassium cyanides, abstracting, W. D. Johnston, 522,260

Governor, centrifugal, L. O'Hara, 522,382
 Gram, etc., apparatus for cleaning, H. Jones, 522,421
 Gram conveyor, pneumatic, F. E. Duckham, 522,458
 Grain conveyers, delivery apparatus for pneumatic, 522,457
 Grate, C. Brandt, 522,180
 Gully catch pit and trap, J. Phillips, 522,351
 Gun, breech-loading break-down, A. H. Fox, 522,464
 Halter, rope, T. Doble, 522,185
 Hame attachment, J. A. Span, 522,456
 Handle, See Saw handle, Sheet metal handle, 522,456
 Hanging fire hammer, 522,456
 Harrow, lever adjusting, W. E. Smith, 522,434
 Harrow, spring tooth, W. E. Smith, 522,435
 Harvester, corn, R. Peterson, 522,385
 Hat box, J. Weber, 522,392
 Hats, ventilating, V. Brown, 522,539
 Head rest, A. W. Brown, 522,189
 Head rest, W. E. Hunt, 522,563
 Heater, See Hot water heater, 522,453
 Heater, H. C. Cowley, 522,453
 Heating apparatus, hot water, S. N. Murgittroyd, 522,226
 Heel, C. L. Schrader, 522,234
 Hinge, awning blind, A. Hewes, 522,235
 Hinge, window blind, W. H. Lindsay, 522,235
 Hony mill, R. G. Jencks, 522,485
 Hook and eye, F. W. Wall, 522,541
 Hoop baring and bending machine, Pleukharp & Schramm, 522,487
 Horse blanket, A. F. Ransom (r), 11,427
 Hot air furnace, T. F. Kinley, 522,391
 Hot air register, R. S. F. Russell (r), 11,426
 Hot air register, W. M. Dyas, 522,391
 Hot water heater, W. Vanderman, 522,453
 Hub band, J. Maris, 522,235
 Ice cutter, J. G. P. Putnam, 522,499
 Ice lowering apparatus, C. J. Foster (r), 11,425
 Impact tool, J. F. Clement, 522,511
 Insect powder, cluster, T. Nagle, 522,301
 Insulating material, manufacturing, Tinneholm & Peterson, 522,242
 Insulator, R. Mace, 522,428
 Jib spirit, G. Hook, 522,244
 Joint, See Ball and socket joint, 522,485
 Knitting machine, circular, H. A. Houseman, 522,210
 Knockdown table, S. J. Lucashovski, 522,221
 Ladder, step, B. A. Wright, 522,444
 Lamp, electric arc, E. & F. W. Heymann, 522,234
 Lamp, electric arc, J. F. Kester, 522,232
 Lamp, electric arc, A. Schweitzer, 522,232
 Lamp, electric arc, A. W. Smith, 522,276
 Lamp lighter, F. Ferguson, 522,462
 Leather waxing machine, E. Guay, 522,411
 Letters or other designs on cardboard, forming, C. D. Vassiliades, 522,442
 Liquid dispensing apparatus, W. M. Fowler, 522,322
 Lock, See Ball and socket joint, 522,430
 Lock, J. J. Ridgway, 522,430
 Locomotive ash pan, H. R. Walker, 522,540
 Locomotive draw bar, P. Leeds, 522,288
 Log carrier, R. E. Terry, 522,340
 Loom, W. G. Connell, 522,554
 Lubricator, G. H. Burrows, 522,447
 Manufacturing apparatus gauge, L. M. Bannan, 522,376
 Manual motor, M. Johnson, 522,376
 Marking tool, L. Schaefer, 522,433
 Mattress and bed-pan, combined, G. C. Dougherty, 522,292
 Meat cutter, W. Keenen, 522,424
 Metallic powder, 522,415
 Mill, See Hony mill, Pulverizing mill, 522,415
 Moistening apparatus, centrifugal air, G. Josephy, 522,217
 Moth proof bag, J. Weinheimer, 522,242
 Motion, machine for converting, J. P. Buckley, 522,249
 Motor, See Current motor, Manual motor, 522,314
 Music or other books, apparatus for turning over leaves of, W. Coates, 522,336
 Necktie holder, E. Staelin, 522,372
 Negative retouching apparatus, C. Hornberger, 522,372
 Nut lock, H. Henderson, 522,562
 Oil, See Oil can, Oil can, 522,218
 Oil can, J. H. Quisenberry, 522,309
 Ornamerent recoil check, J. B. G. A. Canet, 522,546
 Ores, process of and mechanism for smelting, C. M. Allen, 522,410
 Organ, J. P. Ellis, 522,250
 Paper box covering machines, chuck for, I. Dreyfuss, 522,338
 Paper, making transparent transfer, M. Pfaffen-zeller, 522,350
 Paper pulp, bears in imitation of natural wood, making, W. N. Cornell, 522,513
 Parolot for baby carriages, W. A. Marqua, 522,235
 Parcel holder, W. A. Crane, 522,196
 Penholder, E. P. McCallen, 522,482
 Picture hanger, L. Church, 522,510
 Pin, S. Dancyer, 522,244
 Pin, S. Dancyer, 522,244
 Pipe fitting, combination tool for, J. Kohler, 522,471
 Pipe holder, J. B. Davis, 522,156
 Pipes, drainage trap for steam, E. E. Gold, 522,367
 Planter and tobacco mill, combined, T. L. Gray, 522,367
 Planter, chain, G. R. McGinnis, 522,351
 Plug, swivel, Galt & Trembley, 522,279
 Plunger operating mechanism, C. Whitfield, 522,279
 Pneumatic tubing, C. W. S. Turner, 522,278
 Portable elevator, W. M. S. Garrison, 522,252
 Powder, See Metallic powder, 522,415
 Press, See Cotton press, Roller press, Wine press, 522,502
 Printer's quoin, D. C. Breed, 522,542
 Printing machine, M. Wright, 522,502
 Printing surface and making same, A. Ten Winkel, 522,547
 Printing surfaces, producing, A. Ten Winkel, 522,547
 Pulley, friction clutch, J. McCahey, 522,551
 Fuller, sheave, 522,486
 Pulp screen, J. J. Flanders, 522,483
 Pulverizer and barrow, A. D. Powers, 522,489
 Pulverizing mill, F. J. Judd, 522,377
 Pump, rotary, S. N. Eisler, 522,518
 Puzle, C. A. Emerson, 522,550
 Radio, for, 522,550
 Rails, renewing old steel, E. W. McKenna, 522,228
 Railway conduit, electric, A. T. Fay, 522,440
 Railway, conduit electric, J. H. Tyrrell, 522,440
 Railway crossings, electric alarm signal for, J. J. Ross, 522,431
 Railway frog, A. L. Stanford, 522,240
 Railway frog, electric, J. Meyer, 522,349
 Railway signaling apparatus, P. Ribard, 522,494
 Railway signaling, electric terpede apparatus and system for, J. W. Lattig, 522,528
 Railway signaling, terpede machine or apparatus for, J. W. Lattig, 522,473
 Railway switch, electric, R. M. Hunter, 522,350
 Railway switch, R. E. Terry, 522,568
 Railway switch, J. I. Vernon, 522,388
 Railway switch and trolley, electric, F. S. Perrin, 522,388
 Railway track sanding apparatus, C. W. Sherrburne (r), 11,424
 Rail ways, wire support for overhead electric, A. W. Judd, 522,216
 Refrigerator, A. Schuyler, 522,386
 Refrigerator car, F. E. Candia, 522,448
 Register, See Cash register, Hot air register, 522,455
 Register for baskets, etc., A. B. Culver, 522,472
 Revolver cylinder, J. Lamm, 522,247
 Rivets, studs, etc., manufacturing, W. S. Wilson, 522,247
 Roller press, S. Tuttle, 522,243
 Rolling pin and dough cutter, combined, C. S. Goodough, 522,465
 Roofing, J. C. H. Schultz, 522,330
 Rotary steam engine, J. A. Johnson, 522,296
 Rubber, etc., process of and composition for manufacturing substitutes for India, A. A. Blant, 522,312
 Sash weight, C. S. Sergeant, 522,488
 Saw frame, buck, Knowles & Adams, 522,470
 Saw handle, E. J. Fulghum, 522,558
 Saw straightening device, M. Covel, 522,316
 Scaffold, adjustable, M. King, 522,326
 Scraping apparatus, C. Vivian, 522,443
 Screen, See Pulp screen, 522,483
 Screw cutting die stock, J. J. Harrison, 522,296
 Screw machine, C. C. Hill, 522,207
 Screw threads, automatically opening die for cutting, J. Hartness, 522,413
 Sealing wax, hemp, etc., machine for, Domstherpe & Burrows, 522,514
 Seaming machine, can, E. P. Helden, 522,255
 Seams of sheet metal cans, machine ferrolling or crimping end, J. G. Hodgson, 522,255
 Seams of sheet metal cans, machine ferrolling or crimping end, E. Norton et al, 522,269
 Sectional boiler, W. Vanderman, 522,441
 Seeder, F. R. Packham, 522,329
 Separator, See Cream separator, Steam separator, 522,289
 Sewing machine table, W. M. Cuthbert, 522,289
 Shade fixture, window, H. Parker, 522,334
 Shade shifter, adjustable window, C. B. Corbin, 522,357
 Shade, window, H. Parker, 522,334
 Shaft support, vehicle, W. Irving, 522,420
 Sharpening device, knife or scissors, T. T. Hesack, 522,373
 Sharpening machine, razor, C. A. Worden, 522,381
 Sheet metal handle, M. Bersted, 522,388
 Sheet metal boiler, H. Martini, 522,348
 Sheet ankie supporting, Horn & Mayer, 522,371
 Skate, J. Forbes, 522,321
 Slicer, vegetable, P. L. Mars, 522,266
 Soldering machine, can, J. G. Heussen, 522,258
 Soldering machine, side seam, J. G. Hodgson, 522,256
 Spooling frame yarn guide, G. E. Mayhew, 522,278
 Spinning mangle, D. M. Pinckney, 522,290
 Sprocket wheel for chains, W. A. Legge, Jr, 522,427
 Stamp, rubber, R. S. Hall, 522,467
 Stand, See Washstand, 522,271
 Steam boiler, M. H. Plunkett, 522,271
 Steam boiler, water tube, A. W. Shearer, 522,298
 Steam generator, P. Dublin, 522,271
 Steam separator, M. W. Iles, 522,416
 Steam train, J. McKellar, 522,288
 Steam trap, J. J. Royle, 522,496
 Sterilizing purposes, receptacle for, O. B. W. Schler, 522,235
 Steaming wheel, F. B. Verger, 522,546
 Stepper, See Bottle stopper, 522,203
 Strap, See Box strap, 522,354
 Sugar from sorghum, extracting, G. Menselise, 522,478
 Switch, See Electric switch, Railway switch, 522,308
 Switch closer, automatic, W. I. Wands, 522,219
 Switch lock, D. Lavery, 522,219
 Tag, See Knockdown table, 522,221
 Tags, machine for the manufacture of shipping, G. F. Danielson, 522,514
 Teaching telegraph, machine for, T. M. Crepar, 522,454
 Telegraph repeater, A. D. P. Weaver, 522,500
 Telephone transmitter, W. R. Cole, 522,404
 Telephone transmitter, H. Hutin & Leblanc, 522,544
 Tent and awning, P. F. Neenan, 522,483
 Thimble, H. White, 522,245
 Thrasher and separator, combined pea, J. F. Rhodes, 522,493
 Thrashing machines, automatic feeder for, R. L. Cooley, 522,451
 Time sheet holder and guide, combined, F. Clemens, Jr, 522,195
 Toe weight, divisible, J. Clark, 522,288
 Tooth, artificial, E. Bowles, 522,400
 Toy, whistling, E. J. Lumley, 522,241
 Track crossing, M. W. Iles, 522,419
 Tracing apparatus, apparatus for, M. L. Wendling, 522,244
 Tractor, See Steam tractor, 522,550
 Trolley arms, combined for, A. T. Fay, 522,61
 Trolley wheel, C. E. Bestwick, 522,550
 Trolley wire suspension clip, W. F. D. Crane, 522,362
 Truck, electric rail way car, F. O. Blackwell, 522,189
 Truck, hand, J. Frenette, 522,202
 Truck safety attachment, car, L. F. Fisher, 522,318
 Truck, S. Bezman, 522,318
 Trunk, writing desk, E. Von Prell, 522,386
 Tunnel, subaqueous, E. H. Lunken, 522,222
 Typewriting machine, C. H. Boynton, 522,285
 Typewriting machine, G. W. N. Vest, 522,333
 Typewriting machine, pneumatic, W. Raab, 522,491
 Valve mechanism, Kelly, 522,314
 Valve mechanism, E. Reynolds, 522,273
 Valve mechanism, blowing engine, E. Reynolds, 522,273
 Valve, tank flushing, J. J. Berry, 522,397
 Vehicle gear, F. J. Buff, 522,401
 Ventilator, P. Geerlitz, 522,410
 Veneer holder, M. H. Plunkett, 522,545
 Vise, bench, T. J. Walsh, 522,501
 Wagon seat, R. Peterson, 522,387
 Washstand, portable, M. H. Wickman, 522,571
 Watchcase spring, J. H. Fleming, 522,320
 Watch oil or back machine, H. M. Crowell, 522,317
 Water closet seat, P. J. Cahill, 522,553
 Water tub holder, M. H. Plunkett, 522,545
 Wheel, See Carriage wheel, Tractor wheel, 522,372
 Windmill power transmitter, W. E. Snelles, 522,307
 Window guard, Hicketcher & Theobald, 522,523
 Wine press, Zwiarg & Schworer, 522,334
 Wood, preserving, J. R. Bate, 522,284
 Woodworking machine, W. Lyon, 522,475
 Woodworking machines, carrier chain for feeding boards to, B. G. Luther, 522,223
 Woven fabric, W. G. Connell, 522,555
 Wrapping machine, newspaper, L. C. Crowell, 522,198
 Wrapping newspapers, method of and machine for, L. C. Crowell, 522,197

Advertisements.

ORDINARY RATES. Inside Page, each insertion - - 75 cents a line. Back Page, each insertion - - \$1.00 a line. For some classes of Advertisements, Special and Higher rates are required. 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.

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. 65 Water Street, Seneca Falls N. Y.

LATHES, Shapers, Planers, Drills, Machine Shop. Outfits, Foot Lathes, Tools and Supplies, Catalogue Free. SEBASTIAN LATHING CO., 120 CHELSEA ST., CINCINNATI, O.

MANUFACTURE TO ORDER. SPECIALTIES & NOVELTIES—PATENTED ARTICLES—SMALL OR FINE MACHINERY. SEND FOR CATALOGUE. OTTO KONIGSLOW, 49 MICHIGAN ST. CLEVELAND, O.

EXPERT MODEL MAKING. Established 1867. J. C. SEYD, Prop. Chicago Model Works, Chicago, Ill. 179 E. Madison St. Write for Catalogue of Model Supplies.

DO YOUR OWN PRINTING. Card Press, \$3. Circular size \$5. Small Newspaper Press, \$4. All easy, printed rules. Money maker and saver. Stamp for catalogue, presses, type, paper, etc., factory. KELSEY & CO., MERIDEN, CONN.

GAS AND GASOLINE ENGINES. 2 TO 100 H. P. Noiseless, Simple, Economical, Durable. Guaranteed Lowest Gas Consumption. 17 ft. x 8 in. 10 h. p. 14 in. x 10 in. 20 h. p. 18 in. x 14 in. 30 h. p. 24 in. x 18 in. 40 h. p. 30 in. x 24 in. 50 h. p. 36 in. x 30 in. 60 h. p. 42 in. x 36 in. 80 h. p. 48 in. x 42 in. 100 h. p. 54 in. x 48 in. Average cost per h. p. on Gasoline, one-half pint per hour. Six gallons Gasoline—M. ft. Gasoline used direct without Carburetor. Actual Brake h. p. guaranteed. Works on any gas. For electric lighting it is as accurately governed as any steam engine at same speed. Sold on TRIAL and under absolute guarantee. Adaptable to all power purposes. Send for circular. WHITE & MIDDLETON GAS ENGINE CO., 729 to 735 E. Pratt Street, Baltimore, Md.

Durable—Easily Applied. This roofing is manufactured from natural Trinidad asphalt materials, and will not dry up and become brittle under exposure to the weather as coal-tar roofings do. Send for Free Samples and Circulars to WARREN CHEMICAL & MFG. CO., 85 Fulton Street, New York, U. S. A.

\$2.75 Complete with 60 Natural Finish Baby Carriage. Includes complete with painted steel wheels, axle, springs, and one year's trial. Made of best material. Fully guaranteed. Satisfaction guaranteed for 2 years. Shipped on 1 day's trial. \$30.00. 24 hours money returned. We are the only firm who have a complete line of baby carriages. Write for circular. OXFORD MFG. CO., 340 Wabash Ave., Chicago, Ill.

NOW READY! Fourteenth Edition of Experimental Science

EXPERIMENTAL SCIENCE. GEORGE M. HOPKINS & CO. Revised and Enlarged. 120 Pages and 110 Superb Cuts added.

Just the thing for a present for any man, woman, student, teacher, or any one interested in science. In the new matter contained in the last edition will be found the Scientific Use of the Phonograph, the curious optical illusion known as the Anorthoscope, together with other new and interesting Optical Illusions, the Optical Projection of Opaline Objects, new experiments in Projection, Iridescence, Glass, screen, points in Photography, including Hand Cameras, Case Cameras, etc.; Systems of Electrical Distribution, Electrical Ore Finder, Electrical Ricker, Electric Chimes, How to Color Lantern Slides, Study of the Stars, and a great deal of other new matter which will prove of interest to scientific readers. 240 pages, 72 fine cuts, substantially and beautifully bound. Price in cloth, by mail, \$1. Half morocco, \$3. Send for illustrated circular. MUNN & CO., Publishers, Office of the SCIENTIFIC AMERICAN, 361 BROADWAY, NEW YORK.