

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.

Marine Iron Works. Chicago. Catalogue free. For mining engines. J. S. Mundy, Newark, N. J. "U. S." Metal Polish. Indianapolis. Samples free. Gasoline Brazing Forge, Turner Brass Works, Chicago. Yankee Notions. Waterbury Button Co., Waterbury, Ct. Handle & Spoke Mch. Oberlathe Co., Chagrin Falls, O. We buy patents on specialties, or manufacture on royalty. V. P. Van Horne & Co, Dayton, Ohio. Gasoline Engines and Launches. Free catalogue. Geo. H. Gere Y. and L. Works, Grand Rapids, Mich. FERRACUTE Machine Co., Bridgeton, N. J. Full line of Presses, Dies and other Sheet Metal Machinery. Improved Bicycle Machinery of every description. The Garvin Machine Co., Spring and Varick Sts., N. Y.

The celebrated "Hornsby-Akroyd" Patent Safety Oil Engine is built by the De La Vergne Refrigerating Machine Company. Foot of East 138th Street, New York.

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.

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 This is for our information and not for publication.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.

(7463) W. V. asks: 1. Can the same length of spark be obtained in the induction coil of SUPPLEMENT, No. 160, by using No. 30 or 31 single cotton covered wire instead of No. 36? If not, what length will they give? A. No. If wound equally close, the spark will be about one quarter as long with No. 30 as with No. 36 wire. 2. What size will the tinfoil in the condenser be? A. The size of the condenser is determined by the primary current and would not be changed whatever changes were made in the secondary winding. Cut the sheets of tinfoil to go into the box at base of coil. The proper surface of tinfoil is 40 square feet. 3. Do you have a SUPPLEMENT that tells you how to make a folding camera, size 4x5 or 5x7? What number is the SUPPLEMENT? A. For folding camera, see SUPPLEMENT, No. 102L. For mode of making bellows, see SUPPLEMENT, No. 625. Other articles may be found in SUPPLEMENTS, No. 806 and 1064, price 10 cents each by mail.

(7464) S. E. writes: Please send me a SUPPLEMENT containing an article on the prevention of creeping salts in a sal ammoniac battery. A. We do not know any separate article on the checking of creeping of salts in battery jars. It is done by the following method: Take paraffine wax, 2 parts; vaseline, 1 part. Melt together. Clean and dry the cells. Dip the neck of the cell about an inch into the melted solution. By dipping obliquely and rolling the jar around, it will be coated on the inside as well as on the outside. Over this surface the salts will not creep.

(7465) W. G. R. asks: Have you any book or books giving a full explanation of differential arc light system? A. A valuable series of papers on the arc light appeared in the SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 1047-1052, also one on driving powers, equalizers, etc., in SUPPLEMENT, Nos. 694, 695, 696, price ten cents each by mail.

TO INVENTORS.

An experience of fifty 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 unequal 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

JULY 5, 1898,

AND EACH BEARING THAT DATE.

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

Air brake, M. Corrington, 606,708
Air brake, F. L. Guillemet, 606,712
Air compressor, hydraulic, Noack & Grossman, 606,732, 606,733
Alarm, See Burglar alarm. Low water alarm, 606,946
Animal dipping tank, E. A. Steen, 606,948
Autoluminescent composition, Sissoyeff & Braly, 606,938
Automatic can, F. Lowe, 606,931
Ball and socket joint clamp, J. W. Bragzer, 606,914
Band or cord, endless, J. H. Murphy, 606,936

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 be advertised 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.

WOOD of METAL WORKERS without steam power can save time and money by using our Foot and Hand Power Machinery SEND FOR CATALOGUES— A—Wood-working Machinery. B—Lathes, etc. SENeca FALLS MFG. COMPANY, 685 Water St., Seneca Falls, N. Y.

AMERICAN PATENTS.—AN INTERESTING and valuable table showing the number of patents granted for the various subjects upon which petitions have been filed from the beginning down to December 31, 1894. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 1002. Price 10 cents. To be had at this office and from all newsdealers.

POWER & FOOT LATHES. SHAPERS, PLANERS, DRILLS, MACHINE SHOP OUTFITS, TOOLS, AND SUPPLIES. CATALOGUE FREE. SEBASTIAN LATHES CO. 120 CULBERT ST. CINCINNATI, O.

MACHINE DESIGN,

Mech. Drawing, Mech. and Electrical Engineering, Taught at Your Home for \$2 Per Month. This pays for Text Books, Drawing Plates, and Instruction until you complete the course. Write for free S. A. Circular. THE UNITED CORRESPONDENCE SCHOOLS, F. W. Ewald, Gen. Mgr. 154-158 Fifth Ave., N. Y.

Pipefitters! Your Kit is not complete unless it includes the famous STILLSON WRENCH which is particularly adapted for turning out the best work without crushing the pipe in the least. All parts are drop-forged. Once tried, it is always used. It has many imitations but no equals. See explanatory cuts. Price 10 cents on application to WALWORTH MFG. CO., 20 Oliver Street, Boston, Mass.

ROUND OR SQUARE BASE SKINNER IMPROVED PLANNER. CHUCKS, Heavy stocks accurately made. Greater capacity than any other chuck. Set screws of crucible steel. All nuts case-hardened. Drop forged steel wrench with each chuck. Holds straight or taper work. Can be instantly adjusted from 0 to greatest capacity. SKINNER CHUCK CO., Church St., New Britain, Conn.

ARMSTRONG'S PIPE THREADING AND CUTTING-MACHINES Both Hand and Power. Sizes 1 to 6 inches. Water, Gas, and Steam Fitters' Tools. Hinged Pipe Vises. Pipe Cutters. Stocks and Dies universally acknowledged to be THE BEST. Send for catalog. THE ARMSTRONG MFG. CO., Bridgeport, Conn.

TRANSITS AND LEVELING INSTRUMENTS. NEW ADJUSTABLE BENCH LEVEL Bottoms ground true. Vials ground and graduated. Size 4 in. to 18 in. Price \$2.50 to \$8. For book on the level. C. F. RICHARDSON & SON, P. O. Box 977, ATHOL, MASS., U.S.A.

The MIDGET Smallest Generator Out. Weighs 3/4 lbs. Will light our 6 c. p. lamp. Ring bells. Explodes powder, run as a motor on current from battery or Model dynamo, etc. Output 10 Watts, Voltage 4 or 6 as desired. ELECTRICAL APPARATUS COMPANY, Elbridge, N. Y.

SUB-PRESS PUNCHES AND DIES We make to order drawings or models blanking, shaving and swaging dies, either simple or compound, for work requiring accuracy and finish. Sub-Press Dies for the parts of watches, clocks, cyclometers, and other small mechanisms running back over in stock different sizes of Sub-Press Bases and Stands. Send for Descriptive Circular. THE PRATT & WHITNEY CO., Hartford, Conn., U. S. A.

Oster Pat. Adjustable Stocks & Dies They are light in weight, dies made of the best tool steel, guaranteed just as strong and reliable as solid dies, cut the thread at one operation and release from the work without running back over or finished threads. Each set of dies cuts two distinct sizes. THE OSTER MFG. CO., 85 Prospect Ave., Cleveland, Ohio, U.S.A.

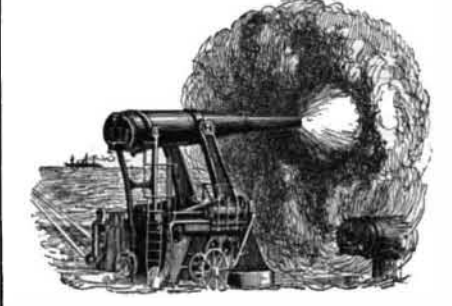
SIGNALING THROUGH SPACE without wires.—An article by W. Preece, describing the new Marconi system of telegraphing without wires. 6 illustrations. SCIENTIFIC AMERICAN SUPPLEMENT 1124. Price 10 cents. For sale by Munn & Co. and all newsdealers.

THE HARRINGTON & KING PERFORATING SHEET METALS MILLING & FINISHING MACHINERY WE SUPPLY WHAT YOU WANT ANY THICKNESS, METAL, SIZE, SHAPE, OR HOLE. 225 NORTH UNION ST. CHICAGO, ILL., U.S.A.

Table listing various items and their prices, including Basket, A. Biggs, Jr., Bed bottom, spring, Peugh & Frazer, Bicycle, J. H. Berry, Bicycle, C. T. & W. B. Burgess, Bicycle, J. E. Wilson, Bicycle lock, Dohm & Schlundt, Bicycle luggage carrier, F. M. Ufford, Bicycle saddle, W. J. Best, Bicycle saddle clamp, C. Smith, Bicycle saddle post, C. A. F. Berg, Binding, brush skirt, A. S. Watzfeld, Board, See Ironing board, Boiler, See Marine boiler, Boiler cleaner and filter, W. Dougherty, Bookbinder, loose leaf, A. Opalla, Bootjack, H. Strate, Bottle, J. T. Hollaud, Bottle, non-refillable, Dofein & Billing, Bottle washer, W. J. Cunningham, Bottles, etc., implement for holding, C. W. Platt et al, See Cake box, Fuse box, Match box, Paper box, Stuffing box, Box fastener, J. W. Evans, Box forming machine, H. Stewart, Brace, See Dental jaw brace, Bracket, See Curtain bracket, Tree prop bracket, Brake, See Air brake, Electric brake, Brake beam, L. C. Burgess, Brakes, water jacket for vehicle, P. E. Doolittle, Brush, T. H. Gulick, Brush holder, G. B. Hussey, Buggy or wagon wrench, Smith & Gould, Burglar alarm, A. G. Gray, Burial apparatus, Kinney & Barnard, Burner, See Oil burner, Vapor burner, Button, tack fastener, A. J. Shipley, Cabinet, kitchen bakery, W. S. Kenner, Cabinet, etc., S. E. Swidlow, Calorimeter or heat measuring apparatus, E. A. Uehling, Can, See Automatic can, Fruit can, Tin can, Can bodies, roller machine for forming round, H. C. Campen, Can opener, J. S. Freeman, Can opener, F. E. Gowen, Car, convertible freight, M. F. White, Car coupling, Oden & Boleman, Car coupling, B. F. Olmsted, Car coupling, J. E. Smith, Car fender, G. W. Norling, Car fender supporting means, H. Grootenboer, Car roof, L. C. Marshall, Car, sleeping, Bassett & Castle, Car step, extension, T. Maxon, Car wheel and axle gage, Smith & Brainard, Canarogowan, Card clothing, device for bending teeth in, E. Whittaker, Case, See Cell case, Sample case, Show case, Cash register and recorder, B. F. Seibert, Cattle tie, O. Gates, Cell case, E. C. Burd, Chair, See Child's chair, Shoe fitting chair, Child's chair, combination, C. J. Fichtl, Chimney holder, Wallace & Hilton, Churn, J. A. Hanger, Churn, J. Lieblang, Cigar cutting and lighting machine, E. A. Johnston, Clamp, See Ball and socket joint clamp, Bicycle saddle clamp, Clamping and pivot supporting device, T. S. Heineken, Cleaner, See Cleaner, Sieve cleaner, Tobacco pipe cleaner, Window cleaner, Clothes line reel, H. Hubner, Collar, A. D. Fenwick, Collar and cuff, T. R. Weidemann, Collar, standing, A. D. Fenwick, Corn sheller feeder, W. C. Rowe, Corn stripping and husking mechanism, A. Steiner, Coupling, See Car coupling, Pipe coupling, Self-locking coupling, Thill coupling, Cultivator appliance, wheel, W. A. Douglas, Cup, See Lubrication cup, Current meter of and apparatus for generating alternating, Hutin & Leblanc, Currycomb, W. A. Townes, Curtain bracket, adjustable, T. H. Eulaas, Cuspidor, car, Manning & Bouchet, Cuspidor for cars, etc., C. Cuttingham, Cutter, See Tobacco cutter, Decomposing solid substances, process of and apparatus for, W. S. Romme, Dental engine handpiece, A. W. Browne, Dental jaw brace, R. L. Halperin, Desk, See Desk, G. B. Burd, Display cabinet, E. Halden, Display stand, P. Miller, Distilling extracts, J. W. Lathrop, Ditching machine, J. H. Clark, Door hanger, J. E. Hartman, Door hanger, V. M. Moore, Door opening appliance, H. Bennik, Dust pan, J. M. Oursler, Dynamo, alternating current, L. Gutmann, Dynamo, alternating current, Hutin & Leblanc, Edgers, sectional feed roll for gang, C. E. Buek, Electric brake, H. P. Davis, Electric heater or rheostat, R. V. Sill, Electric heaters, composition of matter for, G. B. Fraley, Electric light switch, F. L. Temple, Electric meter, Stanley & Darlington, Electric snapper, A. F. Wood, Elevator, See Grain elevator, Elevator safety stop, automatic, R. T. Crane, Engine, See Rotary steam engine, Engine speed limit, J. R. Reynolds, Engraving machine, F. Mink, Eraser and manicure implement, ink, R. M. Hancock, Extension table, C. A. Curl, Eyeletting machine, S. Field, Fabric turling implement, M. F. Connett, Fabrics, producing white effects on, S. F. Carter, Farm gate, F. M. Lucas, Feed water heater for steam boilers, J. Dickson, Fence making tool, D. J. Jones, Fence post winder, wire, L. Matthews, Fence, wire, L. Matthews, Fence, wire, A. E. Probasco, Fender, See Car fender, Fifth wheel, M. Halfpenny, Filter, water, O. Eastman, Fire engine fed water coupling, F. A. Rothgery, Fireplace, smoke consuming, F. E. Humphreys, Fireproof safe, A. De Man, Fitting machine, T. R. Tucker, Folding table, J. H. Simmons, Frame, See Quilting frame, Fruit can or receptacle, J. J. Heins, Fruit gatherer, Pearce & Arbaugh, Fruit gatherer, O. J. Young, Fruit juices, coloring and preserving, H. Muller, Thurgau, Furnace, See Hot air furnace, Furniture spring back, A. G. Hofstatter, Fuse box, J. B. Smith, Game apparatus, T. M. St. John, Gas apparatus, T. M. St. John, Gas apparatus, S. Broichmans, Gas generator, acetylene, E. Gossart, Gas generator, acetylene, T. E. Lewis, Gas heating and expanding device, J. C. Henderson, Gate, Van Fleet, Gear case, Hughes & Musgrove, Gear cutting machine, W. H. Beastow, Gear cutting machine, J. H. Gibson, Generator, See Gas generator, Glass, composition of matter for manufacturing, G. C. Van Fleet, Gold from waste solution of chlorination works, recovery of, J. W. Pack, Grain elevator, pneumatic, J. Brogan, Graphophone tablets, manufacture of, T. H. Macdonald, Grass or similar growths, liquid for exterminating, W. A. Chapman, Gun safety device, bolt, T. C. Johnson, Hair tonic, H. Koorie, Hairwork frame, ornamental, H. May, Jr., Handle, See Package handle, Pan handle, Tool Hanger, See Door hanger, Picture hanger, Hanger, M. O. Reeves, Hat fastener, W. A. Callanan, Head covering, J. Smyth, Heater, See Electric heater, Feed water heater, Heater, J. Demarest, Heating and ventilating system, T. Hennessy, Heating or cooling apparatus, J. C. Henderson, Heel and sole protectors for boots or shoes, machine for setting, I. F. Peck, Hinge, detachable, A. S. Held, Hinge, gate, O. H. P. St. John, Horse shoe and hitching device, D. M. Forsyth, Horseshoe and removable calk therefor, J. McDonough,

WILLIAMS' SHAVING STICK PURE AS THE LILY Williams' Soap sold everywhere, but sent by mail if your dealer does not supply you. Williams' Shaving Stick, 25 cts. Genuine Yankee Shaving Soap, 10 cts. Luxury Shaving Tablet, 25 cts. Swiss Violet Shaving Cream, 50 cts. Jersey Cream (Toilet) Soap, 15 cts. Williams' Shaving Soap (Barbers'), 6 Round Cakes, 1 lb., 40c. Exquisite also for toilet. Trial cake for sale, stamp. THE J. B. WILLIAMS CO., LONDON, GLASTONBURY, CONN., SYDNEY, 74 GREAT RUSSELL ST., W.C., 161 CLARENCE ST.

THE Scientific American ARMY AND COAST DEFENCE SUPPLEMENT.



10-INCH GUN ON DISAPPEARING GUN CARRIAGE.

GUNS, ARMOR AND FORTIFICATIONS.

In response to numerous requests for detailed information regarding our Coast Defences, we have just published a special edition of the SCIENTIFIC AMERICAN SUPPLEMENT under the above title as complementary to our recent "Navy" issue. It is similar in size, quality and general make-up to the Navy Supplement, and in it will be found the most important facts regarding our system of coast defence and the varied character of the "war material" upon which it depends.

- Among the subjects treated are the following: 8, 10, 12 and 13 inch guns. Disappearing gun carriages as used in coast defences. Rapid-fire guns, various types. Machine guns, such as Hotchkiss, Gatling, Colt, Maxim, Armor; method of manufacture, tests, etc. Projectiles, powders and gun-cotton; process of manufacture. Range finders, submarine mines, etc. Tables of size, power, penetration, etc., of the various guns. Mortars, dynamite guns, submarine mines, small arms. Diagrams showing flight of modern projectiles and penetrating power. Mountain guns and method of transportation by mule pack.

This issue opens with a brief discussion of the exact and proper scope of a system of coast defence, in which it is shown that both army and navy are intimately associated in its planning and execution. The descriptive matter commences with an account of the 12-inch coast defence guns and the methods of their construction, mounting and operation. Then in their order follow a series of chapters on heavy rapid-fire guns, light rapid-fire guns and machine guns, in which the leading types of each class are fully illustrated and described. The development of armor is described from the early wrought iron plate down to the re-forged face-hardened Harvey plate of to-day. Under the head of powders is an article on the manufacture of gun-cotton, and following this is a brief account of the much-talked-of smokeless powders. Dynamite guns are illustrated in several handsome cuts.

There is a very full chapter on the subject of harbor defence, including diagrams of the various systems of range-finders and the modern methods of defence by mortar-fire, submarine mines and dirigible torpedoes. Under the last head, the Whitehead, Howell, and Sims-Edison types of torpedo are shown in a series of cuts which will be entirely new to the public. A chapter on the small arms carried by the army, navy and volunteers is followed by tables of statistics of the guns in use in our own service and those of leading foreign powers. The illustrations number over 100 and include a magnificent double page supplement of our largest battleship, the "Iowa."

The colored cover shows an illustration of a large coast defence gun in action. PRICE, BY MAIL, 25 CENTS. MUNN & CO., Publishers, 361 Broadway, New York City.

(Continued on page 46)