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.

"U. S." Metal Polish. Indianapolis. Samples free.

Gasoline Brazing Forge. Turner Brass Works, Chicago.

Yankee Notions. Waterbury Button Co., Waterb'y, Ct.

Handle & Spoke Mchy. Ober Mfg. Co., Chagrin Falls, O.

For bridge erecting engines. J. S. Mundy, Newark, N. J.

Machinery designed and constructed. Gear cutting. The Garvin Machine Co., Spring and Varick Sts., N. Y.

Ferracute Machine Co., Bridgeton, N. J., U. S. A. Full line of Presses, Dies, and other Sheet Metal Machinery.

☞ Machinery for R.R. contractors, mines, and quarries, for hoisting, pumping, crushing, excavating, etc., new or 2d-hand. Write for list. Willis Shaw, Chicago.

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 This is for our information and not for publication.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.

(7744) F. M. asks: If you wind a clock spring up tight and then put it into acid that will burn it to nothing, what becomes of the potential energy? A. We wish we could answer this question for good and all. But we cannot. We do not know what becomes of the energy that was put into that spring. And if anybody finds out, we hope he will tell everybody and set the matter at rest.

(7745) J. A. L. writes: In answer to a recent question which would fall faster, an ounce or a ton of iron, you say that the ounce would do so. If you review that matter more carefully I think you will conclude that it is just the other way. The air resistance being less in proportion to weight in the larger body would allow it to fall faster.

(7746) W. E. H. asks: Whether the pin in the crank or the pin in the cross-head of an engine is properly called the wrist pin? A. Although in general terms a wrist pin is any pin on which a connecting rod oscillates, and which is applicable to the cross-head pin and oscillating-valve gear of engines, we decide that the pin in the crank of an engine or any crank that revolves is a crank pin, and not a wrist pin.

(7747) F. H. asks: 1. What is the best method of attaching wooden bosses to glass plates of a Wimshurst, the plates being drilled with centra lhole for spindle? A. Glue the leather to the bosses and cement the glass to the leather. The object of this is to interpose a yielding medium between the glass and the wood. 2. In an induction coil of 3 to 5-inch spark, is there any danger of spark striking through the coil when the discharging rods are too far apart to allow spark to pass? A. Yes. The insulation of the secondary winding is supposed to be made strong enough to withstand the strain, but this is the point at which most coils break down, when they do break down. 3. Wishing to construct a delicate galvanometer (astatic), how much No. 36 wire should I use, in order to use it for thermo-electric current; which should be wound in first, the coarse or the thin wire? A. Delicate galvanometers have as high as 30,000 turns in the two coils. It is better to wind the coils so that they can be removed, that is, on spools which can be slipped into place and then have the coarse coil for thermo-electric currents on separate spools from the fine wire. 4. The price of Weinhold's "Experimental Physics." A. Weinhold's "Experimental Physics" cannot be had. It is out of print.

(7748) F. S. G. asks: What is the best oil to immerse an induction coil in to attain a high degree of insulation? A. Paraffine oil is commonly used for insulating induction coils.

(7749) V. B. writes: In all the articles on color photography I have read, I have been disappointed at the absence of any hint as to the depth of color used in the color-plates, In the excellent article by M. Vidal, in a recent number of the SCIENTIFIC AMERICAN, this important point is slighted. Would you be kind enough to say how strong a color is used on the three plates used in the camera, and also on the films used in building up the positive? Are they tints or strong colors? Should the red and yellow be as strong as the blue? I should also be pleased to learn where I could procure the great variety of aniline colors now in use. A. We suppose the reason that no attempt to describe the color screens used in color photography is that we have no words which can be used for the purpose. You can probably buy the screens which have been matched against screens known to have proper tints, from photographic dealers. If you wish to experiment in this line, you can obtain the aniline dyes from dealers in chemical materials.

(7750) J. H. S. asks: Is there a dry battery on the market that will light a 16 candle power electric light for an evening. A. We do not know any battery which can economically light a 16 candle power lamp, except the storage battery.

(7751) C. T. H. asks: Is it possible to manufacture a machine that will register one-twenty-five thousandth of an inch? A. Yes. If a screw were cut with 100 threads to the inch, and provided with a large head divided into 250 parts, when the head should be turned through one of these parts the point of the screw would be moved one twenty-five thousandth of an inch.

(7752) F. L. asks: What is the reason for using platinum wires in the base of electric light bulbs to connect with the filament? Could copper or aluminum be used in place of platinum, the cost being less? If not, why? A. Platinum wire is used in the base of incandescent lamps because it is the only metal which expands and contracts with heat at the same rate as the glass. If any other metal were used it would soon break the glass, because it would expand differently from the glass and ruin the lamp.

(7753) J. T. S. writes: Does the mica front in the ordinary base burning coal stove add anything to its value as a heater? I claim that it does not; that the stove would be probably a better heater if the mica were replaced by ordinary sheet iron. A. The mica as truly as the iron absorbs heat to radiate it again at its own temperature. Mica is used for the purpose of showing the condition of the fire and to give some light in a dark room.

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 unequaled 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 Issued for the Week Ending

OCTOBER 24, 1899.

AND EACH BEARING THAT DATE.

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

Abrasive purposes, tool for, R. S. Papprill..... 635,346
Accumulator pole pieces, terminal for, E. Andreas..... 635,287
Acid proof bag for fertilizers, Waring & Breckenridge..... 635,622
Adding machine, W. H. Davis..... 635,670
Adhesive articles, case or holder for, W. Pedrick 635,582
Adjustable chair, J. F. Walton..... 635,452
Advertising device, aerial, J. H. Menkens..... 635,697
Agricultural machine, J. J. A. Morath..... 635,501
Agricultural tool support, R. Rasmussen..... 635,591
Air brake hose coupling, Shepherd & Delaria..... 635,402
Air brake pumps, combined valve and governor for, N. A. Christensen..... 635,424
Air compressing apparatus, S. Broichgans..... 635,419
Air compressor, J. P. Simmons.....635,516, 635,517
Air compressor unloading means, C. Cummings.. 635,667
Alarm. See Burglar alarm.
Alloy for bearings, etc., H. G. Torrey..... 635,615
Ammonia, apparatus for testing liquid anhydrous, F. W. Frerichs..... 635,535
Ammonia making apparatus, Fellner & Steimle.. 635,308
Asphaltic flux, G. F. & G. C. K. Culmer..... 635,430
Asphaltic fluxes, making, G. F. & G. C. K. Culmer..... 635,429
Assaying furnace, Martin & Petter..... 635,586
Axle lubricator, H. D. Moise 635,571
Back band and trace connector, W. H. Thurmond..... 635,408
Back pedaling brake, R. S. Anderson..... 635,414
Back pedaling brake, J. G. Daigneau..... 635,714
Back pedaling brake, N. Wallerich..... 635,704
Bag. See Acid proof bag.
Bale covering, F. B. Deane..... 635,672
Barrels, casks, etc., head for, Pelton & Love..... 635,583
Basket, J. W. Doerflinger..... 635,675
Basket making machine, R. G. Du Bois..... 635,374
Basket making machine, E. Horton.....635,723 to 635,726
Bearing, roller, E. F. Obenchain..... 635,505
Beer drawing and preserving apparatus, T. Schnutz..... 635,514
Bending machine E. Einfeldt 635,433
Bicycle, M. Quinn..... 635,590
Bicycle, C. E. Tomlinson..... 635,451
Bicycle brake, Darbey & Trant..... 635,669
Bicycle brake, M. E. Dunbar..... 635,677
Bicycle gearing, S. H. Weller..... 635,453
Bicycle harness attachment, A. Herman..... 635,683
Bicycle saddle, L. L. Rowe..... 635,589
Bicycle support, E. Fowler..... 635,435
Bicycle supporter, H. Vander Weyde..... 635,618
Binder lock, temporary, W. A. Jones..... 635,438
Binder, temporary, N. Van Sickle..... 635,409
Boiler. See Watertube boiler.
Boilers, device for preventing incrustation of, W. J. Ferguson..... 635,468
Boiling apparatus, milk, M. F. Krogh..... 635,692
Bolt. See Door bolt.
Bottle filling machine, W. Murchison..... 635,338
Bottle stopper, F. W. Schroeder..... 635,398
Bottles, device for preventing fradulent refilling of, E. R. Meyer..... 635,335
Bottles, device for pulling stoppers or seals from, E. A. Lufkin..... 635,330
Box. See Folding box.
Box for cereals and means for handling same, J. Westover..... 635,626
Bracket. See Easel bracket.
Brake. See Back pedaling brake. Bicycle brake. Cycle brake. Wagon brake.
Bridge gate, swing, C. L. Prindle..... 635,589
Bridge, lift, A. Ruthenberg..... 635,394
Brush and mop holder, W. D. Martin..... 635,333
Buckle, A. W. P. Malins 635,331
Buggy top rest, J. Z. Miller..... 635,568
Bung and faucet, combined, C. C. Linindoll..... 635,693
Burglar alarm and door check, combined, W. H Reiff..... 635,595
Burner. See Gas burner.
Burner, ground and fluid fuel, G. S. Emerick..... 635,376
Business transactions, device for facilitating and economizing, Browne & Norton..... 635,731
Butter printand cutter, E. J. Barry..... 635,289
Button, F. R. White..... 635,706
Calcium carbid cartridge, F. L. White..... 635,455

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.

Star ★ Foot power Screw... ...cutting Lathes Automatic Cross feed
9 and 11-inch Swing.
New and Original Features
Send for Catalogue B.
Seneca Falls Mfg. Company,
695 Water St., Seneca Falls, N. Y.

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

Foot Power and TURRET LATHES, Planers, Shapers, and Drill Presses.
SHEPARD LATHE CO., 133 W. 2d St., Cincinnati, O.

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 list on application to
WALWORTH MFG. CO., 20 Oliver Street, Boston, Mass.

YOUR OPPORTUNITY

to become successful in business depends upon your ambition. Without interfering with your present occupation, we fit you to secure an important position through
EDUCATION BY MAIL
in Electrical, Mechanical, Steam, Mining and Civil Engineering; Metalurgy, Art, Architecture, Practical Newspaper Work, English Branches, Stenography, Machine Design and Mechanical Drawing.
Low price; easy terms. Most thorough and complete course of any correspondence school in the world. Send to
THE UNITED CORRESPONDENCE SCHOOLS,
154-158 Fifth Avenue, New York,
For Free Catalogue No. 33.

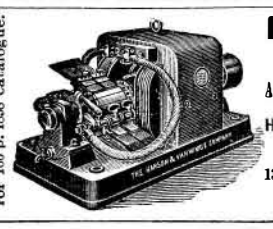
Physical and School Apparatus
GALVANOMETERS

STANDARD, SINE, TANGENT, REFLECTING and WIEDEMANN GALVANOMETERS . . . . .
Catalogue free.
E. S. Ritchie & Sons, Brookline, Mass.

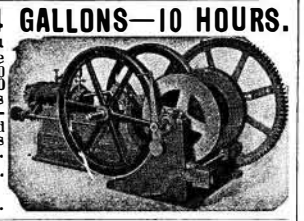
SAVE ½ Your FUEL wasted up chimney.
BY USING THE ROCHESTER RADIATOR.
COST $2.00 AND UP.
Money refunded if not satisfactory.
Write for booklet on economy in heating homes.
ROCHESTER RADIATOR CO.,
60 Furnace Street, Rochester, N. Y.

For the Best Ruling Machines,

Hand and Power, with or without the
BURROWS IDEAL AUTOMATIC STRIKER and LAPPER,
IDEAL BEAM STANDARDS
IDEAL INK FOUNTAINS,
and IDEAL CRANK, apply to
E. J. PIPER, Manufacturer, Springfield, Mass.

Send your business card for 160 p. 1898 catalogue.

NICKEL AND Electro-Plating
Apparatus and Material.
THE Hanson & VanWinkle Co.,
Newark, N. J.
136 Liberty St., N. Y.
30 & 32 S. Canal St Chicago.

BARNES'
New Friction Disk Drill.
FOR LIGHT WORK.
Has these Great Advantages:
The speed can be instantly changed from 0 to 1600 without stopping or shifting belts. Power applied can be graduated to drive, with equal safety, the smallest or largest drills within its range—a wonderful economy in time and great saving in drill breakage. Send for catalogue.
W. F. & JNO. BARNES CO.,
1999 Ruby St., - Rockford, Ill.

10 HORSE—4 GALLONS—10 HOURS.
We can show you that at an altitude of 13,000 feet, our 10 h. p. consumed on 10 hours hoisting, less than 4 gallons of gasoline. Write and find out how it was done. *Catalog S. A.*

Witte Iron Wks. Co.
1207 Walnut St.,
KANSAS CITY, MO.

This beats Wind, Steam, or Horse Power.
We offer the WEBSTER 2½ actual horse power
GAS ENGINE
for $150. less 10 per cent discount for cash. Built on interchangeable plan. Built of best material. Made in lots of 100 therefore we can make the price. Boxed for shipment, weight 800 lbs. Made for Gas or Gasoline. Also Horizontal Engines, 4 to 30 h. p.
Write for Special Catalogue
WEBSTER MFG. CO.,
1074 West 15th St., Chicago.
Eastern Branch: 38-D Dey Street, New York City.
Southern Agents: Boland & Gschwind Co., Ltd., So Peter and Lafayette Sts., New Orleans, La.

Calls and signals, system of, R. J. Louis..... 635,493
Camera, kinetographic, A. Darling..... 635,466
Camera, magazine, T. E. Meadowcroft..... 635,497
Can. See Valved can.
Car coupling, S. J. Meeker..... 635,498
Car, dumping, M. F. Blake..... 635,646
Car fender, W. Morck..... 635,445
Car frame, F. E. Canda..... 635,653
Car head block, railway, J. A. Hinson..... 635,322
Car signaling device, railway, H. S. Rodgers..... 635,391
Car trailers, brake for street, H. T. Brown..... 635,650
Carbid cartridge, L. S. Buffington..... 635,296
Carbureter, F. E. Canda..... 635,298
Carding engine, Andrews & Haley..... 635,634
Carriage, child's, T. Ballatine..... 635,638
Carriage, meter, W. C. Schultze..... 635,603
Cart, F. C. Weber..... 635,623
Case. See File case. Match case.
Caster, ball, J. Guinan..... 635,680
Centrifugal separator liner, J. D. G. Ohlhaver.... 635,579
Chair. See Adjustable chair. Convertible chair. Folding chair.
Chair, D. J. Bigelow..... 635,644
Channeling machine, Keats & Clark..... 635,551
Checking or nnchecking device, R. J. Wylie..... 635,367
Chopper. See Cotton chopper.
Chuck, drill, J. W. Albert 635,458
Circuit controlling device, J. Heinze, Jr..... 635,319
Cleaner. See Flue cleaner. Window cleaner.
Clothes drier, B. Kippels..... 635,553
Clothes line pulley, S. H. M. Seib..... 635,604
Clutch, friction, G. J. Gunderson..... 635,477
Clutch, friction, A. Herschmann..... 635,684
Combination lock, J. R. Houts..... 635,546
Commercigraph, B. R. Herman 635,596
Compass, miner's, W. Van Sleeten..... 635,606
Convertible chair, E. L. Thompson..... 635,613
Corn husker, W. H. Stoner..... 635,610
Cotton chopper and sider, J. M. Pope..... 635,348
Coupling. See Air brake hose coupling. Car coupling. Pipe coupling. Pole or thill coupling. Vehicle coupling.
Cream separators, liner for centrifugal, E. J. Kneeland..... 635,488
Cue support, J. Miller..... 635,569
Cultivator, S. M. Adams..... 635,285
Cultivator attachment, G. W. Tucker..... 635,617
Cultivator, garden, J. T. Clark..... 635,659
Cultivator planter attachment, T. Collier..... 635,298
Cultivator two row disk, J. A. Patterson..... 635,581
Cultivator wheel, cotton, W. W. Holloway..... 635,685
Curtain ring, S. O. Brown..... 635,295
Cutter. See Ensilage cutter. Root cutter.
Cycle brake and motor, B. H. & N. R. Coursey.... 635,664
Cycle mud guard, A. Thym..... 635,614
Desk attachment, D. L. B. Peterson..... 635,585
Display rack, C. W. Kirkland et al..... 635,325
Door, J. Nash..... 635,341
Door bolt, C. W. Sawtelle..... 635,352
Door fastener, C. E. Buck..... 635,530
Door fastening device, W. Doyle, Jr..... 635,422
Door hanger, G. Wideman..... 635,410
Door holdback, A. L. Ware..... 635,621
Door spring and check, combined, J. Wolf..... 635,411
Draught equalizer, S. H. Tinsman 635,360
Drier. See Clothes drier.
Drill. See Rock drill.
Drill, H. Aylmer..... 635,415
Easel bracket, L. Hayre..... 635,542
Eaves trough hanger, G. W. Hartley..... 635,317
Eaves trough hanger, E. E. Taft..... 635,359
Electric cutout, J. Sachs..... 635,395
Electric machine, dynamo, N. J. Laschet..... 635,489
Electric motor reversing switch, E. V. Matlack... 635,496
Electric switch, Downes & Sherman..... 635,373
Electric switch, C. J. Klein..... 635,691
Electric switch, J. Sachs..... 635,396
Electrical conductor junction box, R. L. L. Hundhausen..... 635,485
Electrical machine, J. B. Hague..... 635,681
Electricity from car wheel axles, means for generating, M. Moskowitz..... 635,446
Electroplating apparatus, R. E. Goodrich..... 635,380
Elevator. See Grain elevator.
Elevator, R. J. Melius..... 635,499
Elevator, H. R. Tracy..... 635,362
Elevator, M. A. Wheaton..... 635,454
Elevator speed regulating or controlling device, E. P. Forbes..... 635,679
Elevators, automatic safety lock for, C. S. Stokes 635,521
Engine. See Carding engine. Gas engine. Paper pulp refining engine. Rotary steam engine.
Engine, O. Kinner..... 635,590
Engines, electric igniter for gas, R. E. Olds..... 635,506
Ensilage cutter, O. E. Bray..... 635,464
Escapement, H. Gantey..... 635,729
Exhibitor, jewelry, C. H. Buxton..... 635,711
Extension platform, Seymour & Kahler..... 635,401
Eyeglass nose guard, C. Billington..... 635,645
Eyeglasses, E. E. Pequegnat..... 635,508
Eyeglasses and spectacles, D. H. Ludlow..... 635,494
Fare registers, mechanism for operating, Ohmer & Tyler..... 635,343
Farm gate, W. B. Miller..... 635,570
Fence machine, G. P. A. Weisenborn..... 635,365
Fence machine, wire, A. H. Cook..... 635,302
Fifth wheel, J. L. Taylor..... 635,407
File, binding, A. Dom..... 635,431
File case, L. Klemme, Jr..... 635,555
File, paper, C. E. Mountford..... 635,502
Finger ring, G. M. Saunders..... 635,510
Firearm safety device, revolving, Wesson & Hobbs..... 635,705
Fire escape, F. J. Glaser..... 635,539
Fire escape, E. B. Terdoest..... 635,524
Fire extinguisher, G. G. Schroeder..... 635,399
Fire port hole for buildings, J. J. Schlosser..... 635,601
Fish hook, S. M. Neely..... 635,503
Flat iron, self heating, J. Abrahamson..... 635,632
Flue cleaner, L. Rollins..... 635,701
Flush switch, W. R. Pettis..... 635,587
Fly trap, A. Hammond..... 635,775
Folding box, L. F. Ferrell..... 635,377
Folding chair, H. L. C. F. Ihde..... 635,486
Frame. See Prism light frame.
Fruit drying tray, S. H. Chase..... 635,423
Fruit gatherer, P. M. Gutleber..... 635,316
Furnace. See Assaying furnace. Smelting furnace.
Furnace, J. Flaherty..... 635,469
Furnace, B. C. Heavey..... 635,318
Gage. See Pressure gage.
Garment, J. Shine..... 635,403
Garment supporter, W. L. Braddock..... 635,648
Gas burner, acetylene, F. C. Faxon..... 635,532
Gas engine, J. O. Brown..... 635,264
Gas generating apparatus, acetylene, C. D. Howell..... 635,727
Gas generator, acetylene, G. A. Hervieu..... 635,544
Gas generator, acetylene, Kuppers & Schroeder.. 635,327
Gas generator, acetylene, F. C. Pearre 635,507
Gas generator, acetylene, F. Rhind..... 635,351
Gas generator, acetylene, I. O. Russell..... 635,599
Gas or vapor generator and burner, J. W. Weeks 635,624
Gas producer, W. Garrett..... 635,313
Gate. See Bridge gate. Farm gate. Tank discharge gate.
Gearing, variable speed, G. Sittmann..... 635,518
Generator. See Gas generator. Gas or vapor generator.
Glass blowing machine, M. J. Owens..... 635,344
Glass blowing machine, C. H. W. Ruhe....635,392, 635,393
Glass conduits, collapsible core for manufacturing, T. M. Flower..... 635,311
Glass rolling machine, T. J. McCoy..... 635,340
Glove fastener, G. T. Chapman..... 635,655
Grain elevator, G. B. Mallery..... 635,561
Grain roller, E. Berg..... 35,642
Grain scourer, H. Heinrich..... 635,480
Grate, R. J. Schwab..... 635,400
Grinder, multiple metal, C. E. Blechschmidt..... 635,292
Grinding mill tram, roller, D. M. Carey..... 635,528
Gun brake device, E. Muller..... 635,575
Gun fluid brake, J. Browne..... 6 ,897
Gun, spring spear, W. H. McWhirter..... 635,586
Hammer, pneumatic, Burns & Pickles..... 635,422
Handle bar, adjustable, King & Burns..... 635,689
Hanger. See Door hanger. Eaves trough hanger. Lamp hanger.
Hat smoothing iron, J. Agar..... 635,633
Hay press, C. G. Combest..... 635,663
Hay rake, horse, C. E. Jackson..... 635,550
Head and back rest for invalids, W. A. Niben..... 635,578
Headlight, acetylene gas, C. H. Pagett..... 635,580
Hinge, S. D. Arnold..... 635,268
Hinge, box couch, J. T. Seng..... 635,605
Hog catcher, J. B. Herr 635,543
Hoisting device, C. Berghoefer..... 635,643
Hook. See Fish hook. Ladder hook.
Hook and eye, I. P. Doolittle..... 635,529
Hose supporter, overhead, C. Utman..... 635,364
Hub, vehicle, E. McHugh..... 635,555
Inkstand attachment, A. B. Flagg..... 635,309
Insole, W. Lawes..... 636,559
Iron. See Flat iron. Hat smoothing iron.
Iron oxids, obtaining, A. S. Ramage..... 635,389
Jack. See Wagon jack.
Jar opening device, Colkitt & Pentz..... 635,662
Jaws for jaw rods or jaw bolts, manufacture of, G. G. Barret..... 635,288
Joint. See Pipe joint.
Kiln for burning fire brick, etc., L. O. Boeing..... 635,647
Kiln having superposed chambers for continuous working, P. Schleich..... 635,513

(Continued on page 302.)

© 1899 SCIENTIFIC AMERICAN, INC.