is customary to place crucibles in the muffle, back of the cupels, to keep them and the metal sufficiently cool for cupeilation; but the placing and adjustment of such crucibles requires a great expense of time and labor, which it is the purpose of this invention to obviate. A draft-partition is employed, having transverse draftopenings, one for each cupel, the bottom wall of the opening being below the top of the cupel in front of the opening. A tile-cover is employed, the ends of which project over the cupels and shield them from the heat in the back of the muffle and allow the cool air to collect and pass through the partition openings.

ORE-SEPARATOR .- WILLIAM HOOPER, Ticonderoga, N. Y. This device is designed to separate gold from sand or gravel without the use of water. A flexible bed is secured to an inclined frame and is inclined down to the sides. A series of separating-strips on the upper surface of the bed form channels to receive the heavier particles and direct them to the outer ends of the strips. Plates extending longitudinally of the bed at each side and above the strips form a central conduit. A second series of separator-strips of greater width than the first serve to direct the sand or tailings from each side of the bed to the central conduit.

REIN-SUPPORT.-John G. RYCKMAN, Knappa, Ore To the bridle a strap is secured by one end, the other end being attached to the hames. A ring is secured to the central portion of the strap; and through the ring the driving-rein passes, whereby a support for the rein will be provided a short distance from and in front of the hames The attachment does not in any way interfere with the action of the reins upon a bit and renders it well nigh impossible for the reins to become entangled with or pass under the pole or tongue of the vehicle. The rein guard is adjustable to any size harness and contains no springs or bars to injure the horse.

EGG-SEPARATOR. - JOHN A. BURNS, Woodbine, Iowa. It is the object of this invention to provide an apparatus for separating eggs from the filling materialbran, oats, etc.-in which they are packed and shipped. The egg-separator has a hopper and a rocking cradle with a semicircular reticulated bottom. A slidable egg holder having a semicircular form is fitted in the cradle. In separating eggs, a woven wire cover is drawn over the cradle and egg-box, to hold the eggs while the box is being inverted, the slidable holder being adjusted to prevent the spreading of the eggs. The filling passe through to the hopper and is discharged.

GASOMETER.-WILLIAM F. COOPER, Meriden, Conn The inventor of this gasometer has sought to dispense with the usual water-seal and to give the bell a larger range of movement to adapt it for acetylene generators. The invention consists in the special arrangement of two receptacles which telescope or nest, one within the other, and a peculiar connecting-skirt of impervious elastic material connecting the edges of the two members of the gasometer and forming an annular sheath in which the gas is contained in the form of an annular

BARREL-SHIELD,-WILLIAM A. FRASIER, Guthrie Oklahoma Territory. To provide a cover for such as are used in grocery stores, the inventor has devised a shield of tin, zinc, sheet-iron, paper, or other suitable material, plated or japanned in colors and lettered to indicate the contents of the barrel.

CHOKE-BORE ATTACHMENT FOR GUNS.—RAN DOLPH P. CORY, St. Louis, Mo. This device is an improvement on a choke-attachment patented by the same inventor; and the present invention provides a means whereby the fastening strain in securing the choke-at tachment to the gun-barrel is exerted in lines parallel with the axis of the barrel and choke-section. choke-section links are pivoted, provided with latch-devices, the links being adjusted at their pivotsl connection with the choke-section by set-screws. In latched position the parts lie parallel with the length of the choke-section, so that the strains are not torsional but are exerted in straight lines.

SASH-HOLDER. - SCOTT A. MORROW and JARRET C. HALCOM, Commerce, Tex. In suitable recesses in the stiles of a sash, springs are held so that they will extend in a direction away from the stile and at an oblique angle to the side edges of the stiles. Friction-rollers on the free ends of the springs engage the guide-strip with their peripheries and the window-frame with their side faces. The holder acts as a guard against the admission of dust, air, or rain, and is hence particularly applicable to railway-cars.

FOLDING COT. - JAMES H. MARTINDALE. FOR Worth, Tex. The object of the invention is to improve the corner irons or brackets connecting the end and side bars and the legs, so that these parts will be rigidly held in their operative position. The frame is so constructed that the legs may be folded inwardly into longitudinal alinement with each other upon the under sides of its end bars; and the removable side bars are formed in two hinged parts of equal length with each section of about are removed, folded, and laid parallel with the end bars the legs folded upon the end hars the cot may be rolled up into a compact roll just the length of the end

Designs.

BADGE. - HERMANN SCHAEFFER, Brooklyn, New York city. The leading feature of the design consists of a bust picture of Dewey surrounded by a wreath, at the lower portion of which is a spread-eagle, anchor-arms.

DOOR OR WINDOW SECURER.—George E. Johnson, Brooklyn, New York city. The device is designed to be inserted between the jamb and door or between the sash and frame to prevent the door or window from being opened on the outside. The securer can be carried in the pocket and is of special service in hotel-rooms and the like

MONUMENT.-JOSEPH OSSOLA, Barre, Vt. Upon the monument are represented a broken plant and a worm at the point of fracture as if the plant had been

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(7726) H. P. W. asks: Which will stand the heaviest current of electricity, silver, platinum, or Mushet steel, without fusing or burning up? A. Platinum has the highest melting point of any of the metals ordinarily used in electrical work. It will therefore carry the heaviest current without melting, the wires being of the same size.

(7727) W. R. M. asks the use of and market value of columbium, niobium, or titanium minerals. A. The cost of niobium or columbium, as it is sometime called, is \$7.50 for a 15 grain phial. Titanium costs \$2.50 for a 15 grain phial.

(7728) C. G. writes: 1. I have a small motor which runs fairly well, but as a dynamo it will give no current at all. Could you tell me why it will not generate a current? A. The reason your small motor will not generate current when run as a dynamo is that its current is too weak to magnetize the fields. This is usually the case with such motors. They were not designed for generators. 2. Explain why a deal is stronger on its edge than on its flat. A. Your second question regarding the strength of a deal is not easily answered in a few words. Imagine a stick 2×10 inches the length of the end bars, so that when the side bars on edge, one end fastened in a wall from which the stick projects horizontally with a weight hung from the outer The upper kelf of the stick will the bending due to the weight, while the lower half will be compressed by it. The leverage of this bending is half the height of the stick, or 5 inches. If the stick were placed on its side instead of on its edge, the leverage of bending would be but one inch under the same circumstances, and the stick would bend much more easily. You will find this fully demonstrated in any book on the strength of materials.

(7729) C. F. T. writes: I write to ask if in your opinion lightning rods are any protection to buildings. A. We are very certain that lightning rods when properly put up are a great protection to any building. They do their work in protecting the building from being struck quite as much as in carrying off the electricity when the building is not struck. For this silent service the rod gets very little credit.

(7730) M. C. W. asks: What is the best solder for to stop a leak in ammonia coils, something that ammonia will not affect. A. Pure tin is the only solder uitable for ammonia joints. It is in general use.

(7731) R. M. asks how can I oxidize brass and copper. A. 1. Dissolve sufficient platinum in aqua regia, and carefully evaporate the resulting solution (platinum chloride) to dryness. The dried mass may

then be dissolved in alcohol, ether, or water, according to the effect which it is desired to produce, a slightly different effect being produced by each of the solu tions. Apply the solution of platinum with a camel's hair brush, and repeat the operation as often as may be necessary to increase the depth of tone. A single application is frequently sufficient. The ethereal or alcoholic solution of platinum must be kept in a well stoppered bottle, and in a cool place. The aqueous solution of platinum should be applied hot. 2. Oxidizing Copper and Brass.—Immerse the articles in a solution of 2 ounces iron nitrate and 2 ounces sodium hyposulphite to 1 pint of water, until the desired shade of oxidation is acquired, then wash, dry, and brush.

NEW BOOKS, ETC.

THE PSYCHOLOGY OF REASONING. Based on Experimental Researches in Hypnotism. By Alfred Binet. Chicago: The Open Court Publishing Company. 1899. Pp. 188. Price 75 cents.

The publishers have done a signal service in translating the works of Binet and other great psychologists and sending them out in cheap form. We feel sure that this book will appeal to a large number of our readers who are interested in both psychology and hypnotism.

THE SALMON AND SALMON FISHERIES OF ALASKA. Report of the Operations of the United States Fish Commission Steamer "Albatross," for the Year ending June 30, 1899. By Commander Jefferson F. Moser, U. S. N. Washington: Government Printing Office. 1899. Pp. 178.

Like all publicatious of the United States Commission of Fish and Fisheries, it is a most interesting volume.

of Fish and Fisheries, it is a most interesting volume, and is freely illustrated with half-tone engravings. The salmon fisherles have obtained such enormous proportions that the commission is wise in bringing out a monograph on the subject which is exhaustive and import-

THE SOLUBLE FERMENTS AND FERMEN-TATION. By J. Reynolds Green, Sc. D., F.R.S. Cambridge: The University Press. American Publishers: The Macmillan Company. 1899. Pp. 480. Price, \$3.

Various problems connected with the phenomena of fermentation have received remarkable attention during the past few years by many investigators, and the present volume puts in a compact form all the results which have been obtained up to the present time, and it is a remarkably valuable book, and had been needed for some time. The very latest discoveries, such as that of Büchner, of Zymose, are fully noted. Fortunately, there is an index, and had the book been made without this index, it would have been seriously injured.

SAJOUS' ANNUAL AND ANALYTICAL CY-CLOPEDIA OF PRACTICAL MEDICINE.
Vols. II. and III. By Charles E.
de M. Sajous, M.D., and one hundred associate editors. Each volume 600 pages. Philadelphia, New York and Chicago: The F. A. Davis Com-pany. 1899. Price \$5.

Very clearly and concisely written, giving a digest of the latest and best facts bearing on the several subjects treated of. Volume II. covers notes between "Bromide of Ethyl" and "Diphtheria." Volume III. "Dislocations" to "Infantile Myxœdema." A book invaluable

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INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending SEPTEMBER 26, 1899.

AND EACH BEARING THAT DATE.

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

Adhesive G. J. Gruendler	633.834
Adhesive, G. J. Gruendler	633.871
Advertising sample exhibitor, D. C. Me eban	633,963
Air drill, A. P. Schmucker	633,661
Air drill, A. P. Schmucker Alkaline silicate, making soluble, F. Henkel	633.841
Alloy, W. Van Wart et al	643.743
Alloy, W. Van Wart et al	633 574
Bacillus prograneus, immunizing preparations	100,401
Bacillus pyocyaneus, immunizing preparations from, O. Loew	633,867
Back nedaling brake, McAnulty & Van den	000,000
Kerghe.	633,605
Berghe Bag. See Feed bag. Letter carrier's bag.	0001000
Bait, artificial, R. B. Cantrell	633 797
Baling press cotton M Swenson	633 708
Baling press, cotton, M. Swenson Ballast device, J. P. Pool	633 904
Bark cutting and reducing machine, J. C. Hag-	000,001
Orta	6 22 646
erty	622 775
Bearing, thrust, A. H. Lighthall	633 969
Bearing, vehicle ball. A. L. Carley	622 709
Podetood fastoning V Vohn	000,100
Bedstead fastening, K. Kohn	621 710
Bicycle, E. A. Bolus.	622 504
Bicycle, G. Davies	633 814
Bicycle, T. J. Psimenos.	
Dievole geer W K Cowen	622 752
Bicycle gear, W. K. Cowan	633 748
Bicycle stand, H. Cifka	633 806
Billet conveyer, J. C. Cromwell	633 579
Blowpipe, T. G. Lewls	633 850
Bods brace, J. H. Kellogg.	633 596
Boiler. See Watertube boiler.	000,000
Roller G Kingeley	633853
Boiler. G. Kingsley	633 588
Bolt, spring key thread less, T. C. Hackett	633 710
Book support and bolder, revolving, J. H. Pur-	000,110
due	633 045
due Boot cleaner, E. Shaw	633 737
Boots, etc., fastening or clasp for, V. Bergman	633 947
Box. See Feed box. Folding box. Hat box.	000,011
Strip holding and exhibiting box.	
Strip holding and exhibiting box. Box fastener, E. A. Page	633 896
Brace. See Body brace.	0.00,000
Bracket. See Lamp shelf bracket.	
Brake. See Back pedaling brake.	

	237
	or
handling, J. P. B. Fiske Bridge, bascule lift, J. P. Cowing Brush for doorways, automatic fly. J. R. Holt.	633,955 633,811 633,591
Bricks in manufacturing same, apparatus f handling, J. P. B. Fiske. Bridge, bascule lift, J. P. Cowing Brush for doorways, automatic fly, J. R. Hoit. Burner. See Oil burner. Vapor burner. Butter moulder and cutter, L. Linkiewicz Button F. Clark	633,865
Button, F. G. Neubert Button fastener, A. H. Lohse	633,888 633,868
Cabinet, kitchen, D. Pierce	633,754
Button, F. Clark. Button, F. Clark. Button, F. G. Neubert. Button astener, A. H. Lohse. Button bastener, A. H. Lohse. Buttonhole moistener D. F. Bagley. Cabinet, kitchen, A. A. Cushman. Cabinet, kitchen, D. Pierce. Calcning furnace, C. M. Allen. Can. See Oil can. Self sealing can. Can filler J. F. Burns.	633,777
Can filler, J. F. Burns. Candle bolder, R. F. Perkins. Car coupling uncoupling device, W. L. Park et Car fender, W. Bonham. Car heating and ventilating apparatus, J.	633,900 al. 633,700
Car fender, W. Bonnam. Car heating and ventilating apparatus, J. Fleming.	C. 633,636
Car or train lighting system for electric railway	78, 633,971
mere	633,835 633,739 633,639
mere. Car replacer, A. L. Sprague. Car safety bridge, railway, W. R. Conneil. Car street indicating device, street, Squire Knowles. Cars, advertising street annunciator for, P. 1	& 633,623
Cars, advertising street annunciator for, P. I. Patriarche	H. 633,609 633,800
Patriarche. Carbureter, explosive engine, H. E. Casgrain. Carriage, child's, W. Diemer. Carriage, motor, A. C. Stewart Carriage stop or brake, cbild's, J. E. Osgood Carton folding and setting up machine, Doble	633,817
Carriage stop or brake, colld's, J. E. Osgood Carton folding and setting up machine, Doble Scales	& 633,953
Cash register and recorder 1 A Hoff	683,842
Caster socket holder, L. B. Denton. Cement, J. C. Sellars. Chain, drive, D. J. Sheldrick.	683,618 633,738
Chair, D. J. Bigelow.	633,948
J. B. Hadaway. Check hook, J. A. Lowe. Checking and auditing asprings of passage	633.836
trains, art of and means for, O. L. Miles Chopper. See Cotton chopper.	633,603
J. B. Hadaway. Check hook, J. A. Lowe. Checking and auditing earnings of passeng trains, art of and means for, O. L. Miles. Chopper. See Cotton chopper. Churn, A. R. Anderson. Cigar bundling device, T. M. Wilson. Cigar making machine, J. W. Dunn.	633,744 633,633 633,579
out, J. W. Dunn	633,580
S. Beeman. Circuit breaker, G. Wright. Circuit breaker, automatic, Wright & Aalborg Clamp. See Pipe repair clamp. Textile clamp Clamp. A Mayer.	633,946 633,773 633,772
Clamp. See Pipe repair clamp. Textile clamp Clasp, A. Mayer	633,697
Cleaner. See Boot cleaner. Clod crusber, A. J. Aucoin	633.750 633.742
Clamp. See Pipe repair clamp. Textile clamp Clasp, A. Mayer. Cleaner. See Boot cleaner. Clod crusber, A. J. Aucoin. Clothes book, G. W. Turner. Clothes bine, I. Wirtz. Clutcb, friction, Swasey & Allen. Clutch, boisting machine, C. L. Taylor. Cock, right and left band stop and waste, C. Smith.	633,678
Cock, right and left band stop and waste, C Smith.	F. 633,916
Smith and left band stop and waste. Comin lowering device, J. F. Plein. Coin holder, H. I. Haynes. Comb cutting machine, Koenig & Dedrick. Combs, making metal, J. Koenig. Combing machine, T. Burrows. Combing vegetable fibers. machine for T. Bi	633,902 633,833 633,696
Combing machine, T. Burrows.	6 32,72 1 633,794
Combing vegetable fibers, machine for, T. Birows	633.795 11,775
Combustion motor, R. Mewes	633,876 633,832
Cooler. See Water cooler. Coop. collapsible cbicken, W. L. Walton. Copying press, J. R. Freuler. Copying press, letter, W. L. Spaulding. Cordage machine, F. J. K. Graf. Com busker, W. K. Lillie. Cotton beater cover locking device, Ward & Co	633,929 633,645
Cordage machine, F. J. F. Graf.	633,957 633,600
Cotton beater cover locking device, Ward & Citis Cotton chopper. Wilson & Smith	ur- 633,980 633,985
Cotton beater cover locking device, Ward & Cotton chopper, Wilson & Smith Cream separator, centrifugal, E. E. Bell. Cresting, A. G. Soutber. Crusher. See Clod crusher. Cultivator, F. E. Pearson. Cultivator, F. E. Pearson. Cultivator J. P. Rife. Curtain fixture, H. S. Davis. Curtain fixture, H. S. Davis. Cuttain rod fixture, J. O. Clark. Cutter. See Vegetable cutter. Cycles, mechanism for assisting in propulsion G. B. H. Austin. Damper, H. J. Noyes. Developing tray, A. B. Sbeppard. Display apparatus. A. Klumpp. Distilling and aerating water, apparatus for, M. Kemp.	633,562 633,622
Cultivator, I. E. Pearson. Cultivator, I. P. kife.	633,610 633,906
Curtain oxture, H. S. Davis. Curtain rod fixture, J. O. Clark. Cutter. See Vegetable cutter.	633,569
Cycles, mechanism for assisting in propulsion G. B. H. Austin	of, 633,943 633,890
Developing tray, A. B. Sbeppard	633,912 633,650
M. Kemp	633,851
ridge. Door cbeck and closer, E. Cliff. Door banger, I. A. Climer Door stop, W. V. Bleba Doucbe, nasal, C. H. Ingersoll. Dredger for pulverulent material, J. W. Arro	633,977
Door stop, W. V. Bleba	633,979 633,846
Jr Drill. See Air drill. Grain drill. Ratchet dril	633,941 ll.
Drying apparatus, W. J. M. Dobson Dust collector, P. Eberwein	633,819 633,954
Dust pan, H. O. Brown	633,787 633,694 633,950
Dye, yellow basic, C. O. Muller Electric circuit switch. Wright & Aalborg	633,883 633,771
Electric machine, dynamo, C. A. Eck	633.641 633.529
Dredger for pulverulent naterial, J. W. Arro Jr. Drill. See Air drill. Grain drill. Ratchet dril Driving mecbanism, friction, C. C. de Mocomb Drying apparatus, W. J. M. Dobson. Dust collector, F. Eberwein. Dust collector, F. Eberwein. Dust pan, H. O. Brown. Dye and making same, green blue, R. Bohn. Dye, yellow basic, C. O. Muller. Electric circuit switch. Wright & Aslborg. Electric generator, dynamo, B. G. Lamme. Electric machine, static, J. Gallegos. Electric machine, static, J. Gallegos. Electrical distribution system, L. B. Stillwell. Electrical fuses or cutouts, casing for and mou ing of, L. W. Downes. Electrical machine current collector, B. Lamme. Electrical machines, distributed winding of Electrical machines, distributed winding felectrical machines.	633,920 nt-
ing of, L. W. Downes. 633, Electrical machine current collector, B. Lamme. 633,	676, 633.577 G. 633,972
Electrical machines. distributed winding f Lamme & Mallett.	or, 633.856
Lamme Electrical machines. distributed winding f Lamme & Mallett Electrical machines, field magnet coil f Lamme & Skinner Electromagnetic friction brake, automatic, E.	or, 633,858 M.
Tingley. End gate, wagon, A. W. Douglas. Engine. See Combustion engine. Rotary of	633,756 633,756
Tingley was a to Mouglas Electromagnetic Firction brake, automatic, E. Tingley was a Mouglas Engine. See Combustion engine. Rotary of gine. Rotary steam engine. Excelsion machine, J. Fensom. Explosives, making, F. G. & F. I. du Pont. Eyeglasses, W. F. Todd. Feed bag, H. G. Weibezahl. Feed box, F. Hacbmann. Feed water heater for watertube boilers, J. Mibara.	633,822
Eyeglasses, W. F. Todd. Feed bag, H. G. Weibezahl.	633.670 633.676
Feed water heater for watertube boilers. J. Mi bara	633,693 ya- 633,699
bara. Fibers, gill box machine for preparing, T. B rows. File case for cards, F. & F. Macey	ur- 633.793
Fibers, gill box machine for preparing, T. B. rows. File case for cards, F. & F. Macey. Filling device, receptacle, A. P. Silverthorn. Filter press closing device, L. Hirt. Firearm, breech loading, W. V. Bleha. Firearm lock, J. Rupertus. Fire extinguishing-system, automatic chemic H. Bush. Flour bolting machine, H. C. Robinson. Fly, artificial, A. Manchester. Folding box, W. D. Best. Frolding table, C. F. Kade. Frames with glued mittered joints, clamping pliance for, B. Muller.	633,913 633,759
Firearm lock, J. Rupertus	633,734 633,734
H. Bush	633,970 633,613
Folding box, W. D. Best. Folding table, C. F. Kade	633,782 633,762
compartments, method of and apparatus f T. A. Clayton	or. 633,807 633 199
compartments, method of and apparatus f T. A. Clayton. Funnel. E. W. Vacher. Furnace. See Calcining furnace. Furnace wall cooling device, G. R. Johnson. Galvanic cells or batteries, means for utilizi	633,849
Games, field board for reporting football, A.	A.
Irwin	633.847
Irwin Garment fitter, J. T. Melick Garment supporter, R. Gorton Gas and atr mixer, Bulley & Johnson Gas generator, acetylene, M. D. Compton. Gas generator, acetylene, A. Holland Gas generator, acetylene, J. M. Hull Gas, train lighting apparatus for compress acetylene, Lipschutz & Toltz. Gate. See End gate	633,789 633,684
Gas generator, acetylene. A. Holland	633.592 633.844 sed
Generator. See Electric generator. Gas gene tor. Grain drill. L. L. Haworth	

man. Guns to loading position, apparatus for raising charges for breech loading, Dawson & Buck-ham.

cuarges for oreeen loading, Dawson & Buckham.

Harness connector, E. R. Birk.

Harrow, Blount & Guice.

Harrow, rotary disk. W. N. Rose.

Hat box, hanging compartment, H. F. Lindsey...

Heater. See Feed water heater. Hot water

heater. Water heater.

(Continued on page 238)

ing surfaces of metals, machine for, G. W. acker.

633,939