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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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 enies or to reply to all either by letter or in this department, each must take his turn.

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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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