testing pump and high pressure gage. In the union cohol. It gives the barium spectrum easy to recognize. joint were placed two disks of hard rubber, each about  $\frac{1}{33}$  of an inch in thickness, and above the disks a lead ball, 1 inch in diameter, was placed. On the railing of new element which gives to it radio-activity, and which the next story above was laid a target of five tiers of is close to barium in its chemical properties. 1¼ inch plank, directly over the range of the gun. The whole pipe being full of air atatmospheric pressure, the pump was put in operation, water being forced into also one of us has shown that radio-activity appears the lower end of the pipe reservoir. This forced the to be an atomic property, persisting through all the air up through the pipe line and compressed it under the hard rubber disks. When a pressure of 1,500 pounds this point of view the radio activity of our substance, per square inch was reached, the disks ruptured and not being due to barium, should be attributed to anthe gun was discharged.

The bullet passed through the 6¼ inches of pine planks, making a clean cut through the first planks and of hydrated chloride, an activity 60 times as great as badly shattering and displacing the last plank of the that of metallic uranium (the radio-activity was meastarget, then struck and splintered a beam under the roof and rebounded to the floor. This was repeated several times, the disks bursting at between 1,300 and and precipitating a portion by alcohol, the part pre-1,500 pounds and showing the great power of compressed air in the discharge of the projectiles. The prestidigitator part of Keely's exceedingly small feed series of fractionations, obtain chlorides more and more pipe to the chamber behind the disks and bullet, and his bogus tapping of the resonator, it is needless to say were not included in our experiment.

In conclusion we would remind our readers that the type is extinct; and that "resonators," "vibrators," such human sharks as Keely are still seeking to catch the unwary.

### Radium: A New Body, Strongly Radio-Active, Contained in Pitchblende. BY M. P. CURIE, MME. P. CURIE, AND M. G. BEMONT

cesses, a strongly radio-active substance can be ex- notable with the chloride concentrated by fractiona tracted from pitchblende. This substance is near bismuth in its analytical properties. We therefore came to the conclusion that pitchblende might contain a radio-activity, and this we think is a very serious reanew element, for which we proposed the name of polonium.

Our subsequent researches are in accord with the results first obtained, but, concurrently with these, we have met with a second substance, strongly radioactive, and entirely differing from the first body in its chemical properties.

Polonium is precipitated from its solution by sulphureted hydrogen. Its salts are soluble in acids, and are precipitated by water; polonium is completely precipitated by ammonia. The new radio-active substance we have discovered has, to all appearance, the properties of almost pure barium. It is not precipitated either by sulphureted hydrogen nor by ammonium sulphide nor by ammonia; its sulphate is insoluble in water and acids; the carbonate is insoluble in water; the chloride is very soluble in water, but

## RECENTLY PATENTED INVENTIONS. Agricultural Implements,

SUGAR-CANE WAGON. -- MARK R. SPELMAN. New Orleans, La. This vehicle has fifth-wheels connecting the vehicle-body with the front and rear axles. A reach pivotally connects the axles with each other at their middies. Frames, connected at their outer ends with the respective axles, extend inwardly toward one another; and the sides of the frames converge at their inner ends. Diagonal braces crossing each other are pivotally connected with the inner converging ends of the frames. tion. The two alarms are respectively driven by pri-A wagon thus constructed can readily turn in a narrow space

PLANTER. -CHIEVER C. and LEMUEL S. CAVES. Fremont, Iowa. This planter is especially adapted for planting potatoes, and is so constructed that the potatoes are introduced whole into the planter and automatically cut into proper pieces and planted. The planter is adapted to plant two rows simultaneously. Although designed primarily to plant potatoes, the machine can also be used as a corn-planter.

#### **Bicycle-Contrivances.**

BICYCLE OR SIMILAR MACHINE. - JOHN A. inventor is driven by hand-power and is so constructed whole machine while being swung around. The turn-

Nevertheless, we believe this substance, although in greater part consisting of barium, contains besides a

Here are the reasons which lead us to this opinion : 1. Barium and its compounds are not radio-active; chemical and physical states of the substance. From other element.

2. The first substances we obtained had, in the state ured by the amount of conductivity conferred on air in our apparatus). On dissolving these chlorides in water cipitated is much more active than the part left in solu- of Carnot. tion. Taking advantage of this fact, we may, by a active. We have thus obtained chlorides having an activity 900 times greater than that of uranium. We were stopped here by failure of material, but, from the progress of the operations, we could see that the activdeath of this prince of rogues does not imply that the ity would have augmented still more had we been able master's Department to secure at once an iron ship of to continue. These facts may be explained by the preetheric vapors," and others of that ilk, still walk the sence of a radio-active element, the chloride of which the islands of the Philippines. The War Department earth dressed in the ever varying garb with which is less soluble in alcoholized water than is that of has already ordered 166 miles of cable, which weighs barium.

> in a note following this. M. Demarçay has found in its spectrum a ray which does not appear to be due to

any known element. This ray, scarcely visible with Two of us have shown that, by purely chemical pro- the chloride 60 times more active than uranium, is tion to an activity 900 times that of uranium. The intensity of this ray augments, therefore, with the son for attributing it to the radio-active portion of our substance.

> These different reasons lead us to believe that the new radio-active substance contains a new element, to which we propose to give the name of radium.

> We have determined the atomic weight of our active barium by estimating the chlorine in the anhydrous chloride. We have found numbers differing very little from those obtained with inactive barium chloride; however, the numbers for the active barium are always a little higher, but the difference is of the order of magnitude of experimental errors. The new substance certainly contains a very large proportion of barium. In spite of this, its radio-activity is considerable. The radio-activity of radium ought therefore to be enormous.

Uranium, thorium, polonium, and radium, and their insoluble in concentrated hydrochloric acid and in al- compounds, render air a conductor of electricity, and

act photographically on sensitive plates. From these points of view polonium and radium are considerably more active than uranium and thorium. On photographic plates we obtain good impressions with radium and polonium in half a minute. It requires several hours to obtain the same result with uranium and thorium

The rays emitted by compounds of polonium and radium render barium platinocyanide fluorescent. Their action in this respect is analogous to that of the Roentgen rays, but is considerably more feeble. To make the experiment place on the active substance a very thin sheet of aluminum, and on this a thin layer of barium platinocyanide; in the dark the barium platinocyanide appears feebly luminous over the active substance.

We thus realize a source of light, very faint, it is true, but functioning without a source of energy. There is

.Uranium and thorium under the same circumstances give no light, their action probably being too feeble. -Comptes Rendus.

# A Cable Steamer for the Philippines.

The War Department has authorized the Quarterfrom 1.000 to 1,200 tons burden to lay cables to connect 525 tons. It will be coiled in skeleton tanks in the va-3. M. Demarçay has been good enough to examine rious holds in the vessel. It is considered very importhe spectrum of our substance. The results are given tant by the government to connect the various islands of the Philippines by cable.

# The Current Supplement.

The current SUPPLEMENT, No. 1204, is a very interesting number. It is begun by "The Beginnings of Plastic Art in Europe," in which some curious archæological specimens are presented and a recent book is reviewed. "The Mineral Resources of Cuba" is a timely article. "Methods of Preparing Rubber" is an important technical paper. The work on the new buildings of the Paris Exposition is described in detail. "Acetylene," by Prof. Vivian B. Lewes, is an important and authoritative treatment of the subject. The usual three columns of notes are published.

	· · · · · · · · · · · · · · · · · · ·
Cont	ents.
(Illustrated articles are n	narked with an asterisk.)
Art critic and the tall building 50 Sacteriology, kitchen	Moon, artificial*       52         Navies of the world*       56         Patent Office business       51         Phineappiers, pirates and brigands 51       51         Pineappierber       52         Process, dry cleaning, dangers       54         Radium       52         Roce cultivation, Russia       54         Skates, ice*       52         Sword, Dewey*       54         Tees, loombination*       52         Trees, bread fruit       54         Typewriter, Chinese       55         Wood-werking machine*       53         Y ravs, printing by       51

of the frame, and to relieve the rider of the jar expea wind-engine or other form of motor for the purpose of rienced when riding over rough roads. A novel brake is determining how many, if any, of the figures or articles can be dislodged by the action of the motor.

> MACHINE FOR SHAPING PLASTIC MATERIAL. -GUSTAV STOFF, Berlin, Germany. The machine is designed automatically to roll, form, and cut round-shaped pieces from rods of plastic material, such as marchpane, chocolate, caramel, and clay. The rods are placed above a pair of horizontal rotating rollers, each having several annular furrows or channels divided by sharp edges. The rollers are constructed to engage and to roll the rod placed above them, to change the rod by squeezing and forming while rolling into round-shaped pieces, and to cut the rod into sections.

## Railway-Appliances.

CAR-BRAKE - ERNEST B and ADOLPH L. GESCHE. Bingham Lake, Minn. The brake provided by this invention is controlled mainly from the draw-heads of the car and is applied upon the inward movement of the draw-heads, the movement being caused by the stopping of the locomotive and the bumping together of the several cars of the train.

GRAIN-DOOR FOR CARS.-BENJAMIN W. DAVIS. Rock Springs, Wyo. Vertical guideways are arranged KELLY, Brooklyn, New York city. The bicycle of this chine while moving over the rails, and supports the adjacent to the door-opening, which guideways are continued at their upper ends by a curved portion and a vided with pins mounted to move in the guideways and branch guideways. By reason of this construction, the door can be held open, completely out of the way, when the car is being unloaded. METALLIC RAILWAY-TIE. - GEORGE A. and THOMAS F. PENROSE and WILLIAM R. WARE, Meredith, Ark. The purpose of this invention is the provision of a tie, designed to be held in place without the ise of spikes, the adjacent ends being fastened together without the use of fish-plates. The tie is made in longitudinal sections, each formed with a pair of lugs, arranged so as to engage opposite sides of the rails. The lugs extend over the corresponding base, web, and under side of the rail. Each lug is provided with an extension. Bolts pass through the lugs, extensions, and webs of the rails.

horseshoe is fitted hot to the hoof, so that the rubber pads will form part of the shoe, the pads being remova ble and being provided with side calks. The pads lie snugly in panels made in the bottom face of the shoe between the heel and toe calks, and are held in position by nails driven through the shoe. The nails pass through eyelets which serve to prevent the pads from becoming lacerated by the nails, should they work loose.

AUTOMATIC LOCK FOR DUMB-WAITERS. GUSTAVE SEABERG, Brooklyn, New York city. 'This invention seeks to provide a hoisting and operating mechanism which will hold a waiter at any point, and which will operate as well with the waiter supported from one side of the pulley as from the other. By means of a novel arrangement of two disks provided with interlocking inclines, of sheave-wheels and collars, the rotation of the supporting shaft in either direction is prevented when power is applied by the pulley carrying the hoisting rope. The shaft can nevertheless be allowed to rotate in either direction when the handoperated rope is pulled.

ACETYLENE GAS-APPARATUS.-EUGENE BOUR-NONVILLE, Jersey City, N. J. This apparatus comprises essentially a generating-chamber, a gasometer, and automatic means for controlling the generation of gas. The generating chamber has a tapering bottom to permit the ready withdrawal of the lime residue, and is provided carbid\_recentacle wheel\_like in form as into a number of radial, carbid-containing compartments. The gasometer, by its action in rising and falling, automatically controls the generation of gas by means of a system of levers and rods connecting the carbid receptacle with the gasometer. In order to prevent the escape of gas from the generator, a layer of oil is used, which constitutes an effective seal and renders the generator air-tight. FOLDING BED.-JACOB LEVY, Brooklyn, New York city. The purpose of this invention is to provide a cheap and strong crib which may be made of iron and which may be readily folded into a small space. Each side and end of the bed is made as a frame. The parts are hinged together at the corners, so that when the bottom is removed or swung up these frames may fold so as to lie parallel to each other, and thus occupy less space than when opened out.

has endwise movement in a direction transverse to the frame of the bicycle to effect the steering. The bar or rod, in steering the bicycle, is operated by moving the propelling levers in a line transverse to their driving motion.

BELL.-ORVEY PRICE, Forty Fort, Penn. The purpose of this invention is to provide a bicycle-bell which is arranged to permit a rider to throw the bell into gear with one of the bic cle-wheels in order to sound the gong. With this end in view, the inventor has provided his bell with a revoluble wiper, and with a loose clapper adapted to pass into the path of the wiper and to be thrown outward into contact with the gong, in order to sound the bell.

CHAINLESS GEAR.-KARMELL BROOKS, New York city. The bicycle-gear of this inventor is essentially a roller bevel-gear, the novel features of the device residing in the peculiar construction of the shaft. The device is made so that it will constantly maintain a proper relation construction is enabled to compensate for any deflection will of the riders, into the path of the striking section of

that both hands can be used at the same moment table is detachable from the car-body, and, though loose, borizontal portion having a drop at its inner end. Offsets for driving and steering. A shaft or bar is connected is held in place by flanged metal rings forming a seat to or supports are arranged without the guideways and ad-with the driving-levers and with the steering-wheel, and receive the upper ball-bearing ring of the turn-table. In jacent to the curved portion, the upper surface of the order to turn the machine around, the front end of the offsets forming a portion of branch guideways extending car is raised by jack screws until the flanges on the outwardly from the main guideways. The door is prometal ring are clear of the turn-table. The table is then shifted back under the balance-ring, and the machine is lowered in place, the whole weight resting upon the turn-table.

provided, which is applied by back-pedaling.

Mechanical Devices.

ALARM CLOCK. - ARTHUR C. REICHEL, Union

Hill, N. J. To provide an alarm clock with two bells

differing in sound or pitch, and arranged that both

alarms may be so sounded by one spring that one bell

will ring alone for a short time, and then the two will

ring together for a short time, is the object of the inven-

mary movement gear-wheels. A lever coacts with one

of the alarms to hold the alarm normally inactive. A

slotted wheel has a projected portion engaging and nor-

mally holding the lever. A collar, driven by one of the

gear-wheels, has a finger coacting with the slotted

wheel, whereby the wheel is periodically moved so as to

EXCAVATOR.-WILLIAM S. RUSSELL, Toledo, Ohio.

This invention seeks to equip an excavator with an effi-

cient device for supporting the front end of the machine

and for turning the whole main car and frame com-

pletely around in order that it may work in both direc-

tions. The turn-table used supports the end of the ma-

release the lever.

DISH WASHING MACHINE -- ROBERT R. PARRY and EDWIN EVANS, Poultney, Vt. The machine has a reservoir and cover therefor. Two carriers are mountee to rotate in the reservoir and cover, and are adapted to be raised and supported above the water in the reservoir. A series of open-work receptacles contain the articles to be washed, and are arranged to conform with the outline of the carriers. Brushes are secured to one of the carriers. Means are provided upon the other car-

rier for holding the dishes so that they shall engage the brushes.

MERRY-GO-ROUND.-PETER J. SPRACKLEN, Kenton, Ohio. This invention provides a game-attachment between the driving-gears. The shaft of the gear is of for merry-go-rounds, which attachment is so constructed spring or flexible construction, and by reason of this that a number of figures or articles may be brought at the

## Miscellaneous Inventions.

ELASTIC TREAD HORSESHOE. - ARTHUR W. CROZIER and GEORGE SMITH, New York city. The

#### SPECTACLE ATTACHMENT FOR EYEGLASSES. JOHN J. MUNDORFF, New York city. It sometimes happens that, in violently moving the body, eyeglasses fall off. For this reason an attachment has been devised which can be temporarily secured to the glasses and which converts them into a pair of spectacles. The attachment consists of spring-arms extending along opposite edges of the lenses, and

having jaws attached to their ends adapted to embrace the edges of the lenses. The spring arms are bent to one side, in opposite directions, so as to throw the jaws normally out of line with each other, the object being to enable the jaws to be firmly clamped upon the lenses.

CANOPY FOR BOATS .- JOHN C. HARLOW, Janes ville, Wis. This canopy is so constructed that it can be secured at any desired distance above the gunwales or lowered in order to protect the cockpit when the boat is not in use. The canopy is made so that a half-section at either side may be raised to enable a person to enter or leave the boat.

WIRE-NETTING FOR USE IN MANUFACTUR ING PAPER.-KARL KUFFERATH. Mariaweiler, Germany. The rapid wearing away of the wire fabrics used in carrying the films of pulp bas been a great disadvantage in paper-manufacture. It is the purpose of this invention to overcome the difficulty, by provising a fabric having warp and weft threads, the warp-threads of which fabric are passed, with respect to the top of the fabric, over one weft-thread and under two of the contiguous weft-threads.

BOX-FASTENER.-RUDOLPH C. KUHN, La Crosse, Wis. The fastener is adapted to be applied partially to the body of the box and partially to the cover. The parts of the fastener are so applied that the cover may be quickly placed in position and securely locked and unlocked. The cover has at one edge bracket-carrying projections upon its inner face, one member of each COTTON. bracket being adapted for engagement with the under surface of a cover-projection. The other member of the bracket is provided with a spur adapted to enter the end of the projection. A lug extending from the end of the lower member of each bracket and beyond the upwardly extending member engages a staple on the cover when the latch of the cover is in its full locking position.

SHUTTLE GUARD FOR LOOMS.-MAJOR T. MEL-VIN, Fall River, Mass. To provide a shuttle-guard which shall prevent the shuttle from leaving the loom, should it fly out of the shed, is the object of the present invention. The guard comprises brackets having apertures, a rod secured at its ends by the brackets, and a connecting-piece for the brackets formed at its ends with reduced extensions passing through the apertures in the brackets.

ADJUSTABLE CHAIR -- DAN E. CARTER, Traverse City, Mich. By the combination of a stationary frame and an adjustable frame, this chair is adapted for use as a lawn-chair, a reclining-chair, an invalid's chair, a couch, or a stretcher. The back, seat, and direct support for the lower limbs of the person occupying the chair are made of canvas, which, by means of a roller. may be placed under any desired tension.

COMBINED CLOTHES RACK AND CLOSET. EUGENE CHRISTEN, Decatur, Ind. 'The combined clothes rack and closet has its back fastened to a support and provided with hooks. A shelf is supported from the back. Segmental doors hinged to the ends of the back abut against each other at their free ends. The top of the doors and the shelf are connected with a flexible cover. A mantle made of two pieces of fabric is attached to the doors.

COMBINED CANE AND FOLDING-CHAIR. -NIELS CHRISTIANSON, Brooklyn, New York city. Two half-tubes curved at one end to form a cane-handle or crook and hinged together, serve as the casing of the cane and the back of the chair. A seat-bar curved to lie in the crook of each half-tube extends down to about the middle of the tubes, and is pivoted to swing outward, being held in this extended position by a post adapted to lie within the tubes.

### Designs.

CIGAR-COUNTER UTENSIL.-WILLIAM E. PARsons, Jr., New York city. This design provides a box of cigars supported by a standard, an alcohol lamp, before which are placed two cigar-lighters, and a cigarcutter situated in front of the casings of the cigar lighters.

GAME-BOARD. - SIMON M. LUTZ, Bedford, Pa. This game-board is an ordinary checker-board, having an additional row of squares running both vertically and horizontally at the center of the board. These additional rows are red in color and constitute a red cross. When upon the red cross, a player is upon neutral ground, as it were, and cannot be taken ; he has, moreover, other privileges which may be decided upon before the game.

CLOCK-BACK. - NATHAN L. WHEDON, Everett. Wash. 'The leading features of the present design consist in an offset on the back and in star ornaments of the surface.

COVERED DISH. - ADOLPHE PAROUTAUD, New York city. The body of this dish has an upward swell, the upper portion of which is interrupted by embossed

tiller of the soil, the scientist or the student. They are edited by L. H. Bailey, of Cornell University, N. Y., which is in itself sufficient guarantee of the excellence and accuracy of the volumes. The book before us is most valuable, and it is an extension of the thesis presented to Cornell for the degree of Master of Science and Agriculture. The author was a bush fruit grower before he was a university student. He is now Professor of Horticulture in the Rhode Island College of Agriculture and Mechanical Arts. so that in this instance an ideal combination of the practical man and the scientist is consummated.

BOILERS AND FURNACES. Considered in Their Relations to Steam Engineer-ing. By William Barr. Philadel-phia: J. B. Lippincott Company. 1899. Pp. 405, 468 illustrations. 8vo. Price \$3.

It is a pleasure to examine a technical book which is gotten up in such excellent form as the present work. Thepage islarge, the type is clear, the illustrations lucid the text and the tables are valuable. The author is already well known in steam engineering; so that he hardly needs the present book to assure the reader of his professional standing. No one is better qualified to treat of the subject. The book is of great value, and will be warmly welcomed by all who are interested in manufacturing or using boilers. It is a book we heartily recommend to the mechanical engineer.

TTON. By C. P. Brooks. Lowell, Mass.: C. P. Brooks. 1898. Pp. 362. 8vo. Profusely illustrated. Price \$3.

The present volume deals with cotton-its use, varieties, fiber, structure, cultivation, and preparation for the market and as an article of commerce; also the manufacture of the cotton seed, and fertilizers, with a special reference to cotton growing, ginning, and oil pressing in the United States. The author was formerly the Director of the London Technical School and is a recognized expert on the textile industry, both in the United States and in England. Cotton is the greatest of all fiber products, and the present volume deals in a thoroughly scientific manner with, the interesting problems which the growing, ginning, and shipping of cotton involve. The volume might readily have been made dull and uninteresting, as books on textiles are almost sure to be, but instead it is filled with interesting illustrations and is printed in clear type, admirably illustrated by high class engravings, although some of the engravings of the machines show their origin, the trade catalogue The text is interesting even to the general reader, and we do not see how anyone who is interested in any way in the cotton industry can fail to own this really important volume.

PRISMATIC AND DIFFRACTION SPECTRA. Memoirs by Joseph von Fraunhofer. Translated and edited J. S. Ames. New York : Harper & Brothers. 1898. Pp. 68, plates. Price 60 cents.

Fraunhofer in 1814 worked independently of Wollaston. and discovered the lines in the solar spectrum which now bear his name. The paper of Fraunhofer in which he describes the results of his experiments is printed in fuil in this volume. The great merit of Fraunhofer's work is the systematic, logical method by which he proceeds from investigation to investigation. All modern work in spectroscopy is based upon that of Fraunhofer, and a brief bibliography of the most important contributions is appended to this volume. We believe that this is the first volume of "Harper's Scientific Memoirs" we have reviewed. A number of volumes are in preparation which will deal with original memoirs by celebrated physicists.

THE FREE EXPANSION GASES OF Memoirs by Gay-Lussac, Joule, and Joule and Thomson. Translated and edited by J. S. Ames. New York and London: Harper Brothers. 1898. Pp 106. Price 75 cents.

The present volume is another one of "Harper's Scientific Memoirs," and the remarks made above upon the importance of series of this kind are borne out by the work before us. The papers are accompanied by biographical sketches of Gay-Lussac and Joule. They will prove of great interest to the physicist.

FOWLER'S MECHANICAL ENGINEERING POCKET BOOK FOR 1899. By William H. Fowler, A.M.I.C.E. Manchester, England: Scientific Publishing Company. 1898. Pp. 324. 18mo. Price 60 cents.

'l'he author is the editor of The Mechanical Engineer which, though started only a short time ago, has already shaken up the dry bones of English technical journalism. There was an ample field for this newspaper in England, and we feel sure there will be for this new pocket book. which is certainly published in a cheap and useful form.

## 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 follow ing 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 Lathe Co., Chagrin Falls, O For bridge erecting engines. J. S. Mundy, Newark, N. J. Astronomical Telescopes, Lohman Bros., Greenville, O. FERRACUTE Machine Co., Bridgeton, N. J. Full ine of Presses, Dies and other Sheet Metal Machinery. Inventions developed and perfected. Designing and machine work. Garvin Machine Co., 141 Varick St., N.Y.

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

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

For Sale or Royalty, United States Patent No. 617,649. Improved Ice Skate. See cut and description on page 52, this issue. C. F. Filor, care S. S. Moore, Trenton. N. J.

Roche's "New Standard" Electric Necktie Pin. Works like a charm. Midget Battery. The electric light is a beauty and a wonder. Sent postpaid for \$1.00 Agents wanted. Wm. Roche, 259 Greenwich St., New York.

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#### HINTS TO CORRESPONDENTS.

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 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.
Bu yers wishing to purchase any article not advertised in our columns will be turnished 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 A merican Supplements referred to may be had at the office. Price 10 cents each.
Books referred to promptly supplied on receipt of price.

price. **Minerals** sent for examination should be distinctly marked or labeled.

(7576) J. A. W. asks: 1. Which is the better way to make core of induction coil-of disks of soft iron and tissue paper like an armature core or to make it of small iron wire? A. The core of an induction coil is arranged so that it can be magnetized lengthwise as easily as possible. It is therefore made of wires extending through it lengthwise. These are shellacked to prevent magnetic continuity through the mass crosswise, so that each wire shall act alone. In the armature core of a dynamo the object is to have the magnetic flux crosswise. Hence, disks of sheet iron are used, and the flow of magnetism lengthwise is prevented by disks of paper. These arrangements cannot be interchanged. Both coil and dynamo would be ruined. 2. Is there any advantage in shellacked wire over bare wire ? A. Yes ; it insulates the wire. 3. Have you any back numbers with a good article on coil making? A. A good coil giving a 6-inch spark is described in SCIENTIFIC AMERICAN SUP-PLEMENT, No. 1124. A smaller coil is to be found in SUPPLEMENT, No. 160, price 10 cents each.

(7577) J. H. B. asks: 1. Can you tell me how to make a primary battery that will give eight volts and three amperes for lamp work, and that can be built and run at a reasonable price? A. Five cells of bichromate plunge battery will give you this current. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 792, for plans and description of this battery, price 10 cents. 2. Can you give me any information or reference where it can be found in regard to photographing an eclipse of the moon ? A. Lunar photography is not different from any other astronomical photography. A good equatorially mounted telescope with clock work is required. Attach a camera in place of the eve piece and expose as for any other photograph. We fail to see what advantage there is in photographing the moon in eclipse, since there is less light then than at other times, and the moon

struct a resistance coil so as to reduce a current of 150

(7580) E. M. M. asks: How can I con-ruct a resistance coil so as to reduce a current of 150 (Continued on page 62.)

amperes to 8 or 9 amperes, so I can charge a storage battery by attaching to the incandescent line ? Or give me some simple method of accomplishing this. A. If von wish a current of 9 amperes, divide the voltage of the current by 9. 'The quotient is the number of ohms of resistance required. You do not tell us the voltage, nor do you give the number of cells in the battery to be charged-both absolutely necessary to be known to solve your question. See answers to query 7232.

### TO INVENTORS,

An experience of fifty years, and the preparation of more than one hundred thousand applications for patents at home and abread, 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 per some 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, Sil Broadway, New York.

# INDEX OF INVENTIONS For which Letters Patent of the United States were Granted

## JANUARY 17, 1899,

AND EACH BEARING THAT DATE. [See note at end of list about copies of these patents.]

Alarm. See Burglar alarm.	
Alkyl-hypoxanthin and making same, E. Fischer	618,045
Anthraquinone derivative and making same, O.	017,385
Bally	617,981
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