RECENTLY PATENTED INVENTIONS. Agricultural Implements.

MACHINE FOR HULLING OATS .- S. E. FIELD, Victoria, Canada. In operation this machine receives the oats in a hopper and guides them to rollers in such manner that the rollers will nip the heads of the oats and will squeeze out the groats, the groats failing within the machine, while the hulls pass through to the outside. The oats and other grain may be hulled without going through any previous preparation or process.

PLANTER.-J. P. CALDWELL, Winnsboro, S. C. The present invention relates to an improvement upon a former patent granted to Mr. Caldwell in 1900. The seed-planting wheel may be used at will for planting cotton-seed or smaller seed as peas and corn, the dropping mechanism being automatically operated. The seed-dropping mechanism may be rendered inactive, so that larger or smaller seed may be planted or the seed planted at intervals, thus avoiding chopping out the rows, after the plants have grown. The machine opens a furrow, covers the seed and rolls the covering down; it distributes fertilizing material and provides agitating devices for the bulk of the seed and the fertilizing material.

THRESHING-MACHINE.-N. E. HEIEREN Baxter, Minn. The old form of grain-pan ls improved upon in this invention, by providing such pan with means, whereby should any grain be fed forward with the chaff from the first series of chaffers such chaff containing grain will be compelled to pass over the second series of chaffers before the chaff is thrown off on the chaff heap. The auxiliary chaffers of the grain-pan are adjustable and operate with any kind of grain so as to separate it from the chaff. The fan is located below the grain-pan so that the blast of air therefrom is diverted into the pan and upward through the spaces between the chaffer-slats.

GRASS-SEED STRIPPER .--- II. T. and W. H. McCORMICK, Winchester, Ky. This stripper 1s in the nature of an improvement in devices employed for stripping off grass-seed or the heads of grain. The invention gives ample room for the workman in the box and allows the use of moderate sized wheels; the shafts are attached close to the centers of the wheels, making a light draft: and, as the seedbox is rigid with the axle and is arranged to oscillate with the axle in the hub of the wheels instead of on the axle, the machine may be used on a hillside as well as on level ground.

Electrical Improvements.

ELECTRIC STOP-MOTION FOR KNIT-TING-MACHINERY.—A. L. PATTERSON, Albe-marle, N. C. This device is of that class known as "electric stop-motions" for knittingmachines. It is controlled by electromagnetic mechanism and circuits which automatically, forward or backward. In alighting the speed stop the operation of the knitting-machine, of the wings is slowed up, the machine gently whenever the yarn breaks or too much slack descending, the buffers cushioning the force occurs from a feilure of the traction of the view of the all the force occurs from a failure of the tension devices of the alighting frame. to work properly.

COMBINED ELECTROLYTIC AND ME-CHANICAL INTERRUPTER.-H. R. SMITH, and improved friction-coupling, more especially Altoona, l'enn. This improvement has reference to an interrupter suitable for the operation of Ruhmkorff coils and the like, and comprises both an electrolytic or Wehnelt inforrupter of modified form and a mechanical in other under a heavy load, and to insure proper terrupter connected therewith, the two inter-friction contact of the faces in case the shafts rupters mutually qualifying the effect of each other.

PLATE FOR ELECTRIC ACCUMULATORS. —D. TOMMASI, 7 Rue des Immeubles Indus-triels, Paris, France. This system of accumulator-plate is characterized; first, by the employment of strips placed in close proximity to ratain the active material and permit of the uniform distribution of the current through-out the raass; second, by the employment of a diagonal conducting-strip upon one face of the plate, the strip extending from the angle cortice containing precious metals or gems, and responding to the point of entry of the current the object is to provide a machine of this and serving to insure a uniform distribution of the current through all parts of the plate.

Engineering Improvements.

STEAM-BOILER .- M. K. VAN DER VELDE, Chicago, Ill. In the operation of this boiler,

larly adapting the apparatus to the use of builders in raising brick and other building material to the place of work, the object being to provide a hoisting device that may be readily placed in position and adjusted to height as the building progresses.

WASHING-MACHINE.—D. S. TYLER and L. D. TYLER, Indianapolis, Ind. The inventors' principal object is to provide means whereby to thoroughly and easily cleanse and turn the clothing during the washing operation, as well as means for securing the wringer so that the wringer can be quickly turned into and out of position for use.

SELF-OILING JOURNAL BEARING.-G. A. ENSIGN, Defiance, Ohio. In the present case the improvements refer to journal-boxes of the ring-oiler type; and their object is to provide a new self-oiling journal-bearing which is positive in action, requiring little attention, and arranged to uniformly distribute the lubricant to all parts of the bearing and to permit employment on high-speed shafts.

MACHINE FOR PRODUCING APERTURED DISKS .- G. A. ENSIGN, Defiance, Ohio. This invention relates to woodworking machinery; and its object is to furnish a new and improved machine for producing apertured disks in a simple and quick manner, the disks produced being accurate in shape and the device readily worked without the use of skilled labor. For producing larger or smaller sizes of disks correspondingly-sized cutter-heads and augers are employed.

GRAPHOPHONE - REPRODUCER. — W. HART, Kirksville, Mo. This inventor's improve ments relate to graphophones, and his object is to improve the sounds made by the reproducer, and also to provide certain adjustments for regulating the sounds reproduced. Double diaphragms are used, and the sounds produced by this device are louder, clearer and richer than those afforded by the ordinary reproducer.

GUN BORING AND BURNISHING MAimprovements in the present invention relate to machines for choke-boring a gun-barrel and burnishing the interior of the barrel, the object being to furnish a machine of simple construction to be made and sold at a low cost and that may be readily operated by any person either skilled or a novice in the art of gun making or repairing.

FLYING-MACHINE.-O. A. KAEHLER, De troit, Mich. In operating this machine, the operator from his seat causes the rotation of the cranks by foot power or any other wellknown motor, and thereby revolves the wings. A lifting effect is thus produced by the reaction of the air upon the wings. The operator steers by means of hand-cranks, one of the propellers at his right and the other at his left, so that he can turn either at will in either di-to dress in becoming style where little time is rection. These propellers drive the device available for the purpose.

FRICTION-COUPLING .- A. LEIKEM, Chicago, Ill. Provided in this invention is a new designed to couple shafts together, and ar-ranged to positively lock the driving-shaft to the driven shaft in case the contact frictionfaces of the coupling members slip one on the other under a heavy load, and to insure proper move out of longitudinal allnement.

STOP-MOTION MECHANISM.-D WADE, Cedartown, Ga. Mr. Wade's improve-ment in this invention relates to stop-motion mechanisms for weaving-machines, looms and in other brushes. The object is to provide a other devices used in operating textiles. It is brush which can be readily and thoroughly other devices used in operating textiles. It is based upon the principle that the breaking or to each other in the empty spaces of the lead slackening of a thread controls an electro-grid or frame of the plate, the strips serving magnet, and thereby disconnects some part of magnet, and thereby disconnects some part of the machinery.

DRIER.-J. WATERHOUSE, New York, N. Y. This invention relates to improvements in machines for drying fruits, meats, sand, and matcharacter with which moisture and light dust may be quickly and effectually separated from the material.

Metallurgical Apparatus. APPARATUS FOR TREATING ORES .--- II.

on the vehicle-tongue, to apply the brake by either pulling or back pressure on the tongue, to apply the brake by pulling strain alone, and to so place the parts that the brake cannot be set by either forward or back strain on the tongue.

Miscellaneous.

MEASURING INSTRUMENT.-I. B. HAGAN, North Lamoine, Me. In this measuring instrument, the object is to provide a simple and inexpensive device that will be found useful to surveyors, engineers or others in laying out or plotting angles, measuring distances, and plotting work generally. The wide range of its measuring is shown in the capacity of the instrument to find the course or bearing and distance of two objects at sea, or to lay out rafters for building purposes.

SLICING-KNIFE .-- W. KELLEY, Scammon, Kan. This invention relates to that class of knives provided with a plurality of blades held in parallel planes on a single handle. The object is to provide a knife adapted to cut a plurality of slices at one time and also by easy detachment of the two outer blades from the handle enable the use of a central blade for cutting bread or cake with one edge of this blade and meat or more compact substances with the opposite edge.

MOVABLE LETTERS FOR ADVERTISING BOARDS .- T. KNOBLICH, 43 Pferdemarkt, Hamburg, Germany. This invention has reference to movable letters for advertising pur poses, which either sirgly or connected, so as to form words and either in or not in con-nection with other immovable letters, shall be used for advertising words, for the purpose of drawing the attention of the public through either movement, to such advertisements with which they are connected.

UNDERWAIST .- E. H. HORWOOD, Hoboken, N. J. In this case the inventor provides a con-CILINE .- T. C. HISTED, Pittsburg, Kan. The struction of undergarments in which gathers, plaits, or shirrings are used, and in which a yoke is so combined with the body as to take all the strain from the gathered-in fullness, thus preventing the gathers, etc., from being drawn or wrenched from position at their edges The yoke has integral shoulder-straps and the body has stays at the top and bottom of the gathered material, the upper stay reinforcing both the yoke and the body.

WARDROBE-TRUNK.-N. BARUCH. New York, N. Y. The construction invented by Mr. Baruch relates to a wardrobe-trunk admitting of general use, but particularly desirable for actors, traveling salesmen, and others who have frequent need of carrying wearing-apparel from place to place in journeying to any great extent, and who know the value of being able available for the purpose.

TEMPORARY BINDER.-F. B. TOWNE, Holyoke, Mass. Means are provided in this

invention for increasing the capacity of a binder in storing or filing leaves or sheets. Extensible posts with adjustible ratchet members are provided, the members being attachable and detachable to allow increase or decrease in the length of the posts. The adjustable ratchet members of the posts co-operate with locking devices on a shiftable locking-slat which may be equipped with a waste leaf, and these ratchet members are formed with teeth always in position to engage with the locking devices on the slat.

BRUSH.—D. F. MAHER, Watsonville, Cal. While the application of this invention is mainly to a tooth-brush, it may be embodied cleansed by forming one of the sections movable relative to the other sections, so it can be slipped out of imediate relation with the fixed ections to facilitate the complete cleansing of the brush.

EGG-PRESERVING COMPOUND.-J. BROOKS, Clifton, Texas. Mr. Brooks is the inventor of a new composition of matter which is used for the preservation of eggs. of 11 to 20 or 30 h. p. It keeps eggs sweet and fresh for months at a very low cost. The operation of treating the chine of the greatest promise at a low figure with eggs is very simple and can be quickly and privileges of foreign patents. John Joyce, Box 773, easily done when transferring the eggs from New York. bulk to the shipping cases.

set to apply the brake to a team holding back Business and Personal Wants.

READ THIS COLUMN CAREFULLY.-You will find inquiries for certain classes of articles numbered in consecutive order. If you manu-facture these goods write us at once and we will send you the name and address of the party desir-ing the information. In every case it is neces-sary to give the number of the inquiry. MUNN & CO.

Marine Iron Works. Chicago. Catalogue free. Inquiry No. 4171.—For manufacturers of mat-ress-making machinery.

AUTOS .- Duryea Power Co., Reading, Pa.

Inquiry No. 4172.—For a light weight keresene bil engire, 8 to 12 horse power, suitable for an air ship. Morgan Emery wheels. Box 517, Stroudsburg, Pa.

inquiry No. 4173,—For a duplicator for making simultaneous copies through thin fabrics, such as silk, linen, etc., also for frames for stretching such fabrics. "U. S." Metal Polish. Indianapolis. Samples free.

Inquiry No. 4174.—For material and supplies to manufacture gas mantles.

Blowers and exhausters. Exeter Machine Works, Exeter, N. H.

Inquiry No. 4175.—For firms in Chicago making shuminium house numbers. Handle & Spoke Mchy. Ober Mfg. Co., 10 Bell St.,

Chagrin Falls, O.

Inquiry No. 4176.—Fordealers in flour mills run by kerosene oil engine of 6 to 10 h. p., also of flour mills for family use, operated by hand.

Mechanics' Tools and materials. Net price catalogue. Geo. S. Comstock, Mechanicsburg, Pa.

Inquiry No. 4177,—For a wire-drawing plant and wire nail-making machine. Sawmill machinery and outfits manufactured by the Lane Mfg. Co., Box 13, Montpelier, Vt.

Inquiry No. 4178.-For a portable shingle-sawing machine.

Sheet, bar, rod or wire, cut, formed, any shape. Metal Stamping Company, Niagara Falls, N. Y.

Inquiry No. 4179.—For dealers in transparent colluloid sheet.

Let me sell your patent. I have buyers waiting. Charles A. Scott, Granite Building, Rochester, N. Y.

Inquiry No. 4180.—For dealers in boats, shells and half shells for regattas. Automobiles built to drawings and special work done

promptly. The Garvin Machine Co., 149 Varick, cor. Spring Streets, New York.

Inquiry No. 4181.-For the makers of the Wee-en toy steam engine. Manufacturers of patent articles, dies, stamping

tools, light machinery. Quadriga Manufacturing Com-pany, 18 South Canal Street, Chicago.

Inquiry No. 4182.—For makers of pocket knife blades "blank" ready to drill and fit to knife. Crude oil burners for heating and cooking. Simple,

efficient and cheap. Fully guaranteed. C. F. Jenkins Co., 1103 Harvard Street, Washington, D. C.

Inquiry No. 4183. -- For manufacturers of frames for miniature photograph pins.

The largest manufacturer in the world of merry-go-rounds, shooting galleries and hand organs. For prices and terms write to C. W. Parker, Abilene, Kan.

Inquiry No. 4184.—For manufacturers of acety. lene gas machinery.

Experienced mechanical draughtsman wanted. Permanent employment assured to rapid and accurate draughtsman. Mill Work, Box 773, New York.

Inquiry No. 4185.-For manufacturers of light ools, such as trowels, surgical instruments, pinchers, cools etc.

We manufacture anything in metal. Patented artimetal stamping, dies, screw mach. work, etc. Metal Novelty Works, 43 Canal Street, Chicago.

Inquiry No. 4186.-For dealers in porcelain or crockery trays of special dimensions, not less than $\frac{1}{2}$ in, thick at weakest point, for use under cold storage cells. 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.

Inquiry No. 4187.-For dealers in gun metal. Contractmanufacturers of hardware specialties, machinery, stampings, dies, tools, etc. Excellent marketing connections. Edmonds-Metzel Mfg. Co., Chicago

Inquiry No. 4188.—For makers of noseand mouth protectors to keep out dust.

The best book for electricians and beginners in elec. tricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$5. Munn & Co., publishers. 361 Broadway, N.Y. Inquiry No. 4189.-For a reversible marine clutch for explosive engines.

FOR SALE.-Two patents. One good to handle by shop rights; one a useful household novely for agents, mail order or regular trade. Chas. B. Post, New London, Ohio.

PATENT FOR SALE OUTRIGHT. - Agricultural ma-

SHIP'S TABLE.—W. J. PREATER, Elizabeth, for fly screens. N. J. In carrying out this form. N. J. In carrying out this improvement, the machinery stampings, dies, tools, etc. Excellent marketing connections. Edmonds-Metzel Mfg. Co., 778-784 W. Lake Street, Chicago.

the steam is generated on the several surfaces,
or levels of water, and the steam generated
in the bottom pan forces the water downward
moving the float down and opening a valve, so
that the steam may pass into the middle pan,
and the steam with the steam generated in the
middle pan will cause the valve to open, per-
mitting the steam to pass into the upper space
of the boiler or into the space in the top pan
and thence out through the steam-pipe.

matter to Eli II. Goslin, Petersburg, Indiana. cific gravity of gold as compared with sand The adaptation of this injector is essentially for injecting air or other analogous gas into steam for the purpose of increasing the volume The invention also resides in of the steam. a novel combination of an injector with a source of steam and a motor driven there-

Machines and Mechanical Devices.

HOISTING DEVICE .- M. RATH, Two Rivers.

HIRSCHING, San Francisco, Cal. The primary inventor's particular point in view is to conapparatus can be successfully employed whether one part or all of the above mentioned metals are contained in the ore.

GOLD-DREDGER .--- O. F. BARNES, Arcola, III. The usual suction-dredgers are imprac-INJECTOR.-S. F. SIPLE. Address mail river-bed or the like, because of the great spe- means. and gravel-that is while sand and water are lifted by the suction the gold will sink into the tion the object is to construct a linotype galley sand-bed too deep to be lifted by the suction. The object, therefore, is to provide means for collecting gold with the sand at a point so near the inlet of the suction-pipe that the gold

will be elevated by the suction-draft.

Vehicles and Their Accessories.

VEHICLE-BRAKE.-E. KEPP, Xenia, Ill. ments in hoisting devices or elevators, particu- a brake mechanism so arranged that it may be the invention, and date of this paper.

object in view in this invention is to provide struct a table not liable to be unfitted for an improved apparatus for treating orescontain. Use by the motion of a result. The tap of use by the motion of a vessel. The top of ing copper, zinc, nickel, silver, and gold, which this table always rests in a horizontal plane irrespective of the pitch, roll, or motion of the vessel, and is so arranged that the use of the table is not interfered with. The table-top may be extended or folded outward for use for a large number of persons, such changes tical or of little use in elevating gold from a in size being readily made by lever-connecting

LINOTYPE-GALLEY .- F. E. MILHOLLAND, Brooklyn, N. Y. In carrying out this invenso that it may be locked up—that is to say so that the type may be locked firmly in the galley. The inventor accomplishes this by a movable barrier arranged in the galley and hav ing a certain novel form of locking lever and spring.

Note.-Copies of any of these patents will be furnished by Munn & Co. for ten cents each. Wis. Embodied in this invention are improve- The object in view in this device is to provide Please state the name of the patentee, title of

Inquiry No. 4192.—For makers of kilns for burn-ag lime from limestone.

WANTED.—Catalogues and price lists of all kinds of commodities, novelties, household articles, etc., suitable for marketing through agents or mail order trade. Eagle Commercial Co., Box 332, Philadelphia, Pa

Inquiry No. 4193.—For makers of traction en-gines or road locomotives.

WANTED.-To sell patent, or manufacture on royalty, a combination can opener, can cutter, screw driver, and ack puller. Constructed of steel castings, (2 ps.) weight 3% oz., costing about 4 cts. Have gated patterns and samples. Good seller, John Cooper, Mt. Vernon, Ohio.

Juquiry No. 4194.—For manufacturers of ma-chines for making paper tubes.

FOR YOUR OWN PROTECTION

send postal card for Free Booklet of patent claims relating to Hollow Concrete Building Blocks and machines for their manufacture to the Harmon S. Palmer Hollow Concrete Building Block Company, Washington, D. C., owners of patents, or one dollar for Full Copies, including Drawings and Specifications in bound form. thirty-five pages 8 x 11 inches. Beware of infringe ments, several suits already filed. New patents, adjustable machines.

Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway, New York. Free on application.

Inquiry No. 4195, -For blue prints of one horse power stationary engines. Inquiry No. 4196.-For a large gasoline stove for heating a one horse power boiler.

Inquiry No. 4197.-For makers of collapsible metal tubes for holding polish, etc. Inquiry No. 4198.-For a rotary fan run by clock

Inquiry No. 4199.-For parties engaged in diffi-cult chilled casting work.

Inquiry No. 4200.-For makers of machinery for making potato starch.

Inquiry No. 4201.-For makers of self-cleaning curry combs.

Inquiry No. 4202.-For advertising novelties suitable to advertise medicines.

POPULAR STEAM TRAPS.

There can be no question as to the popularity among steam fitters and engineers throughout the country of the tried and proved "Nason" and "Sidelug" Steam Traps, a cut of one of which is here shown. They are more extensively known and used than any other kind, a fact for which

their excellent reputation is responsible. The "Nason" Traps have been divided into

two groups to meet the demand made by modern steam engineering for higher pres-sures. Consequently, while one "Nason" Trap is constructed for ordinary working steam pressures of 70 lbs. or less, the other is for pressures of 71 lbs. and less than 150 lbs. Both the "Nason" Traps are of a high standard of construction and are manufactured by the Nason Manufacturing Company, 71 Fulton Street and 71 Beek-man Street, New York City.



HINTS TO CORRESPONDENTS.

 Init's to contension parts.
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. his tur

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Minerals sent for examination should be distinctly marked or labeled.

(9018) M. E. B. asks: I understand that the difference between the static and other electric currents is its high voltage and extreme low amperage. Now, what is average voltage and amperage of an electric static current from a common static machine of 16 plates running at moderate speed? A. The voltage of the discharge of a static machine depends upon the distance between the discharging rods. A spark of one inch in air under ordinary con-ditions requires perhaps 28,000 volts. The matter is treated in Thompson's "Elementary Lessons," quite fully. 2. Could a current similar to the static in voltage and amperage be procured from batteries (or lighting street current) and coils? A. Any induction coil gives the same kind of secondary discharge as a static machine. 3. If cells to be used, how many would you need, say of the Laclede national No. 7 to generate such a current? A. A coil giving a one-inch spark should be run with two or three cells of battery; one giving an eight-inch spark with six to eight cells of potassium bicarbonate battery. 4. Describe making the coil or series of coils to produce the static current effect, procured from batteries, and from city lighting current of about 110 voltage. A. A coil giving a six-inch spark is nium chloride will be sufficiently adherent or described in SUPPLEMENT No. 1124, price ten cents. 5. Is there such a machine made (in the market) to give static current effect from (9023) A. C. asks. batteries or city current? A. Induction coils are for sale by all dealers in electric apparatus. 6. Give name of book, brief and comprehensive, for making coils in general for medical bat teries, etc. A. Norrie's "Induction Coils" is a good and recent book on coli making.

16 c. p. light costs \$1 per 100 hours, what would this current cost per 100 hours? A. 16 c. p. light on 220 volts consumes about 1/4 ampere. If this costs \$1 for 100 hours, 1.5 amperes will cost \$6 for the same time. 5 What would two 110-volt lamps connected in series cost at rate mentioned above? A. If the two 110-volt lamps are 16 c. p., they take 1/2 ampere, and the two in series will cost twice as much as one 16 candle lamp on 220 volts. You will also have twice as much light.

(9020) P. T. P. writes: I have one of your SUPPLEMENTS giving directions for the making of an induction coil for sparking purposes. I have as a condenser about 30 square feet of tinfoil, alternated with sheets of paraffin paper. I use one sheet of paraffin between the tinfoil. The paper is some I made mysclf; paper about like what I am writing upon, soaked in paraffin. There is a great noise like sparking or buzzing in the condenser when in operation. Does this indicate that the condenser leaks? That the insulating sheets are not what they ought to be? Your SUPPLEMENT directed paper coated with shellac varnish to be used, but I substituted paraffin. Does the difficulty lie here? Would the placing of two sheets overcome the difficulty? A. Paraffin is a suitable material for coating the sheets of paper for a condenser of an induction coil. The paper must be without pores or visible holes. Before coating each sheet must be examined by holdlng between the eye and a strong light to detect these holes. One sheet of good firm paper is enough to use between two sheets of tinfoil. As we do not know what coil you have bullt, nor how you built it, we are not able to say what your difficulty may be. Norrie's "Induction Coils," price \$1, gives careful instructions for making a coil and the proper size of condenser for each length of spark. One of the most frequent causes of failure in coil making is in getting the condenser too large or too small for the coil. It should very carefully adjusted to the current to be used. It is possible that the margin of the paper beyond the foil is too small, around which a discharge may take place.

(9021) H. R. asks: 1. What is the "elastic limit," or limit of elasticity, of a body? A. The elastic limit of a body is the amount of deformation which a body will endure and still return to its size and shape when the de-forming force is removed. When a permanent change of shape is produced by force, the limit of elasticity is exceeded and the body is weak ened. The factor of the elasticity of a body is called its modulus of elasticity. 2. Is it not a fact that a cannon-ball will sink to the bottom of the deepest ocean? A. A cannon ball will sink to the bottom of the deepest ocean. 3. Will a non-magnetic body have any effect on the action of a magnet? A non-magnetic body has no effect whatever upon the action of a magnet.

(9022) T. A. K. asks how to anneal selenium so as to make it sensitive to light. Also, what form of selenium is best to begin with? I have some selenium in a precipitated or powdered form. Is this the best form to use? I wish to coat a metallic (copper) surface with a thin coat or film of sensitized selenium. Is it better to sensitize it before or after it is applied? What is the best shape to put it in to apply it, and how is the best way to apply it? Can it be dissolved and applied while in solution and then made sensitive to light afterward? If so, what is the best chemical to dissolve it in? As stated above, the whole idea is to coat a copper or nickel surface with a very thin coat of sensitive selenium, and what I want is the best way of doing it. If the powdered or precipitated kind is not the best, where can I find the proper kind? A. The face of the plate is thinly covered with the selenium, which must then be melted on and allowed to cool slowly, so as to assume the crystalline form. In the "selenium cell" the coating of selenium is applied to a strip of mica or other substance of high insulating power. Selenium will dissolve in selenium chloride, and will separate from this solution in the metallic form. However, the selenium cell is always made by melting in the selenium, and we can find no accounts as to whether a coating obtained by using a solution in selesufficiently sensitive. Your powdered selenium, causes of color blindness? Can it be cured? added. No one can tell how many will be If so, how? If not, why? A. Color blindness is the inability to see a difference between colors which to the normal eye appear quite distinct. It is a defect in the eye, born with it, and usually incurable. True color blindness is not removable by education. The same mistakes in matching colors are repeated constantly by a person after they have been pointed out to him. The only remedy for his mistakes is to avoid all occupations having to do with colors. 2. What is a good way to learn colors? A. One ignorant of the names of colors should learn them by having them pointed out to him. This has nothing to do with ocolor blindness. The test for color blindness is simply in selecting tints which look alike. No names are used,

as desired, the switch is thrown and the cur- the horseshoe magnet to make it lift a lever rent in th. primary is reversed. 2. Could a brass tube be used to cover the core of an induction coli to regulate the amount of current? If not, what kind of metal or substance can be used? A. A brass tube cannot be used as a regulator for a coil. It cannot cut off magnetism. An iron tube might be used to screen the primary from the secondary.

(9025) D. G. E. asks: 1. How much and what size wire would it require for a 20ohm telegraph instrument? A. Almost any size wire from 24 to 30 can be employed for a 20-ohm sounder. It is a matter of convenience simply. 2. How many square feet in a pound of tinfoil? A. The number of square feet in a pound of tinfoil varies with the thickness of the tinfoil. 3. What book is there giving size, resistance, and weight of copper wire? A. A conner wire table will be found in Swoope's 'Lessons in Practical Electricity." 4. What is the name of a maker of C. P. battery zinc? A. There is no book on zinc casting. Chemically pure zinc is not used for batteries. Its price is prohibitory. Zine amalgamated with mercury is just as good. 5. How may a 2-inch hole be made in the center of a glass plate? A. To make a hole through a glass plate, break point changes its color in a marked manner. the tip from a three-cornered or round file. Dissolve some camphor in turpentine. Dip the end of the file in the liquid, and by a twisting motion grind a hole into the glass plate, which must rest upon a level surface. Care should be exercised when the hole is about to break through the glass. After an opening is made through the glass, the hole is worked to its proper size by a round or half-round file. Always keep the file wet with the fluid. Experlence is better than any amount of written in-struction on this subject. 6. What is the exact diameter of a single cotton-insulated No. 36 copper wire, or how many wires to the inch? A. No. 36 wire is five thousandths of an inch in diameter. This does not include the ture, weighs 1.29 ounce. A cubic foot of coal insulation. This may be thicker or thinner, gas varies in weight from 0.56 ounce to 0.73 according to circumstances. 7. If a good ounce. The sustaining power is the difference ground is made in the return circuit of a telegraph line, is the resistance of the earth greater or less than a No. 12 iron wire? A. The resistance of the earth in the return circuit is taken to be zero. 8. Have you a book on 6 horse power force that can be had, suitable making batteries for amateurs? A. Bottone's for an airship? A. The lightest 6 horse powthis subject.

shot from a .30 or .40 army rifle straight up in the air, when it dropped to the earth would it have the same force it had when it left the gun barrel, and would it penetrate the same amount of pine as it would if it were shot direct at it? A. A projectile shot vertically up into the air from any kind of gun does not have the same velocity when in its fall it strikes the ground as when it left the muzzle of the gun small a change is not practically of any moon its ascent. The resistance of the air retards it on its upward flight, and hence it does not attain the full height due to its initial the earth is 7,918 miles. The distance from velocity. On its fall .the retardation of the air prevents it from attaining the full velocity of fall from the point where it ceased to rise. It therefore does not rise to its full distance, nor in falling from its lower position does it attain its full velocity due to that altitude. Both causes act to produce a less velocity when it reaches the earth.

(9027) A. S. asks: 1. Has the socalled double strength sal-ammoniac battery that has a carbon cylinder filled with granulated carbon and a zinc cylinder around that, charged with 8 ounces sal-ammoniac to the cell, any advantage over the ordinary pencil zinc batteries for a telephone? A. The ordinary Le Clanché cell with a pencil zinc answers perfectly for a telephone, and there seems to be no need to use any stronger one. 2. I want to put a magnet on my telephone line similar to the relay on the telegraph lines. Could it be wound with No. 20 wire? A. You can put an electro-magnet on a telephone line, and it can be wound with No. 20 wire. 3. Would it interfere with the talking qualities of the line? A. It would lengthen the line by so much and would make it so much more difficult to transmit through the line. 4. How many cells of the above-mentioned double-strength sal-ammoniac batteries would it take to work said heat generated is very intense; the aluminium magnets, if I had say twenty on a line forty miles long? A. Probably twenty cells would prove strong enough to work through twenty (9023) A. C. asks: 1. What are the magnets. If they were not, more could be needed, since that depends on the magnets, the connections, and the leakage, due to moisture and other causes on the line. 5. Could I use a telephone over the same line, say with only two cells in each 'phone? Would there be any more resistance in those magnets wound with manufacture is patented, and is in the hands No. 20 wire than there is resistance on the of a very strong company. The inventor of the line wire? A. You can telephone through the process is Hans Goldschmidt. There are a magnets if you use power enough. You will whole class of mixtures made of aluminium find that out by trying. 6. What size wire is powder with different metallic oxides; all these the ordinary telephone extension bell mag-nets wound with? A. We have not at hand specific name of "thermite" is applied to the the size of the wire in the extension bell. There one above described. The other mixtures are is no reason why it should not be about the same as in the polarized calling bell attached that are otherwise difficult to prepare; such to the magneto, since it is rung by the magneto. as metallic chromium, molybdenum, tungsten, 7. Which requires the greatest current to work titanium, manganese, etc. By mixing the (9024) B. P. L. S. asks: 1. Is the it-a horseshoe magnet, with its two poles oxides, alloys can be directly produced. The secondary coil of an induction coil wound in working together, or the ordinary extension commercial possibilities of these are very great. bell magnets, the wire being the same size? 2. I read in a book called "The Wonders of It makes no difference which way the two coils A. The extension bell with polarized magnet is the World" that one ounce of the fulminate of you the cost of such an arrangement. That coils are furnished with a reversing switch in electro-magnets simply. 8. How many turns of New York. Has this statement any truth for varies much in different localities. 4. If a the primary circuit, and if the poles are not say No. 20 wire should I put on each end of its basis? What are the facts in the case?

weighing say one drachm, when the current is passing, and let it fall as soon as the current stops? A. We should suppose that you could use ordinary relays of low resistance for your magnets far more cheaply than to make the magnets by hand. These will lift a drachm with a small current, and would be exactly alike, if ordered to be made alike.

(9028) J. F. P. asks: Can you tell me anything that will prevent the formation of chrome alum crystals in a battery using a bichromate of potash solution? A. There are three ways of avoiding the troublesome crystals in a bichromate battery. One is to use chromic acid in the cell. The second is to use a saturated solution of bicbromate of sodium in place of the bichromat, of potash. No crystals form. The third is to make the solution after the formula which follows: Take 1 part of potassium bichromate, 21/2 parts of water, and 31/2 parts of sulphuric acid, all by weight. Dissolve the bichromate in the water by boiling, and allow the solution to cool. Then pour the sulphuric acid into the solution slowly and with constant stirring. The mixture becomes very hot, and at a certain This is the moment when decomposition takes place and chromic acid is formed. When all the acid is stirred in, let the solution stand over night. A large crop of crystals will form. These are the alum crystals, and as they are of no use in the liquid, they may be separated by decanting the liquid or by filtering through asbestos. If these crystals are fully gotten rid of, no others will form as the battery is used. This method is due, we understand, to the veteran Prof. A. K. Eaton.

(9029) H. S. asks: 1. How much weight will a cubic foot of gas sustain in mld-A. A cubic foot of air at 30 inches air? of the barometer, and the freezing temperaof the weights of air and gas. This gives from 0.73 ounce to 0.87 ounce. The lifting power is slightly less than these numbers. What will be the entire weight of the lightest "Galvanic Batteries" is the most recent work on this subject. (9026) J. S. asks: If a bullet were greater than close to the earth? A. The attraction of gravity *decreases* as you rise above the earth. This decrease in the force of gravity is so small that it would not be noticeable for any distances to which a balloon ascends. For five miles it amounts to nearly a quarter of a pound in a hundred pounds. As scales for weights as large as 100 pounds rarely mark less than quarter pounds, it is evident that so ment. The change in weight is calculated in the following manner: The mean diameter of the center to the surface is 3,959 miles. Five miles above the surface is 3,964 miles from the center. According to Newton's Law of Gravitation, the weight of a body five miles above the surface of the earth is to, its weight at the surface of the earth as the squares of these distances taken inversely; that is, /3959

× its surface weight. This somewhat 3964

large fraction reduced to a decimal gives 0.9975 nearly. Hence 100 pounds at the surface of the earth will weigh 99.75 pounds if carried to a height of five miles above the surface of the earth.

(9030) J. W. O. says: 1. A weekly paper tells about a new and wonderful explosive compound called thermite—a mixture of aluminium filings and oxide of chromium, which when touched off with a match, using flashlight powder for a primer, a heat of over 5,000 deg, is instantly produced, melting great bodies of iron or steel instantly. The paper says it is in use in Germany for welding steel rails, etc. Can you tell anything about it, and give the details? A. Thermite, properly speaking, is a mixture of aluminium powder and iron oxide. Barium peroxide is the primer most used. The reduced to the metal and melted. It is being largely used in Germany for the tloned, and thousands of miles of rails are said to have been welded together by this process. It offers also an effective means of repairing shafts, gearing, broken lugs, etc., being thus a very great saving, as it obviates the necessity of completely replacing the broken part. Its useful for the preparation of metals and alloys

(9019) C M asks: What is the best way, for practical use, to cut down a current of 220 volts to the strength of a Mesco dry battery? A. The Mesco dry cell has a voltage of about 1.5. The current depends upon the resistance of the external circuit, but on short circuit would scarcely exceed 1.5 to 3 amperes. To cut the current of a 220-volt circuit down to 1.5 amperes will require about 150 ohms. No. 24 iron wire is large enough for this, and you will need about 1,000 feet. 2. Does it matter what the amperage is? A. We have shown you above that the amperes must be taken into account in your calculations just as much as the volts. 3. What would be the you the cost of such an arrangement. That coils are furnished with a reversing switch in electro-magnets simply. 8. How many turns of New York. Has this statement any truth for