

against the southern wall, facing each other, each holding a squash flower emblem in a bouquet of spruce twigs and an ear of corn in his left hand.

Suddenly the fifteen or twenty members of the society drew back from their chief, who then sprang upon the spapû plank and, quickly turning, faced them as all burst forth in ecstatic shouting, with wild flinging of their arms, as they approached the shield bearers. They naturally formed two clusters, and as the shield

bearer dashed his shield in their faces they surged back, to leap again toward him. This assault was maintained in time with the song. The two chieftains joined their men all in ecstatic frenzy and one of them, shaking his shield, sprang from right to left, drawing back his assistants in rhythm with the beating of the feet of all on the floor. After a few moments of most exhaustive movements, some of the weakest staggered up the ladder, and shortly after one of the chiefs fell fainting to

the floor, overcome by exhaustion and the heat of the room. The men who belonged to the Mōñkiva took no part in this exhaustive dance, but stood in readiness to carry those who fainted up the ladder to the outside.

It has been suggested that this assault of the man on the bearer of the sun shield dramatizes the attack of hostile powers on the sun and that the object is to offset malign influences or to draw back the sun from a disappearance suggested by its southern declination.



THE NATACKA CEREMONY AT WALPI.

RECENTLY PATENTED INVENTIONS.

Railway Appliances.

**REFRIGERATOR CAR.**—Charles S. Hardy, San Diego, Cal. In this car the ice receptacle, while designed to act with thorough efficiency for refrigerating purposes, is arranged to fold clear out of the way of an ordinary non refrigerated cargo. The ice box and draught flues are in the main arranged according to plans set forth in formerly patented inventions of the same inventor, the present patent providing for a swinging floor made in sections, and vertical doorlike sections corresponding to the floor sections and having cleats to support them when opened, with latch devices to hold the doorlike sections closed. When the apparatus is folded against the side of the car it takes up but little room and leaves the car interior practically unobstructed.

**CAR COUPLING.**—Elisha F. McMurtrey, Rison, Ark. This coupling is of simple construction, and is automatic in operation when coupling with another drawhead from which an ordinary link is projected, the uncoupling being effected from either the top or side of a car. An apron is fitted in the open lower side of the drawhead, and is pivoted in position to rock as the drawhead is met by an opposing drawhead, to guide the link in the proper direction, and release the coupling pin, which drops by gravity into engagement with the link.

Bicycles, Etc.

**EXTENSION GEAR.**—William E. Golding, Wakefield, N. Y. To enlarge a sprocket wheel on a bicycle, this invention provides a novel form of rim having sprockets on its periphery, while the inner portion of the rim has flanges on both sides to engage opposite faces of the sprocket wheel on the machine. The flanges on the inner face of the rim are adapted to engage the sides of the adjacent sprocket teeth, preventing lateral movement on the sprocket wheel in one direction, and on the opposite face of the rim are bosses adapted to pass between the teeth of the sprocket wheel, and be hammered down in the form of flanges, thus locking the rim on the sprocket wheel.

Mechanical.

**BARK PEELING MACHINE.**—John T. and George W. Jones, Western Port, Md. To peel or cut the bark from logs before cutting the latter into chips for making wood pulp, these inventors have devised a machine to do the work quickly and without wasteful cutting of the wood fibers. It comprises a set of log-turning and supporting devices and two series of yielding cutter heads arranged on independent axes alternately upon opposite sides of the log table, the cutter heads revolving in opposite directions to cause the pull of one set on the log to neutralize that of the other set. As the log is turned one series of cutter heads takes off a series of rings of bark and the other series strips the intervening portion, a single revolution of the log causing it to be entirely stripped of its bark.

**SHEET PAPER DRIER.**—Louie Dejonge, Jr., Stapleton, N. Y. This invention covers an improvement on formerly patented inventions of the same in-

ventor, whereby the sheets will be conducted with greater advantage around with the cylinder of the coloring machine, the color being prevented from flowing under or gathering at the edges, simplified clamping devices being employed to deliver the sheets more accurately to the carriers by which the sheets are taken through the drying section of the machine. The drying section of the machine is so constructed that the sheets while wet will be supported throughout their travel in such a manner that they will not buckle, and the sheets will be delivered to a receiver in perfect condition, steam pipes being placed between the various tiers and also at the bottom of the drying frame to facilitate drying.

**BAKING POWDER PACKING MACHINE.**—James McNab, Catonsville, Md. As the mixed acid and alkali of baking powders quickly deteriorate when exposed to the air, while arranged in layers the portions in contact form a neutral film between their opposing parts, preventing such deterioration, this invention provides for laying the alkali and acid powders in layers side by side or one upon the other, in such proportions as may be desired, in an accurate and expeditious manner. The machine comprises a belt carrier along which is reciprocated a carriage on which a divider is movable up and down, a pivoted rocking arm being geared with the divider and an operating mechanism connected with the arm. A delivery box is arranged at one end adjacent to the carrier, so that a box may be shipped over the end, a plunger forcing the box and the charge off the delivery plate and bringing a new charge in position to receive a box.

Agricultural.

**COTTON CHOPPER.**—Frank L. Richter, Moravia, Texas. A combined disk plow and cotton chopper is provided by this invention, one capable of attachment to any form of cultivator, the chopping attachment being so arranged that all surplus plants will be cleanly and quickly cleared from the ground and the standing plants be left at regular intervals. Upon the axle are secured cultivators, in advance of which are the chopping disks, placed at angles to one another, and revolved in close relation to each other at right angles to the cultivator disks, peripheral recesses in one chopping disk registering with corresponding recesses in the other disk. The disk plows, as the machine advances, cultivate the ground between the rows of standing plants, and the machine is of simple, strong and inexpensive construction.

Miscellaneous.

**STREET SWEEPER.**—Patrick F. Duross, Long Island City, N. Y. This is a device especially adapted for hand use, to take the place of hand brooms and sweepers. It comprises a box or receptacle for the sweepings supported upon wheels and having pivoted to it a hopper to receive the sweepings from a rotary broom, the sweepings being directed into the hopper by a chute which projects under the broom and guides the sweepings into the hopper. The receptacle is open at the upper corner adjacent to the hopper pivot, and the contents of the hopper are dumped into the receptacle by swinging the hopper up so as to fill this opening. At

the lower corner of the receptacle is a door by which it may be emptied.

**MUSICAL INSTRUMENT.**—Gholson H. Graham, 2418 Magazine Street, New Orleans, La. To facilitate playing stringed instruments, as violins, cellos, etc., this inventor has devised an instrument in which a sounding board is held in a suitable casing, strings being stretched over the sounding board, and the performer will be able to properly play the instrument by manipulating the keys. The instrument has revoluble shafts adapted to be moved laterally, there being a hair-covered wheel on each shaft adapted to engage a corresponding string, and levers connected with the shafts adapted to be actuated by keys, the performer in playing the keys causing a sounding of the strings by the action of the revolving hairs.

**SNAP HOOK.**—Charles T. Redfield, Glen Haven, N. Y. This is a cheap and strong device in which the shank is provided with a seat with which the hook is adapted to interlock, the hook having a longitudinal and lateral tension, and being adapted to be sprung into and out of engagement with the shank seat, both of which operations may be easily effected in the dark with mittens or gloves on. The device is of especial utility in harness, or it may be constructed for use on vest chains, for snapping on the ring of a watch, for eyeglass holders, etc.

**TOOL FOR MINERS' USE.**—John D. Campbell, Leesburg, Idaho. This is a combination tool, embracing a candle holder, a powder knife, a fuse cutter, a fuse splitter, a cap crimper, and devices for securing the tool in a beam or suspending it from any convenient support. The tool is compact, and the candle will remain upright while every portion of the tool is being used, the cutters being readily removed for sharpening.

**WINDOW CHAIR.**—William Timmis, Pittsburg, Pa. This is a chair especially adapted for use as a temporary support in window cleaning, being foldable for placing it in or removing it from a window, and forming a firm and stable support when expanded and duly adjusted. The chair is composed of a retaining bar formed of two sections hinged together and a device for holding them in rigid alignment, transverse bottom bars being attached to two parallel bars, and being formed of hinged foldable sections having locking devices.

**SKIRT RACK.**—Cyrus H. Devlin and Norman H. Cowles, Bay City, Mich. In display stands or racks for use in stores, this inventor has devised a rack more especially designed for supporting a large number of skirts and trousers in such manner that customers may readily examine without danger of folding or creasing them. The base has a number of sockets in which are standards supporting parallel rods, a bridge piece connecting the rods, on the inner sides of which are fastening devices to support the garments, while allowing of their convenient removal as desired.

**QUILTING FRAME.**—Nina More, Cutting, N. Y. The parts of this frame are readily detachable, so that the whole thing may be packed away in small space when not in use, but forming a rigid structure when set up. Each side rail carries two extensible legs by which the frame is supported, and may be placed

at the desired height, and the end and side rails are secured together by U-shaped clamps. On the upper face of each rail is a series of pairs of plates carrying clasps to hold the ends of the quilting material and facilitate stretching it as desired.

**RIPPING AND STITCH PICKING TOOL.**—James Darmody, New York City. For ripping stitched seams and cutting threads or bastings from the cloth, this tool is made with a body portion having a longitudinally curved cutting edge at one end and a transverse cutting edge at the same end, with a stitch picking hook at its opposite end, the cutting portion of the tool being covered with a shield when the hook portion is being used.

**PNEUMATIC WATER RAISING DEVICE.**—Edmund Pitcher, of Keene, and Edmund H. Sargent, of Sunapee, N. H. A windmill or other motor, according to this invention, is connected with an air compressor, and the latter is connected with a reservoir, from which a valved pipe leads to a submerged tank sliding vertically on guide rods, the opening of a valve forcing the water to the desired place of discharge, and the tank rising and falling according to the quantity of air and water in it. This pneumatic pump may be located at any desired distance and depth from the motor and air compressor, and a small pipe may be used for conveying the necessary amount of compressed air to the tank and forcing out the water to the required height.

**SIGN.**—William W. Reynolds, New York City. This sign consists of a hollow body having the face next to the observer of opaque material and dark color, through which the characters of the sign are cut, while a background within or back of the surface, and turned toward the observer, is of a light-reflecting color or material. The sign is to be illuminated at night by lamps placed within it, but not visible directly from the outside, the illumination being by reflected light from the background.

**BOTTLE WASHER.**—John Schutz, New York City. This is a machine designed to quickly clean and rinse a case full of bottles at one time. A vertically movable platform supports a box containing the bottles, and is provided with fixed nozzles through which water supply pipes extend, revoluble shafts extending through the pipes and carrying cleaning devices which extend beyond the top of the pipes and are adapted to be closed by the nozzles in the up and down movement of the platform. The cleaning devices are also adapted to pass into the bottles to clean them.

**SHADE HANGER.**—Ferdinand E. Stahlhut, Carpenter, Ill. According to this invention, the roller of the window shade may be moved to any point along the window frame, so that the shade may admit the light from the top or the bottom, or be adjusted as desired in other respects. These different adjustments are effected by drawing on a cord which extends down at the side of the window frame, where it is attached to a suitable cleat, the entire construction being simple and inexpensive.

**IMPROVED BED.**—David D. Toal and Richard Wilson, New York City. This invention provides a novel form of hammock, or suspended bed, sup-

ported from standards at its four corners in such a way that the bed proper may be raised or lowered as desired, while over the bed, and also supported by the standards, is a frame carrying glass panes, preventing insects from falling on the bed, the form of the standards and frame being designed to thoroughly protect the bed against access of insects.

**FOLDING BED.**—Frank A. Cooper, Brooklyn, N. Y. In upright folding beds this invention affords a construction according to which the "action" is contained entirely in the body of the bed, leaving the casing unobstructed except by the brace rods strengthening the wings and preventing them from spreading. The bed has a weighted folding head rest, the head portion having a pendulum or swinging weight when needed. There are cam grooves in the side rails to receive rollers carried by the brace rod, whereby the bed body is pivoted or hung in the casing, and a removable end wall for each cam groove admits of the body being readily connected with or disconnected from the casing, the removable ends serving as stops limiting the outward movement of the bed when down.

**BEDSTEAD FASTENING.**—Edwin F. Tilley, New York City. This invention provides a simple form of fastening device for each corner of the mattress frame, to be fitted between and rigidly secured to the contiguous ends of the end and side rails, each device having a block slidably connecting with a corresponding body portion. By means of this device the sections of the bedstead may be easily and securely connected without inconvenience arising from the unevenness of the parts or from the unequal expansion or contraction of the metals. Either section of the fastening is adjustable on the other, not only enabling the fastening to be adjusted for non-uniformity of the post, but also to change the position of the side rail if desired.

**LAMP BURNER.**—George A. Bodee, New York City. To facilitate lighting the wick of a lamp without having to remove the chimney, this invention provides a burner in which the section of the burner on which the bottom of the chimney rests is formed with a horizontally swinging portion, which may be swung down when the match is to be applied to the wick, a spring holding the swinging section in closed position.

**Designs.**

**PLUMBER'S TRAP.**—Fredrick Kirchner, Brooklyn, N. Y. The body of this trap is tapering, being widest at the top and finished off at the bottom with the usual cap, the leading feature of the design consisting in the shape of the body.

**NOTE.**—Copies of any of the above patents will be furnished by Munn & Co. for 10 cents each. Please send name of the patentee, title of invention, and date of this paper.

**NEW BOOKS, ETC.**

**UNITED STATES GEOLOGICAL SURVEY REPORTS.** Mineral Resources, Metallic Products and Coal. Charles D. Walcott, Director. David T. Day, Chief of Division. Washington: Government Printing Office.

In acknowledging receipt of vols. xxvi, xxvii, xxviii, the Director's Report, the volume on Economic Geology and Hydrography, and two volumes on Mineral Resources, of this splendid series of works published by the government, we cannot refrain from expressing, as we have heretofore done repeatedly, our high appreciation of the thorough and painstaking manner in which the work is carried on, and the skill and technical knowledge displayed, as well as our admiration of the luxurious volumes themselves, with their handsome print, wide margins and wealth of beautiful illustrations. The division of Mineral Resources, etc., under the charge of Mr. Day, now occupies two handsome quarto volumes, instead of the single octavo volume required annually previous to 1894, and it is not too much to say that from no other source can so much information be obtained on this great subject as from this series of volumes, commenced in 1883, the last two volumes covering the year 1895. The great scope of the work is realized when it is remembered that it includes metals, fuels, structural materials, abrasives, chemical materials, pigments, etc., while under "miscellaneous" are classified precious stones, mica, asphaltum, asbestos, mineral waters, etc., the principal treatment in each of the more important subjects being recognized high authorities in each department. For instance, iron ores are written about by John Birkinbine; the iron and steel industries by James M. Swank; copper, lead and zinc by Charles Kirchoff; petroleum, coke, natural gas, and manganese by Joseph D. Weeks; coal, abrasives, etc. by Edward W. Parker; stone by William C. Day; cement by Spencer B. Newberry; precious stones by George F. Kunz; and mineral waters by Albert C. Peale. The distribution, availability and product, in these several lines of the country's resources, together with the varying causes most generally affecting the demand, are set forth in these volumes from an independent standpoint, quite unaffected by the interests of dealers or promoters, which gives especial value to the figures and explanations.

**CARBIDE OF CALCIUM AND ACETYLENE.** Paris, France: J. B. Balliere et Fils.

This book is an enlargement of a series of popular lectures on acetylene by M. Jules Lefevre, of the University of Nantes. As a resume of the experiments which have been tried with this gas and of its practical applications, it is quite complete. The opening chapters describe the various electrical furnaces used in the manufacture of calcium carbide, the different factories where it is made, etc.; while the latter part of the book is given up to the properties of acetylene in both the liquid and gaseous states, its employment for lighting and as a motive power, and its probable use in the future. The author does not think it will supplant ordinary lighting gas entirely, but that its general vogue will be between that of this gas and that of the electric light. Owing to the ease and safety with which the gas may now be produced, as well as to the small expense, it will in time be used considerably for lighting small buildings where an isolated plant must be used.

**Business and Personal.**

The charge for insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in the following week's issue.

Marine Iron Works. Chicago. Catalogue free. Forming engines. J. S. Mundy, Newark, N. J. "U. S." Metal Polish. Indianapolis. Samples free. Gasoline Brazing Forge, Turner Brass Works, Chicago. Yankee Notions. Waterbury Button Co., Waterbury, Ct. Handle & Spoke Mch. Ober Lathe Co., Chagrin Falls, O. Improved Bicycle Machinery of every description. The Garvin Machine Co., Spring and Varick Sts., N. Y. Concrete Houses—cheaper than brick, superior to stone. "Ransome," 757 Monadnock Block, Chicago. Machinery manufacturers, attention! Concrete and mortar mixing mills. Exclusive rights for sale. "Ransome," 757 Monadnock Block, Chicago.

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

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

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

**Notes & Queries**

**HINTS TO CORRESPONDENTS.**

Names and Address must accompany all letters or no attention will be paid thereto. This is for our information and not for publication. References to former articles or answers should give date of paper and page or number of question. Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and though we endeavor to reply to all either by letter or in this department, each must take his turn. Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same. Special Written Information on matters of personal rather than general interest cannot be expected without remuneration. Scientific American Supplements referred to may be had at the office. Price 10 cents each. Books referred to promptly supplied on receipt of price. Minerals sent for examination should be distinctly marked or labeled.

(7250) O. S. writes: I have a Ruhmkorff coil for one-half inch jump spark, made by the Varley Duplex Magnet Company. 1. What battery, of the lightest weight and least bulk will give the best spark this coil is good for? A. The kind of battery to be used with your coil depends on the work it is to do. If it is to be used for lighting gas, three to four Leclanche cells ought to work it. If you want it for more frequent use, the battery should be of the bichromate sort, and two to three cells are sufficient. 2. The condenser ought to be of what square feet surface? In measuring the surface of a condenser, will the ends be counted or only the tin foil between the oiled paper? A. If your coil is a Ruhmkorff coil, you will find the condenser in the box under the coil. The tin foil for a condenser is measured only between the paraffined paper. The ends which project have little effect. Condensers vary greatly in size. If you need to make a condenser for your coil, you will probably require sixty sheets of tin foil 5x7 inches. 3. Would it be possible to get sparks at various points from one coil by having different return wires and breaking circuits in the return wire? A. Yes; in using a sparking coil for gas lighting this is the way it is done. The gas pipe answers for the return wire.

(7251) W. M. says: Will you kindly give me some information regarding a formula for a black dip for brass in which ammonia and copper are used? We have an acid dip which is used for this purpose, but believe the other would be more desirable. A. Dissolve in 4 1/2 fluid ounces of ammonia 1/2 ounce of copper carbonate, stirring constantly while dissolving. Add 1/2 pint of water. The article should be suspended in this solution by brass or copper wires for a short time.

(7252) A. A. U. writes: I have the eight light dynamo and a motor of about the same size. Its field is wound with No. 18 wire, 20 pounds, and the armature with No. 16, two layers, 2 pounds. The dynamo and motor are about 100 feet apart on a No. 8 copper wire circuit. The dynamo has No. 12 on the field and is connected in series. How much resistance ought I to have to start my motor with? I intend to use the motor to run a lathe. A. A resistance of about 15 ohms will be required. It should be put in series with the field of the motor. Run the wire from the dynamo, through the resistance, to field, to armature, and thence back to dynamo.

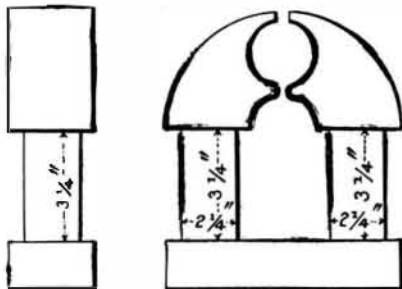
(7253) H. R. K. writes: Permit me to ask for information regarding the famous eight light dynamo described in the SUPPLEMENT quite a long while ago. Made the machine exactly as described in your paper, but now want to use it as a motor on a 110 volt circuit. 1. What size wire shall I use on a new armature core of same size, and how shall I arrange the field circuits? A. For 110 volts wind your new armature with No. 24 A. W. G. wire, 25 turns in each of the 24 coils. The same field can be used with an external resistance of 750 ohms. 2. Could I not use it as it is by putting lamps in circuit with it? A. The machine can be run without rewinding by using an external resistance, either of lamps or wire, equal to or a little more than that of the machine itself. A resistance box is more convenient than a lamp resistance.

(7254) P. C. S. writes: I am making an induction coil with a core 1 1/2 in. in diameter and 15 in. long. The primary wire will carry about 8 to 10 amperes and the insulation is tested to 2,000 volts. It has about 100 turns, and is run from an alternating current dynamo. The secondary is about 12 lb. of No. 22, well insulated.

About what kind of a current should I use in the primary (in volts and amperes) to get the maximum effect in secondary and longest spark? P. S.—How could I get the current from a 50 volt 1.5 ampere alternating current? If by a transformer, how would it be made? A. If a direct current from a battery is used, 4 to 6 cells of bichromate plunge battery, 1 to 2 quart cells, will answer for your coil. You need to be able to vary the current so as to learn, by experiment, how to get the best spark for any purpose, and the longest spark is not always the best. With a direct current your primary will take about 4-6 amperes and 10-55 volts. With an alternating current you will need a "choking" coil, rather than a transformer. This must be adjusted to the circuit in which it is to be used. The engineers of the system from which you draw your current could probably specify your choking coil for you. See SUPPLEMENT, No. 1124.

(7255) J. S., Montreal, writes: A question has arisen as to which of the following methods would be the best and cheapest for making a wall or division to prevent the transmission of heat or cold. To build the wall with a double air space, that is, with an outer and inner wall some distance apart and a thinner wall intermediate between them empty, but for the air. Or, to build a wall of the same material, leaving the same distance between the outer and inner walls, but leaving no middle wall, the whole interspace being filled with cork cuttings or shavings. A. The three-wall system, inclosing two air spaces, makes the best insulation, but not the cheapest. The three walls, in order to have the proper stability, must make a very thick and expensive exterior wall. The wide space and double wall will be very effective for insulation, if the filling can be properly packed so as to stay in place. The trouble with such filling is its disposition to settle and pack, leaving open spaces. The cost of either method of insulation is, we think, greater than the double wall with narrow clear air space, with a lining of asphalt paper on the inner surface, with 1 1/4 inch furring and lath and plaster. This constitutes a double air space with an airtight barrier.

(7256) O. T. writes: I have a casting for a dynamo, a sketch of which I inclose. Could you



tell me what sizes and how much wire I should use for the armature and fields for a 50 or 52 volt current (shunt winding) and how many amperes could I get from same; also speed required? Can you give any information in regard to winding of armature, as number of sections and turns on same? A. On the field wind 400 turns of No. 24 wire, B & S, 200 turns on each side. Make the armature with 16 sections. Wind 20 turns in each section—No. 12 B. & S.

(7257) E. S. H., Illinois, writes: 1. What is your opinion or that of experts regarding the use of castor oil in a locomotive boiler? The water deposits a very salty substance wherever a leak appears and foams very badly; the use of the oil, however, effectually calms the foaming or priming, for it is probably more priming, as great quantities of water were carried over with the steam; so the engine could not be hurried at all. Is it likely to generate a dangerous gas? The water eats the iron very fast. Will the oil prevent that? It is used about a teaspoonful every day. A. Castor oil in boilers produces an effect similar to that of other vegetable oils, in gathering the lime and magnesia salts into cakes or nodules. It may answer the purpose for which it is used, if applied in very small quantities. We advise, if oil is used at all, that the cheaper mineral oil, as kerosene, is preferable. The oil in boilers does not generate a dangerous gas, unless, owing to low water, some part of the tubes or shell is subjected to a heat that will generate a gas by decomposing the oil. The oil will partially neutralize any acid quality in the water. The water of your district contains sulphate of lime and magnesia, and the separation of the sulphur in the form of sulphuric acid, and its action on the iron, is probably cause of the eating away of the iron. For this, we advise use of caustic or soda in small quantities, instead of the oil. 2. Again, what would be the highest speed practicable to run a simple plunger pump 3/4 inches diameter, maximum stroke 2 inches, pumping a light engine oil at from zero to 500 or 800 pounds pressure? Also best style valve to use. A. For the short stroke pump at high pressure, 75 strokes per minute is allowable. Poppet valves are in general use and are the best for high pressures.

(7258) J. R. D. writes: 1. Give formula of solution used in making solder adhere to copper wire when making joints. A. To a sufficient quantity of hydrochloric (muriatic) acid, add zinc in small pieces, so long as it will dissolve. The resulting liquid is zinc chloride, and is used for soldering tin, copper, lead and brass. 2. Can an electric motor (costing about \$1) be wired so as to run reversible? If so, how can this be done? A. The motor will turn in the opposite direction if the direction of the current in the armature circuit is reversed. In so simple a motor run by a battery any reversing switch will answer your purpose.

(7259) A. C. S. says: 1. Please give the full formula for the printing-out platinotype process. The SUPPLEMENT, No. 1139, gives the following: Chloroplatinite solution..... 116 min. Iron ..... 120 " Gum arabic..... 116 " but does not state the amount of the 10 per cent solution of sodio-chloride of platinum to add to the above. A. Add about 10 minims to begin with of last named solution, and increase amount until the requisite brilliancy is obtained. 2. Can the chloro-platinite of potash and the sodio chloride of platinum be obtained from the photo stock dealers? A. New York dealers can supply you.

**INDEX OF INVENTIONS**

For which Letters Patent of the United States were Granted

NOVEMBER 23, 1897,

AND EACH BEARING THAT DATE.

(See note at end of list about copies of these patents.)

Table listing various inventions and their patent numbers. Includes items like Air brake, Ammonium carbonate apparatus, Bicycle, and many others.

(Continued on page 365)