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 This is for our information, and not for publication.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.

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.

Minerals sent for examination should be distinctly marked or labeled.

(1) P. Z. E.—You will find full instructions for electroplating in SUPPLEMENT, No. 310.

(2) H.—Car wheels fixed on their axles slip in going around curves.

(3) U. O. C. asks: In which number of the SCIENTIFIC AMERICAN are the directions for making an induction coil for electrically lighting gas? A. For information on induction coils consult SUPPLEMENT, No. 160.

(4) R. H. asks how to stick celluloid to basswood, as in the manufacture of organ and piano keys.

A. Use the following cement:

Gum shellac	1 ounce.
Camphor	1 "
Alcohol	4 "

Dissolve and filter; or:

Celluloid scraps	1 "
Alcohol	2 "

Macerate the scraps finely divided in the alcohol, and when they are dissolved filter.

(5) J. S. B. asks: What is the correct proportion of gas and air to form the explosive mixture in a gas engine? A. It varies in different engines. In a compression engine, it is one of gas to ten or twelve of air; in non-compression engines, one of gas to seven to ten of air.

(6) A. N. R. asks how to construct a cheap serviceable telephone to transmit sound a distance of 40 rods, if possible, without the use of electricity. A. Two cigar boxes about six inches square connected by a stout cord or, better still, by means of a twisted wire cable will probably answer your purpose.

(7) F. A. T. desires a recipe for polishing shirt bosoms, collars, and cuffs, that will put a gloss finish on them. A. Pour a pint of boiling water upon two ounces of gum arabic; cover it, and let it stand over night. Use a small quantity in the starch.

(8) W. H. B. asks how to polish, clarify, and color ox horns. A. The process is elaborately explained in Spons' Workshop Receipts, First Series. Several columns are there devoted to this subject. The book can be procured from us for $2.00.

(9) F. O. writes: I wish to filter a quantity of bay rum; could you tell me of a cheap way to manage it? A. Filter it through common filtering paper in a glass or porcelain funnel.

(10) W. F. H.—Kerosene can be vaporized by gentle heat. Gasoline is one of the lightest distillates of crude petroleum.

(11) H. E. C. asks if a diamond can be dissolved in vinegar. A. No.

(12) F. L. B. asks: Can you give me directions how to make a cheap anemometer that will give fair results as to accuracy in respect to wind pressure or velocity? Something that an ingenious, handy mechanic can make. A. Make a disk of wood having one square foot area; attach to the center of the disk a rod; place the rod in suitable horizontal guides, and put a spring back of the disk. By means of a spring balance graduate the rod into pounds and fractions of pounds. Support the disk on a pivot, and provide a vane which will hold the disk to the wind. The pressure of the wind upon the disk will then be indicated in pounds and ounces, and from this indication you can readily compute the velocity of the wind. Should you desire to do so, you can apply to the rod an index, and provide a curved scale along which the index may move, thus rendering the divisions of the scale greater, and permitting of seeing the indications at a greater distance. You can also readily make an anemometer by connecting suitable registering mechanism with a small carefully made windmill. The graduations of your indicating mechanism must be arrived at by experiment.

(13) M. D. L. M. asks what sulphurous oxide is. A. It is the product of the combustion of sulphur in dry air or oxygen gas.

(14) C. W. F. asks: In what can rubber be dissolved so that a thick or thin varnish can be made to cover rubber cloth? A. Rubber may be dissolved in naphtha, also in bisulphide of carbon.

(15) E. T.—Any wholesale drug house can furnish you with bichromate of ammonia. It can be made by evaporating a mixture of chromic acid with excess of ammonia, or by decomposing the chromate of barium with sulphate of ammonium.

(16) M. asks a good cure for mange in a dog, rather a light case. A. An ointment consisting of 1 ounce sublimed sulphur and 2 ounces lard, mixed together, is generally used for light cases.

(17) J. H. D. asks (1) the quickest way to make vinegar from cider. A. The manufacture of vinegar consists simply in exposure to the air, thereby causing an oxidation of the cider, at a temperature of from 75° to 85° Fah., in open vats or by trickling over wood. 2. Can vinegar be made quicker from cider water? A. Yes; but the article made from pomace is not marketable, on account of its flavor.

(18) A correspondent writes: Where can the seed of pure Havana tobacco be procured? A. Send to some of the large seedhouses in New York, and they will send to Cuba, and obtain the seed for you. 2. Desires information on the curing of the leaf. A. F. W. Coon, Edgerton, Wis., has recently published a book on this subject, and there is also a book on "Tobacco Culture" published in this city, which we can procure for you.

(19) V. D. & Co. ask: At what point in the discharge of a rifle does the recoil occur—when the ball first starts, or as it leaves the muzzle of the gun? A. When the ball starts.

(20) W. H. A. writes: I have two good magic lanterns, and have very little use for more than one; is there any possible way of using the lenses or combination of the lenses for a photograph camera? The condensers are 3½ inches diameter, the focusing lenses 1½ inches. A. Your lantern objective if of good quality may be used to advantage in photography. The condensers would not be available.

(21) F. J. G. asks: 1. Can you inform me how to make small "electric influence machine," partly described in SCIENTIFIC AMERICAN, March 7, 1885, page 150? A. You will find the Holtz electrical machines described in SUPPLEMENT, Nos. 278, 279, and 282.

(22) J. R. F. asks: 1. Can you tell me where the reels made on the lazy tongs principle can be bought? A. We believe that the reels referred to can be bought at most of the stores dealing in worsteds. 2. If they cannot be bought, will it be safe to make some of the same kind? A. If the reels referred to are made by the inventor or under his sanction, and there is nothing upon any of the reels or the packages that contain them to indicate that they have been patented, you cannot be prosecuted for making the reels.

(23) H. W. B.—When the Bell magneto-telephone is employed for both transmitting and receiving, it is simply inserted in the line. You may use two such instruments at each end of your line, employing one as a transmitter and the other as a receiver.—A patented article may be made and used for experimental purposes.

(24) D. J. A. asks: Will you please inform me how I can prepare plaster of Paris so that it will not crack or chip, without adding greatly to its cost? A. You can harden plaster casts by soaking them in glue size, afterward allowing the casts to dry perfectly.

(25) J. G. writes: A bets B that there is no one-wheeled vehicle in existence operated similar to a tricycle or bicycle. B claims that there is, and says that the unicycle on page 150, vol. l., SCIENTIFIC AMERICAN, proves it. A. The vehicle mentioned in our paper is a unicycle. The best bicycle riders can and do also ride on only one wheel of a machine.

(26) W. H. asks how to make colors adhere on albumenized photographs. A. Make a solution of albumen as follows: Separate from the germs the whites of eight eggs, these should amount to 8 fluid ounces of albumen. Add to this quantity 24 drops of glacial acetic acid diluted with one ounce of water. Stir well with a glass rod for a minute or so without making a froth. Allow the solution to stand for an hour or more, then strain through a couple of thicknesses of cambric muslin. Finally add half a drachm of liquid ammonia; bottle, and cork tightly. The solution will keep indefinitely, and can be used at any time. In mixing or dissolving the colors, use one part of the albumen solution in four parts of pure water. The colors will adhere perfectly to the surface when laid on with a brush. Add to the 4 ounces of water a few drops of prepared ox gall when the colors are diluted.

(27) C. H. McC. asks: What will remove the spots from a zinc lined bath tub in which water has been permitted to stand for several days? Ordinary scouring, etc., have no effect upon it. A. Soap and sand or sapolio should be all that is necessary to remove any spots. If the spots fail to yield to these substances, a little dilute hydrochloric acid can be used, but this dissolves away the zinc.

(28) O., Ky.—The tin bath used in tin plating becomes foul by absorption of iron or other metal being tinned. The fluid tin may be poured off just above the melting point of tin by allowing the bath to cool down slowly until signs of setting are noticed, when the pure tin will run off. The refining of the spongy mass or thick tin is too difficult for ordinary practice, and this is generally sold to chemical manufacturers or to brass foundries for brass alloys. Banca tin is supposed to be the purest and best for tinning purposes. The production is very small, and the probability is that it is mostly absorbed in the English tin plate interest. The trade is not reliable, and you may buy almost any kind from the same pile.

(29) H. F. S. asks how red flannel underclothing can be treated so as not to cause constan irritation to the skin. A. The irritation is caused by the flannel and not by the dye. The belief is very common that red flannel has some special value because of its color, but the belief is without foundation, and any other color where the flannel is of the same quality is equally efficacious. The red flannel selected is often and perhaps generally thick and heavy in texture, and consequently causes an irritation of the skin, for which the dyestuff is by no means responsible. A softer flannel, or one made soft by wearing and washing, is what you need.

(30) W. T. S. asks: What will congeal gasoline so as to make it somewhat like jelly? There is a man here selling a preparation for taking grease out of clothing. He has something that he puts in gasoline which makes it like jelly. A. Gasoline, which is one of the first distillates from crude petroleum, and very much the same as benzine, will remove grease without any admixture. Possibly the ingredient is some inert substance, like fuller's earth, chalk, magnesia, or it may be Castile soap. Sometimes scouring balls are sold having the following composition: Dry fuller's earth, moistened with the juice of lemons; add a small quantity of pearl ashes and a little soft soap; knead the whole well together into a thick elastic paste; form it into small balls, and dry them in the sun. When used, moisten the spot on the clothes with water; then rub it with the ball, and let the spot dry in the sun. When washed with pure water, the spot will disappear.

(31) O. F. asks: 1. What is the best kind of putty to fill the seams of the planking on the bottom of a small sailing yacht, and how should it be mixed, etc.? A. Fuse together equal parts of pitch and gutta percha, and to this add about 2 parts of linseed oil, containing 5 parts of litharge. Continue the heat until the ingredients are uniformly commingled. This cement should be applied warm. 2. The mahogany trimmings on the above yacht are finished with an article known as Crockett's spar varnish, and cannot be removed by the use of sandpaper, emery, or scraping, except by a great amount of labor. Please inform me if there is any other means by which it can be removed with less difficulty. A. Try the preparation recommended in answer to query 17, in SCIENTIFIC AMERICAN for October 3, 1885.

(32) J. C. asks (1) the best welding compound for welding cast steel when the coal is bad. A. A good welding compound may be made by pulverizing 10 parts borax and 1 part salammoniac together; then heat the mixture until the water boils off and the mass is dry, and pulverize and use for welding in the same way as with borax powder. A better way (if you can not get coke) is to make your own coke, for welding use only, by taking from the forge fire, a little at a time, the coked or half burnt coal and quenching it by sprinkling with a little water; lay this aside for special use. 2. The reason for four rollers on roller skates? A. The wear on four rollers is much less than on two rollers. The facility for making the mechanical movement required for turning curves is also favored by the use of four rollers. Two rollers have been used. Experts now skate on one roller.

(33) A. M. writes: In trying to take out a few rust marks in a silk handkerchief with javelle water, I stained the part whereon I poured it. Will you please let me know how to remove it? A. The javelle water is a bleaching agent, and removes color. If the andkerchief was originally colored, it is doubtful whether the shade can be reproduced. When color on a fabric has been accidentally or otherwise destroyed by acid, ammonia is applied to neutralize the same, after which an application of chloroform will, in some cases, restore the original color.

(34) J. N. asks (1) how tincture of iron and steel is made. A. Tincture of iron is officinal, and therefore can be found in any pharmacopœia. It consists of solution of chloride of iron 35 parts and alcohol 65 parts. The use of the word steel becomes superfluous, as tincture of steel and tincture of iron are synonymous. 2. How carbolic salve is made. A. Take carbolic acid, ½ fluid drachm, and lard 1 ounce. Triturate together in a porcelain mortar. 3. To give name of any papers treating of the hair, in keeping it from falling out and preserving the same. A. See "The Hygiene of the Hair," SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 102 and 388.

(35) W. A. W. desires a recipe for making a mucilage such as is usually sold in stationery stores. A. The best mucilage is made by dissolving gum arabic in water, and adding a little oil of cloves to prevent its decomposition. A common receipt is: Mix 3 ounces gum arabic, 3 ounces distilled vinegar, 1 onnce white sugar; 1 part of acetic acid in 5 parts of water can be used instead of the distilled vinegar. The poorer grades are made by treating starch with sulphuric acid. The government uses the following: Gum dextrine 2 parts, acetic acid 1 part, water 5 parts. Dissolve in a water bath and add alcohol 1 part.

(36) A. E. S. asks (1) if there is anything that would keep the scum out of an aquarium without injury to the fish? A. Get a dozen or so of fresh water snails, and they will keep the aquarium in order. 2. How to clean the shells and corals of the greenish matter? A. The shells can be cleaned by washing with a little dilute hydrochloric acid. Great care must be taken to remove all traces of the acid before the shells are replaced in the water, as the acid will destroy the fish.

(37) G. W. W. asks for a description of an imitation of etched or embossed glass. A. The following is used to render glass opaque:

Mastic	50 grains.
Gum sandarac	½ ounce.
Ether	5½ "

Powder the gums and add to the ether, and shake till dissolved; then filter or pour off from the sediment after standing a while, and add of benzole from 2 to 2½ ounces, beginning with the smaller quantity and testing till a surface of the right degree of fineness is produced, upon evaporation. This varnish should be carefully preserved in a tightly stopped bottle, so as to prevent evaporation.

(38) J. D. W. desires a formula how to make the so-called "tablet glue." A. 1. White glue, refined glycerine, acetic acid, and coloring material. 2. Common glue with about 5 per cent glycerine. 3. A quarter of an ounce crude gutta percha dissolved in carbon disulphide to the consistence of mucilage. The materials used in making this glue or cement for pads are generally of a low grade commercially, so that some experiment is necessary to make a good article.

(39) A. F. C. asks (1) for a preparation to clean silver—liquid or paste. A. Mix 8 ounces prepared chalk, 2 ounces turpentine, 1 ounce alcohol, 4 drachms spirits of camphor, and 2 drachms liquor of ammonia. Apply this mixture to the article with a sponge, and allow to dry before polishing. 2. How to make a dressing for ladies' boots? A. See answer to query 27, SCIENTIFIC AMERICAN, vol. li., No. 17.

(40) M. S. P. writes: 1. I have two fingers dislocated in the knuckle joints. The joints are considerably enlarged, and somewhat stiff and tender to pressure. What shall I use on them to reduce them to their natural size and usefulness? A. Consult a physician is the best thing to do. Tincture of iodine or solution of arnica, or indeed both, may be applied with advantage. 2. How shall I make a cheap and serviceable paint for tar paper roof? A. See "Receipt for Roofing Paint," in SCIENTIFIC AMERICAN SUPPLEMENT, No. 113.

(41) J. T. L. asks how to obtain a cement which can be used on crockery, etc., and not be affected by hot water. A. Calcine oyster shells, pound and sift them through a sieve, and grind them on a flat smooth stone with a muller till reduced to the finest powder, then take white of egg, and form the whole into a paste, join the pieces of glass or china, and press together 6 or 7 minutes. This cement will never yield if properly applied. Glue with which a little potassium bichromate is mixed becomes insoluble when exposed to the light.

(42) J. G. asks: 1. What is acid phosphate of lime? A. The calcium phosphate which contains hydrogen. 2. Which is the best kind of molasses to use in the manufacture of shoe blacking? A. Ordinary common molasses. 3. A receipt for a first class blacking would be very acceptable. A. See four formulas in SCIENTIFIC AMERICAN, vol. li., No. 5, in answer to query 71, and numerous subsequent answers.

(43) L. W. asks the meaning of the photographic terms f 8, f 11·3, etc. A. The term f represents the equivalent focus of a lens, which we will say is seven inches. This is multiplied by 16 or 64, which transforms the seven inches into so many sixteenths or sixty-fourths inches, say $\frac{448}{64}$. The diameter of the largest diaphragm measures perhaps $\frac{54}{64}$ of an inch; the question then arises, What part of the total equivalent focus does that represent? We find it by dividing the $\frac{448}{64}$ by 54, the diameter of the diaphragm:

```
54)448(8·3
   432
   ---
   160
   162
```

Therefore the largest stop is equal to one eight and three-tenths of the equivalent focus, and we express it in terms f 8·3. These terms are uniform for any lens, hence it is much more intelligent to mark the stops in such terms than to call them 1, 2, 3, 4, 5, etc., as is common. f 8·3 in any lens means relatively the same sized stop; we thereby can understand readily whether it is a large sized or small stop, and what sort of an illumination we should have on the ground glass.

(44) J. H. W. asks what process of finishing Turkey red cloths undergo after leaving the dye vats, that is, from the time the cloth leaves the vats to the time when it is placed in the market for sale. A. The material is first singed over a flame or heated surface, then boiled in a soap solution, and this washed away with cold water. Next it is hot pressed under a hydraulic press at a high pressure with hot steam. In some cases it is stretched in a stretching machine. Details of the process may be found in either Professor Crookes' Practical Hand-Book of Dyeing and Calico Printing or Calvert's book on the same subject.

(45) R. W. writes: A drum or pipe is filled with water, and the cap screwed on tight. This is put inside another and larger drum, which is also fastened steam tight. Steam is then admitted to the larger drum. Now, what will be the effect on the smaller drum? Will it burst or will it collapse? A. The effect will be to generate pressure in the inner drum, equal to the pressure of the steam admitted around it. There can be no collapsing of the interior drum, and the pressure within it and outside of it being equal, the water within the inner cylinder will be in much the same condition as that in an ordinary boiler generating steam, but without ebullition or foaming.

(46) W. C. F. asks: 1. What sized cell of the battery illustrated on first page of SUPPLEMENT, No. 149, would be most economical for use in ringing electric bells? A. One quart cells will answer the purpose. 2. How many cells at each end would be required to ring an ordinary bell a distance of 600 feet over a No. 16 galvanized wire with good ground connection? A. Two at each end of the line will be required for so small a line wire; better use No. 12 for your line, when one cell will probably answer. 3. In giving surface required for plate for ground connection of lines, do you compute surface on both sides of the plate, or only one? A. Both sides of the plate are available.

(47) B. & D. write: Please inform us through the columns of your paper what the difference is between (if any) one square yard and one yard square, considering it as applied to flat or surface measure. A. The term square yard signifies a surface equal to a rectangular surface measuring one yard along each of its sides. A square yard of surface may be of any shape. The term yard square applies to anything of rectangular form that measures one yard upon each of its sides.

(48) W. B. P. asks: 1. Can a good working photographic camera be made from a lens taken from a Marcy sciopticon? It has no place for diaphragms. Are they necessary? If so, can they be added? Where can I get specific directions? A. If your sciopticon has a first class objective, it may be used in photography. You can apply diaphragms by securing a flat ring in the middle of the tube, and sawing into the side of the tube at the edge of the ring, so that you may insert diaphragms by the side of the ring. Diaphragms are often necessary to good definition and depth of field. 2. Can glue or gelatine to which bichromate of potash has been added be kept in a common glass bottle for use, or must it be kept in the dark, or be prepared fresh each time? A. Glue to which bichromate of potash has been added must be kept in the dark or be freshly prepared. 3. After it has dried and become insoluble in water, does it become hard and brittle? A. Yes. 4. Is frequent oiling good for a new harness? A. Yes, if oiled with neatsfoot oil. 5. Ought it to be oiled each time it is cleaned? A. Yes. 6. Can you recommend a preservative dressing that will leave the leather bright and smooth, so that dust will not adhere and water will not penetrate? A. Consult SUPPLEMENT, No. 368.

(49) B. A. L. asks: 1. A practical receipt for a lacquer for varnishing an old theodolite? A. Good lacquer can be made by dissolving seed lac in 95 per cent alcohol, afterward filtering the varnish thus produced, and coloring it with turmeric or dragon's blood. If you are unable to procure seed lac, use the best quality of white shellac instead. The article to be lacquered should be slightly warmed before applying the lacquer, to prevent it from becoming chilled. The lacquering should be done in a very warm room, and as soon as possible after the application of the lacquer the article lacquered should be warmed, either by placing it in an oven or by applying to it the heat of a Bunsen gas burner or alcohol lamp. 2. Which is the working side of the inclosed piece of drawing paper? A. The rough side. 3. Is the concave side of rolled paper always the working side? In some papers there are no water letters. A. It should be, because the working side is in that way kept clean.

(50) Querist asks: I have seen several articles published in regard to oil on the troubled waters, but no satisfactory solution of the phenomenon. The idea has occurred to my mind that electricity may have something to do with it. It is a well known fact that oil is almost a non-conductor of electricity; that being the case, are there different kinds or qualities of electricity in combination with the atmosphere and the water? If so, have they any attraction for each other, and would an insulator destroy the attraction? Does the wind passing over the water create friction enough to excite or produce electricity similar to friction of metals? Or would the wind passing over oil (that being a non-conductor) confine the different kinds of electricity to their own elements, or the air kind to the air, and the water kind to the water? A. We think the electricity generated by the passage of the wind over the surface of the water is immediately conducted away by the water. It is probable that electricity has nothing whatever to do with the quieting effect of the oil upon the water.

(51) C. W. T. asks: 1. Are steel screws stronger than brass? A. Yes. 2. Is there any way simpler than plating them, to prevent rust? A. Bluing them will prevent rusting to a great extent; nickel or brass plating is probably better. 3. Would not bricks set in Portland cement make good ballast for flat bottomed sailboat? A. They would answer very well, although heavier material would be better. 4. Would not screws serve as well as nails in putting a flat bottomed boat together? A. Yes.

(52) E. W. R. asks (1) how celluloid stereotypes are made. A. Celluloid stereotypes are made by placing the dried mould and the celluloid of which the stereotype is to be made in a frame provided with a spring, which will keep the celluloid under constant pressure. The whole is then immersed in hot oil, until the celluloid is sufficiently softened to be forced into the mould by the spring. 2. What to put on, to prepare plaster of Paris moulds for casting? I have no trouble to make the moulds, but cannot fill them with metal so as to make a perfect cast. A. Plaster of Paris moulds for metal stereotypes must be very thoroughly dried before any attempt is made to use them. The common method of drying them is to bake them in an oven until no further moisture can be removed in that way. They are then immersed in the melted metal, face upward, and allowed to remain until bubbles cease to rise from the mould. It is then lifted from the melted metal, bringing with ita portion of the metal, and supported in a horizontal position until the metal is cooled.

(53) F. W. T. asks: 1. Would Swedish iron do as well as soft cast iron for armature? A. It would answer very well, but would be no better. 2. How can I stop the articles turning black when plating nickel? Consult SUPPLEMENT, No. 310. 3. Would I have a right to sell the machine I am making? A. We cannot reply to this query without knowing what kind of machine you are making. 4. What kind of a gas is made by putting zinc in nitric acid? A. Hydrogen gas.

(54) O. A. writes: I possess a camera front Dallmeyer lens, 10x12, rapid rectilinear, lenses 2 inches diameter. Could I use it in a camera 5x8 for dry plates by substituting the same for the original, and what would the result be? A. If you use a 10x12 rapid rectilinear Dallmeyer lens on a 5x8 camera, the picture will be too large in proportion to the plate. This may be remedied byplacing the camera at a much further distance from the object to be photographed than would be necessary ordinarily, and thereby have the picture of a proportionate size.

(55) C. J. F. writes: I have bent seven pieces of tire steel 1 inch by ¼ inch into a uniform horseshoe shape, and bound them together. They weigh about 20 pounds. What quantity of wire and what gauge will I require to work it as an electromagnet. Also, how many Bunsen cells will it require, and the probable strength of attraction? A. Steel is not suitable for the cores of electro-magnets. You should use the softest iron, with a winding of No. 16 wire, and with iron cores of the size given you would require about four Bunsen cells. Such a magnet ought to sustain from 200 to 300 pounds.

(56) J. M. A. writes: I would like to know if it is absolutely necessary in using Mangin's optical telegraph (SUPPLEMENT, No. 284, page 4522) that nothing should intervene between the observers. Can the instrument be made to reflect a beam of light upward so as to be visible 25 miles, the country level but heavily timbered? How can I obtain data for formulating the lenses? A. Telegraph signals have been produced by illuminating clouds with light flashes, but this plan is impracticable. The only practicable way of telegraphing by light flashes is to throw the light directly from one station to the other. There can be no intervening object. Consult SUPPLEMENT, Nos. 253, 258, 287.

(57) T. McN. asks: Will you please tell why rotary engines have never come into practical use? What the objections to them, etc.? Can you furnish me any work treating of them? A. Because they are practically far inferior to the reciprocating engine, and because they are theoretically no better; also because of the difficulty of constructing a rotary engine with suitably packed contact surfaces. Rotary engines, so far as we know, have proved to be very uneconomical. You will find most of the types of rotary engines described in Reauleaux, Kinematics of Machinery.

(58) J. D. writes: 1. I should like to know how large can a dynamo machine be made like the one described in SUPPLEMENT, No. 161? Is there any danger of the wire on the armature swinging out and touching the electro-magnet? If made on a much larger scale, does the thickness of wire want to be increased accordingly? A. A few years ago these machines were made of quite large sizes, and many of them are now in use for the electric deposition of metals, but they have been superseded by more efficient and economical machines. In large machines the armature is grooved circumferentially at different points along its length, to receive a binding wire which is wound around the iron and the wire forming the conductor of the armature to restrain it, and prevent it from being thrown out by centrifugal action. 2. What is a good thing to mix with rouge to keep in a paste, such as is sold in the stores in tin boxes for polishing purposes? A. A mixture of beeswax and olive oil. 3. What is oxide of tin soluble in? A. Protoxide of tin is soluble in acids. Binoxide of tin when fused with alkalies or their carbonates forms compounds which are soluble in water. 4. Is there any rule laid down in which the different numbers of wire can be known in parts of an inch? A. Nearly all electrical works contain tables in which the various sizes of wire are given in fractions of an inch. 5. What is a good hard paste for a razor strap? A. See answer to No. 2. 6. What is the wire made of that is used in the Edison electric lamp? A. The wire conductors which extend through the glass are platinum. The loop which gives the light is a filament of carbon.

(59) F. E. P. asks: 1. How many times will the hammer of a common clock strike from noon till 6 o'clock in the evening? A. Twenty-seven times. The striking mechanism of a clock is released exactly at the close of the hour, so that the striking for any hour of the day really transpires after that hour has passed. For this reason all of the hours which would be struck between noon and six o'clock would be 12, 1, 2, 3, 4, 5, the sum of which is 27.

(60) T. P. E. asks the origin of the length of the yard measure. Also why St. Rupert's drop was so called? A. The yard appears to have had its origin in England in the reign of Henry the First, "who ordered that the ancient ell should be made of the exact length of his own arm, and that the other measures of length should be based upon it.", In 1824 it was enacted by the English Parliament that if the standard yard should be lost or defaced, it should be restored by making a new standard yard bearing the same proportion to a pendulum vibrating seconds in London as 36 inches bears to 39·1393 inches, the latter being the length of a pendulum vibrating seconds in London. This measurement, however, was found incorrect when the attempt was made to reproduce the standard yard, after the destruction of the Parliament House by fire in 1834. The standard was restored by making four standard yards from the best authenticated copies of the old standard. These duplicates are the bases of the present United States and English standards of length.—Prince Rupert's drops were so called from Prince Rupert, who carried them to England and showed them to Charles II., in 1661.

(61) M. A. W. sends a plant for identification. A. It is the *Monotropa uniflora*, known by the common names of Indian pipe, corpse plant, ice plant, fit plant, etc.

(62) J. W. M. writes: 1. When grinding with an emery wheel, is it the iron or the emery that gets in the eyes and is so hurtful? A. Both emery and iron are thrown off in the operation of grinding with emery wheels. If the particles become embedded in the eye, so that they cannot be removed with a pointed stick, the end of which has been slightly bruised and wet between the teeth, you should apply to a competent surgeon. It is always best while using an emery wheel to employ some protection for the eyes. 2. What is the best way to get it out? Also give me a receipt for making a good soap to take off grease from the hands, such as oil, from a dirty machine shop. A. Tryalcohol and aqua ammonia equal parts.

(63) J. F. W. writes: I am about to commence the study of insectology, and have been told to get a microscope; what powers will be required? A. You will require a microscope of medium quality, with about three objectives and two eyepieces. The entire insect should be examined first with a low power, say a two inch; then the general structure may be examined by a higher power, say a 3-4; finally, the details will require a 1-4 or 1-5. 2. Which is the more interesting study—insects or botany? A. It depends entirely upon the taste of the student; both subjects are deeply interesting, and might be conveniently carried on together. 3. I had a collection of moths, butterflies, and insects; some kind of an insect got into my boxes and destroyed them. Is it not the cabinet beetle? A. Probably. The buffalo moth is also destructive of specimens of this kind. 4. Is there any preparation with which I can capture nocturnal insects? A. By employing a light and a net you will be able to secure the insects. Ordinary sticky flypaper might be of some service in this connection. 5. In capturing insects last summer, I killed them by dropping them in a bottle in which I had previously burnt a piece of sulphur. Is there any better way? Prussic acid. I have been told. A. Place your insects in a long necked bottle, and a short distance down the neck insert a pledget of cotton. Place a few drops of ether or chloroform on the cotton, and close the mouth of the bottle with a cork.

(64) L. M. F.—The lower layer of bricks undoubtedly supports the entire building.

(65) M. R., Jr., writes: What is the latest discovery in metallizing a non-metallic substance, like wood or plaster of Paris, for instance? I wish to electroplate wood and plaster of Paris figures, and do not want to take moulds of them in wax. I know that by first coating the substance with wax or paraffine plumbago will adhere to it, but I wish to learn of a speedier way of preparing them for the bath. A. We know of no speedier way of preparing articles for the electro deposit of copper than the one you describe. There are different ways, however, among which are the deposition of a film of silver, also the covering of the objects with the bronze powder.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted,

November 24, 1885,

AND EACH BEARING THAT DATE.

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

Acid, manufacture of beta-naphthol sulphonic, M. Hoffmann 331,059
Alarm. See Burglar alarm.
Annunciator and alarm, combined, F. E. Kinsman 330,903
Annunciator, automatic electric, Price & Barrett 331,257
Ant trap, W. H. Thompson 331,099
Auger blade, earth, A. Schulte 331,006
Auger, earth, W. W. Curtis 331,228
Awning, F. X. Brenner 330,956
Axle lubricator, car, D. Duprat 330,968
Back band hook, Johnson & Moore 330,900
Baling press, Clark & Bachman 331,035
Baling press, P. K. Dederick 330,877
Baling press, W. Gardner 331,049
Bars. See Clothes bar.
Bedstead, W. B. Clowers 330,872
Beer, apparatus for filling kegs with, C. Mussel 331,351
Belt equalizer and tightener, combined, D. Hanney 330,977
Bicycle, F. Jannus 321,199
Bicycle treadle, G. W. Weidman 331,173
Billiard table leveler, G. Livingston 330,911
Binder, temporary, S. B. Dunn 330,967
Blind, window, W. G. Hale 331,130
Board. See Pastry board.
Boiler furnace, Fowler & Nepil 330,885
Boiler tube scraper, A. B. Smith 331,093
Bolt. See Reel bolt. Square headed bolt.
Book holder, W. R. Field 330,882
Book rest and holder, H. F. Hendrix 331,057
Book, scrap, H. A. Hulburd 330,897
Boot, G. Valiant 330,945
Boot and shoe lasts, measurement indicator of, J. Kimball 331,143
Boot or shoe, R. R. Mathews 330,912
Boot or shoe, G. Valiant 330,944
Boot or shoe soles, machine for channeling, J. G. Ross 330,926
Boot or shoe soles, tool for channeling, J. S. Leavitt 331,145
Boot or shoe soles, tool for channeling, J. G. Ross 331,214
Boots or shoes, device for holding, J. P. Kelly 330,902
Bottle stopper, H. Barrett 331,023
Box. See Letter box.
Box, G. W. Miller 331,076
Box fastener, E. W. Kuehn 330,986
Bracelet, H. E. Chadwick 331,083
Bracket. See Shingle or roof bracket.
Bracket, G. B. N. Dow 331,187
Brick fronts, glass or vitreous facing for, W. Butler 330,957
Brick machine, A. B. Woodward 330,953
Bridle, A. F. Bowen 331,030
Buckle, M. E. Zeller 331,176
Burglar alarm, B. T. Trimmer 330,942
Burner. See Gas burner.
Bushings, machine for threading tapering, H. H. Taylor 331,167
Button, E. Flagg 331,124
Button feeder, Wilkins & Bartlett 330,951
Button setting machine, F. H. Richards 330,925
Calculating device, A. W. Tucker 331,264
Can testing machine, J. E. & W. S. Reynolds 330,924
Canning apparatus, J. Kinney 331,065
Canes or umbrellas, box handle for, L. Steinberger 331,095
Car coupling, H. A. Giles 331,126
Car coupling, W. H. Knight 331,066
Car coupling, G. C. Thompson 331,218
Car coupling, P. L. Wetmore 330,947
Car door change gate, J. Stephenson 331,010
Car, poultry, Jenkins & Streeter 330,899
Car, sleeping, H. Guillaume 331,233
Car starter, W. P. Vickery 330,946
Car starter, H. H. Watson 331,220
Cars, movable dressing closet for sleeping, A. J. Chandler 331,034
Carpet covering, stair, T. J. Dennis 330,963
Carrier. See Cash carrier. Cash and package carrier. Hay carrier.
Cartridge loading and reloading machine, M. F. B. Rice 331,159
Case. See Show case.
Cash and package carrier, W. P. Bigelow 330,869
Cash carrier, Kenney & Mason 331,245
Caster, Osborn & Estey 331,211
Casting moulds, machine for making, M. R. Moore 331,208
Ceiling, metallic, A. Northrop ..... 330,915 to 330,917
Cement, manufacture of, W. Joy 331,243
Chair. See Convertible chair.
Chairs, book rest for, J. D. McClure 331,149
Chalk holder, D. Jennings 331,139
Chart for teaching and producing facial expressions, F. E. Woodin 331,268
Check hook, harness, F. T. Davis 331,040
Chicken brooder, M. H. Strong 331,096
Chimney cowl and ventilator, G. Fischer 330,883
Chuck, lathe, J. C. Bauer 330,867
Clamp. See Gripping clamp.
Cloak, circular, T. D. Barter 331,179