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 next issue.

NEW BOOKS AND PUBLICATIONS.

HOW TO MAKE PHOTOGRAPHS; A MANUAL FOR AMATEURS. By T. C. Roche, and edited by H. T. Anthony, Esq., well known for his practical knowledge of photography. New York: E. & H. T. Anthony & Co.

This book contains a concise description of "How to Make Photographs," intended for beginners in photography. All of the latest and best formulas are briefly stated. It contains two characteristic photographs, is finely printed and abundantly illustrated. A valuable work for those wishing to learn this interesting art.

Notes & Queries

HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from $1 to $5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at the office. Price 10 cents each.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identification.

(1) A. K. writes: On the evening of April 26, one of the armature journals—Babbitted box—of a 20 light dynamo electrical machine became highly heated, melting the Babbitt, which after examination was found, as it were, welded to some portions of the journal and could only be removed by use of cold chisel and file. The only apparent and usual thing to do was to true up the journal, which was badly cut, and pour a new box. But owing to the location of the machine this was difficult to accomplish, besides necessitating considerable delay. The idea thus suggested itself of inserting a lining of sheet lead between journal and old box. After running the machine at a slow speed on the old bearing, and being fully convinced that it would heat rapidly, I procured a piece of sheet lead—from the covering of a tea caddy—about one sixty-fourth of an inch in thickness—and inserted it under the journal, started up the machine, and have been running it for hours at a time since then without any signs of heating, the journal soon taking a good polish and being apparently as good as ever.

(2) A. M. V. writes: I have a handsome blued rifle barrel, which has become rusty from lying in a closet against the outside wall of the house. When I attempted to clean it with fine emery paper and oil, I also took off the bluing. Will you tell me if I can reblue it, and if so, how? A. The bluing of a gun barrel is quite an art, and requires some experience. It is done by carefully heating the barrel. We recommend you to have a gunsmith blue it for you. 2. Of what does the ink used in the hektograph or gelatin copying pad consist? A. Dissolve 1 part of methyl violet in 8 parts of water and add 1 part of glycerine. Digest the whole for about one hour; then allow it to cool, and add one-fourth part of alcohol. The black ink is made with nigrosin.

(3) E. A. D.—There is no satisfactory method of preserving rubber hose. The best cure is to use pure rubber. The coating of hose with a solution of sodium silicate or water glass is recommended. Immersion in ammonium hydroxide 1 part and water 2 parts is recommended as giving new elasticity to the hose.

(4) L. J. D. asks: Will you be kind enough to answer the following questions through the columns of Notes and Queries in your valuable paper: I have a lot of tan which has been used for tanning leather and is of no use now. Can you tell me how to mix it with coal dust so that I can press it into cakes about the size of brick, dry it quick, and break it about the size of stove coal? Give me the amount of coal dust and other ingredients to be used with the tan. I would also like to know the quickest way to dry the tan when mixed, and where to get machinery for mixing and pressing the tan into bricks. I would also like to know how to make a liquid to keep the polished work on engine bright. Something that I can use when the engine is running and that the heat will not affect, such as steamer polish that is sold in liquid form in the stores. A. Spent tan bark can be dried in the air cheapest, or in a steam drying oven at the cost of handling and the heat, which is probably more than the tan bark is worth as fuel. You can mix asphalt with the tan bark and coal dust and press warm into bricks. The quantities will have to be ascertained by experiment. Those that make brick machines can make the proper machines for your purpose. The waste coal dust of the mines can be had free, we believe, by taking it away. Use oxalic acid and water for brass work; tripoli and oil for iron work.

(5) A. T. S.—The difference in illuminating power in reflectors depends very much upon the fineness of polish. As a general rule, 60 to 70 per cent is the value of a reflecting telescope as compared with a refractor of the same aperture and focus. Both being the same in defining power, and sharp, you should be able to see the companion to the pole star bright and clear; the companion to Rigel faintly. Among the close faint stars, Zeta Hercules, *a*, 3d mag., *b*, 6th mag., distance 1·2 seconds; No. 37 Pegasus, *a*, 6th mag., *b*, 7½ mag., distance 1·1 seconds; Lambda Ophiuchus, *a*, 4th mag., *b*, 6th mag., distance 1 second; if you can separate this, you have a first class telescope.

(6) J. C. H.—For cast iron bells you will need, for bringing out a good tone, a hard, crystalline grain which will also be tough enough not to crack easily. This can often be done where you have a good selection from the different grades of iron. No 3 iron or its equivalent, by mixing Nos. 2 and 4, or Nos. 1 and 4, makes a good tone. No. 2 and good tough scrap make a good mixture. If you are casting general machinery or agricultural work from all sorts of mixtures, and have a few bells to cast, then you may make a good alloy with tin—tin scrap, or copper, from 1 to 3 ounces to a 75 pound ladle. Draw into the ladle when the best metal is running, then put in the ingredient, and thoroughly stir and pour. Antimony has also been used for toning iron bell metal—one to two ounces of antimony to 100 pounds iron, and possibly a little more according to the grade of iron you are using. You will need to make a few trials with a 20 or 30 pound bell, so as to get a good tone and also to secure toughness of metal to prevent cracking.

(7) A. W. M. asks how to wash rags that have become saturated with benzine, coal oil, and resin varnish, so as to enable them to be used again. A. Soak the rags in a bath of naphtha or benzine, and when sufficiently cleaned the benzine or naphtha can be driven off by exposure to the sun.

(8) C. D. & Co. write: Will you please inform us through the SCIENTIFIC, the proper speed for driving grindstones with safety, for surface grinding? A. There is considerable difference in the strength of grindstones. The soft, coarse kind will bear 700 feet peripheral velocity per minute up to 4 feet diameter. Hard stones fine and compact will bear a speed of 900 feet as above. These speeds are sometimes exceeded, but we do not know that there is any advantage derived. This will be from 60 to 75 turns per minute for a 4 foot stone.

(9) F. A. G. asks: 1. What is the number of your paper in which you describe a new double revolving plate electric machine; and is the description minute enough to enable an amateur to construct one? A. See page 71, current volume SCIENTIFIC AMERICAN. 2. What is the best kind of paper to use for the armatures of the Toepler-Holtz machine, also the best adhesive to use in applying it? A. Use drawing paper, secure it to the glass with starch paste. 3. In what respect do the Toepler and the Vose improved machines differ? A. Mainly in details of construction.

(10) G. H. W.—For case hardening large articles like locomotive links and blocks, pack the pieces in bone charcoal or bone meal such as is sold for fertilizers, if you do not care about the smell, in an iron box—thick sheet iron or tank iron is the best, but cast iron will do. Pack so that the faces required to be case hardened shall have the benefit of the carbonizing substance; the rest may be filled in with sand. Heat in a slow fire to a cherry red for from a half to two hours according to size of piece or depth to be case hardened, and harden as with steel. Charcoal pulverized with 10 per cent of its weight of prussiate of potash is good.

(11) T. S. G. writes: I expect to burn screenings under my boiler; would there be any advantage by taking the hot air from chimney? If so, is there a blower made for that purpose? A. We cannot recommend drawing air from the chimney for feeding a fire. If your combustion under the boiler is perfect, there is no free oxygen left in the gases of the chimney.

(12) J. H. Z. asks: Can you give me through your SCIENTIFIC AMERICAN a receipt for a paste that will paste gum or leather soles on gum boots? A. Rubber cement is prepared by dissolving India-rubber in carbon disulphide, chloroform, or benzine; apply it to both portions of the soles. 2. Also, how can I keep flowers from withering when plucked from the bush, and kept out of water? Is there anything better than sprinkling them with cold water? A. Keep the stems in water in which 25 grains ammonium chloride have been dissolved.

(13) H. R. E. writes: In using a 3 inch achromatic object in a telescope like the one described in SUPPLEMENT 252, can I use the same eyepieces, and what power do I get with them? How can I make a celestial eyepiece of high power for the above? What is the best focal length for a 3 inch object—36 or 48 inches? A. The 1¼ inch and half inch combinations in SUPPLEMENT 252. A three-eighth single lens, which will give you a power of 90 with a 36 inch object glass, or 128 with a 48 inch O. G. You can make higher or lower power by following the proportions as described in SUPPLEMENT 252. The shorter focus is the best, provided the form, definition, and achromatism are perfect.

(14) D. H. writes: I have been watching your Notes and Queries column for a long time, for a liquid that will give a gloss to a black surface; it must not be sticky, and must dry in three or four hours. A. Use an ordinary shellac varnish.

(15) J. W. asks: Will you give directions that will enable us to dye feathers a "glossy jet black?" A. Try the following: First thoroughly cleanse the feathers with ammonium carbonate and wash them out. Steep over night in a bath of iron nitrate at 7° B., then rinse them in water. Boil out equal parts of logwood and quercitron bark, enter the feathers at a hand heat and turn them frequently, raising the temperature slowly to a scald, but not to boiling point. Let them steep in it till perfectly black, take out, and wash in warm water. Dissolve 3¼ ounces potassium bicarbonate in 5 quarts of hot water and stir in 17½ ounces of olive oil till an emulsion is produced; take them openly through this at hand heat for a short time; then gently draw all the wet out with the thumb and fingers, and then well shake them till dry over a stove or in a well heated room.

(16) S. L. M. writes: Will you please give me recipe for making a good liquid glue from common glue? A. Fill a glass jar with broken glue of best quality, then fill it up with acetic acid, keep the jar in hot water for a few hours, until the glue is all melted, and you will have an excellent glue always ready.

(17) J. L. D. asks for the best mode of destroying stumps of trees that have lately been cut, and how are they burned by petroleum. A. The method by which stumps are removed by petroleum consists in allowing the stumps to become completely saturated with petroleum, and then setting them on fire. The method by using saltpeter consists in boring holes into the head of the stump and putting into each 1 ounce of saltpeter, and after leaving it to become wet and penetrate the substance of the stump, the latter is set on fire, when it will be completely consumed.

(18) J. L. C. asks: Will you please give a recipe for making good wine from cherries? Also, the best cherries for making wine. A. Ripe fruit, 4 pounds; clear soft water, 1 gallon; sugar, 3 pounds; cream of tartar dissolved in boiling water, 1¼ ounce; brandy, 2 to 3 per cent; flavoring as required. A better and stronger article may be made by adding 1 or 2 pounds each additional of fruit and sugar.

(19) R. W. M. writes: 1. I have a rare old German coin with some curious designs upon it, and some of my friends would like a copy of it as a curiosity. I made a plaster of Paris mould of it, and poured in, first lead and then type metal, but although the metal fills the mould it does not run into the fine crevices. Please tell me how to proceed or what to use to make it a success? A. See SCIENTIFIC AMERICAN SUPPLEMENT No. 17, page 272. 2. Please tell me how to dissolve gum copal in alcohol so as to make a good varnish for oil paintings. A. Fuse 8 pounds of very clean pale African gum copal, and when completely fluid pour in 2 gallons of hot oil; let it boil until it will string very strong, and in about 15 minutes, or while it is very hot, pour in 3 gallons of turpentine. Perhaps, during the mixing, a considerable quantity of the turpentine will escape, but the varnish will be so much the brighter, transparent, and fluid, and will work freer, dry quickly, and will be very solid and durable when dry. After the varnish has been strained, if it is found too thick, before it is quite cold heat as much turpentine and mix with it as will bring it to a proper consistence. 3. Please give a good receipt for "black heads" or "flesh worms?" A. See page page 52, vol. xlvi., SCIENTIFIC AMERICAN, January 28, 1882.

(20) J. J. B asks: Can you give the receipt of how to make imitation turtle shell? Can celluloid be softened and cast in moulds? A. The dark spots in horn that are made to represent tortoise shell are produced by using a strong aqueous solution of silver nitrate mixed with gum arabic so as to flow properly from a brush. A little red lead may be mixed with it to give body. After standing an hour soak in soft water for several hours before finishing. Pieces of horn may be united by softening the edges with boiling water and then submitting to powerful pressure while surrounded with boiling water. For description, etc., of celluloid, see SCIENTIFIC AMERICAN SUPPLEMENT No. 227, page 3617.

(21) W. C. asks if there is any process whereby beef bones can be softened so as to be used in moulds. The bones can be softened by placing in dilute hydrochloric acid, which extracts the calcium salts.

(22) F. J. R. asks: What would be the size of a boiler (of the same construction as that shown in SUPPLEMENT No. 158, January 11, 1879, built by H. S. Maxim) that I need for a steamboat, 16 feet long, 3 feet 4 inches beam, of good shape, so as to be able to run it at least 10 miles an hour, the engine being 3 inches bore and 3 inches stroke? What size, shape, pitch, and weight of a propeller wheel would I need? A. To make 10 miles per hour you will require a screw 2 feet in diameter, 4 blades. Pitch 45° on edge, making over 300 revolutions per minute. This would be hard work for your little cylinder. If you could be content with 6 or 7 miles per hour, a wheel of 18 inches diameter would require 250 revolutions of engines per minute which could be possible with 60 pounds steam and a good boiler of 20 square feet heating surface.

(23) T. B. asks: Is the expansion of metal lengthwise the same in all thicknesses, say for instance in two pieces 24 inches long, one 16 wire gauge and the other half an inch round. In the raising of the temperature from 32° Fah. to 90° Fah. will the longitudinal expansion be the same in each, or will the half inch expand more, in proportion to the larger amount of metal in it? A. The wire No. 16 gauge and the half inch round iron should expand exactly the same, provided they are both annealed and are the same quality of iron. A hard drawn wire cannot be expected to expand exactly in unison with a hot rolled iron rod. The differences in lateral dimensions should not make an appreciable difference in longitudinal expansion until the difference becomes so great as to involve a considerable change in crystalline structure.

(24) E. J. K.—A boiler that is just large enough for your work with fresh water is too small for the same work with salt water. Your boiler should be blown off enough to keep the water inside clear or far below the point of saturation. It requires the same kind of care that is given to marine boilers. Again, an upright boiler is unfit for salt or brackish water under any circumstances. Boilers for salt water need large evaporating surface.

(25) S. W. asks when that motion commonly called "kicking" is given to a gun. Whether at the time the powder is ignited, or at the moment the

charge leaves the gun. A. The kicking or recoil of a gun commences at the instant that the ball begins to move. The impulse lasts until the ball leaves the muzzle. The recoil continues after the ball leaves, from the momentum generated by the first impulse.

(26) J. inquires: 1. How to prepare a rust cement for iron? A. Wrought iron filings, 65 parts; sal ammoniac, 2½; sulphur (flowers), 1½; sulphuric acid, 1. The solid ingredients are mixed dry, sulphuric acid diluted with sufficient water being then added. This cement dries after two or three days, and unites with the iron, making a very resisting and solid mass. 2. Also an iron cement for high temperatures? A. (1.) Iron filings, 20 parts; lime powder, 45; borax, 5; common salt, 5; permanganate of potash, 10. The borax and the salts are dissolved in water, and are then mixed with the two first named ingredients as quickly as possible and used. This cement changes at a white heat to a glassy mass, which is perfectly airproof. (2.) Permanganate, 25 parts; zinc white, 25; borax, 5. These are treated with a solution of soluble glass, and used at once. This cement must be left to dry slowly, and then it will resist the highest temperatures.

(27) G. H. asks for the process of preparing a bichromate solution for a small electric light battery. A. M. Trouve in his improved electric battery takes 150 grammes of bichromate of potash powder to a like amount of water, and after slaking adds, drop by drop, 450 grammes of sulphuric acid. The liquid warms and the salt dissolves, while no crystals are formed on cooling, nor are chrome alum crystals deposited in the cell. The elements are arranged with two carbons to each zinc, the latter being so placed that it can be drawn from the solution. With 12 elements and the solution above described, it is stated that 10 incandescent lamps can be kept at work for five hours, each lamp giving 10 candles. There is thus 100 candle power for five hours.

(28) J. H. writes: Please inform me if there is a method known to ascertain whether there is any moisture left in kiln dried timber, or in other words to find out when timber used in carriage building or any equal mechanical branch is dry enough. Is there any cheap chemical test to detect the presence of water in timber, warm yet from the kiln? If so, what is the agent, and how is the test performed? Can timber like hickory or oak be dried too much, and if so, is the original tenacity lost for good, or will exposure to the atmosphere restore it again? A. There is a way of ascertaining the quantity of water left in timber after kiln drying, first by putting a known quantity by weight, as a sample, into an iron retort and subjecting it to a heat that will discharge all the water, and then weighing the remainder for ascertaining the amount discharged. The best and most reliable way of determining is by practice and experience, as to the heat of the kiln and time used in drying. You can dry the wood too much and make it brittle, or kill its toughness. Over dried wood works crisp under the tools. Exposure to moisture only partially restores it.

(29) R. R. C. asks: Will you inform me of the nature of the composition or the kind of metals used for the regulation of the heat, by reason of the expansion or contraction of the metal, in artificial hatching machines, hot houses, or for other purposes where a standard degree of heat is desired? A. Metallic regulators should be made of metals having the greatest difference of expansions if possible such as steel and zinc, combined in a spring. Iron and brass make good regulators by making the strips one or two feet long, soldering together, and coiling up like a clock spring.

(30) W. W. M. asks: 1. Will you inform me what will make hoof and horn material pliable, so that it will not get hard and brittle, and how may it be welded? A. Horn may be welded or joined by heating the edges until they are quite soft and pressing them together until they are cold. It may be softened, after sawing it into plates or sheets, by exposing it to powerful pressure between hot iron plates. Before pressing, the pitch must be removed, and the horn softened, first by soaking for some days and then boiling in water. 2. What will prevent sulphuric acid from destroying woody and fibrous materials? A. Nothing; sometimes a coat of varnish or paraffin may be applied with advantage, but it is very difficult to prevent the acid from getting through. 3. In making an electrical machine, as in SUPPLEMENT 161, could the electro magnets be made similar to an ordinary horseshoe magnet? A. Themachine may be made in the manner described. 3. Will the electrical force generated by one dynamo run another? Yes, but at considerable expense of power.

(31) A. E. S. asks: 1. How can flowers be preserved in their natural form and color? A. Insert their stems in water, in which 25 grains ammonium chloride (sal ammoniac) have been dissolved. Flowers can be preserved in this way for 15 to 30 days. To preserve them permanently for several months, dip them into perfectly limpid gum water and then allow them to drain. The gum forms a complete coating on the stems and petals, and preserves their shape and color long after they have become dry. 2. What is a cheap and effective disinfectant for outside use about house and barn, etc.? A. Carbolic acid or zinc sulphate, both of which are poisonous.

(32) A. S. writes: W. R. asks how to use charcoal in casting brass, in No. 14 of Notes and Queries, SCIENTIFIC AMERICAN of May 19, 1883. Tell him to make a flame of the outer bark of the birch tree and thoroughly smoke the mould in every part, and he will get a perfect casting.

(33) W. M. H. asks: 1. What process will enable me to letter or stencil letters and figures upon glass, such as glass signs for advertising purposes, that may be done cheaply and quickly? A. Etch with hydrofluoric acid. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 313. 2. By what process can I drill holes in glass? A. Make a circle of clay or cement rather larger than the intended hole; and use a drill formed of a copper tube and supplied with emery and water.

(34) E. M.—The following method of etching on silvered glass is given by Leclere, of Paris. Glass which is thinly silvered is coated with a very thin coat of asphalt. A photographic cliche or a properly cut pattern of dark paper, pasteboard etc., is laid upon the asphalt coat when dry; and the whole then exposed to the rays of the sun, which will render the asphalt, whenever the latter is exposed, insoluble. The protected asphalt coating is then washed away with benzine, and the silver coating beneath it is etched with nitric acid, while the drawing or patterns will appear in silvered lines and figures upon the glues.

(35) A. C. F.—The following inks afford copies without a press:

1. (Black).

Nigrosine C. P. fine	10 ounces.
Glucose "A"	1½ ounces.
Hot water	1¾ pints.
Glycerine	1¼ ounces.

Dissolve the nigrosine by trituration in the hot water, then add the other ingredients and strain through a piece of silk. If too thick when cold, dilute to the proper consistence with water.

2. (Blue).

Cotton blue (aniline) C. B.	6 ounces.
Glucose "A"	1 ounce.
Glycerine	¼ ounce.
Hot water	2 pints.

Proceed as directed for black ink (above). In preparing these inks it is essential that the water should be kept quite hot while the operation of trituration is performed. The trituration should be continued until all of the dye has been taken up by the water. The straining must be performed hot, otherwise the filtering cloths quickly become clogged. In purchasing nigrosine and aniline blue, obtain if possible the purest quality. Cheap grades of these dyes are almost invariably heavily adulterated with dextrine.

(36) P. F. S.—The following varnish is recommended for coating the stalks of flowers for the preservation of their color and general character:

Isinglass	11 ounces.
Concentrated glycerine	9 "

The isinglass to be softened by first soaking it in cold water, and then dissolved in the glycerine by digestion and agitation with the latter heated to 212° Fah. over a water bath. When properly prepared this varnish is colorless, and when cold resembles rubber in all but color. Another varnish recommended for this purpose is prepared from:

Bleached gutta percha	1 ounce.
Deodorized benzole	7 "

The gutta percha is cut into fine shreds and gradually added to and agitated with the solvent kept hot or (warm) over a sand bath—away from fire. The whole flower may be dipped into this varnish, shaken. and exposed to the air to dry. Another preparation suggested for this purpose is plain collodion diluted one-third and mixed with two per cent of camphor, also dissolved in a small quantity of ether and alcohol.

(37) C. W. N. K. writes: Would you kindly inform me through your paper the size screw it would take to run a boat 12 feet long by 3¾ feet beam, and whether it would be better to have a two blade or a three, supposing it revolves at the rate of 375 a minute? A. The diameter will depend somewhat on the draught of water. We think 15 inches or 16 inches diameter, two blades, best.

(38) G. B. asks: Can you inform me how mosaics are made? A. The enamel used is a kind of glass, colored with metallic oxides, and it is so fusible that it can be drawn out into threads, small rods, or oblong sticks of varying degrees of fineness, slightly resembling the type used by compositors. These polychromatic rods are kept in drawers properly numbered, so that the artist always knows to which case to repair when he requires a fresh supply of a particular tint or tints. When the picture is commenced the first step is to place on the easel a slab of marble, copper, or slate, of the size fixed upon; and this slab is hollowed out to a depth of about three and a half inches, leaving a flat border all round which will be on a level with the completed mosaic. The excavated slab is intersected by transverse grooves or channels, so as to hold more tenaciously the cement in which the mounts of enamel will be embedded. Then the hollowed slab is filled with "gesso," or plaster of Paris, on which the proposed design is traced in outline, and usually in pen and ink. The artist then proceeds to scoop out a small portion of the plaster with a little sharp tool. He fills up the cavity thus made with wet cement or "mastic," and into this mastic he successively thrusts the "spiculæ," or the "tesseræ," as the case may be, according to the pattern at his side. In the broad folds of drapery or in the even shadows of a background, or a clear sky, his morsels of enamel may be as large as one of a pair of dice; in the details of lips, or eyes, or hair, or foliage, or flowers, the bits of glass may be no larger than pins' heads. The cement, or mastic, is made of slaked lime, finely-powdered Tiburtine marble, and linseed oil and when thoroughly dry is as hard as flint. Sometimes the mastic which fills the cavity is smoothed and painted in fresco with an exact replica of the pattern, and into this the bits of glass are driven, according to tint, by means of a small wooden mallet. If the effect produced wounds the artist's eye, he can easily amend the defect by withdrawing the offending piece of enamel and driving in another while the cement is still wet; and, by observing proper precautions, it can be kept damp for more than a fortnight. When the work is completed any tiny crevices which may remain are carefully plugged with pounded marble, or with enamel mixed with wax, and the entire surface of the picture is then ground down to a perfect plane, and finally polished with putty and oil.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

F. A.—The specimen is simply mica in clay, of no value at all.

COMMUNICATIONS RECEIVED.

On a New Electrical Condenser. By N.
On the Orbits of Planets. By C. W. H.
On the Theory of the Turbine. By S. W. R.
On Electricity in Printing Offices. By T. H. B.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

May 15, 1883,

AND EACH BEARING THAT DATE.

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

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Bottle stoppering, Macvay & Sykes, 277,758
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Box and package filler, Bolton, Strieby & Rankin, 277,540
Bracelet and necklet fastening, J. M. Banks, 277,537
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