NEW BOOKS AND PUBLICATIONS

COMMERCIAL ORCANIC ANALYSIS. Vol. I. By Alfred H. Allen. P. Blakiston Son & Co., Philadelphia.

This is the commencement of a revised edition of a standard work, containing much later and additional information. It is intended now to treat the whole sub-ject matter in three separate volumes, this one taking up bodies of the fatty series and of vegetable origin, and including chapters on the alcohols, ethers, and other neutral derivatives of the alcohols, sugars, starch, and vegetable acids. The work will be found especially valuable to manufacturers whose business requires any knowledge of chemical manipulations, and to all who have to examine commercial organic products for the detection of adulterations or sophistications of any kind.

THE WINDMILL AS A PRIME MOVER. By Alfred R. Wolff. John Wiley & Sons, New York.

This work gives a fairly complete elucidation of the mathematics of windmill construction, as necessary for the engineer, together with a history of the introducwindmills, and accounts, with practical illustra tions, of most of the more recent windmills which have been introduced in recent years in this and other coun-

Sons, New York.

This is a text book for the study of such only as have had a good training in mathematics and theoretical mechanics. It is designed for the use of classes in technical schools and colleges, and problems follow each article to enable the student to become well grounded in the theories stated.

THE ANGLER'S GUIDE BOOK. Compiled and edited by W. C. Harris. The Anglers' Publishing Company, 252 Broadway, New York. 288 pages. Broadway, Price \$1.00.

This is a very complete and useful book for persons having the propensity for fishing. It gives over 2,000 center points from whence over 7,000 angling waters are more or less accessible. It tells how to reach these points, the species of fish most abundant, the best months for angling, the kind of baits or flies to use, list of hotels or boarding houses with their charges, cost of guides, boats, and baits where necessary, and the cost of permits for fishing where required.



HINTS TO CORRESPONDEN'I'S.

Names and Address must accompany all letters or no attention will be paid thereto. This is for our

Annes and Address inits accompany an 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 This is for our information, and not for publication.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 answersd 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 Information requests on matters of persons; rather than general interest, and requests for Prompt Answers by Letter, should be accompanied with remittance of \$1 to \$5, according to the subject, as we cannot be expected to perform such service 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) E. E. W.-We think the steel and brass strips soldered together for a thermostatic bar themost sensitive, and of longer range than the bowed wire. For a hygrometer use a strip of flat sheep gut stretched across the inside of the incubator, with one end fast and the other hung by a light spring, using the moventent of the point of attachment as an index.

(2) F. S. M. asks how acid coloring is done on gold. A. For small gold articles a very good plan is to place them on a lump of charcoal and make them red hot under the blow pipe flame, and then to throw them into a pickle composed of about 35 drops strong sulphuric acid to 1 ounce water, allowing the articles to remain therein until the color is sufficiently enhanced; washing the article in warm water in which a little potash has been dissolved, using a brush, and finally rinsing and drying in boxwood sawdust, completes the operation. See also Spons' Workshop Receipts, second series, which we can send for \$2.00.

(3) D. D. L. writes: Some time ago you gave a cure forcorus-collodion, salicylic acid and Cannabis indica. I find it takes a long time to dissolve. The proper formula is as follows

Consult also "A Practical Treatise on the Raw Materials and Fabrication of Glue, Gelatine," etc., price \$2.50, by F. Dawidowsky.

(5) H. V. A. asks for directions for making a small mine lamp. A. To make a phosphorus lamp, dissolve 24 grains of phosphorus in an ounce of olive or cottonseed oil. The mixing should take place a zinc lined refrigerator should not be used. It is unin a thin| flask, which must be placed in hot water. doubtedly poisonous, and the flavor is anything but When the phosphorus melts, cork the vial and shake palatable. Make a heavy tin plate box soldered with vigorously until nearly cold. Upon being uncorked it pure tin, with a close cover, fill with water and ice and emits considerable light. This preparation is an ex- set it in the ice box. A small butter jar with cover ceeding dangerous operation, and one demanding experience in the manipulation of chemicals.

dangerous, in case of lightning, to run a wire cable from the roof of one block across the street to roof of another, both roofs being tin? A. Unless both roofs are well connected with the ground, the lightning striking one roof might be conducted to the other, thence through the house, doing damage. 2. What result do we obtain by mixing a solution of acetate of lead and a solution of sulphate of zinc? A. A precipitate of lead sulphate.

(7) C. G.-Silver is platinized as follows: Place some platinum in a small quantity of aqua regia or nitrohydrochloric acid, and keep it in a warm place

for a few days, whon it will have dissolved. As soon MECHANICS OF MATERIALS, AND OF as it has dissolved, evaporate the liquid at a gentle heat BEAMS, COLUMNS, AND SHAFTS. By until it is as thick as honey, so as to get rid of the ex-Mansfield Merriman. John Wiley & cess of the nitric and hydrochloric acids. Add a little water, and it is ready for use. A dozen drops of this solution goes a long way in platinizing silver. The operation is performed in a small glass or beaker, cov ered with a watch glass to keep in the fumes, and placed in a little sand in a saucer to equalize the heat

> (8) W. J. G. asks: 1. I would like a receipt for a varnish suitable to revarnish walnut barber chairs. I want it so it will stain the bruised parts and will dry quick. A. Use either of the following: 1. Shellac 1½ pounds, naphtha 1 gallon; dissolve, and it is ready for use without filtering. 2. Shellac 2 pounds, benzoin 4 ounces, spirit 1 gallon. Either of the foregoing makes excellent furniture varnish. It is best, however, to first thoroughly remove all varnish and other matter on the wood before applying a new coat of varnish. 2. A receipt book giving receipts for making hair dyes, oils, cosmetics, pomades, etc., for bar-bers' use. A. There is a comprehensive treatise on perfumery and kindred arts by R. S. Cristiani, which we can send for \$5.00.

(9) A. D. asks how to clean and polish sea shells, and what acids are used, if any? A. Shells are cleaned as follows: Make a lye by boiling strong densities or refractive and dispersive indices of both ashes; allow it to settle, pour the lye over the shells. and boil them six or seven hours, or longer, if they are large; then soak, and wash often in fresh water. Dilute then make the correction of curves by trial and obacids, such as hydrochloric acid, mixed with from ten to twenty parts water, will readily eat away any portion of the shell. If polishing is necessary, a little pumice stone and oil will make the surface smooth where desired.

merly on the market maps of the Holy Land, the uneven topography shown in relief. After the plates were lithographed, how was this done? A. The maps you describe are probably first made in clay, from which a plaster cast is taken. Into this female cast the paper pulp is forced, and the resulting cast constitutes the map. The engraved sheet is wetted, then stretched over the model, and glued down, the paper giving wherever

(11) J. B. writes: I wish to run a steam pipe from my boiler to lint room in gin house. I wish to use this in case of fire. Would it be necessary to have the lint room very tight for the steam to extinguish fire? A. It is not necessary to have the gin house tight, but it is well to have the pipe pass around the half filled with tubes of any convenient size, can be gin room and terminate under the gin, with perforations made by a coppersmith of suitable thickness for presat various points so as to distribute the steam quickly.

made into solution with water? I think there may be some powdered substance that will not change the character of the acid. It is used in the following way for the removal of tattoo marks on the skin: "Make a marked, then rub vigorously with a solution of potash, and finally with diluted hydrochloric acid. A. Hydrochloric acid itself is a gas, and the acid of commerce is simply an aqueous solution of the gas. No practical method exists by which the gas can be used in the dry form. We do not believe that tattoo marks can be removed by the method suggested. As regards the preparation of such an ointment, the simplest plan would be to have it prepared by a pharmacist. The ordinary dilute solutions are made in the proportion of one of the substance to ten of water.

(13) L. H. S. desires a recipe for preventing mildew in blotting paper used in copying let ters. A. If you dry the paper thoroughly in a current of air, no mildew spots should appear. As the mildew is a fungous growth, dipping the paper into some convenient disinfectant should be all that is necessary. A solution of zinc chloride, carbolic acid, oil of cloves etc., we should think would prevent its appearance. (14) G. H. asks: What is used to fill out little holes in cast iron to make it smooth, before japanning same? A. Fill the holes with iron putty made of iron filings or cast iron borings and boiled linseed oil or a little japan varnish. Make the putty as hard as possible; fill the holes, and bake to harden. When hard, smooth with sand paper, when it will be ready for japanning

are classes in wood engraving for females at the the exact amount of quinine necessary for your prepara Cooper Institute, New York, but practical wood engravers engaging to teach the business usually require

a fixed sum therefor and a long time of gratuitous work. (16) J. P.—The water percolating from

will be still better.

(17) H. A. L. asks how to remedy (6) H. S. S., Jr., asks: 1. Would it be clothes which have become shiny. A. The shininess is angerous, in case of lightning, to run a wire cable from generally due to wear, and under such circumstances cannot be restored. The following reviver may prove useful, however: Take of blue galls bruised 4 ounces, logwood, copperas, iron filings free from grease, each 1 ounce. Put all but the iron filings and copperas into 1 quart good vinegar, and set the vessel containing them in a warm water bath for twenty-four hours; then add the iron filings and copperas and shake occasionally for a week. The preparation should be kept in a well put out the growth from the top; they do not pull or corked bottle. It may be applied to faded spots with a soft sponge

> (18) Scud asks: What can I coat a muslin bag with that will make it air tight, and also flexible, so that when not inflated it may be rolled and carried without breaking? A. Take 11/2 ounces of finely cut shreds of India rubber and 1 pint of either chloroform, washed ether, or carbon disulphide; digest in the cold until solution is complete. It will dry as soon as it is laid on. Pure gutta percha may be substituted for the India rubber.

> (19) W. F. B. asks: 1. If a nickel solution be made according to Mr. Weston's process, as described in SUPPLEMENT, No. 192, and 10 ounces of chloride of nickel be used with 4 ounces of boracic acid, what would be the amount of water required to make the solution? A. Use 1 gallon of water to 1 pound of the crystals. The exact quantity of water is not important, for the reason that just as fast as the nickel is deposited on the object to be plated the nickel anode gives up an equal amount of nickel to the solution, so that its composition remains constant. 2. Should a nickel solution be worked hot? A. The nickel solutions are worked cold. See Alexander Watt's "Electro-Metallurgy," practically treated. Price \$1.00.

> (20) V. B.-We cannot recommend the quality of an objective made from plate glass, unless it was thoroughly examined and found of even density. The curves cannot be given without a knowledge of the glasses. You may make the radius of all the curves about 21/2 feet with one side of the flint glass flat, and servation, in the absence of more positive knowledge of the nature of the glass.

(21) W. F. B.-The trouble with steam tricycles is not with the light engine, but with the heavy boiler, water, and fuel. They have been built in Eng-(10) A. B. S. writes: There were for-land to run 8 to 10 miles an hour. We do not think you can attach an engine and boiler to any ordinary tricycle that will be of much service. The power stated gredients of a cement or pitch used by brush makers in would no doubt give the desired speed. Fuel, water, cementing hair in the handles of brushes. A. Paint and attendance make the trouble.

> (22) E. J. W. asks: 1. What kind of steel is used in the manufacture of French cathedral bells? A. Best tool steel. 2. Is it used in a tempered or soft condition? A. Soft. Small triangles may be hardened.

(23) J. P. A.-We do not know of any cheap way of making smallboilers; whatever pattern is chosen, there should be as much pains taken to have it well done as with those of a larger size. A horizontal cylinder 15 inches diameter, 2 feet long, with lower sure required; 6 square feet of fire surface will be suffi-(12) C. E. P. writes: Is there a way of cient for one-third horse power. We do not recommend four hours, or exposing to the heat of the sun in sum-putting up hydrochloric acid in a dry form so it can be a pipe boiler, which if made of serviceable proportions mer. The tincture must be strained through a piece of is more difficult to make than one of copper.

enough to inform me which "system of stenography" you consider the most efficient and best adapted for salve of acetic acid and lard, with which anoint the part practical use in regard to quickness and plainness for a beginner? A. Pitman's system is largely used by newspaper reporters. Graham's and Munson's systems are likewise both extensively used

> (25) W. E. S. writes, relative $\star to \ the$ question of the moon's presenting to the earth the same side always: There may be known conditions in this problem not within my knowledge, which forbid the following explanation, but a very simple cause would seem to be sufficient to account*for this phenomenon, to wit, a greater density in the part of the moon which is next the earth, as compared with the remainder, or such a shape of the moon as gives a greater amount of material in that part, with the neces- ings, photographs, water colors, oil colors, crayons, sary consequence, through attraction of gravitation, of show cards, labels, etc., can be transferred to glass in holding that part always next the earth. A. Its form the following manner: Takeglass that is perfectly clear, may not be a perfect sphere, and it may also be overloaded on the earth's side of its center of gravity. All it perfectly smooth; place it where it will be entirely these conditions have been derived from its original free from dust; let it stand over night, then take your condition of rotation, and yet we do not know the fact engraving or photograph and lay it in clean water unt of its initial rotation, or why it is different from its it is wet through, say 10 or 15 minutes, then lay it upon primary.

tion. Double decomposition in most cases is far simpler than a direct process

(27) R. asks: What is a sure destruction to the small red ant? A. Powdered borax sprinkled around the infested places will exterminate both red ants and black ants. Powdered cloves is said to drive them away. Another plan is to grease a plate with lard, and set it where these insects abound. They prefer lard to anything else, and will forsake sugar for it. Place a few sticks around the plate for the ants to climb up Occasionally turn the plate bottom upover the fire, on. and the ants will fall in with the melted lard.

(28) W. T. H.-The sample is simply unsized paper dipped in a strong solution of Prussian blue. A good bluing solution is made by taking one ounce soft Prussian blue, powder it and put it in a bottle with 1 quart of clear rain water, add 🖌 ounce of oxalic acid. A teaspoonful is sufficier' for a large washing.

(29) F. B. D.-In the growth of vines and plants the stalks simply enlarge at the bottom, and materially stretch their stalks out-A cloud burst is only a thunder storm of great intensity. Its effects are intensified in the canons of the Rocky Mountains by their steep and rocky slopes precipitating the water into the gorges. A water spout is the sucking up of water from sea, lake, or river by a tornado, which in 1ts turn may become a cloud burst by its precipitation at a different locality.

(30) J. F. N. wants to know all about petroleum soaps and how they are made. A. Caustic lye at 36° B. is placed in a suitable vessel, and then equal parts of animal acty matter and mineral oil are placed in separate versels. The combined weight of the fatty matter and the mineral oil being taken as a standard, boric acid sufficient to dissolve the alkali is used: the mineral oil is heated to a temperature of about 90° Fah., and the animal fatty matter is melted by steam heat, and while in this condition a quantity of boric acid is dissolved therein, which, with that acid used as before, will make up 1/2 per cent of the combined weight of the fatty matter and mineral oil employed. The partly acidified animal fatty matter and the mineral oil, being heated in separate vessels, are now united by gradually pouring the former into the latter, with constant stirring or agitation, in order to effect a perfect combination; the acidified alkali is then gradually added, and the mass kept well stirred. The process of converting the mineral oil into a solid is completed by gradually adding the ordinary or unacidified alkali in sufficient quantity to effect this result, keeping up the agitation as before. When the entire mass is found to be granulated, the conversion into a saponaceous compound is complete. While animal fatty matter only has been mentioned, the same results can be reached by the use of vegetable fatty matters. The soap is fluished by the free use of steam. Liquefaction is accomplished by a jet of steam to thoroughly deoxidize the saponified matter and disintegrate the compound. After the use of steam for this purpose, the soap is boiled by superheated steam.

(31) C. H. R. desires to know the incementing hair in the handles of brushes. A. Paint brushes are made by inserting a bunch of full length bristles between two projecting prongs on the handle, and securing them by a wrapping of twine which is afterward coated with a covering of glue mixed with red lead. Equal parts of asphalt and gutta percha melted together and applied hot under a press will form a black cement of considerable strength.

(32) C. E. F. desires the receipt for making and applying the gilt or lacquer that opticians and manufacturers of electrical instruments use on most of their fine brass work. A. Take 💥 ounce gamboge, 2 ounces gum sandarac, 2 ounces of gum elemi, 1 ounce of dragon's blood, 1 ounce of seed lac, 2 grains of oriental saffron, and 20 ounces of pure alcohol. The tincture of saffron is obtained by infusing in alcohol for twentyclean linen cloth, and ought to be strongly squeezed. (24) H. S. asks: Will you be kind This tincture is poured over the dragon's blood, the gum elemi, the seed lac, and the gamboge,allpowdered.

> (33) W. S. M. desires a receipt for a cement that will stick leather, something that oil or water will not affect, and at the same time is pliable and will not crack. A. Gutta percha dissolved in carbon disulphide to form a mass of treacly consistence is probably the best cement for splicing leather. The parts to be joined must be thinned down; a small quantity of the cement is then poured on each end and spread so as to thoroughly fill all pores of the leather; the parts are warmed over a fire for a few minutes, applied quickly, and hammered well together. Or gutta percha 1 pound, India rubber 4 ounces, pitch 2 ounces, shellac 1 ounce, linseed oil 2 ounces, melted together.

(34) E. N. H.-Colored or plain engrav-

Extract of Cannabis indica	5 parts.	
Salicylic acid	30	"
Collodion	240	44

Mix and dissolve. The result is a clear light green solution. There should be no difficulty in its preparation. To prevent it from evaporating, keep the solution in a stoppered bottle. Be sure and use the Indian hemp, and not the American article; the latter is not easily soluble.

(4) A. A. O. asks if he could manufac ture glue from dog fish. A. Glue is largely made from the skins and refuse of fish in the same way that ordinary glue is prepared from the skins and offal of land animals. Thus far, however, it has been found impossible to free it from the disagreeable fish-like odor, and also it does not gelatinize satisfactorily. In the East the scales of fish are thoroughly washed and placed in is then placed in a pot of water until the scales are re-

(15) J. A. A.—Wood engraving is one of Thus, for instance, in the case of barium sulphate, BaSO, where is a magic lantern to be used. the most difficult of occupations to become an expert we find that the atomic weight of Ba is 137; of SO4, a glazed earthen jar, which is stoppered tightly and in-much more so than an ordinary trade-and one S=32, O=16×4=64, or 96; hence barium is 133 of 100; or weighted so that it will remain under water. This jar | seldom becomes moderately proficient in less than four 5923, that is to say, Ba combines with SO, in the propor or five years. There is always a demand for the better, tion of 59.23 of Ba to 40.77 of SO4. Therefore in every duced to a semi-transparent viscous mass. Care should class of workmen, who are necessarily in some mea- 100 pounds of barium sulphate there are 59:23 pounds be taken that no water or extraneous matter, fluid or, sure artists, but of poor engravers there is never any of barium and 40.77 pounds of the SO4. In like manner solid, be allowed to get into the jar with the scales. scarcity, and the price varies proportionately. There you must compute from the formula of borate of quining holic solution to crystallization. You can then mix

(26) D. T. writes: I wish to prepare different chemicals by using the direct process, avoiding ing upon it, pressing it down firmly so as to exclude double decomposition. I want to make borate of every particle of air; next rub the paper from the back quinia. What quantity of each must be used? A. until it is of uniform thickness, so thin that you can see The information you desire is determined by calculation. A knowledge of stoichiometry must be obtained.

clean it thoroughly, then varnish it, taking care to have a newspaper, that the moisture may dry upon the surface, still leaving the other side damp. Immediately varnish the glass a second time, then place the engravthrough it, then varnish it a third time and allow it to dry. Scientific American Supplement, No. 87, de-

(35) G. C. K. asks: How could I prepare helenina or elecampane to make tests with it in butter to keep? If it is wholesome for veal and eggs, it must be so for butter. Would alcohol in this case be detected? A. The helenina is obtained by evaporating the alco-

(36) H. R. C. asks: Is there a point in the axis of a revolving wheel in which there is no motion? A. There seems to be much misunderstanding as to the meaning of the word axis, it being a line having neither breadth nor depth, around which a body re volves. Every particle of the body revolves or moves around its axis. The axis does not revolve. Axles re volve

(37) W. H. D. asks (1) if worn out files can be recut by using acid? A. Yes. 2. With what success? A. Fair. 3. What acid to be used? A. 1 part pitric, 3 parts sulphuric, 7 parts water; dip from 5 Feconds to 5 minutes. 4. What can be used in place of oil on the drawing and blanking dies? The oil touching certain rubber parts rots the rubber. A. Glycerine.

(38) W. M. B. asks for an easy and cheap way to clean beer bottles, that is, what can I put in water to make them become clean, and at the same time remove old labels, etc.? A. At factories where beer is bottled, the empties are cleaned by means of a revolving brush, which is pushed in through the mouth of the bottle, turned around once or twice, and then withdrawn. The labels are acted upon by simply soaking in water and then scraping with knives. If the bottles are contaminated with grease alkalies are used to cleanse them, and sometimes ecids are used, but we believe as a general thing that nothing but water is em-ployed. See the article "How to Clean Bottles," SCIEN-TIFIC AMERICAN SUPPLEMENT, No. 318.

(39) C. D. writes: There is a bet bet ween two miners here who are working Burleigh drills. A described by us some twelve years ago, as Pepper's claims that there is more pressure in a 2½ inch pipe-a conductor of compressed air-than in the 34 inch pipe server, is seated below the stage, in the light of a strong leading from it. B claims that the pressure is not re- lamp, and facing a mirror, while above the figure is a duced by transmission into the smallerpipe. How is it? piece of plate glass, both mirror and glass being placed A. If the drill is not at work, the pressure is uniform | at an angle of about 45°. The ghostly image or reflect throughout the various sized pipes. If a drill is running by a ¾ branch from a 2¼ inch pipe, the pressure behind the real figure. is less in the % pipe than in the 21/2 inch main-the amount depending upon the speed of the drill or the relative velocities of the air moving through the two pipes.

(40) J. H. desires a recipe to make Persian sherbet powders. A. We presume you refer to plates in each cell, and separate the carbons from the the following: Take 8 ounces carbonate of soda, 6 ounces tartaric acid, 2 pounds loaf sugar (finely powdered), 3 drachms essence of lemon. Let the powders be very dry. Mix them intimately, and keep them for use in a wide mouthed bottle, closely corked. Put 2 good sized teaspoonfuls into a tumbler, pour in 1/5 pint and zinc plates with your lamp, arrange the elements so good sized teaspoontuis mot a tamoet, pointing provide and zine places when you there is not not or withdraw times of cold water, stir briskly, and drink off. See also arti- that you can readily plunge them into or withdraw times cle on Summer Beverages in SCIENTIFIC AMERICAN from the solution. 2. How to make an electro magnet, cle on Summer Beverages in SCIENTIFIC AMERICAN SUPPLEMENT, No. 192.

(41) S. S. S. writes: I have a canvas and leather strop for stropping razors, but they don't put a MENT, No. 182, in which you will find a great variety of keen edge on. What shall I put on to mend them? A. forms described. Cotton insulated wire will do. 3. Razor paste is made as follows: Mix fine emery inti- Could old insulated wire (cotton covered) be made good mately with fat and wax until the proper consistency is by running it through melted shoemaker's wax, leaving obtained in the paste, and then rub it well into the a thick coat over the cotton? A. Old insulated wire leather strop. Prepare the emery by pounding thoroughly in a mortar the coarse kind, throwing it into a fine. large jug of water, and stirring well. Immediately the (5 large particles have sunk, pour off into a shallow plate or basin, and let the water evaporate. Another receipt is, levigated oxide of tin, prepared putty powder, 1 ounce, powdered oxalic acid ¼ ounce, powdered gum 20 grains; make into a stiff paste with water, and evenly and thinly spread it over the strop. With very little friction this paste gives a fine edge to the razor, and its efficiency is still further increased by moistening it.

(42) B. B. ask for a mixture that will clean rags that have been used in wiping off oil. A. Boil the rags with a dilute solution of caustic soda, and then wash in water to make them perfectly free from chemicals. 2. How wood filling is made of oil and corn in running machinery where the belts are so treated, stach? A. For porous hard woods, a filler is made by instead of their running for years without any attenusing boiled linseed oil and corn starch stirred into a very thick paste; add a little japan, and reduce with the pulley, and of proper size to transmit the desired ! turpentine. Add no color for light ash; for dark ash and chestnut, use a little raw sienna; for walnut, burnt um ber and a slight amount of Venetian red: for bay wood. burnt sienna. In no case use more color than is re quired to overcome the white appearance of the starch, unless you wish to stain the wood. The filler is worked with brush and rags in the usual manner.

(43) G. W. S. asks: What can I coat a muslin bag with so that it will be air tight and pliable, that it may be readily rolled when not inflated? A. Take 11/2 ounces of India rubber, cut small, and of chloother (mashed) or carbon disulphide 1 pint

A. Sprinkling beds of vegetables and flowers with a weak solution of chloride of lime is said to effectually eserve them from caterpillars, slugs, etc.

(47) J. A. J. wishes to have full particulars of how to cover copper wire with gutta percha and cotton, etc., also how to construct a cheap ma chine to do the same. A. The copper wire is drawn through vessels containing the guttapercha in a melted condition. A sufficiency of this material adheres to the wire as it cools. It is then passed through suitable dies, in order to give proper shape and thickness. There are everal modifications of this general process, and the entire manipulation is patented.

(48) S. T.-We know of no mineral glaze that is pliable.

(49) J. M. S.-For cleaning a running engine, use tripoli or rotten stone with kerosene oil. If the hollow places get gummy, use a stick dipped in the mixture. Sometimes it is necessary to use emery cloth or flour of emery on neglected parts. After once getting your engine clean, the less emery you have around the better. If you wipe and clean everyday, use only a little whiting wet with kerosene. If you use mineral oil for lubricating, you may need but very little polishing powder of any kind. Use only whiting on the brass.

(50) T. C.-The "invention" you mention as having been recently brought out by an exhibition company for producing tableaux, etc., was fully ghost. The real figure, which is not seen by the obtion is then seen by the observer apparently above and

(51) J. W. B. asks (1) how to make a Grenet battery. A. Procure two plates of zinc two inches by six, and four plates of carbon of the same size, and two jars adapted to receive them. Amalgamate the zincs, place one zinc between two carbon zinc by means of rubber or wood; the distance should be % inch. Place in each cell a bichromate solution which you will find described in recent Notes and Queries. Connect the zinc of one cell with the carbons of the other, and connect the remaining carbons and if No. 20 of cotton insulated wire would do? A For instructions on electro-magnets consult SUPPLE will answer; better coat it with beeswax or with paraf-

(52) C. L. M. asks: Which side of a belt should be run on the face of a pulley-the grain or flesh side? Which will develop the most power, and why? A. All the best belt makers say, run grain side to the pulley, and it is claimed that 33 per cent more power can thus be transmitted than with the flesh side next the pulley. The grain of the leather has a velvety surface, which enables it to hug the pulley closer than will the hard flesh side. Some users run the flesh side to the pulley for small belts, and then daub and stick up the belt with beeswax or resin to make it take hold, but this is not economical for the life of a belt, is unworkmanlike, and there is always more or less fussiness tion, as they will sometimes do when run grain side to power

(53) E. J. S.-The Waterbury watch was invented by Mr. D. A. A. Buck. who also built an engine so small that, with boiler governor, and pumps, it would stand on a gold dollar. It was % inch high, had 148 separate pieces, held together by 52 screws and 3 drops of water were required for the boiler. Diameter of cylinder one-sixteenth inch. stroke three thirty-seconds inch, total weight 15 grains.

is held in tension, lose its elasticity if it not used? Take Case. See Clock case. Ticket case. Watch Glass furnace, regenerating and reverberating.

(58) G. M. G. asks: 1. What pressure is steam trapforreturning water from heating coils, etc., to the boiler liable to? A. The boiler pressure. 2. What pressure or strain is it liable to besides the regular boiler pressure? A. None, by its proper use

INDEX OF INVENTIONS For which Letters Patent of the

United States were Granted

June 30, 1885.

AND EACH BEARING THAT D	ате.	
[See note at end of list about copies of these pa	tents.]	Di Di Di
Air compressor, W. T. Fox	, 321,207	Di Di Di
Amalgamator, dry ore, H. Kappner	. 320.937	D
Axle and box, carriage, J. Fowler		D
Axle iron, carriage, C. F. Harrington		
Axle nut, vehicle, A. V. Smith Bandage, suspensory, E. G. Winchester		
Bathtub, portable, C. A. Hayward		D
Bearing, anti-frictional, T. R. Ferrall	, 321,351	D
Bed, sofa, J. Loebig	321,305	D
Bedstead, J. Garrand Beeswax extractor, J. D. Enas	. 320,925	D
Beeswax extractor, J. D. Enas Belt clasp, G. E. Zeltmacher		
Belting, B. L. Stowe		E
Bench. See Draw bench.		ĖΕ
Bicycle, W. N. Eyster	320,917	E
Blasting timber, W. T. McCall	321,208	E∉ El
Boiler. See Steam boiler. Bolt. See Flour bolt.		El
Book backing, G. A. Schurmann	321,142	E
Boot and shoe edge trimming machines, cutter	r	
head for, C. A. Gilman	321,3 7	El
Boot or shoe, P. Fischer		₁₇₇
Boots or shoes, manufacture of, G. Boivin Bottle stopper, E. H. Morgan		' El
Bottle washer, H. P. Merriam		E
Box, See Paper box.		_
Box, A. Saupiquet	321,056	El
Bracelet clasp fastening, G. W. Washburn	321,066	
Bracket. See Lamp bracket. Brake. See Car brake. Wagon brake.		En En
Bran duster and cleaner, Hogeboom & Smith	321.108	E
Breast shield, J. B. Phillips		Eı
Brick machine, H. Martin	320,944	E١
Bridges, safety gate for pivot, J. H. Quacken-		_
bush Bridle blinder, H. A. Johnson		Ex Ex
Buckle, J. M. Basinger		Ex
Bureau, D. R. Kinley		E
Burglar alarm and sash fastener, combined, J.		
Burner. See Gas burner.	-221,184	*نظ ا
Buttonholes, device for cutting and centering, F.		Fa
W. Ostrom		Fa
Buttons to fabrics, implement for securing, Wil-		Fa
king Miller		Fe
Calcimine, K. A. Hohenstein Camera. See Photographic camera.	321,109	Fe Fe
Can. See Creaming can. Oil can. Sheet metal		Fe
can.		Fe
Can heading machine, F. A. Walsh		Fe
Cane, apparatus for treating sugar, H. J.		17:
Chapin		Fi Fi
Car brake, F. G. Susemihl Car brake, Wescott & Bristol		Fi
Car brake and starter, E. L. Heidenreich		Fi
Car coupling, L. Anderson	321,271	
Car coupling, E. M. Brown		Fi
Car coupling, Curtis & Wood, Jr Car coupling, M. Fennell		Fin Fin
Car coupling, M. Fennell		Fii
Car coupling, J. McCoy		Fi
Car coupling, J. O'Brien	320.955	Flo
Car coupling, W. S. Temple	320,983	Fle
Car coupling, Westbrook & Cook Car, dumping, J. M. Hartman		Fl
Car platform safety gate, J. T. Loweth		Fr
Car starter, J. King		Fr
Car starter, J. Van Zandt	321,405	Fr
Car ventilator, Doyle & Stanley	321,346	Fr
Car wheel, J. L. Tucker Car wheel, self-lubricating, P. B. Perkins		Fu
Car window, railway, J. R. Whitney		
Card grinding machine, wire, W. Decker		Ga
Carding machine, G. & E. Ashworth	321,331	Ga
Carriage, W. E. Roberts.	321,386	Ga
Carriage and cradle, combined, Hemelright & Stone	321 910	Ga
Carriage seat, C. Morgan.		Ga
Carriage spring, S. Gilbert		Ga
Carriage, spring, C. C. Hayes		Ga
Carrier See Straw carrier Trace carrier	1	Co

te. See Railway gate. Swinging gate.

321.23 Cork retainer, E. H. Morgan...... 321,237 Corset, L. S. Purinton.... Corset bustle attachment, M. A. Waterhouse...... 321,408 Corsets, etc., stiffener for, J. F. J. Gunning...... 321,289 e. See Wire drawing die. gester door, T. F. Rowland..... 320,971 awing frame, J. H. Wilson...... 321,267 ier. See Fruit drier. ill. See Grain drill. Metal drill. Twist drill. r jewels, ball cover for, G. W. Washburn...... 321,407 ectric responding signals, producing, A. G. Hol-etrical conductors, into conduits, driving, D. vator cages, safety device for, P. F. Laar-Hayes. 321,025 ccavator, H. Rengstorff. 321,051 kercising apparatus, J. E. Rubesam. 321,388 sercising apparatus, J. E. Rubesam. 321,388 ... 321.278 . 321,157 nning mill, Bales & Riley...... 321,270
 11. Wheel, D. E. Baden.
 321,333

 11. e, bill. T. E. Baden.
 321,333

 11. erack, newspaper, H. D. West.
 321,164

 1ter, V. M. Law.
 321,228

 1ter, J. Thomson.
 320,935

 10. or openpo.
 320,935
 e escape, Hargrave, Sr., & Lee...... 321,212 Slate frame. Wire frame. it jar, S. R. Barhite...... 321,272 nit jar cap, C. G. Imlay..... rnace. See Glass furnace. Metallurgical fu**r**-.... 321.220 nace. Ore roasting furnace. Portable furnace uge. See Screw thread gauge.

fororm, chief (washed), or carbon discipline, i pint,					
digest in the cold until solution is complete. Dries as					
soon as it is laid on. Pure gutta percha may be substi-					
tuted for India rubber.					

(44) J.S. McL. asks how the letter press and how long would they probably retain their elasprinting plates are made of celluloid. A. The process is patented and the property of a company. It is parfially secret also. 2. Is there a liquid solder that will solder metal plates together without the use of a hot soldering bolt? A. A so-called liquid solder is prepared as follows: Feed hydrochloric acid all the small pieces of zinc it will eat, dilute with equal amount of water, and it is ready for use.

(45) E. G. P. desires a receipt for whitening a helmet covered with white cotton cloth, some frequently to cover over defects. A little pipe clay likewise might be used.

(46) S. J. H. asks for some means by which the odor of a new refrigerator can be gotten rid of. I have tried charcoal, but without relief. Water.

for example a spring door hinge held either open or shut for a year at a time, and not used in that period, would the spring have lost much of its strength? What is the best metal to make springs of for that purpose,

Cas Cen ticity if strained in either direction? A. Hardened Cen steel springs retain their elasticity under restraint for many years. Brass springs weaken. Cha

(55) H. H. L.-An electric current must have both quantity and intensity to kill an individual. We do not believe there is any practical way of glazing porous paper so it will take ink, except by the use of size, as paper manufacturers do.

(56) H. P. B.-No insulation for mag-! Chu thing that will not rub off. A. There is no preparation, netism has been discovered. A substance for this pur-for the purpose, but among individuals chalk is used pose might find some applications' which would render Chu Cide Ciga it valuable Ciga

Cla (57) W. H. B.—The pitch of screws is a

Clo matter of study in regard to the lines of the boat. The Cloc narrow, fine lined boat will allow of greater pitch than Coa a blunt, wide boat. The proposed speed of screw and Coff butter, and milk suffer most, but other things more boat are also essential elements in the computation. Colli

case.	W. F. Modes 320,951
sh ånd parcels in drygoods stores, device for	Glass tubing, manufacturing, W. L. Jukes
transporting, J. R. H. Hinton 321,340	Glassware, ornamenting the handles of articles
sh carrying apparatus, D. H. Rice	of, J. S. Dignam 320,915
sh register and indicator, C. J. Weinman 321,163	Glove, boxing, A. R. Rumsy 320,972
ment, manufacture of, Lesley & Griffith 321,121	Glove fastening, G. W. Prentice
ment, manufacture of Portland, Lesley &	Grader or road scraper, B. R. Abbott 321,269
Griffith	Grain drill, H. C. Beebe 321,273
ain, drive, E. Huber 321,361	Graining composition, T. Head 321,295
air. See Convertible chair. Infant's posing	Grapling bucket, W. G. Thompson
chair. Revolving chair. Rocking chair.	Grinding ring, metallic, J. G. Mole 321,045
eck rower, O. J. Colton 321,087	Grindstone frame, J. B. Johnson
ickens, artificial mother for raising, H. B. Tat-	Gunnery, A. S. Lyman
ham, Jr	Gymnastic performance with rats, birds, etc., im-
ocolate cream drops and other confectionery,	plement for, J. B. Peirano 320,960
marking, Hawley & Hoops 321,216	Hame, J. Bloedel
uck for gem settings, QiI. Loveren	Hame, G. J. Letchworth 321,122
urn, Burt & Burgess 321,339	Hame fastener, Heinzer & Gillingham 321,026
ler press, E. W. Lehman 321,039	Handle. See Door handle. Shovel handle. Sur-
ar machine, G. W. Tanner 321,259	gical instrument handle.
gar support, C. C. Knowlton 320,938	Hanger. See Door hanger. Eaves trough
ay crushing machine, Alsip & Drake 320,905	hanger.
ock case, A. D. Tyrrill 321,402	Harrow, H. L. Whitman 321,071
ock, electric, F. Bauman 320,997	Harrow, rotary, C. Hawley 321,105
al drilling machine, Johnson & Thompson 321,034	Harrow, wheel, D. H. Dolby 321,283
ffin, S. Coombe	Harvester finger bar, W. L. Walker 320,988
lar and swe t pad, horse, E. L. McClain 321,128	Harvester reel, D. Gingrich 320,927

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