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 asearly as Thursday morning to appear in next issue

Best Squaring Shears, Tinners', and Canpers' Tools at Niagara Stamping and Tool Company, Buffalo, N.Y. Lewis' Combination Force Pump makes three ma

chines made of brass throughout. See Adv. page 317. Saw Mills, Hauck & Comstock, Mechanicsburg, Pa. Wanted, Superintendent for Malleable Iron Works

Address " Y," P. O. Box 773, New York. Wanted, man who understands making the mandrels,

and turning all kinds of furniture springs; give refer-ence and experience. Address A. B., P. O. Box 3,621, New York.

Am. Twist Drill Co., Meredith, N. H., make Pat. Chuck Jaws, Emery Wheels, Grinders, automatic Knife Grinders. American Fruit Drier. Free Pamphlet. See ad., p. 318.

Drop Forgings of Iron or Steel. See adv., page 316. Brass & Copper in sheets, wire & blanks. See ad.p. 318.

The Chester Steel Castings Co., office 407 Library St., Philadelphia, Pa., can prove by 20,000 Crank Shafts 15,000 Gear Wheels, now in use, the superiority of their Castings over all others. Circular and price list free.

The Improved Hydraulic Jacks. Punches, and Tube Expanders. R. Dudgeon. 24 Columbia St., New York

Diamond Drills, J. Dickinson, 64 Nassau St., N. Y. Tight and Slack Barrel Machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv. p. 317.

Gear Wheels for Models (list free): Experimental Work, etc. D. Gilbert & Son, 212 Chester St., Phila., Pa. Drop Hammers, Power Shears, Punching Presses, Die

Sinkers. The Pratt & Whitney Co., Hartford, Conn. Catechism of the Locomotive. 625 pages, 250 engrav ings. Most accurate, complete. and easily understood book on the Locomotive. Price \$2.50. Send for catalogue of railroad books. The Railroad Gazette, 73 B'way, N.Y.

20.000 Duc Spherical Elevator Buckets, sizes 3½ to 17 inches, constantly on hand. Telegraphic orders filled. T'. F. Rowland, sole manufacturer, Brooklyn, N. Y.

First Class Engine Lathes, 20 inch swing, 8 foot bed. now ready. F. C. & A. E. Rowland, New Haven, Conn.

Catalogues free.-Scientific Books, 100 pages; Electrical Books, 14 pages. E. & F. N. Spon, 44 Murray St., N. Y. Straight Line Engine Co., Syracuse, N.Y. See p. 317.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 300. For Mill Macb'y & Mill Furnishing, see illus. adv. p.300. See New American File Co.'s Advertisement, p. 302.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423. Pottsville, Pa. See p. 302. Woodwork'g Mach'v. Rollstone Mach. Co. Adv., p. 300.

Steam Pumps. See adv. Smith, Vaile & Co., p. 300.

Stenographers, type-writers, clerks, and copyists may be obtained free of charge at the Young Women's Chris-tian Association, ? East 15th Street, New York.

Ejector Condenser for Steam Engines or Vacuum Pans. J. L. Alberger, Buffalo, N.Y.; or T. Sault, New Haven, Ct. Lathes 14 in. swing, with and without back gears and

screw. J. Birkenhead, Mansfield, Mass. Five foot planers, with modern improvements. Geo. S. Lincoln & Co., Phoenix Iron Works, Hartford, Conn.

The Best.-The Dueber Watch Case.

If an invention has not been patented in the United States for more than one year, it may still be patented in Canada. Cost for Canadian patent, \$40. Various other foreign patents may also be obtained. For instructions address Munn & Co., SCIENTIFIC AMERICAN Patent Agency, 261 Broadway, New York.

Curtis Pressure Regulator and Steam Trap. See p.236.

The Celebrated Wooton Desk. See adv., page 286.

Lightning Screw Plates, Labor-saving Tools, p. 286.

articles on royalty. Give full particulars. Cuts, draw- traveling bag or reticule, and adapted to the inviting ings and specifications will be returned, if not in our laziness of the seashore or the cool silence of the forest line, on request of parties sending same. Lock Box 35, West Troy, N. Y.

Farley's Directories of the Metal Workers, Hardward Trade, and Mines of the United States. Price each. Farley, Paul & Baker, 530 Market Street, Phila.

Correspondence solicited from parties desiring bras or bronze castings. Special facilities for large and heavy work. Lock Box 35, West Troy. N. Y.

Improved Skinner Portable Engines. Erie, Pa Guild & Garrison's Steam Pump Works, Brooklyn, N. Y. Steam Pumping Machinery of every description. Send for catalogue.

Boiler Scale .- Parties having fine specimens for sale or loan. address Jas. F. Hotchkiss, 84 John Street, N. Y. Union, N.Y. City, Every facility for exhibition of machin-

ery, merchandise, and inventions. The expense is small -the advantages great. Send for particulars.

Wanted.—Patented articles or machinery to make MYSTERIES OF TIME AND SPACE, WITH lently stirred with a short wooden spatula. With this nd introduce. Gaynor & Fitzgerald, New Haven Conn. TWENTY-FOUR ILLUSTRATIONS. Richard the portions of the linen to be dressed are well smeared Water purified for all purposes, from household supplies to those of largest citles, by the improved filters manufactured by the Newark Filtering Co., 177 Commerce St. Newark, N. J.

Latest Improved Diamond Drills. Send for circular to M. C. Bullock Mfg. Co., 80 to 88 Market St., Chicago, 11. For Power & Economy, Alcott's Turbine, Mt.Holly, N. J. Ice Making Machines and Machines for Cooling Breweries, etc. Pictet Artificial Ice Co. (Limited), 142 Greenwich Street. P. O. Box 3083, New York city.

Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works. Drinker St., Philadelphia.Pa.

Machinery for Light Manufacturing, on hand and built to order. E. E. Garvin & Co., 139 Center St., N. Y. Presses & Dies. Ferracute Mach. Co., Bridgeton, N.J

Supplement Catalogue.-Persons in pursuit of information on any special engineering. mechanical, or scientific subject, can have catalogue of contents of the Sci-ENTIFIC AMERICAN SUPPLEMENT sent to them free. The SUPPLEMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physi-cal science. Address Munn & Co.. Publishers, New York.

NEW BOOKS AND PUBLICATIONS.

REPORT OF THE CHIEF OF ORDNANCE FOR 1882. Government Printing Office.

In this summary of the condition of his departmen for 1882, General Benetspeaks of the Springfield breach loading rifle as having no superior for army uses, and expresses the belief that it will hold its place until it is superseded by a magazine gun. Of this class of rifles submitted for examination therewere forty guns, representing different systems of detachable and fixed magazines. After tests extending over a period of fifteen months, only three were recommended as " suitable for military service"-the Lee, the Chaffee-Reece, and the Hotchkiss. In view of the appointment of a select committee on heavy ordnance for the navy and seacoastdefenses, General Benet says that "full power" guns must be made of steel. An improvement on the present ordnance can be made, however, by using cast iron guns with a rifled tube of steel, the barrel to be wound exteriorly with steel wire. He doubts if steel guns can at present be produced in this countryguns of the requisite caliber made entirely of steel-as we have neither the suitable plant nor the means of producing the steel in the necessary masses. He suggests either the establishment of a national foundry, or encouragement to private foundries to procure the necessary plant and experience. The report is illustrated with plates and contains several instructive and useful tables.

TECHNOLOGISCHES WORTERBUCH-TECHNO-GERMAN. Gustav Eger, Brunswick. Frederick Vieweg & Son, B. Westermann & Co., 838 Broadway, New York city.

This is an octavo volume of over 700 pages containing words, terms, and phrases, of a colloquial and technical character, giving the German equivalent for the English subject. Among the titles are: Architecture, ship building, railways, roads, bridges, mechanics, manufacture, agriculture, navigation, mining, and the sciences connected with the arts. The volume makes a valuable and convenient reference book.

THROUGH ONE ADMINISTRATION. Frances Hodgson Burnett. Boston: James R. Osgood & Co.

Those who have patiently accepted the installments of this story as they have periodically appeared, may be glad to have it in complete and usable form for ready reference; for, unlike some writings which are only stories, the delineations of character and relations of incident by this author invite a revision and re-reading. Those who have not yet read this attractive novel will now be path for their retience by the appearance Wanted.-Patents or the right to manufacture the of this volume, which is of just a handy size for the

> DEEP BREATHING AS A MEANS OF PROMOT ING THE ART OF SONG, AND OF CURING WEAKNESSES AND AFFECTIONS OF THE THROAT AND LUNGS, ESPECIALLY CON-SUMPTION. Sophie Marquise A. Ciccolina, from the German by Edgar S. Werner. New York: M. L. Holbrook & Co.

The object of this little treatise is to restore as an art a perfectly natural physiological habit, that of deep breathing, or of inflating the abdomen as well as the lungs with atmospheric air. The directions are the results of efforts made to restore a lost voice, to enable one with natural vocal powers to sing. She claims that the public life of artists can be greatly prolonged, that Permanent Exposition .- Inventors' Institute, Cooper | persons of " weak " voice can become singers, that the general health can be improved by a voluntary practice of deep breathing, such as is seen in the sleeping infant ; Any numbers of the SCIENTIFIC AMERICAN SUPPLEand in the adult when excited by coughing, retching, etc. The ultimate result of this practice, on the author, office Price 10 cents each. and its good effects on others, who adopted it by her advice, seem to be conclusive as to its benefit. These for examination, should be careful to distinctly mark or Nickel Plating -Sole manufacturers cast nickel an- facts are contained in a small volume of about fifty label their specimens so as to avoid error in their identipages, to which our readers are referred for the modus fication.

A. Proctor. New York: R. Worthington, 770 Broadway.

This is the title of a collection of twenty-four essays by Mr. Proctor, the well known popular writer and lecturer on astronomy. That they are intensely interesting need not be stated to those who have either heard Mr. Proctor's public addresses, or who have read only the newspaper reports, which have necessarily been abstracts, or at most merely synoptical. Mr. Proctor has a faculty of presenting the results of wearisome calculations, not merely in dictatorial statements, but with a foundation of mathematical and historical fact that carries conviction. For instance, in the opening essay he elucidates the astronomical fact of the gradual retardation of the period of the earth's rotation, by history and observation, so that what might before have been accepted as a true statement becomes appreciated as a proved fact. In his essay on the "Birth and Death of Worlds," Mr. Proctor finds actual illustrations in the solar system of the five stages, earth at present occupying the middle or third one. The sun represents the first stage of planetary life, that of existence in the form of vapor-the hardest minerals and most obdurate metals being held in a gaseous, glowing state by intense heat. Jupiter is an example of a world the nucleus of which has become solid, but which holds its oceans suspended in its atmosphere. Jupiter is in the second planetary life stage and will not be in the third, or earth stage, for 240 millions of years. The earth represents the third, or life-producing stage. Mars is in old age, or decreptitude: and the moon is essentially a dead world, a condition which earth will reach in about 200,000,000 years.

THE POSSIBILITY OF NOT DYING; A SPECULA-TION. Hyland C. Kirk. New York: G. P. Putnam's Sons.

This little volume of scarce more than 100 pages at tempts to give some speculations on the possibility of a continuous physical existence. The "speculations" are curious and interesting, and whatever they may tend to prove or disprove, the writer appears to be animated by his statement in the preface: "The chief conservator of morality in this life is religion. No one, therefore, has the right to attempt the destruction of those barriers which protect society, unless he has stronger methods of defense to substitute therefor."

THE FRENCH FOREST ORDINANCE OF 1669; WITH HISTORICAL SKETCH OF PREVIOUS TREATMENT OF FORESTS IN FRANCE. John Croumbie Brown, LL.D., Compiler

Dr. Brown has given a valuable history of the sylvan property in France, from the earliest times, in a neat volume of less than 200 pages. The object is to give practical information on the subject of the value and use of standing forests: how they may be utilized for the needs of man without being destroyed, and how they may be restored where the country has been left bald by their destruction. There are portions of this country that need the benefits of such intelligent instruction as this compilation affords,

THE CENTURY. Vol. XXV., from Novem-ber, 1882, to April, 1883. The Century Company, New York.

An elegantly bound volume of between 900 and 1,000 pages looks as little like the monthly visitor that we know as The Century as the mature " cock of the walk" looks like the hatching dozen of eggs. The fine letter press and exquisite engravings seem much finer and more exquisite in solid backs, and en masse



HIN'IS TO CORRESPONDENTS.

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

Names and addresses of correspondents will not be iven 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.

oferred to in these columns may he had

(the linen moist from wringing and the starch quite hot). Thus smeared the pieces are laid aside for a few minutes. then rubbed well between the hands, so that the paste is well distributed in the fabric. The linen is then usually dried by artificial heat. When ready for ironing, the starched portions are dampened by means of a cloth dipped in raw starch water to which has been added a small quantity-about half an ounce to the quart-of blood albumen-clarified serum of bullock's blood. The proportion of starch in this water is usually about as one to fifty of water. In ironing, the irons are first made very hot, and cooled somewhat externally just before using by momentarily plunging them into a pail of water. The irons commonly employed are what are termed polishing irons-they have the posterior edge rounded instead of angular, as in the ordinary smoothing or sad iron. Much of the fine gloss observed on shirts laundried by Chinamen is accomplished by the skillful manipulation of this "rounded edge" over the work-a manipulation very difficult to describe in words. It is most laborious work for those not accustomed to it. It not only renders the surface glossy, but imparts easy flexibility to the heavily starched fabric otherwise not attainable. Custom made shirts are usually laundried before delivery in trade at the factory, theironing in these cases being largely performed by steam mangles, thongh some are hand finished. The following receipt for a laundry starch is said to produce a very fine and lasting gloss on linen without the expenditure of the amount of labor in ironing usually requisite to produce a fair appearance:

Corn starch1 oun	ce.
Water, boiling 1% pin	its.
Bluingq. s.	

To this when it has cooled somewhat is added and thoroughly mixed in about half an ounce of the following preparation:

Gum arabic	8 🖁	parts.
Sugar, loaf	. 21/2	- ··
Soap, white curd	. 14	••
Water glass (" A " sirup)	.1	66
Egg albumen	4	6 K K
Water, warm	.20	44

In preparing this the first three ingredients are dissolved together in the water at boiling heat, the water glass is then added and when the mixture has cooled down to about 150° Fah , the egg albumen is put in and the whole well beaten together.

(3) G. P.-'The following has been suggested as a very desirable substitute for the ordinary and Translator. Edinburgh: Oliver & pastes used for mounting photo. prints. It is said that it can be used so as to scarcely swell the paper at all, avoiding the objectionable cockling so much complained of:

Thick, well boiled, clear starch (corn)

paste		1 pound.
Glucose sirup ("A" clear)	!	7 ounces.
White curd soap		1/2 quince
Dextrine, flowered		ounces.
Borax		⅓ ''

Clove oil a few drops. All are heated over the waterbath and thinned down to a proper consistence (if thin paste is required) with fresh skimmed milk. It is advisable to use the paste warm and as thick as possible.

(4) E. P. S. asks how to make matches without phosphorus? A. The following is one of the best receipts for composition match tips without phos. phorus. It is the same as that used in preparing the well known U. and P. matches, and does not require a separate rubber or prepared surface:

Manganese, black oxide......25

- ... 64
- Glass powder...... 4

These substances are first powdered separately and then gradually mixed into a solution of 1 pound gum in 4 pounds water. to form a thick, smooth paste; with this paste the dry wood splints are tipped, and after about eighteen hours' exposure to the air in a drying room, kept at about 80° Fah., the matches are ready for boxing. To render the matches non-absorbent of moisture, or "waterproof," they are momentarily dipped into a liquid composed of:

Shellac, best white....1 pound.

Alcohol (or wood naphtha).....1 quart. digested together in a closed vessel for several days with occasional agitation, then strained through fine linen cloth.

(5) E. G. B.-Briefly stated, the process of rendering fabrics water resistant, yet not impervious to air. is as follows. First the cloth is put into a boiling bath composed of:

Yellow soap % pound.

Water gallon. and worked through and about in this for about one

Contra	icts taken	to manu	f. small g	goods in	sheet or
cast bras	s. steel, o	r iron. E	stimates g	iven on r	eceipt of
model.	H. C. G 00	drich, 66 t	o 72 Ogden	Place, C	hicago.

odes, pure nickel salts, polishing compositions. etc. Complete outfit for plating, etc. Hanson & Van Winkle. Newark, N. J., and 92 and 94 Liberty St.. New York.

Lists 29, 30 & 31, describing 4,000 new and 2d-hand Machines, ready for distribution. State just what machines wanted. Forsaith& Co., Manchester, N. H., &N. Y. city.

"Abbe" Bolt Forging Machines and "Palmer" Power Hammers a specialty. Forsaith & Co., Manchester, N. H.

Railway and Machine Shop Equipment. Send for Monthly Machinery List to the George Place Machinery Company, 121 Chambers and 103 Reade Streets, New York.

East Newark, N. J.

"How to Keep Boilers Clean." Book sent free by James F. Hotchkiss, 84 John St., New York.

Engines, 10 to 50 horse power, complete, with governor, \$250 to \$550. Satisfaction guaranteed. More than seven hundred in use. For circular address Heald & Morris (Drawer 127), Baldwinsville, N. Y.

operandi, which is illustrated by diagrams.

Α

MANUAL OF PHOTOGRAPHIC CHEMISTRY. Scovill Manufacturing Co., 419 Broome Street.

The usefulness of this treatise as a manual for photographers may be inferred from the publication of a 25" Lathes of the best design. G. A. Ohl & Co., ninth edition. In addition to its information for the professional and the amateur photographer, this volume contains, also, an interesting history of photography and a chapter of outlines of general chemistry. In its descriptions of the details of the practice of photogra- fine rice flour with about one quart of water, making a phy; this manual does not confine itself to one method, but gives several processes and explains the reasons why some, or one, should be preferred.

Correspondents sending samples of minerals, etc.,

(1) O. A. T.—To make a furniture polish, take turpentine (oil), one pint; alkanet root, one half according to the nature of the fabric and the require-THEORETICAL AND PRACTICAL. By Rever take turpentine (oil), one pint; alkanet root, one half T. Frederick Hardwich, M.A. Ninth ounce; digest until the liquid has become sufficiently edition. Edited by J. Traill Tarlor, Ed. Photographic Times. New York: a homogeneous mixture is obtained. If wanted pale, the alkanet root should be omitted. 2. White: white wax, one pound; liquor of potassa, two quarts; boil to proper consistence.

> (2) S. M.-The Chinese method of laundrying shirt bosoms, etc., is thus described: A rather thick starch paste is prepared by first beating up a handful of of lead 8, antimony 2, but it shrinks in cooling. Lead raw starch (usually cornstarch) and a teaspoonful of 75, antimony 16, bismuth 8, does not shrink in casting. liquid of cream-like consistence. A certain quantity (determined alone by personal experience) is poured into a quantity of boiling water while the latter is vio-

hour, when it is passed through a roller wringer to press out excess of the liquid and suspended in the air for an hour ormore, or until nearly dry. Next the cloth is put into a bath composed of:

Ammonia alum	 5 pounds.
Water	 3½ gals.

and remains therein for from eight to sixteen hours, ments. The time of this exposure may be considerably lessened by working the cloth through a series of rolls, which cause the discharge of the absorbed liquid and admit of the reabsorption of fresh portions of the bath. Finally, after wringing out, the cloth is put through the soap bath again, and after rinsing in clean water, dried. See other similar processes of waterproofing in SCIEN-TIFIC AMERICAN, No. 6, vol. xlv., 1881.

(6) J. H.-Good pattern metal may be made It also makes good patterns. Good red brass; 88 copper, 11 zinc. Electrotype manipulation is the deposition of metal by the galvanic batteries. Consult "Napier's Electro Metallurgy."

leathermay be said to be hardened without any material alteration of its nature by the following treatment. Prepare a bath as follows:

Slaked lime	½ pound.
Sal soda	
Water	
Boil together, cool, and add:	
Slaked lime	½ pound.
Winton	1/

Water . . . Put the leather into this for three days, then remove and put it into a bath of:

Slaked lime.....3 pounds. and let it soak in this for from two days in summer to plied. three days-or even four flays-in winter. When taken out of this, pass through water heated to abont 180° Fah., and then pass between heavily weighted rolls, or, if a denser material is demanded, press in a hydraulic press. When subjected to the latter, a product nearly as hard as vulcanite is obtained, but one still possessing the appearance and nature of leather quite distinctly.

(8) G. C. W. asks how to make a cheap white metal that will beat thin, same as gold leaf is beat. It is to be used for gliding on plaster of Paris, A. immediately put to it, he would soon have only dead The common white gliding leaf is composed of tin and trunks. He accordingly went to work and wrapped old lead-2 parts tin, 1 part lead make a very white tough leaf. Equal parts of each is a little darker; 1 part tin at the ground, and wrapping for a distance of, say, two to 2 parts lead is about as low as you can go with this | feet up, tying the paper with an ordinary cotion string, compound and have it keep bright. There is a plastic These trees were never afterward touched by the rabmetallic alloy described in the Journal of the Franklin bits. Institute, vol. xxxix., page 55, which might be of use to you

stamping, heat to low red and quench in water._Some are denuded of skin and slit up longitudinally. Near kinds of brass need be only heated to what is called the the hoof is a small mass of soft fat, which is scooped black heat. As the composition of vellow brass varies very much, you would do well to order your sheets annealed and of the kind used for stamping.

(10) G. E. Z. asks: How can I cut out round glasses that will not crack easily? I now heat the glasses almost to a melting point and press them out to the size required, three-fourths and one-half inch diameter, but find that heating the glass makes it very brittle. I cannot use a diamond, as they must be exactly alike, and the glass will not always break where cut, without the edge chipping. The glasses are used between two lead washers held by a nut against a boss, and are tested to 150 pounds pressure to the square inch. A. The process of stamping or pressing glass makes it brittle because of uneven cooling. The pieces can be made as tough as the nature of glass will allow by thoroughly annealing in the same manner as is done in the glass houses. You can construct a small oven, somewhat after the style of a baker's oven, or get what is called a muffleand set it in small furnace if your work is small in quantity. copper with linseed oil or varnish.

(11) D. P. K.—Back draught or explosions in fire chamber are generally due to imperfect combustion at the commencement of firing, caused by accumulation of carbonic oxide above the fire, when upon opening the door it takes fire by the contact of gir. At other of green tansy into a barrel and add cold water, let it times, when the ash pit door, and fire door are entirely closed to prevent steam making, the fire chamber will fill with carbonic oxide and will take fire upon opening • the door. It is well to allow a little air through the fire door at all times. For "sun dial" see Notes and Queries, No. 3, September 30, 1882, which is correct for New York.

(12) J. O. B.—The enameling of cast iron is done by brushing upon the surface for the first coat. the following composition, of the consistency of paint: be used for the purpose. Salt of steel is probably a so-66 parts powdered calcined flint, 84 parts borax; mix, | lutton of steel in some acid, and may, we think, be remelt, and pulverize, then add 12 parts potter's clay. placed by using the iron chloride. Grind together in water enough to spread with a brush Paint the work and putina warm place to dry. For the second or glaze coat take 15 parts borax, 73 parts of | liable rubber cement which I am using evaporates so powdered glass that has no lead in it. 12 parts causic rapidly that in a short time it becomes too thick to The. soda; thoroughly pulverize and mix with enough water 1 have tried thinning it with benzine; but when I put to make it flow under a brush. Lightly and quickly on a patch with the cement diluted with benzine, the brush a thin coat of the last mixture over the drycoal of rubber peels off the patch, leaving only the cloth stickthe first mixture, and dry. Then fuse the enamel in an ing to the patched surface. 1. Can you inform me oven at low red heat. To tin cast iron is difficult and through your Notes and Queries how I can thin the unsatisfactory. You can galvanize cast iron with zinc and then redip in tin, if necessary to have a tin surface. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 176, for bon disulphide, chloroform, or benzine, and you must galvanizing process, also SUPPLEMENT, 161, for zinc bath add some one of these. 2. What is the best India rubfor galvanizing.

(13) E. K. asks: 1. How is resin oil made? A. Crude resin oil is obtained by heating the lower grades of resin in an iron still up to 158° to 160° C. First adhering tiles to the walls of a Turkish and Russian water, pyroligneous acid, and naph tha pass over. Then bath, which would resist the action of heated air and the temperature is raised to near the red heat of iron, steam. A. Use a mixture of commercial glycerine and when the resin boils, and crude resin oil distills over. 2. finely powdered litharge. This compound will resist a What percentage will it give? A. 20 to 25 per cent. 3. temperature of 225°. 2. Also a kalsomine or paint for Is it necessary to have a copper condenser, or would an the walls of baths, which would resist the action of heat iron one do? A. Iron will answer. 4. A receipt to make and steam. A. Use zinc white in dammar varnish; letit yellow axle grease. Also receipt to make black axle dry very thoronghly. grease. A. The following is a receipt for a thick oil

(7) M. E.-Ordinary hemlock tanned sole page 298, A. G. G. asks, What are the ingredients of Spencer's acid? I have used the following for the past nine years, with very satisfactory results, on steel and copper plates. (a) Dissolve 1 ounce granulated silver in For which Letters Patent of the Unite 5 ounces of pure nitric acid and 5 ounces water. (b)Dissolve 3 ounces mercury in 5 ounces nitric acid and 5 ounces water. For strong Spencer acid take 2 ounces of (a), 2 ounces of (b), 1 ounce nitric acid, and 24 ounces soft water. Mix and keep in a dark bottle. It may be interesting to state that the above acid does not take effect on steel unless started off by touching the steel under the acid with a piece of clean zinc, when instant and rapid action takes place. It might remain on the steel plate forever without biting if the zinc is not ap-

> (16) G. T. R. writes: In your issue of April 28, you gave an account of a meeting of the "Elmira Farmers' Club " to inquire into the best method of preserving fruit trees after being girdled by mice or rabbits. A very simple treatment by my father a number of years ago, in the State of Missouri, was wholly successful in preventing the girdling. About a year after he had planted a large or chard, the rabbits commenced "barking "his trees so rapidly that, unless a stop was newspapers around those yet unbarked, commencing

(17) G. B. asks for the mode of making neatsfoot oil." A. The ox feet-the feet and hocks (9) C. C. C.-To soften sheet brass for of neat cattle cut off about 18 inches above the hoofout with the knife, and set aside for the preparation of the best quality of oil. The hoofs are washed in cold water, and then boiled in open pans set in brickwork, and heated by a fire beneath. A certain quantity of oil is thus boiled out of them, and when skimmed off, forms an inferior grade of neatsfoot oil. After about three hours' boiling, the tissues between the horny hoof and the last digit bone are sufficiently softened to allow of the latter being easily scooped out of the hoof with a knife. These "cores" consist of bone, gelatinous matter, and fat, and, together with small pieces of fat previously alluded to as being removed by the k ife before boiling, are put into a separate pan of fresh water and all boiled together for the extraction of the oil. This forms the best kind of neatsfoot oil.

> (18) M. C. B. writes: Can you tell me how to make the copper paint? A. Precipitate metallic copper out of any solution of a copper salt by introducing scrap iron into the liquid. Then mix the precipitated

(19) H. B. writes: Having seen an article from the SCIENTIFIC AMERICAN relating to the green caterpillar, or worm which destroys so many cabbage heads, I will send you my sure cure. I put a quantity stand a day or two, then sprinkle the cabbage heads (using a fine sprinkler) with the liquid about twice a week. I have never found a worm on them after the third sprinkle. Continue to sprinkle, or they will come.

(20) W. asks: What is "salt of gold"? I am advised to try " an ammoniacal solution of an oxide or salt of gold," and ask your suggestions as to how 1 am to proceed. What is "salt of steel"? A. The chloride of gold, which is the usual commercial salt, can

(21) J. V. S. writes: I find that a very recement without impairing its value? A. Most all rub ber cements consist of rubber dissolved in either carber solvent? A. A mixture of methylated ether and petroleum spirit.

(22) J. C. McR. asks (1) for a mortar for

(23) M. Bros. write: We are trying to find a white enamel paint that will resist the action of water. Chu We use it on the inside of a pine pail for dairy purposes. Chu Have tried dammar varnish mixed with linseed oil, and Cide put on four to five coats; and although it makes a nice Clar enamel it does resist the action of water for any length of time. A. Use zinc white in dammar varnish and let Clea dry very thoroughly before putting the liquid into it.

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AND EACH BEARING THAT DATI

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si case.		
1. For use in winter:		
Tallow	35	parts
Oil of resin	10	**
Olive orrape oil	65	4

2. For use in summer:

Tallow	
Oil of resin	
Olive or rape oil	
The blue color is due to the da	rk violet ti nt of the oi
referred to, while the yellow tint	is produced by the ad
dition of a solution of turmeric r	oot in caustic soda.

(14) W. H. F. asks how powder is made. a composition equal to:

Saltpeter 74.84 per cent.	i not at har
Sulphur	the work
Charcoal	table or
The pulverized ingredients, thoroughly mixed, with-	cleaned u
out the addition of water. form "meal" powder.	the every
	[!] It preven
(15) H. R. E. writes: In your last issue, on	the labor.

(24) W. A. I. asks for the best method of Cloc polishingbrass work, and the best way of retaining a polish for a length of time. I am assistant engineer of Clo one of our fire companies, and find it very difficult to obtain a good polish. I have been looking over back Clut What is mealed powder? How is it made? A. The numbers, but cannot find desired information. A. For Clut composition of powder varies according to the use for keeping up the polish upon your brasswork, do not Coff which it is intended; thus sporting and rifle powder has scour with coarse powders. Get "electro silicon," or Coll rotten stone; even whiting does well when the others are 'Cold not at hand. Use a little kerosene oil in rubbing off Còr the work; it does not oxidize or become acid like vege-Cor table or animal oils. After you get the article well cleaned up, you need use only whiting for rubbing off Cos the every day stains, and wipe off with the oily cloth. Cott It prevents the action of moisture and air, and reduces . Cott

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