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R. A. C. is informed that the manufacture of rubber stamps has been already patented.-T.S. is informed that we have not heard of M. Lebarre's experiments on hydrogen.—B.'s mathematical query is not in-telligible to the general reader. What are the relative values of a and ?—W. J. will find full directions for the preparation of nitro-glycerin on p. 138, vol. 29.—P. will find full explanation of the bisulphide engine on pp. 199. 247, vol. 27, and p. 144, vol. 29. The reports he asks for have not been received.—S. R. S. will find directions for plating brass and copper with silver on p. 320, vol. 24. Nickel plating is described on p. 177, vol. 25, and p. 91, vol. 29 .- S. S. should address President Morton at the Stevens Institute of Technology, Hoboken, N. J.-G. B. O'N. will find a recipe for aquarium cement on p. 267, vol. 25.-H. M. P. is informed that the pressure resulting from the fall of a body has been fully discussed in these columns, and we do not propose to re-open it. -W. F. B. will and directions for tempering files on p. 235, vol. 24, and in the answer to F. W. H., on page 59.

 $P.\ S.\ asks:\ How\ can\ I\ get\ rid\ of\ vermin\ which infest the plumage of my canaries? A. Give the birds a bowl of water to bathe themselves in occasion$ ally. Do not use very cold water.

J. A. H. says: I want to obtain a large quantity of pulverized metallic zinc, as fine as it is possible to makeit. Please suggest a suitable means of accomplishing it. Its granulation by melting and pouring into water does not afford me a sufficiently fine product. A. Zinc becomes very brittle at high temperatures, and can be reduced to a fine powder by pounding.

H. G. Y. asks: Can I obtain a rapidly mov-ng current of air through a 4 inch tube 100 miles long, the power being a 50 horse power engine at each end of the tube, with an 8 x 4 feet cylinder containing a fan, to produce forceat one end and suction at the other? 1 propose to use a fanning mill which admits air at the side, to obtain the suction. If not one hundred miles, please state how far I can do it. A. We do not know of any experiments that give data for the conveyance air to such a distance. You will find the subject treated in Weisbach's "Mechanics and Engineering."

A. G. asks: 1. What is the best liquid for dissolving India ink for drawing? 2. Would chloring bleach a drawing without injuring the ink? The paper is brown through excessive handling. A. 1. Water, or water to which a little alcohol has been added. 2. We would advise moistening the drawing and then exposing to the fumes of burning sulphur, and finally passing through pure water. Any treatment of this kind of courserequires great care.

K. W. M. asks: In reference to your answer to J. M., on page 316, vol. 29, I would ask: 1. What number should the wire for the respective helices be? 2. What number should the iron wire for the core be? What causes the iron bar to revolve? 4. Could not a tube, made of baked wood and varnished, be substituted for the glass tube? 5. Could I make the helices of common copper wire by placing cotton cloth between each layer of wire? A. 1 and 2. You can easily find the number, which is a trade matter, and the cost, from a hardware dealer. The outside helix should be made of the finest copper wire you can manipulate, and the interior one of ordinary stout wire. 3. The successive attractions of the interior bar. 4. Yes. 5. Not so as to make an effective apparatus. You ought to get the wire already wound from a philosophical instrument maker.

M. E. H. says: I am building a small pleasure boat & feet long. With machinery in, she is to draw but 6 inches water. Is there any form of a propeller that can be used with advantage in 6 inches water, and yet have power enough to drive a boat of that size four or five miles an hour? Her machinery is to be worked by hand. A. Possibly you can manage it with two screws.partlysubmerged.

J. F. says: I have seen a clock, which appears to consist of a glass plate, 24 x 30 inches, three sixteenths thick, set on two wooden bases. There is a gas burner over this glass plate and two fine wires leading from the gas pipe to the wooden bases. There is nothing on the glass but the two hands, one on each side of the glass. How is its action maintained? A. We have seen a clock answering to this general description, which received its motion from a weight in the end of one of the hands, this weight being moved by delicate mechan ism, so that its leverage was continually changing.

C. N. J. asks: 1. What is the usual width and depth of the water in canals? 2. Is steam ever used to propel canal boats, and in what manner? 3. What objections are there to the general use of the ordinary propeller wheel, of a size to suit a canal boat? 4. What is the average speed of a loaded canal boat drawn by two horses? 5. What horse power would it require to drive such a boat, loaded, at the same speed, with steam ap plied to a proper sized propeller wheel? A. 1. The dimensions of different canals vary from 6 to 9 feet in depth, and from 50 to 70 feet wide. 2. Yes, both by tugs and by engines in the boats. S. None that we know of except the excessive slip usual with canal boats of For Bolt Forging Machines, Bolt Holding ordinary form. 4. One and a half miles an hour, wet Vises to upset by hand. J. R. Abbe, Manchester, N. H. lieve. 5. Probably from three to four times as much. ordinary form. 4. One and a half miles an hour, we be-

L. W. E. asks: What is carbolate of lime? A. Carbolate of lime s a compound formed by the union of carbo lic acid and lime. Although not a powerful acid, carbolic acid combines with bases, as carbonic, sulphuric and nitric acids do, forming salts called carbolates.

W. P. asks: How can I color the wool on tanned sheep skins for making mats? A. You can use any of the ordinary dyes for wool. For blue, use Prussian blue with a persalt of iron or tin as a mordant. For red, use cochineal, madder, or logwood with a tin mordant. For yellow, use turmeric or annatto. Splendid shades may be obtained by using the aniline colors.

G. F. P. D. says: 1. What is the cost of Gramme's electric light machine illustrated in your journal, page 351, vol. 29? 2. You say (in describing Mr. A. Ladiguin's exhausted glass tube, in which he produces the light) that he makes use of but one carbon point. Is the other terminal metallic, and is it near the carbon tip, as is the case when the usual two carbon points are used? A. 1. We do not reply to questions of a business nature. 2. There is no other terminal. Our description is perfectly clear on this point.

E. L. asks: 1. How can I estimate the percentage of acetic acid (approximately) in a given weight of the common gray commercial acetate of lime? 2. Is acetate of lime used indirectly in the manufacture of Paris green? A. 1. You can estimate approximately, if sufficient care be used, as follows: To a filtered solution of the commercial acetate, add carefully a solution of oxalic acid until a precipitate ceases to be produced. Pour off the solution of acetic acid and carefull yneutral ize with a weighed amount of dry carbonate of soda, in powder, adding by degrees until effervescence ceases Every 54 grains of dry carbonate of soda used are equivalent to 51 grains of anhydrous acetic acid. It is necessary, of course; to weigh accurately the sample to be tested. 2. It is used indirectly in the manufacture of what is known as Scaweinfurt green.

A. W. C. asks: How can I dissolve iodide or bromide of potassium in absolute alcohol and concentrated sulphuric ether mixed in equal proportions, without using more water than just enough to dissolve the lodide or bromide, or (better still) without any water at all? I can succeed in dissolving the salt in the alco-hol; but no matter how carefully I add the ether to the solution, the salt will be precipitated. I wish to dissolve 4 to 10 grains of salt in each ounce of the ether and alcohol. A. If potash is the essential ingredient desired in solution, you might try other salts of potassium, bearing in mind the properties peculiar to each particular salt.

W. R. S. asks: How can I make gold and silverink, that can be used in a pen or a hand stamp? 2. Can I use the Tom Thumb battery for learning tele graphy? 3. Can you furnish me with back numbers of yourpaper? A. 1. A gold ink is made by grinding fine gold powder with a little gum water. The yellow bisulphide of tin or bronze powder may be used instead of gold. Silverink is made in the same way, by using pow dered silver. 2. Yes. 3. Yes, generally.

A. L. McC. asks: Is there any instrument orchemical preparation which will enable me to discover buried gold and silver? A. There is no known means of indicating the position of your treasure. Your only chance of success is to keep digging.

A. R. asks: What metal expands most with east heat? A. Mercury.

C. C. F. asks: How can I make variously colored fires? A. Red fire: Sulphur1 part, sulphuret of antimony 1 part, niter 1 part, dried nitrate of strontia 5 parts. Blue fire: Tersulphuret of antimony (orpiment) 1 part, sulphur 2 parts, dry niter 6 parts. This is the Bengal blue light. Green fire: Boracic acid 10 parts, sulphur 17 parts, chlorate of potash 73 parts. Yellow fire: Sulphur 16 parts, dry carbonate of soda 23 parts, chlorate of potash 61 parts. Violet fire: Charcoal8 parts, sulphur 10 parts, metallic copper 15 parts, chlorate of pot ash 30 parts. Orange fire: Sulphur 14 parts, chalk 34 parts, chlorate of potash 52 parts. Purple fire: Lampblack, realgar and niter, of each 1 part, sulphur 2 parts, chlo-rate of potash 5 parts, fused nitrate of strontia 16 parts. By parts are meant equivalent proportions, ounces, pounds, etc. The different ingredients are to be separately reduced to powder, sifted through lawn, and kept in well corked wide mouthed bottles until used. Care must be exercised in handling, especially the chlorate of potash, when in contact with combustible materials. The material smust be carefully mixed on a sheet of paper with a wooden stirrer with a light hand, avoiding excessive friction. They should not be mixed long be-fore using, as they are apt to deteriorate by long keep-ing and even to infiame spontaneously. The nitrate of strontia, alum, saltpeter and carbonate of soda, before being weighed, should be heated until their water of crystallization is driven off and they fall to powder.

J. T. says: 1. Supposing we have two boilers, both connected with a steam chest. The steam in both is to be at 40 lbs. pressure. If the steam is admit-ted from one boiler to the steam chest, the pressure, of course, will be 40 lbs. A friend of mine contends that if the steam benow admitted from the other boiler in addition, it will raise the pressure to 80 lbs. I, however, maintain that the volume will be increased but not the pressure, by the addition of one or any indefinite num-ber of boilers. Who is right? 2. Supposing that the first botler is amply large enough to drive a certain engine, and the feed pipes, valves, etc., in proper proportion, could the addition of another boileringrease the power? 3. I happened to state to the same party that a piece of machinery in a cotton mill revolved at the rate of 1,200 to 2,000 revolutions per minute. He thought that nothing could be made to stand such a speed. I say that that speed has been more than doubled. Please to state what is the greatest speed that has been attained by an object of say 12 inches diameter. A. 1. You are right. 2. No. 3. Circular saws of 12 inches diameter are frequently run at a speed of 3,000 revolutions per minute.

S. B. asks: If a man takes out a patent for a washing machine, can another make it himself and use itin his own house for his own use only? Has he the right to do it without being liable to an action for infringement of the patent? A. No person has a right to make or use a patented article for his private purposes without consent of the patentee.

E. C. O. asks: 1. Does such a thing exist as a perfect vacuum? 2. A friend claims that a window 6 x 6 gives more light than two windows 3 x 3. I clain that they are equal. Which is right? A. 1. See article entitled "A Perfect Vacuum," on page 400, vol. 28. 2. Other things being equal, your friend is right.

S S asks. How can I make the best violet ink? A. Make a weak decoction of logwood and add a little alum or chioride of tin. When the decoction of logwood isstrong, the ink is purple.

H. W. M. asks: How can I drill holes in plate glass? Answer: Keep the cutting edges of your drill wet with turpentine.

J. F. A. asks how to make malt vinegar. A. Make a mixture of malt and barley, mash with water, and ferment as in brewing. Put in barrels placed endways, and tie over the bungholes with canvas; keep in the dark in a well-ventilated place, moderately warm. Leave till the acetous fermentation is complete; this will take some weeks or even months. Then run off into two large casks, and put in some green twips or cuttings of grape vines. Fill one of the casks wholly, and let the other be % full. The fermentation will recommence and the acetification proceed more rapidly in the last named cask, consequently it will be the sooner ready for use. As you consume it, replace the quantity drawn off with vinegar from the other cask. If you make it on a large scale, you can use several pairs of casks in this manner

D. C. says: I have two boilers, connected together. I wish to supply the second with steam from the first, in which the pressure is 100 lbs. I want 50 lbs. pressure in the second. The co_n necting pipe has an area of one square inch. How large a hole should I cut in the second to keep it at 50 lbs., allowing for pressure of at-mosphere? Would the velocity of steam through pipe be that due to 50 or 100 lbs. pressure? Are two volumes of steam at 50 lbs. as powerful as one volume at 100 lbs.? A. See article on " Efflux of Steam," page 118, voi. 29. Two volumes of steam at 50 lbs. pressure are more powerful, or are capable of doing more work, than one volume of 100 lbs.

C. I. asks for a recipe for bronzing green.
A. Dissolve 2 ozs. nitrate of iron and 2 ozs. hyposulphite of sods in 1 pint water. Immerse the articles in the pickle till the required shade is obtained; wash with water,dry, and brush.

C. C. asks: 1. Is there a salve that will cure corns in a short time? 2. What is a good polishing powder for house use? A. 1. Take powdered verdigris 1 dram, savinointment, 7 drams. Mix and apply on soft rag. 2. For polishing plate, take jeweller srouge 1/4 lb. prepared chalk 1/2 lb.: mix and use with water.

A. J. C. says: I suffer very much from cold feet; the soles seem to be the most affected. My woolen stockings get damp, but I hardly think it can be sweat A. A vigorous walk of a few miles every day would prob ably remove your difficulty.

J. A. L. asks: Is there any residual magietism in Gramme's electric light machine, producingresistance and necessarily heat, as in Wilde and Ladd's machine? The armature is retarded and heated by the above machines, which is a serious defect. A. We think not.

J. C. D. wants us to illustrate Siemens' steammotor, believed to bevery applicable to theminor industries, such as sewing machines, the lathe, etc. A. We published a n engraving of it a few weeks ago

H. U. says: I have been a subscriber to your valuable paper for a considerable time, and I find all sorts of questions answered through your columns. Ihave agreen parrot, one of the yellow head-ed kind, with red wing butts. What is the best way to teach it to talk? Is there any other way than merely talking to it? A. You might use the speaking machine to teach your parrot. Set the machine so that it will repeat "how do you do," and keep it slowly running all day with the parrot in the same room. Next day set the machine on "good morning;" and so on, chang-ingthe wordsdaily. Yourparrot, if a good talker, would soon become well educated. An enterprising person might do a good business, we think, by opening an institutionforthe instruction of parrots. A class of a hundredbirds might be simultaneously taught by means of a single machine.

T. C. asks: 1. How many species of moles are there known to naturalists? 2. Have all of them eyes? 3. Have snails eyes? 4. Have fishes, that live in watery caves, eyes? A. 1. The best known are talpa, found in Europe and Asia; scalops and condylura, in North America; chrysochloris, in Africa; and urotrichus, in Japan and North America. 2. Yes. 3. Yes, situated at the extremities of the longer tentacles. 4. Fishes and all other animals lose their eyes if they are perpetually in the dark.

W. H. S. asks: How can I remove stains from marble? A. Make a paste of equal parts of carbonate of potash and whiting with boiling water, apply, and leave on for three days. Then wash off with soap and water. To re-polish, use tripoil in water, and then putty powder in water.

J. H. T. asks: 1. How is gunpowder made? 2. What is oil of rhodium? A. I. Take powdered saltpeter 75 parts, powdered willow charcoal 15 parts, sulphur 10 parts, mix well, add enough distilled water to make a paste, and grind till thoroughly incorporated. Leave in a cake to dry; granulate and dry by a steam pipe at a heat not over 130° Fah. 2. This is derived from the wood of a species of rhodoriza, and is much used for adulterating other essential oils. Its preparation on a small scale is not likely to be successful.

W.T.V. asks: What kind of sizing can be applied to the surface of cloth to smooth the surface, stiffen the cloth, and at the same time render it waterproof? A. Try the elastic varnish described on p. 282. vol. 29.

J. M. B. asks: Is there such a thing as an adding or an adding and multiplying machine? Λ The British government has now in operation a "difference engine," for facilitating calculations of averages, etc. We do not know of any other which is at work.

W. R. asks: What proportions of bismuth, block tin, and lead are required to make bismuth solder, for plumbers' joints on block tin pipe? How hot can f use the solder without melting the pipe? A. You can make a solder of two parts, by weight, of lead and one part of tin, which melts at about 100° below the point

J. F. A. asks: How is heel ball made? A. Melttogetherbeeswax 1 lb., suet 4 ezs., and stir in ivory black 4 ozs., lamp black 3 ozs., powdered gum arabic 2 ozs., powdered rock candy 2 ozs. Mix and, when partly cold, pour into tin or leaden molds.

H. B. asks: How can I make sailors' clothing waterproof? Answer: There are various processes for waterproofing cloth: 1. Moisten the cloth on the wrong side, first with a weak solution of isinglass, and when dry with an infusion of nut galls. 2. Moisten with a solution of soap, and another of alum. 3. A simple method of rendering cloth waterproof without being airproof is to spread it on a smooth surface and to rub from grease) until it presents a slight, but even, white or grayish appearance. A hot iron is then passed over it; and the cloth being brushed while warm, the process

H. G. T. asks: Is there anything better and cleaner than black lead and tallow as a friction wheels or brakes? A. We think not.