Notes & Queries

1.—G. T. P. says: How can I make good red sealing wax?

2.—T. E. B. asks: How can I remove clinkers from the inside of a stove?

3.—E. R. asks what is the best way of resuscitating a person apparently drowned?

4.—W. T. H. says: Please let me know what is put on the tin oval butter kettles to make them look like silver, and how it is made and applied.

5.—T. G. asks: Will some one give full directions for making a solid emery wheel ¼ inch thick and 6 or 8 inches in diameter for cutting slots in rough castings?

6.—P. asks for the *modus operandi* of producing "Grecian painting," also for the transparent varnish for the same.

7.—J. M. asks for a method of treating old oil paintings, which have been almost obliterated by frequent and bad varnishing; also for the best way of treating a painting on panel of which the wood is cracked.

8.—G. E. H. claims to have a process for tinning cast iron, which he has tried with success both on finished and rough castings. He asks: Has nothing of the kind been done before, and if not, to whom is it of the most value?

9.—E. H. asks: What is proper speed per minute for a common wood turning lathe, and also for a circular saw from 8 to 12 inches in diameter? What is the best method of tempering cast steel for common wood cutting tools?

10.—P. P. has often observed such birds as eagles, hawks, and turkey buzzards, and wishes to know how they can gyrate and ascend by a spiral course without any motion of their wings and tails. As a phenomenon utterly at variance with the laws of gravitation, P. P. thinks it deserves investigation.

11.—H. says: I have a great many horses with tender feet, having what I call corn on the inside of the heel of the fore feet. I have been trying many ways to cure it, and I wish to know if there is any certain remedy, and what is the cause.

12.—L. says: I have a house organ which troubles me by giving every pulsation of the bellows feeders when less than half the instrument is in use. The reservoir for wind is three feet six inches by three feet, rising twenty-two inches, with two feeders of the usual construction. Can any correspondent tell the cause or its remedy?

13.—W. H. says: Is there such a society as a co-operative grocery store in this country, from which we can get a copy of the constitution and bye laws? If so, where is it, and what is its name?

14.—S. W. P. asks: What system of phonography is most used by the reporters of the press at the present time? Which is the easiest to learn, and can phonography be well learned without a living teacher?

15.—A. S. G. says: I recently saw a receipt for liquid glue in the SCIENTIFIC AMERICAN, stating that nitric ether would dissolve glue. I have had some white glue soaking in this ether for nearly three weeks, and find no solution; the glue has become leathery, with no further change. Can you tell me anything practical about this

14.—A. K. asks: Are there any power looms for weaving sacking out of the Mexican "istle," and machinery for transforming that fiber into the necessary thread, in existence? Istle is a very hard and cross grain fiber, about as stiff and thick as horse hair. The threads used for sacking are two cord and ⅛ inch diameter, making 3 to 4 meshes to the inch. The sacking is now all made by hand, and I would like to know if and where any simple machinery, to make such coarse fabric, is to be had.

Answers to Correspondents

G. S. T. says: My mouth is full of your praise! You are at the pinnacle of wisdom, and are ever ready to impart instruction to your subscribers. Please tell me (1) how I shall prepare a black board upon the wall of a room? I have read and racked my brain without success, and, without your help, I will abandon the task. 2. Which arrangement of a stove pipe is the better, a straight slanting or a perpendicular and then a horizontal one? Which would secure the best draft? Should the chimney be contracted at the top or a little enlarged, and should it be closed just below where the pipe enters it? 3. Am I right in believing that some glass is not a non-conductor of electricity? I find it impossible to construct a Leyden jar of the ordinary fruit jar or bottle green glass. 4. How long before the United States mail will remove my anxiety by bringing on my SCIENTIFIC AMERICAN of February 15? Answers: The editorial countenance is suffused with blushes as the compliments of our gushing correspondent become fully comprehended. 1. Send for the preparations of the dealers in silicate slate; or mix shellac varnish with any slightly gritty material and lay on rapidly with a brush. 2. The fewer the bends the better. Make the chimney straight. It does not pay to attempt a deviation from the uniform sectional area. 3. Some glass, especially that containing iron oxide or the oxide of lead in considerable quantities, it is stated by President Morton and other authorities, is sometimes quite a good conductor. A hard glass, without iron or lead in excess, is the best non-conducting glass. Good non-conductors, such as are used in insulating the best submarine wires and in insulators, are better than any glass. 4. "For ways that are dark and tricks that are vain" commend us to some of the agents of the Post Office department. Do not despair, however.

J. M. W. says: 1. Can you tell me the composition of printers' ink, both black and in colors; also the composition of inking rollers? 2. Can you tell me whether, in stuffing animals, the natural eyes are ever left in? Answers: 1. Printing ink is essentially a combination of lamp black and oil; the best is obtained from the smoke of naphtha and boiled linseed oil. The rollers are made of glue and molasses. 2. Apply to some reputable taxidermist. We have many enquiries of this nature, and our readers can probably find replies to them by watching our advertising columns.

G. W. K. asks for some idea of the first cost, and cost per day of the calcium light. Answer: About $50 first cost for apparatus, and 50 cents to $1 an hour to run it.

A. B. S. says: I have a dispute with a friend o mine with regard to a piece of rubber. My friend maintains that it is devulcanized, "that the mere trace of sulphur that it contains is not in chemical union with the rubber, that the quality of the rubber is not injured and that it is in a suitable condition for manufacturing purposes." I maintain that the rubber is not devulcanized or only slightly so, that its quality is injured, and that it is not in a condition to be worked into rubber fabrics. We refer the matter to you, and upon your decision rest three year's subscription to the SCIENTIFIC AMERICAN. Answer: To decide this question, an analysis would be necessary, and our time is too much occupied to allow us to do it.

E. R. S. asks: 1. By what means can ordinary writing ink be given that intense, shining gloss which some kinds have? I have a small ink well in one of the desks at school, made in the ordinary way of glass within zinc, in which after the ink has stood several days, it is found to have this gloss, I suppose the zinc must produce some chemical action in union with the acid in the ink. 2. Can you inform me in what way a letter should be addressed to the Emperor of Russia, and how it should be sent? Answers: A fine gloss is imparted to ink by the use of gum arabic solution. For copying, the following is a good recipe: Mix thirty grains of extract of logwood, seven grains of crystal soda, and half an ounce of water. Boil till dissolved; then, while stirring well, add thirty grains of glycerin, one grain bichromate of potash previously dissolved, and four grains of powdered gum arabic. 2. A letter sent by mail addressed to the Emperor of Russia, St. Petersburg, would reach its destination if prepaid.

J. M. asks how to treat oiled walnut wood to polish it without varnishing. Answer: The directions given on page 72 of our volume XXVI. will no doubt serve your purpose.

L. F. A. L., of Cal. The only metallic substances in the minerals you send are pyrites and oxide of iron. It is an old idea to propel vessels by means of endless belts of paddles. Placing floats around the edges of boats, filled with cork or inflated by air as you propose, is also very old.

W. H. W. asks: Will shrinking a cast steel tire of ordinary thickness on the circumference of a cast iron locomotive driver affect the central hole of the latter? Answer: We presume not. Ask the skillful railroad superintendent at the Marquette railroad repair shops to try it and send us results.

B. N. C. would like to know if there is a rule for cutting patterns, such as tin and sheet iron workers use. Answer: Study the "Sheet Metal Worker's Instructor," by Warn.

P. J. C. sends a mineral specimen found imbedded in limestone, and asks what it is. Answer: The mineral you send is iron pyrites.

J. J. C. comments on our reply to J. H., who asked how the outside wheel of a locomotive or car on a curve keeps pace with the inside wheel, on account of the distance to travel being greater, both wheels being fast on the axle. Our answer was: "With wheels of equal size, having cylindrical bearing surfaces, one or both must slip on the rail. The wheels of the cars on railroads are coned to avoid the difficulty, their diameter on the outer edge of their bearing or tread being less than that of the portion of the tread next the flange. In turning a curve the wheels ride toward the outer rail, and thus, to some extent, if not wholly, this tendency to slip is prevented." J. J. C. says: I claim that cooning of the wheel is more of a damage than a benefit in rounding a curve, for this reason: The wheels, being in pairs of equal diameter, will roll the flange of the outer wheel hard against the outer rail and set so tight to the head of the rail that the wheel on the inner side, merely touching the top portion of the rail, will slip, being the easier of the two Any one can demonstrate the fact by the experiment of taking one wheel of 30 inches and another of 29 inches diameter, and keying them on to an axle. Then move them forward on a level floor, and they will describe a circle; but take two pairs of such wheels and construct a car truck, the wheels being fastened as truck wheels are. Now push this truck forward over a smooth surface, and it will be found upon examination that the small wheels have slipped and the large ones have traveled in a straight line. This proposition will convince any mechanic that the coning of car wheels is a damage rather than a benefit to the safety of traveling on the rail. Answer: Our correspondent's experiments confirm fully our former statements.

C. C. says to J. D. W., who asked of what material a mold for casting a small engine cylinder should be made: I have a good cylinder that I cast in a mold made of pine wood. Take a block of the length you wish your cylinder to be, bore a hole through it, and put in a core. Cut through one side for your valve seat, make some small pieces of wood to the shape and size you want your ports to be and fasten them into each end of the core, and fix your exhaust to the bottom of the mold. Cover the ends and side and pour in your metal. I used block tin with a little zinc, mixed.

C. T. says, in answer to T. C. M. who asked for directions for gilding on marble, porcelain, etc.: I use, for sizing, equal parts of elastic copal varnish and fatty linseed oil slightly diluted with turpentine. The time required to produce the requisite "tack" is about 24 hours. Barbers' shaving mugs have been treated in this way with success; but, if the articles are such as require repeated washing and rough usage, it may be well to cover the gilded portions with a coat of good varnish.

S. L. D. replies to S. T. W., who asked how to transfer engravings on glass: First coat the glass with a varnish composed of balsam of fir diluted with turpentine, then press the engraving on smoothly and evenly, being careful to remove all air bubbles; let it stand for about 24 hours, then dampen the back sufficiently to allow the paper to be rubbed off by the forefinger, ruobing it till a mere film is left on the glass; then varnish again. When dry, it is preferable to put a yellow paper on the back of it, next the varnish, which adds greatly to the beauty of the picture.

H. A. B. says: I am taking the position of engineer in a steam saw mill, and there is a dispute, between myself and the man who is building the furnace, as to the proper place for the wall to strike the boiler (a tubular one); he contends that the wall should strike the boiler above the upper water gage; while I contend that it should strike the boiler a little below the lower water gage, as I think that it is dangerous to have the fire strike the boiler at any point above the water line. Answer: Our correspondent is right. No part of the steam space should be left exposed to the action of the hot gases and flame from the furnace until, at least, they are reduced in temperature, nearly to that of the steam itself and far below the temperature at which iron is perceptibly weaker than when cold.

C. M. S. asks: How can I calculate the effective heating surface of an upright cylindrical boiler, with horizontal water tubes arranged across the fire chamber? Answer: Determine it by measuring the total area of all surfaces exposed to the directly or indirectly communicated heat of the furnace gases, and proceed as directed in replies to earlier correspondents.

B. M. P., who asks for the best thing to remove scale from steam boilers, should read our advertising columns and especially the answers to correspondents. In the latter, directions for treating particular cases are constantly being published.

R. O. B. asks: How can I collect small particles of lead from dross and ashes cheaply? Oil answers very well, but it is too costly. Answer: Fuse the lead with some cyanide of potassium in a crucible.

F. H. asks: Can a valve which has sufficient lap to cut off at one half of the stroke be set so as to admit steam correctly when the crank is upon either center, and shut off the steam when the piston has traveled an equal distance from either end of the stroke? Answer: No. The obliquity of the connecting rod will prevent perfect equality of cut off.

J. F. B. says: Knowing that strange and singular freaks of steam engines are interesting to you, I will tell you of one in our place, that puzzled us for some time. The cylinder is 14 inches bore by 36 inches stroke, with a common slide valve, using steam the whole length of stroke, making 41 revolutions per minute. About two weeks ago, she commenced by making a strange crackling noise in the cylinder, increasing until it seemed as if she would break everything to pieces. Steam poured from every joint that, at other times, was tight, and she slowed down in speed until she scarcely moved. The fly wheel trembled as though about to fall in pieces. But the moment steam was shut off, if only for an instant, she would start up again all right, and the trouble would probably not occur again for one or two hours. At some times it would be more severe than others. Everything seemed to get loose during the difficulty, and all the keys would have to be set up after each occurrence. I took off the cylinder head, found the rings a little slack, and set them out; but the next day, she was as bad as ever. The two boilers are 42 inches in diameter and 26 feet long, having two 13 inch flues in in each. Can you tell me what the difficulty is? Answer: The difficulty arises from excessive priming, we presume and will probably knock out a cylinder head or do worse damage if the trouble is not remedied.

J. P. S. says: How many inches does the lawful bushel used in Pennsylvania in measuring coal contain? Answer: The standard United States bushel is that which contains 2150·4 cubic inches, when level full; when heaped up to standard hight, 6 inches, it contains about 2,700 cubic inches. Usually 28 bushels are reckoned to the tun.

N. L. T. asks: Why is it that the shadows cast by an object from two different lights, as those of the moon and of a candle, on a white surface are of different colors? The difference is most distinct when the object is placed on a line between the two lights. Answer The colors of the lights being different, they together illuminate all of the white surface, not the shadow, with a tint which is compounded of both. The shadows are each illuminated by the light from only one of the two sources, and each therefore differs in tint from the general field, as well as from the other.

C. D. R. & Co., say: We have a 12x20 inch plain slide valve engine, cutting off at about ¾ stroke and running at 80 revolutions. Would it be economy to speed up to 125 revolutions with the same valve? Answer: If more power is required than the engine can now develope, it would be proper to speed up as proposed. If the boilers are reliable at higher pressure, carry five pounds more steam to make up for friction of pipes and passages at the greater speed. Watch the crank pin and other journals. They may heat at a higher speed.