(34) J. F. asks: 1. Will the inside wheels f a car or locomotive slip on a track when running ground a curve. A friend of mine save he don't see how hey can. He says when a locomotive is running around t curve, the flanges on the outside wheels press against he side of the outside track: he says this brings the arge part of the taper or bevel of the outside wheels and orings small part of the bevel of the inside wheel, bringing the wheels in this position; he says he don't see how he inside wheel slips on the track, for, he says, the outside wheel has a larger circumference on the track than the inside wheel, therefore the inside wheel would not nave to travel as fast as the outside wheel. A. Your friend's explanation would be correct if all the curves were of the sameradius and the coning of the wheels atted for that radius: but as this is not the case, there always more or less slip in running a curve. 2. Will a locomotive tend to run to the low side of the track when the tracks are not level? A. No; if running on a straight stretch of road. 3. Will a locomotive push head when steam is let in the cylinders, before the ariving wheels tu n? A. No.

(35) J. C. D. asks: 1. Will you explain to ne on which quarter of the stroke the piston of an enfine moves the farthest, and the cause of its doing so? A. The difference of travel on the different quarters of he stroke is caused by the angularity of the connecting od, and the amount of the difference is governed by he length of the connecting rod in proportion to the stroke of the piston. Lay down a diagram of the arrangenent, and you will see at once the cause of the difference. When the piston is in the middle of its stroke, the crank is not at right angles to the center line, but at slight angle from the right angle. 2. Also, in regard to steam pressure in boilers. I have been informed by a party that is supposed to be reliable and well posted n the properties of steam, that in addition to what a correct steam gauge would indicate, there was an actual additional pressure inside of a steam boiler of the amount of the atmospheric pressure, and that at, say, 60 pounds steam pressure, the actual pressure or strain on the inside of the boiler would be 75 pounds. A. Your friend is right. There is about 15 pounds more pressure per square inch in the boiler than shown by the gauge; but as this is balanced by the pressure of the atmosphere on the outside, it exerts no bursting pressure on the boiler.

(36) R. W. H. writes for directions for bronzing cast iron and to give it a greenish shade. A. In Supplement, No. 235, full directions as to details in regard to this process may be found.

(37) H. G. M. writes: I am in the canning business, using steam retorts. Pressure on retort, five pounds durin : thirty-minutes process; at starting, steam gauge on boiler indicates 15 pounds pressure; during time of process, steam rives in boiler to 40 pounds. My gauge on retort indicates 5 pounds steadily. Query: Do I get any greater heat in retort when the pressure of boiler is at 4) pounds than when at 15 pounds? In should increase the pressu e on the retort to 10 pounds, what variation in time would be required to give process as at 5 pounds pressure for thirty mmu'e Do I get sumerheated steam by carrying it in a pipe from the top of the dome of the boiler, back down into the same boiler, and then out through the dome to my retorts? Do steam gauges need ofling? If so, how applied? I notice the hand on one of my gauges carches at about 5 pounds pressure, and then with a jump will To up three or four pounds. A.—The temperature of steam at 15 pounds pressure is 251° Fahr. You can only get the heat in the retort due to the pressure in the tetors. Your gauge must be out of order, or it would indicate the increase of the pressure in the boiler, proyided the pipe to the retort from the boiler is not throtiled. The heat due to steam at 5 pounds pressure 1-228°, at 10 pounds 241°, which would quicken the operation. You cannot superheatthe steam by passing it through the steam chamber in a pipe as you propose It must be passed through a hotter medium than the steam itself. A watchmaker ought to be able to put your gauge in order, if there is only a catch in the move-

(38) A. P. writes: A few weeks ago a correspondent requested you to send him a receipt for a dip to color brass black, and you advised him to try a weak solution of permanganate of potassium and a very dilute solution of nitric acid I have tried it, but without result, as it would not color one particle. I take pleasure in giving you a good receipt for a dip to color brass black that will not rub off: Dissolve two pounds blue vitriol in three gallons of hot water, and add one and a half gallons of potash, mix these two ingredients well together while hot, and let it stand till cold, and add to it one pint of aqua ammonia, and it is feady for use. It will color brass black in about from twenty to twenty-five minutes. The articles must be taken out of the dip as soon as they are sufficiently black, otherwise they will turn brown if left too long. This dip is good for brass, but does not answer for bronze, You did not employ it in the proper manner receipt is excellent, however.

(39) J. J. S. asks for a receipt for thoroughly deodorizing lard. A. Fats which are rancid may be improved by treatment with hydrogen peroxide. Many other substances are recommended, but none are en tirely satisfactory. Chlorine water is sometimes used. but the introduction of chemicals is not considered advisable.

(40) M. H. asks, 1, how to clean Roman gold that has become tarnished, ammonia not having the desired effect. A. Dissolve cyanide of potassium in about ten parts of cold water and wash the articles with it. N. B. As this salt is a powerful poison, care must be used in employing it, that it does not come in contact with your hands, etc. 2. What will remove freckles without injuring the skin? A. There is nothing that accomplishes this satisfactorily. The following preparation has been recommended: Snbcarbolate of zinc. 2 parts: glycerine, 25 parts: rose water. 25 parts; and alcohol, 6 parts. It is to be applied twice a day, and allowed to remain on for about a half hour, when it is to be washed off.

(41) A. C. D. writes: 1. I am thinking of building a steam launch for trawl fishing on this coast; she will be 35x7x4 feet, engine compound, 3x3 and 6x6. I wish to have an inboard surface condenser. What size should it be, and is brass the best metal for its tubes? Would a cylinder 3 feet long, 6 inches diameter. with 50 % inch water tubes through it -which is best, to draw or force the water through it? I was thinking of putting a vertical centrifugal pump, mounted on main shaft. What size should it be? Would 2 iuch injection and discharge be large enough? The air pump would be independent. I thought of putting in a No. 00 Knowle's, which would also exhaust into the condenser. Would a boiler of the return tubular type, say 41/2 feet long. 3 feet diameter, firebox 16 inches by 2 feet, 12 3-inch flues 2 feet long, and 30 2-inch return tubes, be too much; boiler fuel soft coal, natural draught? I would like an easy steaming boiler. About what power would she develop. I make her 9 horse power at 80 pounds pressure, 400 revolutions, but by a rule in use here for finding the approximate I. H. P., viz., H = $\left(\frac{A \times L \times P}{2}\right)$ 2%=14 nearly, where A=sum of squares of

diameter of cylinder. L=length of stroke in feet. P= pressure per square inch. H=1. H. P.; 35 is a constant which I fancy gives too much. About how much coal should I burn, and what speed could I attain? A. You should have 40 to 50 square feet condensing surface. Brass tubes turned on both sides. We think your tubes should be not less than half an inch diameter. It makes little d fference which way the water is sent through tubes A centrifugal pump will answer well; 2 inches delivery would be large enough. We think your boiler would steam very well, but would recommend increasing it at least 10 or 15 per cent. We think your estimate of 9 horse power not quite high enough Are you not mistaken in the formula? Is it not A= cquare inches area of the two pistons, instead of square of diameters? If so,=then 14×07854=1099 H. P.

(42) H. A. C. asks: For bending, does the timber have to be seasoned before steaming? How long does the timber have to be kept in the steam box before it is ready to bend? A. No special machinery is required for bending plow handles, further than a wooden form to bend overand an eye to hold the end with a hook to catch the long end and hold it, all of which may be home made. The timber does not required to be seasoned. The handles, if green, require steaming long enough to heat them through, possibly one hour. If they are dry, they should be soaked in warm water at least one day before steaming, then two to three hours' steaming should be enough. Much depends upon what kind of timber the handles are made of. Those that make a business of bending and making plow handles, make them double to prevent splitting the ends by bending close to the end, and afterward cut them. Often a piece of band iron is placed on the convex side of the wood, and bent with it to pre vent splintering.

(43) J. S. H., Jr., writes: 1. I would like a receiptfor a wallpaper paste. A. Fourpounds of fine wheat and flour are mixed with a small quantity of cold water. thoroughly stirre; two ounces of powdered alum are then added, and when dissolved. a gallon of boiling water. When cool, it may be thinned as desired with cold water and used. 2. Also a receipt for putting an egg shell polish on fancy woods. A. Three parts of shellac, one part of gum mastic, and one part of sandarac gum are dissolved together in forty parts of alcohol and form a beautiful polish, which may be applied with a brush or cloth. 3. A receipt for painting or coloring borders on flors. A. Use fine umber mixed with oil and alittle turpentine, this being the prevailing color, 4. How can I gild wood work? A. This is rather a difficult operation to do satisfactorily, but may be accomplished in the following manner. Dampen the wood with a little gum water, and with great care transfer the gold leaves from the book to the wood, lightly pressing them upon it with a fine brush.

(44) H. J. L. asks: 1. What materials, and in what proportions, are used for making the brown heads of parlormatches? A. Fine glue, 2 parts; water, 4 parts; phosphorus, 11/4 to 2 parts; potassium chlorate, 4 to 5 parts; powdered glass, 3 to 4 parts; red lead mixed with litharge to suit in color. 2. How can the mixture be changed to make it ignite by very slight friction? Or of what materials can a similar composition be made which will do so? A. Increase the phospho rus and diminish the potassium chlorate.

(45) J. J. H. writes: I have seen a mention of a positive ferroprussiate, or reversed blue process paper, giving dark blue lines on a white paper background. Can you give the preparation for the paper (the composi ion of the solution and process)? A. The following is said to be good: Well sized paper is painted over with a brush with the following solution, freshly prepared: 30 volumes of gum arabic solution (1 to 5), 8 volumes solution of citrate or iron and ammonia (1 to 2), 5 volumes solution of perchloride of iron (1 to 8 hafting, Steam Engines, Boilers, 2). The mixture appears limpid at first, but soon grows ker The paper is dried in the dark, then expos for a few minutes under a negative or drawing, and developed with a solution of 1 part ferrocyanide of potassium in 5 parts of water, applied with a brush. It is fixed with dilute hydrochloric acid, 1 to 10, washed thoroughly, and dried.

(46) M. J. D. asks: 1. How can a good furniture polish for c'euning, polishing, and filling old furniture be made? A. Rub a coat of shellac varnish into it and smooth off with fine sand paper; then apply a coat of polish made by mixing a half pint of fine shellac varnish with a quart of boiled liuseed oil, 2 How is starch polish made, as used for imparting a gloss to shirt bosoms, etc.? A. To ordinary starch, for each quart, one ounce of silicate of soda solution is added and thoroughly mixed. 3. How can I make a solid and also liquid laundry blue? A. Soluble Prussian blue in powder for the former, and one ounce of the same blue to a pint of water, to which one ounce of hydrochloric acid has been added, for the latter, How is stove polish paste for cleansing and polishing stoves made? A. Finely powdered black lead mixed to a paste with water in which a small amount of glu has been dissolved. 5. How is soap powder made,

something similar to pearline, soapine, etc., us'ed for cleansing cloths? A. Washing soda is the principal ingredient in these mixtures, and more or less powdered soap-say equal parts of each.

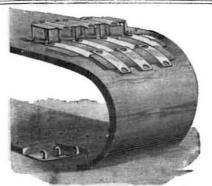
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T. R. B .- a is quartz holding a small amount of copper pyrites, possibly containing gold. An assay would be advisable. b is similar to a, but richer. cis ordinary trap rock, holding iron pyrites of no value. d is similar to c.-H. K.-The mineral is graphite, containing pyrite. The latter may carry gold .- G. T. S .-The quality of the clay is excellent, and it would posmuch value for brick or similar pottery ware.-E. S. M. -The mineral is decomposed feldspar.

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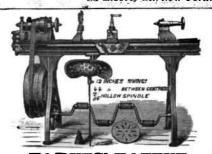


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