

openings there are awaiting men who are good workmen here. 4. What are the rates of wages of American or any other countries outside of the United States? A. Wages in Mexico and South America for expert workmen are higher than in the United States. In all other countries wages are low.

(35) G. C. F. writes: I have a small yacht that ran against the rocks and rubbed holes into her sides, from one-quarter to one-half inch deep; and as I do not want to put in new planks or pieces, would like you to tell me what composition I can put in them, to stay, and make a smooth surface, the holes being above water mark? A. Haul out the yacht and turn up the sides, let the wood dry, and with a hot iron melt shellac into the bruised spots. Make the iron hot enough to melt the shellac quickly, but not to burn. Smooth over the surfaces evenly with the iron a little cooler. Finish with a scraper and sand paper. Then paint.

(36) J. R. B.—The plastic asbestos felting will not hold well on a traveling boiler. Use a layer of asbestos paper next the boiler, and cover with hair felt and canvas; leave the front of the boiler naked. You may probably save from 5 to 10 per cent of the fuel by thoroughly felting both boiler, steam pipe, and cylinder. Copper thimbles are used in locomotives. Not used in stationary boilers. The thimbles are rings cut from seamless tubes.

(37) T. P. R. writes: What would be the best method for polishing irregular shaped steel, such as drill points or cultivator points? If with belt, which would be preferable—leather or canvas; and what is the method for applying the emery, and what sized emery will give the best results? Should the glue and emery be mixed before applying, and at what speed should the belt be driven? A. Emery belts are much in use for polishing. They are economical for the thorough surface of iron castings. Steel that is formed in a drop or press, in a die and smooth, may be pickled in muriatic acid and water, which takes the scale off, after which the belt will finish in good style. Use No. 60 emery and the best glue. Spread the glue hot and sift the emery on quickly and as thick as the glue will hold. The best way is for two persons to do the work—one to spread the glue and the other to follow with the emery as close as possible to the brush. If the points are hardened, a coarser grade of emery is preferred—50 or 40.

(38) C. S. S. writes: I have a small horizontal boiler 2 feet in diameter, $3\frac{1}{2}$ feet long, with 26 two inch flues running the full length; the flues are put in one-half of the heads. Can I use it as an upright as it is, or shall I have to put flues in the other half, and if so, how many? I think there is heating surface enough for my engine as it is; engine is 3 inches diameter by 5 inches stroke. How much power will it develop with 60 pounds steam, running 300 times a minute? A. If you set your boiler horizontally, as its make was intended, it will be 3 horse power. If you set it upright, it will be necessary to fill the space with tubes laid out in the same way as those already in, to make it 3 horse power. It will only make a poor boiler at that, as you will then have to make a thick head. Heads should be 14 inches from shell in either case. Your engine will develop about $2\frac{1}{2}$ horse power. Use $\frac{3}{4}$ inch steam pipe, 1 inch exhaust, smoke stack 8 inches diameter, 15 feet high. 2. Could I make a larger dynamo than the one described in SUPPLEMENT, No. 161, from the descriptions given in it, and if so, what proportion should it be to require 2 full horse power to run? A. For a larger dynamo, such as you ask for, you had better consult some of the establishments in the electric light business.

(39) F. O.—We could not undertake to instruct you in making an air gun. It requires a skillful mechanic in gun work to make these guns. A few hints will be of no value. You will find them described and illustrated in Knight's "Mechanical Dictionary." You may also obtain drawings of a number of patents on air guns from the Patent Office for a fee. We think that you could make a windmill that would drive your fret saw, and for this also you could find a variety of ways, according to your location and facilities.

(40) R. E. writes: Please let me know if I would get any more speed out of my boat by using a smaller propeller wheel—using $24''$ now, $3'$ pitch—engines $3' \times 3\frac{1}{2}'$, coupled, or if I would be better with a two-bladed one, boat $30'$ long, $5' 10''$ beam? Can make between 6 and 7 miles now, but think I ought to do more. Also let me know if boiler is large enough, size $28''$ diameter, $4'$ high, 32 two inch tubes $22''$ long? A. Your wheel is about right. A smaller wheel would have to run much faster, and be subject to more slip. If your boiler and engines are running up to their capacity, you could only improve by making the wheel larger, and very little at that, unless you also increased the engine power. Three-bladed wheels are preferred for this class of launches. You are making very good speed. Boiler is probably large enough. You do not give speed of engine when making 7 miles an hour, nor pressure in boiler—all essential points to know in giving an opinion as to proper proportions.

(41) J. A. D. writes: Take three pieces of metal: first a standard silver dollar; second, piece of gold; third, piece of platinum; to be precise in measurement, they shall each be struck in the die of the silver dollar. Question: Which of these pieces will displace the most water when immersed? J. M. says the gold piece will displace more than the silver, and the platinum will displace more than the gold. J. D. maintains the displacement will be the same, as bulk causes the displacement, and not specific gravity, which I understand J. M. to maintain. A. J. D. is right.

(42) C. H. C.—We could not undertake in this place to attempt an explanation of the phenomena of alleged spiritual manifestations, or even a definition of what is claimed in this line.

(43) E. S. writes: I have an instrument of music called the Musical Cabinet, for which I paid \$90. It performed very well at first, but it soon got to fray the edge of the paper on the bass side, and did not re-roll true. I should like to know how to prevent it if possible? A. Get a piece of roll drawing paper, and cut a new sheet; this can be done by taking out the old one and using it for a pattern, marking the holes with a pencil. Cut on a board with a knife.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined with the results stated.

E. M.—Sample No. 1 consists of hematite or specular iron ore, sometimes called micaceous iron ore. No. 2 is simply a metallic plate of the same a little larger than the majority of the plates in the first sample.—R. S. H.—The deposit is calcium carbonate, and it is soluble in acids.

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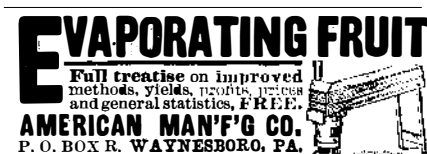
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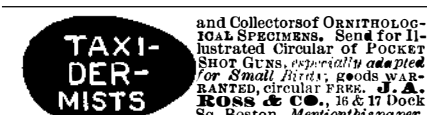
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