

Notes & Queries

HINTS TO CORRESPONDENTS.

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

Names and addresses of correspondents will not be given 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.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at the office. Price 10 cents each.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identification.

(1) H. B. S. asks: What power will be required to force a steel shaft 2 inches diameter into a block of cast iron 4 inches square, bored the proper size to make a very tight fit? These blocks of iron are 24 inches long, and the shaft goes through, having a bearing at each end of about 6 inches. If the shaft is turned 2 inches diameter, what should the bore be, or, in other words, what should be the difference between the shaft and the bore? A. If we understand you right as to what you wish to accomplish, we think you will find it impracticable to force a steel shaft through a hole 24 inches long having perfectly parallel sides. The shaft will drag and give you a great deal of trouble. A taper of two one-hundredths to three one-hundredths of an inch in the length to be driven, and ream the block three-fourths through with a reamer that cuts the size of the shaft at the center, and the rest of the way with a reamer that cuts the size of the point of the shaft; clean and oil before driving. You will have to use much judgment, and it generally requires experience to do this properly to prevent dragging of the metal or splitting the block. For short distances of three or four times the diameter, driving can be done with an enlargement of shaft of fifteen one-thousandths of an inch.

(2) C. S. asks: What is the cause of the occasional singing of the bass violin string? What is the remedy, if any? A. There is no remedy for the vibration of the bass string. It is caused by shrinkage of the catgut. This is avoided in the best strings by more painstaking in making.

(3) C. F. W. asks: Is the screw or propeller for ocean steamships considered to work perfectly in every particular? A. There are disadvantages, such as friction of the blades in the water and that a very large proportion of the power applied is lost by indirect action.

(4) T. M. G. asks: 1. What is the greatest speed an engine could be run, driving wheels 10 feet diameter, and not leave the track? A. This cannot be answered in general terms, as much depends upon the track and height of center of gravity of engine. On good track 80 to 90 miles per hour has been made for short distances. 2. What can be put in water to make it so that it will not freeze? A. Alcohol, if added in sufficient quantity, will answer every purpose.

(5) L. K. asks how to make the electric call bell for a telephone; or if you have an issue of your paper which gives the full demonstration of it, I would like to know. A. See Telephone Calls in SUPPLEMENT No. 162. 2. I am making a horse shoe telephone, and what kind of paint can be used to give the mouthpiece a black, glossy appearance? A. Add a little fine lamp-black to shellac varnish, and apply it with a camel's hair brush to your telephone mouthpiece.

(6) W. S. R. asks: What substance is used in gluing sawdust and other fibrous materials together? Also if it is used in a dry state, and if not, what will act as a glue and render it both tenacious and firm when it is submitted to a hard pressure? A. We know of nothing better than common glue. Shellac is sometimes used. For kindlers powdered resin is mixed with the sawdust. The whole is then heated and compressed. The shellac and resin are used dry, but with heat. The glue would of course be wet.

(7) J. A. asks: Is there a fluid that a mark made on paper with it will conduct electricity, and what is the composition of it? Does it color the paper? Are there any uses to which it has been put? If so what are they? A. The following solutions are used in the electro-chemical telegraphs:

- a. Nitrate of ammonia. 4 pounds. Ferricyan. potassium. 1 ounce. Gum tragacanth. 4 " Glycerine. 4 " Water. 1 gallon. b. Nitrate of ammonia. 2 pounds. Muriate. 2 pounds. Ferricyan. potassium. 1 ounce. Water. 1 gallon.

The current passing through paper saturated with either of these solutions turns the paper blue.

(8) C. H. B. asks: 1. How many gallons of water can be pumped from a well per hour by steam power, through a 4 inch pipe? A. It will depend somewhat on the length of pipe, but cannot exceed about 87,000 gallons per hour. 2. How much water will pass through a 1 1/2 inch pipe per hour, with an average pres-

sure of 40 pounds? A. It is affected by the length of pipe, but cannot exceed about 24,000 gallons per hour.

(9) J. E. E. asks (1) for some practical directions about putting together a steam yacht. He wishes to learn how the frame is made, so that planking will go down flat on ribs and not hit only on a corner of the rib; also general construction of hull, not only dimensions of hull, but dimensions of timber in proportion to one another. A. Lay down your boat's lines full size on a mould loft floor, and from this you can get the bevel of the ribs or frames at any point, and if they are sawed square, they must be beveled by hand. Our SUPPLEMENTS give more details respecting the construction than any published work we know of. The "Practical Boat Building for Amateurs," gives many details that are applicable to all classes of boats. The fastening of planking to frames may be by nails, screws or rivets; the common mode is by copper nails driven through and riveted on a ring, and in the better class of boat copper rivets driven through and riveted parts of frames may be fastened by iron rivets driven through and riveted on ring or washer. Ribs or frames, if steamed and bent, are made in one piece. If sawed or cut from crooked timber or roots, they may be in two or three pieces. As to dimensions of frame, you can judge of proper size from dimensions given for different sizes of boats in our SUPPLEMENTS 2. Equivalent of metric system in our system of weights and measures. A. You will find the French measures with their equivalents in English measure in Trautwine's "Engineer's Pocket Book." This book will also be of great value to you for other information.

(10) A. C. Y. asks: What amount of power is lost in a side wheel steamer caused by the lifting of water? A. It depends in great degree upon the diameter of the wheel and amount of dip. 2. Also of a screw propeller. A. With a screw propeller, upon its diameter and pitch. There is no rule of general application. 3. With the same power applied, without the present resistance to overcome, what would be the gain in speed to a vessel which now runs 18 knots an hour? A. Without defining more specifically, this question cannot be answered.

(11) M. M. L. asks: If a radiator be placed below the base of a boiler, in heating by hot water, will there be circulation sufficient to heat an ordinary sized room? A. You can heat a room with a circulating coil below the boiler, but you must have an upward or ascending column at or above the boiler to induce a flow, or you can make the coil the end of circulation from the other rooms. It will not be as hot as a proper circulation, and would require more pipe, say for your room of 1,200 cubic feet, 50 feet of 1 inch pipe.

(12) H. V. C. writes: Last winter I dug a well 12 feet deep and put in a galvanized iron pump. Now if I pump water, it has a very disagreeable smell and taste, while water drawn with a bucket does not have any smell, being very good for drinking. A. The bad taste given to the water is undoubtedly caused by the influence of the zinc upon the water which has been standing in the pipe. You should always waste as much water as the pipe and pump holds before catching the water for drinking or cooking; for other purposes it is harmless.

(13) W. H. L. asks if water drawn from galvanized iron ice coolers is also injurious. A. Yes; if the water has been left standing in the cooler for any length of time. Such an ice cooler should be completely emptied at least once a day before refilling.

(14) T. H. R. asks: What is the best method of getting rid of the quality of stickiness in boiled linseed oil, or of overcoming such stickiness in canvas or calico cloth already dressed with that oil? A. The stickiness complained of probably arises from the want of proper driers. The linseed oil should be boiled with at least 12 ounces of litharge or oxide of lead to one gallon. For cloth that is already dressed with oil, painting with turpentine that has been treated with litharge and exposure to the sun for a day may accomplish what you desire, but will not look as clean and bright as the oiled goods were originally. Another way is to rub powdered soapstone upon the surface of the goods and then expose them to the sun. This will also change the color, but is preferable to sticky surfaces.

(15) J. H. M. in SCIENTIFIC AMERICAN of November 10 (No. 25) asked about siphon, and in the reply the editor should have suggested that he could raise water by that means only about 28 feet.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

November 6, 1883.

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

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