

(40) W. W. asks: What is the cheapest substance I can use for cementing together readily layers of straw board, the same to be waterproof or nearly so? A. You can use a solution of shellac in alcohol for this purpose, or a hot solution of glue in water, in which is dissolved 1 oz. of bichromate of potash and 2 ozs. of gelatin: this cement must be exposed to sunlight in order to render it partially insoluble.

(41) J. H. H. asks how he can become an engineer on an ocean steamer? A. You must search for a position as engineer's assistant, or even as stoker, on some vessel; prove yourself to be steady and reliable, and if you are strong and healthy, and have good mechanical ability, so as to be able to make repairs under difficulties, you will be able to pass the required legal examination for a third, then a second, and if you are fortunate, a first rate, or chief engineer.

(42) C. W. D. asks how to transfer pictures on paper to glass? A. Use good starch paste fastening the printed side next the glass; when dry use castor oil as directed on pp. 226 and 392, vol. 27, SCIENTIFIC AMERICAN.

(43) J. N. asks how to make the American commercial potash, and where is it made? A. Wood ash, preferably that of green wood and oak leaves, is digested in water and the solution obtained evaporated in iron pots and calcined at red heat to free from carbonaceous matters. The greater part of American potash by this method is produced in Canada. The Stassfurt salt mines, the residue from the manufacture of beet sugar, and the sluit of wood now supply the major portion as commercial potash.

(44) T. E. M. says: A friend of mine has a tree in front of his house, one limb of which points toward the west. In the winter, when very cold, the limb turns about 7 inches towards the south. With warm weather again it resumes its former position. What is the cause of it? A. The cause of this phenomenon may be found in the power of frost to expand water in congealing it. If you stand upon the roof of a house in a thickly populated city and observe the chimneys of the houses, you will find that almost without exception they lean towards the south and east. An explanation of this may be given in this way: The water absorbed by the mortar in the joints of the brickwork is frozen in the night, and during the day on the north side remains frozen; but on the south and east sides it is thawed out. The result is evident: one side is elevated and the other depressed, thus warping the chimney over towards the lower side. In the same way the frost acting upon the water in the pores of the wood may bring about a similar result in the tree you refer to.

(45) R. R. J. asks: What is the best solvent for India rubber when designed for marine glue, and is the crude or pure rubber best? A. Pure naphtha. Use ordinary caoutchouc or crude gum rubber.

An experienced painter tells me that bronze powders, if put on when the size is too green, will be drowned, and soon turn color. Is the same danger to be apprehended in the use of bronze powders on paper with printer's size? What grade of bronze powder is best for durable work? A. No; pure gold bronze should be employed.

(46) C. F. F. asks (1) how to keep cider sweet and (2) how to clean musty cider barrels? A. 1. Add to the cider about 1/1000 part of sodium sulphide dissolved in a little water. 2. Use a strong solution of soda containing a little alum, and then wash with plenty of cold water.

(47) O. C. L. asks for an easy, safe, and economical recipe for testing steam boilers? A. Fill the boiler with water, load the safety valve to the desired point, and heat the water gradually.

Also for destroying lice on cattle without injury to the brute? A. Perhaps some of our readers will be so kind as to send notes of their experience.

(48) C. R. asks how to make good hard soap? A. See No. (19), p. 123, vol. 37.

How can I prepare good hair oil? A. Castor oil 6 1/2 pints, alcohol 1 1/2 pints, oil of citronella 1/2 oz., lavender 1/4 oz. Shake well before each application.

(49) S. M. B. asks: Is mica a conductor of heat? A. Yes, to some extent.

Please tell me how to keep my feet warm without fire? I wear heavy boots and two pairs of socks. A. From your account the only alternative would seem to consist in increasing the thickness of the covering.

Is air heated by compression? A. Yes.

What is the best method of operating locomotive turntables? A. A well constructed turntable can easily be turned by any man with a lever of moderate length.

What is the best means of preventing a vessel from sinking, the means to be set in operation after the vessel strikes? A. A cellular construction of hull and watertight bulkheads.

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

J. E.—It is not a meteorite, but marcasite imbedded in quartz. The brown coloration on the exterior is due to the conversion of the sulphite of iron into ferric oxide.—G. D. R.—It is sulphide of iron in a gangue of slate.—W. D. M.—It is a weathered sedimentary rock consisting principally of aluminous silicate, lime, and iron oxide. It contains nothing of value.—J. N.—It is limonite—a hydrous iron sesquioxide.—J. T.—The rock contains magnetic and ferric sulphides, and a little nickel and copper.—J. H. P.—It is ferric sulphide—not valuable.—B. L.—It is principally resin. No "diamond dust" could be found in it.—P. L.—It is crystallized carbonate of soda. The commercial article is worth 5 cents a pound—chemically pure, fifty cents a pound.—A. I. H.—It is aluminic in a clay matrix. The aluminate consists of alumina 29.8, sulphuric acid 23.2, water 47.0—parts in 100. It contains no pigment.—G. K. No. 1 is galenite—lead sulphide. No. 2 is calcopryite (copper iron sulphide) and galenite in quartzose gangue. May contain also zinc. No. 3 is dolomite containing sulphides of iron and copper and argentiferous galena.—No. 4 contains copper, iron, and lead sulphides—and some silver. No. 5 bears similar to the preceding. No.

6 contains much iron, but is rich in argentiferous galena. The vein is probably valuable.

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges with much pleasure, the receipt of original papers and contributions upon the following subjects:

On Mechanism of the Heavens. By G. D.
On the Law of the Pressure of Saturated Steam with Relation to Temperature. By E. V.
On the Steam Yacht Estelle.

HINTS TO CORRESPONDENTS.

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 fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Inquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

WANTS AND BUSINESS INQUIRIES.

Almost any desired information, and that of a business nature especially, can be expeditiously obtained by advertising in the column of "Business and Personal," which is set apart for that purpose subject to the charge mentioned at its head.

We have received this week the following inquiries, particulars, etc., regarding which can probably be elicited from the writers by the insertion of a small advertisement in the column specified, by parties able to supply the wants:

Who makes electric machines for magic lanterns?
Who makes the machine for felling trees exhibited at the Centennial?
What kind of battery is used in mines to fire several blasts simultaneously?
Who sells toy rubber balloons?

OFFICIAL.

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were

Granted in the Week Ending

November 27, 1877,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A complete copy of any patent in the annexed list, including both the specifications and drawings, will be furnished from this office for one dollar. In ordering, please state the number and date of the patent desired, and remit to Munn & Co., 37 Park Row, New York city.

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