

it and the ceiling below, has been saturated with neat-foot oil. What can we do to prevent spontaneous combustion? A. It is better to remove the danger by substituting a new floor; but if this is not practicable, saturate the floor as thoroughly as possible with a strong solution of washing soda in lime water.

(28) C. R. asks: Is there any preparation that will hinder the decomposition of gelatin when used for moulds and often remelted? A. Try the addition of a little lime.

(29) F. P. W. says: I have spilt some black ink on my carpet. Please tell me how I can get it out without injury to carpet? A. If the ink is of the same kind as that used in your letter, it cannot be removed without destroying the coloring matters of the carpet.

(30) W. H. asks: What are the causes of the formation of lead ore, to the best of your knowledge? A. You do not state which ore of lead. Galena was probably formed by the fusion of oxide of lead in contact with sulphur, from which it crystallized.

(31) S. W. asks: What are the names of the elementary bodies discovered since 1869? A. The element gallium, discovered by Lecoq in 1875, is the only one.

(32) L. F. B. says: In answer to J. J. S., and others, you say that water boils at 184° on the St. Bernard. This mountain is 8,400 feet high. Are you right? A. The Swiss St. Bernard is 11,080 feet in height.

(33) W. C. L. asks: Does galvanized iron attract more cold than copper or other metals? A. If we understand you, the metal that is the better heat conductor will condense most moisture upon its surface; in this respect copper far surpasses galvanized iron. If copper be taken as 100, galvanized iron equals about 16 in the scale of conductivity.

(34) J. asks: Is there any substance which, if dissolved in alcohol and applied in solution to surfaces of raw, light-colored woods, such as ash and maple, will give them a luster and make the grain more apparent without changing the color? A. A filtered solution of pure, bleached shellac in alcohol will do this, or a very thin varnish of mastic. Such woods darken by age; this cannot be avoided.

(35) B. H. L. asks: What liquid could I use, that would be cheap enough, to kill weeds without injuring wood, so as to sprinkle 2 or 3 miles of plank road without hastening the decay of the wood? A. A sprinkling of crude carbolic acid would, in great part, accomplish this, without injury to the planking.

(36) E. A. W. asks: How can I remove the clinkers which accumulate on the brick linings of cooking stoves? A. These are due to the presence of alkalis or lime and sand with the coal, which become fused together, forming a glass which constitutes the adhering clinker. It can only be removed by mechanical means, but may be avoided by using only fuel free from these impurities.

(37) G. H. A. asks: 1. Is there any extract of lime that will answer the purpose of fresh slacked lime for a preservative, and not make anything that is immersed in it look limy? A. There is no extract of this kind. 2. How can I, after leaching the lime and getting the strength out of it, make it so that anything immersed in it would not show the lime after taking out and drying? A. The excess of adhering lime may be removed by immersing the substance, after digesting in the lime water, in pyroligneous acid; or the lime water may be acidified with the wood vinegar.

(38) W. L. I. says: I want to lift water to a height of 46 feet, then convey it to a tank distant from the well 45 yards. I have plenty of power with which to run any kind of pump. Can I get one to lift water to that height? A. There are pumps made especially for such situations, that can be driven by belts, gearing, or lever connections, as may be most convenient. It is not our custom to recommend special manufactures in these columns; but if you will make your wants known under the "Business and Personal" heading, you will open communication with the proper parties.

(39) H. D. D. asks: How can I calculate the dimensions of a boat to carry a given weight? A. Find how many cubic feet of water the boat displaces at different assumed draughts, and the product, in any instance, of the displacement multiplied by 62, gives the number of lbs. the boat can carry at that draught, including its own weight.

(40) F. R. R. S. asks: From what depth will a steam siphon draw water perpendicularly, and to what height above the siphon can the water be forced? A. It can draw about as far as a good suction does, and as ordinarily arranged does not force the water, but could easily be made to do so to a height depending on the pressure of steam.

(41) T. R. R. asks: Could you give a short table showing the rate at which atmospheric air is increased in temperature by sudden compression, as well as the increased pressure per inch, starting at about 60° Fah.? A. The following figures are taken from a table published by Professor Thurston in the Journal of the Franklin Institute:

Table with 3 columns: No. of atmospheres, Degrees of temperature Fah., Lbs. pressure per inch. Values range from 1 to 10 atmospheres.

(42) A. B. asks: What would be the power of a 100 lbs. fly wheel attached to one end of a horizontal shaft, worked by hand? A. The actual energy of such a wheel depends upon its dimensions and velocity, the general rule being:

Energy = Moment of inertia x (angular velocity)^2 / 64.4

(43) H. H. asks: 1. Is steam visible in a boiler? A. No. 2. Does water boil in a boiler when there is a pressure of steam? A. There is no violent

ebullition unless the pressure is practically removed. 3. How large a boiler is required for a 40 horse engine? A. One capable of evaporating from 10 to 60 cubic feet of water per hour. 4. What size of steam pipe is required for a 20 horse engine? A. Make it about 3/4 the diameter of cylinder.

What size of balance wheel would a person want for a 22 inch circular saw? A. None will be required in general, except the pulley on the saw mandrel.

(44) J. J. T. says: What is the cause of the knocking in a water pipe? I am running a 20 horse engine, and the pump is attached to the crosshead; the feed to it is 3/4 inch lead pipe with an air chamber on it; the discharge pipe to the boiler is 1 inch, with an air chamber. When pumping, the feed pipes make a fearful noise, as though some one were hammering it. A. The area of the suction pipe or suction valve is probably too small, causing the valve to have too much lift; and its violent closure causes the noise.

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

G. M. S.—No. 1 is pyrolusite, a gray ore of manganese. No. 2 is chalcophyllite or copper in combination with arsenic acid. No. 3 is quartz. No. 4 contains calcite and apophyllite—carbonate of lime and silicate of lime and potash.—E. M. P.—Your powder consists principally of some organic body; but the quantity was so small that we could not determine its nature.—D. A.—It contains mica and sesquioxide of iron.—J. R. B.—It is an impure clay—silicate of alumina. You did not pay the postage on your specimen.—A. D. G.—No. 1 is mica schist. No. 2 appears to be cassiterite (oxide of tin). Send a larger specimen.—F. W. M.—It is iron pyrites. See p. 7, vol. 36.—E. T.—Your mineral seems to be a piece of scoria from some furnace. It contains iron, sulphur, lime, and a large quantity of carbon.—B. H. L.—Your specimens are basalt and granitiferous rock.

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects: On a Geographical Question. By P. G. On the Distances of the Stars. By W. W. On Shipping Nitro-Glycerin. By C. L. K. On a New Car Coupling. By the O'K. McK. On Civilization. By T. R. V. On the World's Age. By A. F. Also inquiries and answers from the following: J. C.—W. A. M.—Y. S.—J. M. P.—N. S.—J. B. H.—O. O. O.—F. Z.—J. H. G.—A. B.—T. W. P.—H. A. H.—H. C. H.—A. G.—R. T. G.

HINTS TO CORRESPONDENTS.

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.

Hundreds of inquiries analogous to the following are sent: "Who sells sewing machines? Who sells blue glass chimneys? Who makes artificial limbs of hard rubber? Who makes artificial eyes? Why do not makers of artificial stone advertise in the SCIENTIFIC AMERICAN?" All such personal inquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

OFFICIAL.

INDEX OF INVENTIONS FOR WHICH Letters Patent of the United States were Granted in the Week Ending February 6, 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.

Table listing inventions with names and dates, such as 'Adding pencil, C. C. Fields', 'Advertising, B. S. Howard', 'Animalsubstances, etc., J. P. McLean', etc.

Table listing inventions with names and dates, such as 'Button, Vose & Southwick', 'Buttons to cards, attaching, A. Brear', 'Car brake, atmospheric, W. Loughbridge', etc.

Table listing inventions with names and dates, such as 'Loom, H. D. Wood', 'Lubricated moulds, producing, C. S. Brooks', 'Middlings separator, P. Muller', etc.

DESIGNS PATENTED.

Table listing patented designs with names and locations, such as '9,729.—COOK RANGE.—J. Beesley, Philadelphia, Pa.', '9,730.—SLEIGH BELLS.—A. A. Bevin, East Hampton, Ct.', etc.

[A copy of any of the above patents may be had by remitting one dollar to MUNN & Co., 37 Park Row, New York city.]