

(35) J. D. G. asks: 1. Could I get a flowing well in about the center of the State of Kansas? A. It is extremely improbable that you will obtain a flowing well in central Kansas, except on low grounds.

(26) W. B. asks when the Winnecke comet will return, the name of the next comet to return, and if Biela's comet or part of it will ever return, and when. A. The Winnecke comet was last seen in 1875.

(27) W. S. writes: A brass spring, after being heated, loses its power. How or by what process is the lost power restored to the spring? A. The hardness of brass is due solely to the compacting of the mass by compression, as in rolling or hammering.

(28) A. B. W. asks the best material to use to prevent water from freezing in iron pipes above ground. A. Cover the pipes with hair or plaster felt, or make a box around the pipes and fill it with sawdust, shavings, or wool.

(29) T. H. K. writes: I am going to make a half dozen No. 14 plate iron barrels about 25 inches diameter and 28 inches high, made out of Philadelphia R. G. iron. These barrels are required to be tinned inside with pure tin, the same as tinning sheet copper.

(30) W. G. writes: In a steam cylinder where the piston rings are steam packed, does the steam enter the follower on both ends of the cylinder or on only one? A. There is a small leakage into the piston at both ends, depending entirely upon the closeness of fit of the rings.

(31) W. H. S.—A steam pleasure boat of less than 5 tons register needs no license. Over 5 tons, the license fee is \$5.00 to a United States inspector.

(32) W. T. W. A.—The hay stack could take fire by spontaneous combustion from the heat generated by fermentation. We cannot recommend anything for ingrowing nails, except more constant care.

(33) D. B. G. asks: 1. Of what advantage is a slack between the cars in starting a heavy loaded freight train? Does it aid the engine in starting? A. The slack connections between freight cars aid the engine in starting a heavy and long train by giving motion to the cars successively.

(34) H. D. J. desires a pure fruit acid as substitute for tartaric acid, at about one-third the cost, to use in the manufacture of jellies. A. There is an acid sulphite of lime, better known as the bisulphite of lime, which is used for the purpose mentioned.

(35) J. M. asks: What chemical ingredient can I mix with water to prevent it from freezing? A. Glycerine is used to prevent water freezing in gas meters.

(36) Q. T. S. asks: 1. What preparations are more commonly used in waterproofing paper and pasteboard? A. See articles on this subject in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 39, 96, and 207.

(37) E. R. R. asks how to mark or ornament polished steel, such as we see on saw plates, etc. A. Take 4 parts by measure of pyroligneous acid, alcohol 1 part. Mix, and add 1 part nitric acid (sp. grav. 1.28).

(38) C. F. B. asks how to make a liquid extract of beef that will keep six months or longer. A. Cut the lean of fresh killed meat very small, put it into eight times its weight of cold water, and heat it gradually to the boiling point.

(39) J. M. asks (1) for a recipe for a cheap solution, to make Manila or Sisal fiber fireproof, at the same time preserving it without staining. A. The following mixture, consisting of boric acid 6 pounds, ammonium chloride 15 pounds, pure borax 3 pounds, and water 100 pounds, is applied by immersing the articles therein.

(40) J. W. Q. asks the carrying capacity in pounds of a scow 42 feet long and 11 1/2 feet beam. A. 2424 pounds to 1 inch in depth. If the above dimensions are on the water line.

(41) H. B. S. writes: Having a boiler with twelve square feet fire surface, a 1 1/2 x 3 inch engine, with oscillating cylinder, and a boat 12 feet long by 2 feet 6 inches beam, what size and pitch of propeller is required, and what speed can be realized in still water? Boiler, engine, and boat weigh 175 pounds.

(42) O. P. F.—A "water bath" is used instead of a "sand bath" for heating glass alembics or other glass vessels used for distilling or evaporating. It may consist of any vessel of hot water in which another vessel may be placed for heating.

(43) W. F.—The motions of barometer and thermometer are mostly in opposite directions during storm periods, occasionally otherwise—the direction of the storm winds varying their relations to considerable extent.

(44) C. S.—Bessemer steel is made in the United States equal to that made in England.

(45) M. E. E. asks a way in which lead can be made tougher and more durable, without becoming harder, or much harder. A. Alloy with tin.

(46) O. S.—The value of mica, according to its size and quality, is from 25 cents to \$5.00 per pound. The average price during 1885 was \$2.50 per pound.

(47) G. W. K. writes: Using one pound coal for evaporating seven pounds water or fluid, feeding the boilers at 200 degrees, how many pounds of coal will be required to evaporate 700,000 pounds of water or a fluid evaporating at 200 degrees?

(48) C. R. R.—For your safety valve: Divide the weight of the ball in pounds by the area of the safety valve, which quotient will be the pressure per square inch in pounds, if the ball were set upon the pin of the valve.

(49) B. C. writes: I have a meerscham pipe broken at the elbow. What kind of cement shall I use to fasten it together? A. Use quicklime mixed to a thick cream with the white of an egg.

(50) C. E. W. asks: 1. An explanation and diagrams of construction of the polyopticon for throwing enlarged pictures on white screen from solid objects or prints, as the magic lanterns do from transparent slides? A. The polyopticon is in every particular like a magic lantern with the condensing lens left out and the light placed in front of the picture on one side of the optical cone, and shaded, such that the direct light shall not pass through the lenses.

(51) A. G. L. desires (1) a receipt for baking powder. A. Take of: Powdered cream tartar. 30 ounces. Sodium bicarbonate. 15 " Flour. 5 "

powder (such as is used to make pancakes, etc., without eggs). A. By the addition of about 1/4 drachm turmeric powder to each pound of baking powder, it is converted into egg powder. 3. Linen gloss (I mean the powder gloss, something that can be used in cold starch (raw starch) for giving a fine gloss to shirt collars, cuffs, etc.). A. White wax 1 ounce, spermaceti 2 ounces; melt them together at a gentle heat.

(52) C. M. W. asks: Will common black powder explode in a vacuum? A. Frick says, "Gunpowder burns without explosion in a vacuum," and also powder may be set on fire by means of a lens within an exhausted receiver; but it will be found to burn away slowly without explosion.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined with the results stated. F. F.—Of the specimens sent, No. 1 appears to be a piece of slaty rock; No. 2, a weathered slate; No. 3, a shale; No. 4, a slate; and No. 5, limestone.

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