

will absorb moisture or deposit it, according to the condition of the air itself as regards saturation. If the building be kept closed when the atmosphere is in an evidently humid condition, and a strong current maintained when the air is dry, a reasonable degree of success may be looked for.

(27) O. A. & B. say: We have a boiler 38 inches in diameter and 20 feet long; it has a flue 13 inches in diameter. Will such a boiler provide steam enough for an engine 10 x 23 inches, so as to work it to its full capacity? A. You can answer this yourself by allowing 15 square feet of heating surface to each horse power.

(28) C. H. B. asks: How can I make good copper plate printing ink? A. Take linseed oil 1 pint, put into a dry iron saucapan and boil until it will readily ignite on applying lighted paper; let it burn 10 minutes, put the lid on, and it will cease to burn; add 1/2 oz. litharge, and stir well; when cool, use it by grinding with fine lampblack, forming a thick paste; grind very fine with a muller. Boil the oil out of doors.

(29) L. E. K. asks: 1. Do gunners in naval warfare have to make allowance for the motion of their ship when shooting at another? A. Yes. 2. Do their shots have the same effect when fired from the stern of a fast moving vessel that they would if shot from the vessel's bow and directly in front? A. See our article on "Motion in a Moving Body," p. 273, vol. 32.

(30) E. H. says: It is stated that chemists have produced a degree of cold estimated at -257° Fah. How was this temperature obtained? A. Probably by means of liquefied nitrous oxide and bisulphide of carbon in a vacuum.

(31) J. R. asks: 1. What is the cheapest source from which to obtain hydrogen? A. One of the most economical methods of obtaining hydrogen is from the action of dilute oil of vitriol on scrap iron. In many cases coal gas may take the place of pure hydrogen, and the cost of production of the carburet is very much cheaper. 2. Can you give the chemical reaction of sulphuric acid and water on iron? A. Fe + H2SO4 = FeSO4 + 2H.

(32) O. W. asks: How can the oxyhydrogen light be rendered absolutely free from danger? I frequently make the gases and run them, each into its own bag, and subject them to about equal pressures. As an additional precaution, I employ a trap, and also a safety bottle for each gas. Neither gas can possibly return to its source of supply; where then can the danger lie, for I am told an explosion is possible? A. Where bags are employed, all that is necessary is that both the gases should be under the same conditions of pressure, which must remain constant. If these precautions are properly attended to, and the safety bottles be placed near the jet, no danger need be apprehended. It is not advisable to wire or tie any of the connections; this is a common practice and source of trouble.

(33) J. C. asks: What is the best method of testing a new shaft to find if it has any cracks in it? A. If a shaft shows any signs of a crack, heat it at that spot to a low red heat, and drop a few drops of water upon the doubtful spot; and if it is cracked, it will show plainly a black line along the crack.

(34) W. S. asks: How much power does it take to run a small planer, to dress strips of wood 2 inches wide? A. About half a horse power.

(35) J. S. asks: 1. How is ozone powder made? A. We know of no such substance. 2. How can I test for ozone? A. The usual test for the presence of ozone is its action upon paper moistened with a solution of iodide of potassium and starch.

(36) C. H. M. says: I have a colored chromo which has become defaced by a spot of ink. How can I remove the ink without taking out the color of the chromo? A. Try a little oxalic acid applied with a camel's hair brush, and absorb with good bibulous paper.

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

T. S. L. G.—No. 1 is iron pyrites in quartz. No. 2 is talc.—F. M. S. S.—The specimens did not come to hand. If the silver is present as chloride, the chloride of silver may be reduced to metal by zinc and dilute sulphuric acid.—U. D. M.—The white is kaolin, and is valuable. The other is clay, and is less so.—J. T.—Not gutta serena. It consists principally of a gum, much resembling in character Canada balsam. The coloring matter may be nearly all removed by boiling water to which has been added a little alcohol. It may then be further purified by dissolving in ether or naphtha, filtering the solution, and evaporating the ether to dryness.—G. A. F.—It is carbonate of lime, and contains no barium salts.—F. P. M.—It is galena or sulphide of lead.—A. W. S.—No. 1 is quartz containing small amount of iron. No. 2 is clay rock containing decomposed sulphide of iron.—H. W.—It is chromic iron.—T. P. S.—It is a crude pipe or porcelain clay, of some value if found in large quantities.—W. O.—It is the larva of the *Limnophilus subpunctulatus*. Consult Packer's "Guide to the Study of Insects," pp. 616-620.

COMMUNICATIONS RECEIVED.

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

- On Experimental Geometry. By A. B.
On the Electric Telegraph. By L. M. B.
On Intermittent Springs. By J. F. R., and by G. H. H.
On Moistening Tobacco. By W. B.
On Grasshoppers' Eggs. By J. F. D.
On Preserving Fish Bait. By C. F.
On Snake Bites. By J. M. M.
On Cotton Factories in Louisiana. By E. H.
On Bees Making Honey. By H. L. E.

Also inquiries and answers from the following:

- A. O. S.—W. F. B.—E. U. S.—C. W. B.—C. L.—J. R.
—A. H. R.—A. N. B.—H. D. E.—L. M. B.—E. H. D.—
C.—L. E. B.—H. M. W.—H. C.—C. J. T.—S. M.

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.

Enquiries 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 wood-carving machinery? Who sells mariners' compasses? Who is the best metal-testing machine? Who makes the best insulating compound for telegraph wires? Why do not makers of electric telegraph apparatus 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, May 2, 1876,

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 patent numbers. Includes items like Abdominal supporter, Acid, recovering, Adding machine, Air, compressing, Alarm, burglar, etc.

Table listing inventions with names and patent numbers. Includes items like Cotton gin feeder, Cracker box, show, E. & C. Maginn, Cranberries, etc., gathering, A. K. Gle, Cuff fastening, S. Houghton, etc.

Table listing inventions with names and patent numbers. Includes items like Pump, E. Reynolds, Pump, air, F. Manz, Pump, steam and vacuum, G. R. Gleason, etc.

DESIGNS PATENTED.

Table listing designs patented with names and dates. Includes items like 9,251, 9,252.—TYRE.—D. W. Bruce, New York city, 9,253, 9,254.—CARRIAGE STEPS.—E. A. Cooper, Lancaster, N. Y., etc.

SCHEDULE OF PATENT FEES.

Table listing patent fees. Includes items like On each caveat, \$10; On each Trade mark, \$25; On filing each application for a Patent (17 years), \$15; etc.