(29) R. E. asks: Will soap suds improve the soil, no matter what soap has been used? The suds contain sal soda. A. Yes, if the quantity used be not excessive.

(30) F. C. S. asks: 1. Please give directions for preparing a simple but good silver solution for plating by the battery process. A. Dissolve ¾ oz. cyanide of potassium in a pint of water, and hang in it sheets of silver connected with the positive pole of a battery. A porous cup, containing a like solution, and an iron or copper plate connected to the negative pole of the battery, is also placed in the jar with the silver. When a deposit forms on the plate in the porous cup, the solution will be of a proper working strength. 2. With what shall I charge a Bunsen battery? A. Fill the porous cup with strong nitric acid, and the outside vessel, which contains the zinc, with water to which from twelve to twenty parts sulphuric acid in one hundred parts water have been added. 3. How can carbon plates be preserved? A. They should be placed in water after being used, and allowed to remain until the absorbed battery product has been dissolved out of them.

(31) J. H. S. asks: Can you tell me of any acid that will dissolve the oxide of iron? A. There is nothing cheaper or more effective than muriatic acid for the purpose. Dilute sulphuric acid will dissolve it, but is not nearly so effective.

(32) C. W. C. says: Ships laden with petroleum in cases (and so far as I have been able to learn, the same is true if the oil is shipped in casks) experience more or less local deviation in their compasses, varying as to the position of the ship's head and the length of time occupied in loading. This deviation is found to gradually disappear during the progress of a protracted voyage. At least this has been my experience. My theory is that it is due to a polarization that takes place in the iron contained in the packages containing the oil, while laying a long time in a ship with the head towards the north, as is usually the case with ships loading at the wharves in the East river, New York. But why should this be so much more marked with petroleum-laden ships than with ships laden with other cargoes? Many captains with whom I have conversed upon the subject are of opinion that it is the oil which affects the compasses. Can you enlighten me? A. Your theory is undoubtedly the correct one. During a long voyage the changes in position of the vessel would tend to dissipate the previously induced magnetism of the casks. As petroleum is not sufficiently magnetic to affect the compass, some other cause must be looked to for the marked deviation of the needle on petroleum-laden vessels.

(33) A. B. C. asks: Can you inform me if there is any chemical or other article, the fumes of which, when burnt, will be destructive to flies and other small insects? A. The sulphurous acid gas evolved by burning sulphur in contact with the air will accomplish this; but its bleaching properties are such that, if it be permitted to come in contact with colored woolen and other fabrics, their colors will be destroyed.

(34) F. S. A. says: I have an aquarium holding 5 gallons, which I wish to stock with salt water animals and plants; but although I have repeatedly attempted to do so, both animals and plants have died from the water becoming foul. Could I purify the water by driving air through it or by forcing the water to a hight of 5 feet and allowing it to fall back into the tank in a constant stream, ¼ inch in diameter? A. In similar cases on a larger scale, the mechanical method of aerating the water by a steady current of finely divided air forced into the water is for the most part resorted to. Where this method is employed very little vegetation should be used, and much of the light excluded.

(35) C. W. M. asks: 1. What should be the diameter of a helix whose length is 6 inches, to give the greatest lifting force? Of what size should the wire with which it is wrapped be? A. Such questions can be answered definitely only when the other relations of current magnitude, resistance of circuit, etc., are known. Three or four Daniell cells and a helix of No. 20 or 23 copper wire will charge an iron core sufficiently to lift 4 or 4 lbs. The helix should be about ½ inch internal and 1¼ inches external diameter.

(36) H. C. says: I was told by a friend that if I used a solution of common washing soda in water it would make my hair blonde. I was so foolish as to try it, and my hair is now an ugly red. What in the world am I to do? A. The application of alkaline solutions such as you employed not only removes all the natural oil from the hair, but soon weakens and finally destroys its vitality, as well as reduces to sesquioxide all of the iron salts to which was due its dark color. In fashionable society, at various times, this and even more objectionable, not to say dangerous, means have been resorted to, such as the employment of orpiment, chlorine water, sulphurous acid solutions, and even aqua regia (nitro-muriatic acid). It is hardly necessary to add that, in the majority of cases in which the hair has been thus misused, the result has been its complete or partial loss. We would advise you, as the safest and most sensible method, to have your hair cut as short as possible; this will cause the remainder to grow quite rapidly, and with its natural color. If it is very objectionable to have the hair thus shortened, a suitable dye might be employed of as near the color of the original hair as possible. Make only one application of this dye; and as fast as the hair grows, cut off a corresponding length from the extremity of the dyed capillus until all of that portion has been removed. The former suggestion is, however, much the quicker and better method. It would be well to keep the hair moist with a little simple pomatum.

(37) L. M. K. asks: I want to build a small steamboat 20 feet long and 10 feet wide, to draw as little water as possible. How shallow can I make the hull? I want the boat to run at the rate of from 7 to 12 miles an hour. A. We doubt the practicability of making a boat of this size, with the limited conditions mentioned, having the desired speed.

(38) A. C. C. asks: How can I make a spectroscope? A. See p. 261, vol. 31.

What will remove the brownish deposits in porcelain urinals? A. First wash well with a little lime and potash, rinse with water, wash again with dilute muriatic acid, and rinse finally with water.

(39) H. M. says, in reply to T. C. D., who asks what is the lowest temperature indicated in any polar expedition: *The Polar and Tropical World* says: "The voyages of Kane and Belcher have made us acquainted with the lowest temperatures ever felt by man. On February 5, 1854, while Kane was wintering on Smith's Sound (78° 37′ N. latitude), the mean of his best spirit thermometer showed a temperature of —68°, or 100° below the freezing point of water. Then chloric ether became solid, and carefully prepared chloroform exhibited a granular pellicle on its surface. The air had a perceptible pungency upon inspiration, and every one had to breathe guardedly, with compressed lips. About the same time (February 9 and 10, 1854), Sir E. Belcher experienced a cold of —55° in Wellington Channel (75° 31′ N.) and the still lower temperature of —62° on January 13, 1853, in Northumberland Sound (76° 52′ N.). Whymper, on December 6, 1866, experienced —58° at Nullato, Alaska (64° 42′ N.)

(40) J. W. D. E. says, in answer to E. H., who wishes to know why his cannon has lost its loud report: This is very common to all guns which have been long in use. The reason is that the bore of the gun, probably several inches from the breech, has become enlarged, in which case there is a vacant space between the bore of the gun and the charge; and at the instant of discharge a considerable amount of the gas escapes.

COMMUNICATIONS RECEIVED.

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

On Rat-Tailed Larvæ. By R. M.

On Expansion and the Locomotive. By F. G. W.

On Lightning Rods. By W. J. C.

On Removing Shrunk-On Pulleys, etc. By T. J. B.

Also inquiries and answers from the following:

J. H. A.—H. F. W.—H. D. E.—J. E. B.—J. R. A.—S. H.—H. C.—H. C.—J. E. H.—W. F. W.—H. H. L.—W. G. W.—C.—E. H. R.

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 makes knitting machine needles? Who sells mariner's compasses? Whose is the best machine for drilling holes in brush backs? Why do not makers of astronomical 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 August 29, 1876,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

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APPLICATION FOR EXTENSION.

MAKING CARPET LINING.—J. R. Harrington, Brooklyn, N. Y.

DESIGNS PATENTED.

9,473.—EMBROIDERY.—E. Crisand, New Haven, Conn.
9,474 to 9,477.—CENTER PIECES.—S. Kellett, San Francisco, Cal.
9,478.—NUBIAS.—J. Phipps, Philadelphia, Pa.
9,479, 9,480.—CARPETS.—A. Righter, Philadelphia, Pa.
9,481.—OIL CLOTH.—J. Robley, Brooklyn, N. Y.
9,482.—SHIRT FRONT.—S. Steinweg, New York city.
9,483.—CHAIN SWIVELS.—V. Draper, North Attleborough, Mass.
9,484.—ORNAMENT.—A. Miozzi, New York city.

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