

from the charcoal and gives each piece a short exposure to air while hot; the oxidation by contact with the air while hot gives the color or cloudiness. The distance the box is held above the water may be 6 inches to 2 feet, according to the effect you wish to produce.

(7) G. H. S. asks: 1. Is it true that the force of an explosion of dynamite, giant powder, or indeed any of the nitroglycerine compounds, acts vertically? If true, does it exert greatest pressure downward? If above be true, please explain the rationale of the phenomenon. Why does dynamite when exploded differ from gunpowder, since, like gunpowder, the pressure is produced by the rapid disengagement of a large volume of gas under the action of heat, due to chemical combination? A. The explosion of dynamite and similar compounds differs from that of gunpowder in being more sudden. It acts equally in all directions except as modified by the position of the point of ignition. It is often supposed to act most violently downward, because the air shows no effects of an explosion. The general reason why dynamite is more powerful than gunpowder is because it is a chemical compound, and not a mechanical mixture.

(8) W. H. complains of having trouble in working Prof. Husnick's asphaltum process. A. First obtain a pure solution of asphaltum in turpentine from some reliable drug house; we recommend Eimer & Amend, New York. Add a little oil of lemon. Then coat the plate, expose, and when dry and cold proceed to develop. This requires great care, and is apt to proceed too rapidly. For further particulars see SCIENTIFIC AMERICAN SUPPLEMENT, No. 158, page 2507, No. 138, page 2195, No. 243, page 3866. The benzole dissolves out the portions of the film not affected by light.

(9) J. V. F. writes: I have a linoleum cloth on my floor which looks rough and the first finish is worn off. What shall I use to renew it and make it last longer? A. Wash occasionally with skim milk and water. Rub once in three months with boiled linseed oil. Put on a very little, rub it well in with a rag, and polish with a piece of old silk.

(10) A. G. A. N. writes: I have a large quantity of argentic nitrate partially oxidized; also some scraps of gold of different carats. How am I to proceed to extract the pure metal from each one? A. See Practical Hints on Saving Gold and Silver Wastes, in SCIENTIFIC AMERICAN SUPPLEMENT, No. 307. Metallic silver can be obtained by fusing the chloride with dry sodic carbonate in a Hessian crucible, and the gold is thrown down by iron sulphate from a solution of its salts.

(11) B. H. L. asks: How can I fasten a lead top on a carbon plate? A. Make a mould of wood or plaster of Paris large enough to inclose the end of the carbon, and also to produce a cavity for the lead, then cast the lead around the carbon. The mould, if made of plaster, should be thoroughly vented and baked before use.

(12) J. C. F. P. asks for instruction for making large (or small) trays out of wood, for photographic purposes—the best manner of making the joints, and the best process of rendering them water and chemical proof. A. Make them of white pine. Halve the corners. Put them together with brass screws. Soak the tray when done in hot paraffine, or make the joints with glue to which has been added a little bichromate of potash. Expose to daylight for 10 or 12 hours, and finally varnish heavily with alcoholic shellac varnish.

(13) E. P. B. asks: Is there any drug or acid or any other cheap preparation that will destroy the smell attaching to salad oil and China nut oil, and render them odorless and not make them muddy or discolored? A. Thoroughly wash the oils with hot water, frequently renewed, or blow steam through them until the desired effect is produced. A. If freely employed for some time succeeds admirably with certain oils, and its use has the advantage of not introducing moisture into the article. Another method is to boil the oil for 15 to 30 minutes with calcined magnesia. To remove the odor, however, charcoal is the simplest means, but of course it takes the color with it.

(14) J. A. asks: 1. Is there any way of removing stains made by water in tracing cloth? A. Tracing cloth is made by varnishing linen with Canada balsam dissolved in turpentine, to which a few drops of castor oil have been added. An application of this mixture will cover the spots from which it has been partially removed by water. 2. I desire a rapid method for copying printed engravings, cuts, etc., clearly, from one book into another, without injuring the leaves in either book; or how could I accurately reproduce them in any manner? A. We know of nothing simpler than photography.

(15) J. G. C. asks: 1. Can I obtain a supply of oxygen by any simple process of separation from the atmosphere? A. For separation of oxygen from the atmosphere, we refer you to our SCIENTIFIC AMERICAN SUPPLEMENTS, Nos. 92, 119, 313, which we can send you for 10 cents each. 2. Why does egg albumen assume the condition it does from the effect of beating? A. Egg albumen has a high coefficient of viscosity and does not evaporate. Hence the bubbles it forms last for a long time.

(16) W. H. R. asks: 1. Is there any cement that will fasten glass to brass? A. Boil 3 parts of resin with 1 part of caustic soda and 5 parts of water, thus making a kind of soap, which is mixed with  $\frac{1}{4}$  its weight of plaster of Paris. 2. Please give the analysis of refined petroleum. A. It should have a density of .46° Baumé, a flashing point of 115° Fah., and a burning point of 138° Fah. 3. Is there much chance for improvement in oil lamps? A. There is always an opportunity of producing something better, although a great deal has been done in this line. 4. What is the extreme range of the English 110 ton gun? A. They penetrate

35 inches of iron at 1,000 yards. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 586, for article on this subject. Such guns are very seldom tested as to the extreme distance to which they would send a projectile. To do this they would have to be fired at an angle of 45 degrees, and the whole force would be expended in carrying the projectile the greatest distance. They are instead fired with much flatter trajectory, to give penetrating power of more or less efficiency at a certain distance.

(17) E. K.—The black willow flowers in May, and fruits in June. As the catkins usually fall off in one piece soon after fruiting, you will probably not be able to obtain any so late in the season. The black willow is widely distributed, and ought to be found in abundance in your neighborhood. If you need the catkins for study, you might perhaps get dried specimens from Mr. M. S. Bebb, of Rockford, Ill., who has made the study of willows a specialty.

(18) W. H. H. desires a receipt for making a white liquid for stamping with perforated paper patterns on dark goods. A. Use white lead mixed with dry gum arabic powder, which goes through the perforations and is attached to the material by pressing with a hot iron. We know of no fluid for the purpose.

(19) D. L. asks if there is any economical way to condense the exhaust steam of an engine so it can be used in the boiler again, where the water supply is very short. A. An air condenser may be made of iron pipe so that air can circulate upon the outside, cooling the pipe, which in turn will condense the steam upon the inside. If you have a small portion of water to spare, the coil may have a sprinkler over it, so as to wet the surface with cold water, which will enable you to use a much smaller coil than when cooled by air alone.

(20) O. C.—You can carry steam 200 or 300 feet if pipes are carefully fufed and boxed, with very little loss. You cannot pump as much water through a two inch pipe as a pump having a 3 inch discharge opening is capable of pumping.

(21) J. J.—The pole star is about 1° 17' from the true pole. When Polaris is on the meridian at upper culminations, the star Alioth, the second star from the pointer in the dipper handle, will be on the lower meridian. The east and west elongation is opposite to Alioth when Alioth is at the same altitude as Polaris.

(22) A. S. E. asks (1) how to take iron rust from granite. A. Scrub with dilute muriatic acid. 2. A cement to make joints for granite monuments. A. Use clean sand 20 parts; litharge 2 parts; quicklime 1 part; and linseed oil, sufficient to form a thick paste. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 313.

(23) C. W. desires a recipe for preserving the juice of lemons. A. Mix it with one-tenth of alcohol and then bottle. By this means it will be prevented from decomposing.

(24) Portnanteau asks: What would be the best way of renovating a black canvas covered portmanteau on which the color has been rubbed off a good deal? A. Coat it with a black leather varnish, such as the following: Digest shellac 12 parts, white turpentine 5, gum sandarac 2, lampblack 1, with spirits of turpentine 4, and alcohol 96.

(25) R. & K. ask the manner of preparing and the ingredients used in the manufacture of carpenter's prepared chalk. A. The ordinary white crayons are made by taking the finest powder of calcined oyster shells, sifted through muslin. Mix up with water in which a little rice and a little white sugar candy has been boiled; according to the quantity of the rice, so will be the hardness of the crayon. For process of manufacture, see Spon's "Workshop Receipts," first series, which we can send you for \$2.

(26) H. S. asks: 1. What is understood by second growth of potatoes? A. In order to obtain a maximum crop of potatoes, they must have constant growth, which, if checked in any way, the tuber ceases to enlarge evenly and starts a second growth from its eyes, forming prongy or knobby potatoes. 2. What kind of grass is best on a hill that washes? A. Bermuda. 3. Where can I get a good book on poultry? A. We can send you Lewis' "Practical Poultry Book" for \$1.50, postpaid.

(27) E. R. S. desires a preparation that is good for marking and stenciling cases with a brush. I have been using lamp black, but it rubs off so. I am now using bluing, but it is so thin that I cannot stencil with it, and it also runs terribly in marking. A. Dissolve ordinary asphaltum in turpentine, and you will have an excellent stenciling ink. See also answer to query 2, in SCIENTIFIC AMERICAN for September 3, 1887.

(28) R. G. writes: I have in my possession a rosewood bassoon, which is cracked through in one of the joints. Would you give me a receipt for a cement or glue which will resist the warm moisture, and make the instrument air tight? A. Powder and dissolve one part of glue in one of thick linseed oil, varnish boiling hot, and mix thoroughly. In using it, heat the two pieces, apply the glue warm, and press the pieces together.

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

A. T.—They are worthless.

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INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

September 6, 1887,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Table listing inventions with names and patent numbers. Includes items like Auger power and tile injector, Automatic indicator, Axles, Baling press, Bicycle holder, etc.

Table listing inventions with names and patent numbers. Includes items like Drill, Dust conveyer, Electric cable, Electric generator, Elevator, Engine, Engines, Exhibitor, Eyeglass, Feed bag, Fender, Fence, Fencing, Furnace, Gauge, Galvanic cell, Gas burner, Gas pressure regulator, etc.

Table listing various scientific articles and their page numbers, including topics like 'Metal sitting machine', 'Stoves or fire boxes', 'Threshing machine', 'Photographic camera', 'Iron and steel analysis', 'Autocopyist', 'Systems of distribution of electricity', 'Hand machinery', 'Hydrogen gas process', 'Virulent diseases', 'Trade marks', and 'Printed envelopes'.

Continuation of the table listing scientific articles and their page numbers, including 'Seamless tubes', 'Reclining chair', 'Sewing machine', 'Sawmill carriage', 'Photographic camera', 'Iron and steel analysis', 'Autocopyist', 'Systems of distribution of electricity', 'Hand machinery', 'Hydrogen gas process', 'Virulent diseases', 'Trade marks', and 'Printed envelopes'.

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