

ductions," but are the product of skilled "human workmanship." There is no difficulty in perceiving a striking difference between a flint implement or arrow head and a splinter of quartz.

(16) H. C. W. asks: 1. If an engine of 100 horse power propels a boat 5 miles per hour, will an engine of 200 horse power double or quadruple the speed? A. The power required is as the cube of the speed. It would require 8 times the power for 10 miles per hour, that would be necessary for 5 miles. 2. If two cannon balls, one weighing 8 and the other 2 pounds, be fired with the same velocity, which will go the further? A. The larger one.

(17) W. E. writes: 1. I have a lot of grapes that I want to keep on the stems until the middle of the winter. How can I do it? A. Dip the ends of the stems in melted paraffine and pack the bunches in tight boxes, with or without a packing of cotton. 2. Can you refer me to any paper that has an article on hammering saws? A. See SCIENTIFIC AMERICAN, Vol. 36, page 259.

(18) T. B. asks: What is spelter composed of? Dictionary says, an impure zinc. Is that the same as the spelter commonly sold in the stores for brazing purposes? A. No. Spelter for brazing copper and iron is composed of copper 1 part, zinc 3 parts. Melt the copper, then add the zinc. When the alloy has cooled sufficiently to become solid, pulverize coarsely in an iron mortar.

(19) C. E. B. asks: 1. How can I put a hole through the bottom of a glass bottle? A. By means of a very hard drill wet with turpentine. 2. Will a wooden rod coated with shellac varnish make a good insulator? A. It will answer for some purposes, but is not so good as glass. 3. In making the resinous cake for an electrophorus I find the resin (when used alone) to be too brittle. Can you tell me of anything that I can mix with the resin so as to obviate the above difficulty? A. Use a mixture consisting of shellac 5 parts, wax 1 part, pitch 1 part. 4. In making a Leyden jar, with what is the tin foil put on? A. Shellac varnish. 5. It is a very difficult matter to put the tin foil on the inside of a Leyden jar. Can you give me directions for anything else that I could put on with less difficulty? A. You may fill your jar half full of crumpled pieces of tin foil.

(20) J. H. S. writes: I am using a gelatine copying pad which I have made myself. I find it very useful, but experience some trouble in washing the ink off. Can you tell me of some method which will take the ink off easily? A. If you allow the ink to remain it will be absorbed in a few hours so that it will not print. This renders it unnecessary to wash the pad.

(21) F. H. S. asks: 1. Which has the most power, pressure of steam being equal and cylinder the same size, an oscillating or ordinary eccentric engine? A. Practically there is scarcely any difference. 2. Can you also refer me to any number of the SCIENTIFIC AMERICAN which contains plain directions for making either kind, that a good mechanic could follow? A. There are no such instructions published in the SCIENTIFIC AMERICAN, nor can you find them published, except perhaps scattered through a number of books.

(22) R. A. R. writes: I see mention made of graphite as a lubricant. Is it, as is claimed, far superior to oil as a lubricant and a remedy for hot journals, friction between wearing parts of a machine, etc.? Is it what it is claimed to be? A. Graphite, or black lead, has long been used with oil as a lubricant, in troublesome cases, but care must be taken that the graphite is clean and fine, otherwise it will not answer well.

(23) W. E. C. asks: Can you give me the rule to find the vertical height of a ball governor, the number of revolutions being given? I am thinking of making a different governor for our engine. The present one runs 56 revolutions, and the vertical height is 16 inches. According to the rule (188 / revolutions)^2 = height—the height is only 11 2/3 inches. I want to run the new one 78 revolutions, but this rule don't appear a safe one. A. Your rule appears to be correct. Another method is to calculate the number of vibrations of a pendulum of the given length, the revolutions of a governor will be half the number of vibrations.

(24) R. L. S. writes: In a late work on philosophy I notice the author makes a difference between "momentum" and "striking force." He says momentum "is equal to the weight of the body multiplied by its velocity per second expressed in feet," and that the "striking force of a body is equal to its weight multiplied by the square of its velocity." Example: A bullet weighing two ounces, fired with a velocity of 1,400 feet per second, would strike with a force of 245,000 pounds. Is there any difference between momentum and striking force? Please explain. A. Momentum means the mechanical effect which a body in motion will produce in a moment (second) of time, and is as the weight multiplied by its velocity. "Striking force,"—"Force of Impact," and "Vis Viva"—all these terms mean the same thing; the whole mechanical effect which a body in motion will produce in being brought to rest, no regard being had to the time in which the effect is produced, and is as the weight multiplied by the square of its velocity.

(25) A. D. asks: What sort of hose, rubber, cotton, linen, etc., is most durable for country use with lawn sprinklers, etc., the size being 1 1/4 inch? A. Cotton or linen; but it must be carefully drained and dried after use; but if this cannot be done, then "carbolic" rubber hose is to be preferred.

(26) C. M. D. writes: Yesterday I watched the engineer while boiler-cleaning, and find on the bottom of shell there had formed scale. This was broken up in small pieces and left the iron voluntarily. All did not come off, and the thickness varied. I have never tried any of the compounds advertised to prevent scale; have always been warned against them. Some say that potatoes are a preventive or loosener, some say crude oil. One remedy suggested by one of the best machinists in the city was to blow out, half way down,

twice a week. Now please give me your idea of the last-named preventive and such other information as you think will be beneficial. A. The blowing down is good; only instead of blowing half way down twice a week, blow down two inches once a day. Potatoes in small quantity are good, so also is a small quantity of crude petroleum oil.

(27) G. S. C. asks: Can you tell me the cause of the Indian summer haze, so frequently remarked? A. Mainly due to vapors rising from decaying (fermenting) leaves, recently fallen; partly to smoke from burning leaves, swamp grasses, prairie fires, etc.

(28) E. L. asks: 1. Can water through heavy pressure in a heater get above 212° Fah.? A. Yes. 2. How is the best tailor's chalk made? A. It is a natural mineral (talc).

(29) W. E. P. asks: 1. How fast should the teeth of a circular saw run in sawing hard wood into lumber, to get the best effect of the steam? A. 8,000 to 9,000 feet per minute. 2. How fast should a pair of 30 inch underrunner burrs run in grinding corn? A. About 260 revolutions per minute. 3. What is the practical difference between hemp and ring packing for cylinders? A. Ring or metallic packing has less friction and will keep tight much longer. 4. How are 2x4 inch engines packed? A. Best packed with metallic rings.

(30) J. S. N. asks: 1. What is the least depth that paddle wheels should be immersed in water to work well on a boat 20 inches deep? A. Should not dip less than 6 to 8 inches. 2. Should I have 4 or 6 buckets, if I make 100 revolutions per minute? A. Should have a sufficient number that at least one bucket has constantly full dip. You cannot work successfully at 100 revolutions per minute with a paddle-wheel.

(31) E. W. asks for a recipe for ebonizing wood. A. Apple, pear, and walnut, if fine grained, may be ebonized by the following process: Boil in a glazed or enameled iron vessel with water, 4 oz. of ground gallnuts, 1 oz. of logwood chips, and 1/4 oz. each of green vitriol and crystals of verdigris. Filter while warm, and brush the wood over with this repeatedly. Dry and brush over with strong cold solution of acetate of iron and dry. Repeat this several times, and finally dry in an oven at a moderate temperature, and oil or varnish.

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

E. H.—Scales of mica and carbonate of lime.—W. W. A.—Not a petrifaction—but partially altered hornblende.—C. H. C.—It is hornblende rock.—F. D. H.—Hornblende.

INDEX OF INVENTIONS FOR WHICH Letters Patent of the United States were Granted in the Week Ending November 2, 1880, AND EACH BEARING THAT DATE.

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1866, 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. We also furnish copies of patents granted prior to 1866; but at increased cost, as the specifications not being printed, must be copied by hand.

Table listing various inventions such as 'Acid, apparatus for burning sulphur to produce sulphuric, H. Glover', 'Advertising device, A. S. Wetmore', 'Air compressor, H. C. Sergeant', etc., with corresponding patent numbers.

Table listing various inventions such as 'Car, stock, J. Kay', 'Car wheel, J. H. Watt', 'Car window cinder fender, G. W. Smith', etc., with corresponding patent numbers.

Table listing various inventions such as 'Metal slotting apparatus, W. H. Taylor', 'Metal working machine, compound, R. B. Jentsch', 'Mill for reduction, E. P. Baugh', etc., with corresponding patent numbers.

DESIGNS.

Table listing designs such as 'Carpet, J. B. Neil', 'Glassware, A. H. Bagg', 'Type, font of printing, A. Will', etc., with corresponding numbers.

TRADE MARKS.

Table listing trade marks such as 'Clock, H. J. Davies', 'Coffee, Java, J. Stiner', 'Desk and bench, school, J. L. Ayres', etc., with corresponding numbers.