

per cent of the power. This can only be ascertained by knowing the amount of friction in the change wheels for a given strain.

(15) B. F. T.—High pressure engines exhaust into the air, and realize their power only from boiler pressure and expansion.

(16) D. H. V. asks: 1. Can a complete vacuum be formed, and, if so, what would be the external pressure on vessel containing same?

(17) J. M. S.—The atmospheric pressure only acts upon surfaces freely exposed to the atmosphere. When other pressures are applied, the atmospheric pressure is not removed.

(18) W. C. B. asks a short practical method of calculating, without the aid of the nautical almanac, the time of high water on any given day at a port whose corrected establishment is known.

(19) J. G. McK. writes: We have boiler and engine capacity to do our work with 30 pounds steam. Is it not economy of fuel to carry a higher pressure, say 80 or 90 pounds?

(20) R. K.—The solar mean day is 24 hours. The sidereal day is 23 hrs., 56 m., 4.091 s. in solar mean time, which is the time of revolution to the same star.

(21) L. S. D. asks what to use to polish a new mahogany counter. A. Bees' wax 1/2 pound, alkanet root 1/2 ounce; melt until well colored.

(22) C. G. desires a remedy to destroy ants. A. Use powdered borax sprinkled around the infested places.

(23) J. L.—Stuttering is a purely nervous difficulty. The vocal muscles are able to do perfect work, but, from deficient innervation the mind cannot command them fully.

(24) D. E. X. asks a remedy for the "heaves" in a horse. A. Take calcined magnesia, balsam of fir, balsam copaiba, of each 1 ounce, spirits of turpentine 2 ounces.

(25) J. F. asks how wash bluing, such as is put up in small wooden boxes, is made. A. Ultramarine is thoroughly mixed with small quantities of an adhesive substance.

(26) E. J. K. asks if aluminum is prevented from rusting by the formation of a thin scale of aluminum oxide. A. Aluminum may, like many other metals, become protected from further oxidation by the formation of a semi-oxidized film.

(27) G. E. B.—Hydrogen gas has the lowest conducting power of the gases; lead the lowest conducting power among the metals; asbestos the lowest conducting power of minerals; and cotton is probably the lowest conductor among vegetables, charcoal being also very low.

(28) E. H. asks how near to New York sulphur springs have ever been discovered. A. While water containing slight traces of sulphur may be found within comparatively few miles of the city.

(29) F. S. B. asks for the composition of hydraulic mortar. A. One part of Portland cement to two parts of sand.

(30) T. J. G. asks: 1. Explode a charge of dynamite between two stone slabs of equal weight and strength, lower one on the ground, and both in contact with the charge.

(31) S. V. T. asks for a cement that will mend china, which will not give way under cold water. A. Mix quickly 50 parts of plaster of Paris, 10 of quicklime, and 20 of white of egg.

(32) Sphinx ("L. L. S.," "O. J., Jr.," and "T. L.").—The Grecians usually represented the sphinx as a winged lion with the head and breast of a woman. The great Sphinx of Egypt, however, is a recumbent andro-sphinx, or man-headed lion.

(33) J. E. C. asks: How much would a composition of gas and air expand in exploding in the proportion of one of gas to ten of air?

(34) W. E. W. asks: Why is it that hydrogen is any more diffusive than oxygen or any other diatomic element? Why is it that a hydrogen molecule can crawl between the intervening spaces between the molecules of an iron cylinder, in attempts to liquefy it.

(35) H. A. M. says: A has an orange tree which gives a sour flavored orange. To sweeten the fruit he makes a hole in the tree and fills it with as much sugar as he can stow in.

(36) G. F. H. asks: Will you please inform me if silkworms in cocoons can be killed by electricity, and how it is done? A. We know of no way of killing silkworms in cocoons by electricity.

(37) J. B. asks: Is the stroke of an engine the length of cylinder? If not, how is the stroke measured? What is relative horse power of two engines: 1st cylinder 10 inches, 3 feet stroke, 2d cylinder 12 inches, 2 feet stroke.

(38) Dr. H. S.—Warts may be burned off by application of nitrate of silver or other caustic, but we know of no special treatment to prevent their recurrence.

(39) H. J. P.—Vacuum gauges do not indicate pounds, but correspond with the barometer, and indicate inches of mercury.

(40) E. S. asks directions by which considerable adulterations of white lead and linseed oil may be detected by one not a chemist. A. To detect barytes in white lead, dissolve the latter in dilute nitric acid.

(41) A. B. asks why infusorial earth is called electro-silicon. Is it a non-conductor of electricity or a non-conductor of heat? What is it composed of? A. It is a siliceous silica, from which the trade name "electro silicon" has been derived.

(42) Mrs. J. B. F.—The insects which you send are a species of plant louse of the genus Lachnus. They prove injurious to evergreens when they occur in large numbers.

remedy is hot water a few degrees below the boiling point, which will not injure the tree, but will effectually destroy the pest.

(43) O. W. M. desires a recipe for making a stain to imitate cherry or cherry stain. A. A cherry stain may be made by boiling in a copper kettle 3 quarts of rain water, and 4 ounces of annatto.

(44) G. A. G. asks how to destroy ants that infest his lawn. A. If the nests of the ants can be readily found, there is no better remedy than to pour a tablespoonful of bisulphide of carbon into each hill.

(45) W. A. writes: I have noticed in your issue of the Scientific American, at various times, the receipt for making a printing machine called the hektograph. You also gave a recipe for making a black ink to be used with the same.

(46) W. C. B.—To make stereotypers' paste: Take 5 ounces of flour, 7 ounces of white starch, a large tablespoonful of powdered alum, and four quarts of water. Put the flour, starch, and alum into a saucepan, and mix with a little of the water.

(47) W. F. C.—Black, glossy leather belts, made of japanned leather, can be improved in appearance by rubbing with linseed oil.

(48) G. H. L.—The fluid extract of sarsaparilla is made by exhausting the powdered root with alcohol. Sarsaparilla sirup used in soda fountains is made of oil of wintergreen 10 drops, oil of anise 10 drops, oil of sassafras 10 drops.

(49) N. P.—Ox gall is an excellent and delicate cleansing agent. It is a liquid soda soap. But a receipt said to be excellent for removing all such substances as tar, axle grease, etc.

(50) R. I. M.—For a good paste that will neither decay nor become mouldy, mix clean flour with cold water into a paste well blended.

(51) A. W. L. writes: 1. A gentleman who has been lecturing here says that but very little rain has fallen in Palestine for 1,200 years.

(52) E. A. M. D. asks the greatest height known of a wave of water in mid-ocean and near land, during a storm. A. According to Scoresby, the greatest height of waves from storms observed by him was 43 feet from top to bottom of trough.

(53) J. T. McC. asks how oil can be taken out of a marble tombstone; has been in it now about four years. A. Such stains can be removed by applying common clay saturated with benzine.

(54) J. N. W. asks how the composition used for whitening military belts is made. A. First brush the belt over with a mixture of: Best boiled linseed oil..... 4 oz. Precipitated oxide of zinc..... 1 "

(55) E. D. asks how to gild the edges of cards in gold and silver. A. Obtain an extremely thin leaf of gold. Put your cards together so that the edges are perfectly even. Then place in a press,

with the exposed edge uppermost. Coat the edge with a mixture of red chalk and water. The gold is blown out from small books, and spread on a leather cushion, where it is cut to the proper size by a smooth edged knife. A camel's hair pencil is dipped into white of egg mixed with water, and with this the partially dry edge is moistened; the gold is then taken up on a tip brush and applied to the moistened edge.

(56) G. Z. asks: 1. Would you kindly give me a good and simple method for purifying the gas called carbonic anhydride (CO2), chemically expressed? A. Wash it with a little water already saturated with gas. 2. Also a formula for making fireproof wood having a black appearance. A. Wood is made fireproof by treatment with various metallic salts, as tungstate of soda or silicate of soda.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted,

June 22, 1886,

AND EACH BEARING THAT DATE.

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

Table listing inventions and their patent numbers, including: Abdominal support, W. Teufel... 344,065; Adding machine, Burnes & Shapley... 344,025; Adding machine, E. Halsey... 344,180; Advertising puzzle, L. G. Granger... 344,040; Air heater, J. L. Wells... 344,285; Alarm. See Electric alarm.

