(38) J. P. A. asks: What is Paris green, and how is it made? A. Paris green is an arsenite of copper, the chemical symbol being $2CuO,H_2O,As_2O_3$. It is prepared by dissolving arsenious acid in a solution of carbonate of potash, and decomposing the arsenite of potash thus produced, by adding sulphate of copper, when the arsenite of copper is precipitated.

(39) H. G. asks: How much water does a steam boiler require in, say, one hour to furnish an engine of 10 horse power? A. It varies, in different engines in common use, from 300 to 1,000 lbs.

(40) W. H. asks: What is the best instrument in use to test or register the temperature at a glass factory, where the heat rises to 2,500° Fah. or more? A. An air thermometer, or a Siemens pyrometer, can be used for the purpose.

(41) J. C. M. writes: I have a mercurial barometer, the column of which is broken about 6 inches from the bottom. There appears to be an air bubble, about ¼ of an inch long. How can I unite the mercury? A. We think it will be necessary to remove the mercury, boil it, and then refill the tube.

(42) J. B. writes: I have a steam engine which has been in use two years. The first year I could take hold of the flywheel and turn it around with all ease, when everything was cold; but now I cannot move it, unless I first let steam into the cylinder to warm it. The cylinder is true, and so are the rings; they have not been moved since they left the shop. I use none but extra winter strained lard oil. What is the trouble? A. We presume from your account that the engine is out of line.

(43) J. K. asks for a harmless method of eradicating dandruff. A. Dandruff (*Pityriasis*) is a chronic inflammation of the skin, characterized by the production of minute white scales or scurf in excessive quantity. The affection is often very rebellious to treatment. Various preparations are sold which are claimed to be beneficial, and physicians sometimes prescribe tonic infusions, purgatives, and the application of sedative lotions. In obstinate cases an internal dose in which arsenic is the essential element is sometimes prescribed. The efficacy and safety of such measures are to be doubted. Probably the best plan is to keep the hair short and shampoo it frequently with a solution of borax in warm water, avoiding rough treatment, which has a tendency to increase the irritation.

(44) M. E. T. asks: Can street lamps burning kerosene oil be lighted by electricity? A. We do not know of any electric lighting apparatus which could be advantageously used for this purpose.

(45) A. S. asks: 1. What thickness and what kind of glass are generally used for microscopic slides? A. Usually finest lime glass plate, one millimeter (about $\frac{1}{25}$th inch) thick. 2. Are there not two layers of glass? How are they fastened together? A. Yes, generally. Fastened by marine glue, dammar lac, balsam, etc. Consult Davies' "Preparation and Mounting of Objects."

(46) C. M. writes: Will you please settle a dispute between a friend and myself in regard to the use of chloroform and its effects on a human being? 1. I claim that if administered to a person while asleep it will produce the same effect as it would if the person were awake. He claims that it awakens the person the instant it is applied. Who is right? A. The effect is the same. 2. How much does it require to produce unconsciousness, if applied with a handkerchief? A. It depends upon the person, the age and condition. 3. Does it have the same effect on an intemperate person as upon one who is temperate? A. Yes, generally. 4. Would it be advisable to try an experiment? A. No.

(47) G. P. W. asks: What is the best coating for the finished iron work of machinery, to prevent rust, and to be easily removed when desired? A. A mixture of white lead and tallow is frequently used.

(48) J. D. M. asks: 1. Does increased distance from the motor cause a load to pull any heavier? A. No; if the weight of the connections is disregarded. 2. Does the diameter of a wheel make any difference on a level surface? A. As we understand you, it generally does, in practice.

(49) T. S. L. asks: Is there a rule in geometry for dividing a circle into any odd number of parts, for example, 3, 5, 7, 11, 13 parts? A. We do not think there is any rule quite so general as this. A number of polygons with an odd number of sides can, however, be described geometrically. See Barlow's "Theory of Numbers."

(50) J. H. W. asks: Will a gauge at the top of the steam drum and another at the bottom of a boiler indicate the same pressure? A. No; because the gauge at the bottom is pressed by the water, while the other is not.

(51) H. W. D. asks: What is the best plan for uniting large belts? A. Leather lacing is generally preferred. See SCIENTIFIC AMERICAN, August 7, 1875, p. 83; also, January 23, 1875, p. 52.

(52) A. F. asks: Is steam that is condensed from an iron boiler more healthful for drinking and cooking purposes than well water? A. It is more healthy than some well water, and is equal to the best; though not, perhaps, in taste.

(53) W. S. writes: We have an injector to throw water from a heater into a tank above. When the water is cold it works, but stops as soon as the water gets hot. Can you give us a remedy? A. The only remedy that occurs to us, if you must continue to use the present injector, is to abandon the heater.

(54) D. E. R. asks: Do you think petroleum oil would be a damage or a benefit to boilers, if passed through the cylinder and pumped into the boiler with the feed water? A. If a moderate quantity is used, and the boiler is frequently blown off and cleaned, the use of the oil does no damage, and is sometimes beneficial.

(55 W. M. writes: I wish to run a circular saw 4 inches in diameter, with a coiled spring. If after being wound up it would make one cut through hard wood (oak) 2 inches in diameter without rewinding it would be sufficient. A. There are spring motors in the market which would probably answer your purpose. Insert a notice in the "Business and Personal" column.

(56) E. S. B. asks: How is floor wax made? A. Two ozs. of pearlash, 10 ozs. of wax, and about half a pint of water are heated to boiling in a dish, which is frequently agitated, until a thick fluid mass is formed, from which, upon removal from the fire, no watery liquid separates. Boiling water is now cautiously added to the mass, until no watery drops are distinguishable. The dish is again set on the fire, but its contents are not allowed to boil (otherwise myricin would separate out), 8 or 9 pints of water being added, little by little, with constant stirring. Coloring matter may be added if desired.

(57) J. H. C. writes: A steam engineer friend of mine is making a test gauge, and claims that if a square inch be thrown into a circle, the diameter would be 1·25 inch, and undertook to prove it to me by taking a strip of tin 4 inches in length, and showing that it just meets around a mandrel of that size. A. The area of a circle equals the square of the diameter, multiplied by the decimal ·7854, and conversely, the square of the diameter will equal the area, divided by the decimal ·7854. In the case you mention the area is 1 square inch, and its diameter is therefore $\sqrt{1{\cdot}273}$. By inadvertence 1·273 appeared as the diameter (in No. 3, answer No. 17) instead of $\sqrt{1{\cdot}273} = 1{\cdot}128$ of an inch.

(58) S. M. writes: We are using a wooden wheel covered with glue and emery, to scour metal castings, but the glue scales off. Can you tell us what to put in, or how to prepare the glue to prevent the scaling? A. We judge that the best plans are trade secrets, which are worth the price charged for them to those who buy wheels from successful manufacturers.

(59) W. C. M. asks: 1. Can a man lift more in weight in a coal mine 300 feet deep than he can at the surface? A. Yes, under the same conditions; but the difference would be so slight as to be inappreciable. The pendulum experiments of Professor Airy at great depths in English collieries indicated this difference, but for practical purposes it may be disregarded. 2. Why should there be a falling off in the force of gravity toward the center of the earth? A. Because, as one goes deeper, there is less matter to attract bodies toward the center, while the portion of the crust above exercises a counterbalancing attraction.

(60) C. A. G. writes: Will you please let me know which boiler will give more steam, a return tubular boiler or a locomotive boiler, both having the same size of firebox and the same amount of heating surface, and pressure of steam, and the same draught; both to fire with wood, the workmanship alike, with same size of tubes, but longer in the locomotive boiler? A. The difference, if any, will usually be in favor of the return tubular boiler.

(61) D. H. writes: Supposing it were possible or practicable to construct a wooden trough 10 miles long, and for convenience' sake say 6 feet wide and 6 feet in depth, the trough to be perfectly level in all its parts according to a spirit level, would or would not the water in the trough (supposing it to be half filled with water) be perfectly level according to a spirit level, and the water be the same depth at each end and in the middle? A. Any difference of depth that might exist would be too small to be detected by an ordinary measurement.

(62) C. D. asks: Would an air chamber placed on the suction pipe of a No. 8 Blake steam pump, which draws water from a pond 150 feet from pump with a 12 foot lift, and discharges through a pipe running 186 feet horizontal and 60 feet perpendicular, prevent the knocking of the pump piston and the jar in suction pipe? With this exception the pump works well. A. Probably it would, or at all events, it would greatly reduce the shock.

(63) W. G. L. asks: What is the proper way to temper curved dies, for cutting out steel shovel plates, so as to avoid springing and cracks? A. Fill the holes with fire clay and wire to keep it in place. Heat evenly and slowly in a furnace. Lift the dies from the furnace with the face vertical, and plunge vertically into water heated to about 50° and containing about ½ lb. saltper gallon. Hold them still at the bottom of the water until cooled.

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

J. M. S.—The following represents the average of two analyses of the mineral keilhauite, by Erdmann: $SiO_2$ 29·72, $TiO_2$ 28·57, $Al_2O_3$ 5·99, $Fe_2O_3$ 6·41, $Mn_2O_3$ 0·76, $Ce_2O_3$ 0·47, CaO 18·80, YO 9·68. Gravity of sample = 3·519 to 3·733. Hardness 6·5.—D. S.—It is quartzite containing graphite and mica schist.—R. E. K.—No. 71 consists principally of a micaceous hornblendic schist from the degeneration of a syenite. Contains a trace of manganese. No. 49.—Quartz and orthoclase. No. 56.—Send larger sample if possible.

## COMMUNICATIONS RECEIVED.

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

Double Postal Cards. By G. W. H.
Howe Truss Angle Block. By W. W. R.
Approximating Curve Areas. By L. S. B.
New Fire Escape. By L. B. B.
Atmospheric Contraction and Expansion. By H. R. B.
History of Glass. By A. O. B.
Transatlantic Steam Navigation. By A. J. M.
Plant Propagation. By J. P.
Extension of Patents. By G. W. H.
Infinity of Time and Space. By H. D. T.
Conformator Diagrams. By G. H. M.
Hydraulic Engines. By D. C.
Bicycle Travel. By L. L. F.
Stroke of Locomotive Engines. By J. A. H.
Aerial Navigation. By H. S. B.
Cotton Machinery. By T. W. W.

OFFICIAL.

# INDEX OF INVENTIONS

FOR WHICH

**Letters Patent of the United States were Granted in the Week Ending**

**February 12, 1878,**

**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.

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[A copy of any of the above patents may be had by remitting one dollar to MUNN & Co., 37 Park Row, New York city.]