

H. W. S. asks: 1. How can I plate brass or copper with silver without a battery? A. Mix chloride of silver 1 part, pearl ash 2 parts, common salt 1 1/2 parts, and whiting 1 part. Rub the mixture well on the surface of the brass or copper (previously well cleaned) with a piece of soft leather, or cork moistened with water and dipped in the powder. When silvered, wash the metal in hot water slightly alkaliized and wipe dry. 2. With what solution can I clean the articles before plating or galvanizing? A. In silver plating, the articles to be plated are first carefully freed from grease by boiling in a solution of potash, then quickly dipped in red nitrous acid to remove any oxide, and afterwards well washed in water to remove all traces of acid. If the surface be amalgamated, the adhesion of the silver will be promoted. In galvanizing, the iron is first dipped in dilute sulphuric acid to remove the oxide on the surface.

M. E. says: 1. A friend informs me that ice brought from Boston, exposed in the sunlight, will last one third longer than southern ice. Is this so? Does the ice absorb cold after freezing? A. Trials have been made of natural ice and that frozen artificially by various ice machines, with reference to their lasting qualities, and the latter were found to take longer time to melt. This is probably due to the fact that artificial ice has been frozen at and reduced to a lower temperature than the natural material. The crystallization may also, at a long continued low temperature, be more compact and render the ice more firm, as what is known as snow ice is very perishable. After water has congealed at 32°, the ice formed may be reduced like any other solid to any low degree of temperature, and ice being a bad conductor of heat, it (compared with some other solids) takes a long time for the mass to receive an accession of heat from without. These remarks may serve to explain the difference between Boston and southern ice, the former being probably frozen at a lower temperature than the latter.

J. W. H. says: I have a common wooden pump with its valve bucket about six feet below the level of the ground, being attached to the pump handle by a rod nearly nine feet long. During cold weather, the water in this pump froze, and I have reason to believe that the pump was full of solid ice from the spout down to the valve bucket, which is about eight feet. I first tried to thaw it out with hot water, but found that made but little impression; so I poured in about one quart of hard coarse salt. I soon found the ice was melted down about two feet below the spout. Twelve hours afterwards, it had melted nearly four feet, and the next day the pump was all free of ice and works as well as ever. Nearly all the time the mercury has been below zero. Will you inform me why cold salt will melt ice in cold weather? What chemical action, if any, takes place with the salt and ice? A. Whenever a solid body passes into the liquid state it absorbs heat, and the heat which is thus absorbed is called latent or hidden heat. When it passes back again from the liquid to the solid state, this heat is again given out and called sensible heat. The particles of salt find their way into the pores of the ice; and since the point of freezing of a mixture of ice and salt is many degrees below that of ice alone, the mixture becomes liquid and in passing from the solid to the liquid state must absorb heat. Finding no source to take it from, its temperature falls until the liquid is 32° colder than the solid ice and salt.

A. R. W. asks: To how many degrees of heat must iron be raised to weld it? A. According to Siemens, the welding heat of iron is 2,700° F.

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

E. L. F.—Iron pyrites, with rounded pebbles of quartz.

J. W.—Carnelian, but are not brightly enough colored to be of value.

H. B. S.—Magnetic iron ore, and is good for making iron.

R. J. L.—Your material is clay, which might prove useful in the potter's art.

W. R. E.—Your specimen is not black lead, but sulphuret of lead, and is distributed through quartz.

N. D. M. Iron pyrites.—It does not indicate coal, although it is sometimes found with coal.

J. P. D. asks: What will soften copper wire so as to work as readily as lead? Can I soften the wire to any degree of temper?—J. F. H. asks: How can I make bungs, cut across the grain of the wood?—W. E. C. asks: What are the ingredients used to increase the adhesive properties of sugar or molasses in making popcorn balls, and what is the process of making the same?—J. C. asks: What is the best bait for enticing rats into a trap? Is there any chemical preparation that will draw them?—J. B. G. asks: Is there any way to prevent the slacking of stone coal? We lay in fuel in the fall, in good sized lumps; before spring much of it is useless.—J. O. T. asks: How can I prevent an ivory flute head from cracking, and how can I stop the cracking after it has commenced?—S. asks: How is a steely luster given to the surface of black glass? I have seen polished black glass, with a very thin coat of platinum or bismuth, I think, which nitric or muriatic acid does not affect. Fluoric acid raises it from the surface in bubbles. It is not an enamel burnt in, as that would destroy the facets on the glass, which show the polishing marks through this thin coat.—M. S. W. asks: 1. How is contraction of a horse's hoof produced? 2. How can I prevent contraction of the hoof? 3. On what part of the horse's leg does contracted hoof operate, to make the horse lame?—W. H. G. asks: Can you give me directions for the treatment of green moss, to prepare it as an article of commerce? There are two different processes, one in which the moss is soaked in water until it is sufficiently rotted, and another in which this result is secured by the use of chemicals.—L. F. S. asks: How did B. N. C. (see your issue of January 24) arrange his pulley to carry power from the drum on main line to his lathe? How was the pulley thrown out of gear? Could such a friction gear carry as much as 25 horse power?

COMMUNICATIONS RECEIVED.

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

- On East Tennessee Industries. By H. E. C.
On the Centralization of Matter. By J. P.
On a Steam Buggy. By F. G. W.
On Poisonous Aniline Dyes. By J. E.
On Ventilation. By G. N.

- On the Northern Lights. By J. R.
On Wood Engraving. By H. C. F.
On the Non-Actinic Rays of Light. By E. J. H.
On Glue as a Healing Remedy. By E. P.
On a New Breech Blight. By J. S.
On Coal Oil on Railroads. By G. H. K.
On Mental Arithmetic. By J. P.

Also enquiries from the following:

W. F.—J. T.—A. C. G.—W. E.—J. R. & Co.—H. W. T.—P. W. L.—J. B. G.—P. M.

Correspondents in different parts of the country ask: Who makes steel bars, to be used instead of bells? Who sells horse clipping machines? Who makes microscopes, sufficiently powerful to detect the animalcules in water? Who sells a rubber preparation in imitation of mahogany and rose wood? Who buys potato flour? Who sells hair cloth? Makers of the above articles will probably promote their interests by advertising, in reply, in the SCIENTIFIC AMERICAN.

Correspondents who write to ask the address of certain manufacturers, or where specific articles are to be had, also those having goods for sale, or who want to find partners, should send with their communications an amount sufficient to cover the cost of publication under the head of "Business and Personal," which is specially devoted to such enquiries.

[OFFICIAL.]

Index of Inventions

FOR WHICH

Letters Patent of the United States

WERE GRANTED IN THE WEEK ENDING

February 17, 1874,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

Table listing various inventions and their patent numbers, including items like 'Atr, forcing and exhausting, W. I. Ellis', 'Apple parer, F. W. Hudson', 'Apron supporter and page, W. H. Chipley', etc.

Table listing various inventions and their patent numbers, including items like 'Engine valve, steam, J. D. Bown', 'Engine valve gear, steam, A. S. Cameron', 'Excavator, M. D. Marcy', etc.

Table listing various inventions and their patent numbers, including items like 'Spool box, B. F. Carpenter', 'Stair hand rails, joint for, W. Leduc', 'Stamps, cancelling, Goff & Hursy', etc.

APPLICATIONS FOR EXTENSIONS.

Applications have been duly filed and are now pending for the extension of the following Letters Patent. Hearings upon the respective applications are appointed for the days hereinafter mentioned:

- 28,378.—FIRE ESCAPE.—L. King. May 6.
28,389.—RUBBER TUBING.—T. J. Mayall. May 6.
28,402.—ICE CREAM FREEZER.—C. W. Packer. May 6.
28,463.—HORSESHOE.—R. A. Goodenough. May 13.
28,634.—CORN PLANTER.—D. C. Myers. May 27.

EXTENSION GRANTED

27,241.—PHOTOGRAPHIC CAMERA.—A. Semmendinger.

DESIGNS PATENTED.

- 7,168.—BARBER'S CHAIR.—A. A. Bel, New York city.
7,169.—GLASSWARE.—T. B. Atterbury, Pittsburgh, Pa.
7,170.—ADVERTISING DESK.—L. W. Burton, Syracuse, N. Y.
7,171 to 7,178.—CARPETS.—R. R. Campbell, Lowell, Mass.
7,179.—SWING SEAT.—G. De Notbeck, New York city.
7,180.—INSECT CASE.—G. De Notbeck, New York city.
7,181.—BOTTLES.—E. R. Durkee, Brooklyn, N. Y.
7,182.—CARPET.—J. Hamer, Lowell, Mass.
7,183.—TOBACCO BOX.—C. J. Hauck, Brooklyn, E. D., N. Y.
7,184.—BANK BILLS.—W. B. Hotchkiss, New York city.
7,185.—CARPET.—D. McNair, Lowell, Mass.
7,186.—GLASS TUMBLERS, ETC.—T. W. Mellor, Phil., Pa.
7,187 to 7,189.—OIL CLOTHS, ETC.—C. T. Meyer & V. E. Meyer, Bergen, N. J.
7,190.—CANISTERS.—J. H. Preater, Brooklyn, N. Y.
7,191.—PEN RACK.—F. R. Seldensteker, Meriden, Conn.
7,192.—WAITER.—H. C. Wilcox, West Meriden, Conn.

TRADE MARKS REGISTERED.

- 1,634.—BRAID.—D. Goff & Son, Pawtucket, R. I.
1,635.—TOBACCO, ETC.—E. H. & W. H. Hamman, Emaus, Pa.
1,636.—WHISKY.—G. W. Kidd & Co., New York city.
1,637.—HEEL COUNTERS.—J. Kimball, Boston, Mass.
1,638.—FERTILIZER.—Lorentz & Co., Baltimore, Md.
1,639.—PENS.—W. F. Murphy's Sons, Philadelphia, Pa.
1,640.—CARPETS.—R. Scott, Philadelphia, Pa.
1,641.—MEDICAL COMPOUND.—P. P. Van Alstine, Barnesville, Ga.
1,642.—ILLUMINATING OIL.—Warden & Co., Pittsburgh, Pa.

SCHEDULE OF PATENT FEES.

Table with 2 columns: Fee description and Amount. Includes 'On each caveat \$10', 'On each Trade Mark \$25', 'On filing each application for a Patent (17 years) \$15', etc.

[Specially reported for the Scientific American.]

CANADIAN PATENTS.

LIST OF PATENTS GRANTED IN CANADA.

FEBRUARY 20, 1874.

- 3,114.—J. Tufford, Beamsville, Lincoln county, Ontario. Improvements on machine for drilling iron or steel called "Tufford's Improved Drilling Machine." Feb 20, 1874.
3,115.—G. B. Getty, E. Mendenhall and E. Barton, all of Bloomsburg, Columbia county, Pa., U. S. Improvements on head blocks for circular saw mills, called "Getty's Improved Head Block for Saw Mills." Feb 20, 1874.
3,116.—H. R. Barnes, Rock Stream, Yates county, N. Y. U. S. Improvements on hoes, called "The Barnes Hoe." Feb 20, 1874.
3,117.—Jas. Defoe, Detroit, Wayne county, Mich., U. S. Improvements on wood pavements, called "Defoe's Wood Pavement." Feb 20, 1874.
3,118.—Jas. Tredale, Toronto, Ontario. Improvements on coal oil stoves and lamps, called "Tredale's Portable Coal Oil Stove." Feb 20, 1874.
3,119.—W. M. Mixer, New York city, U. S. Improvements in refrigerator buildings, called "Mixer's Preserving House." Feb 20, 1874.
3,120.—S. R. Wilmot, Bridgeport, Fairfield county, Conn., U. S. Improvement on sheet metal tubing, called "Wilmot's Improved Lock Seamed Tubing." Feb 20, 1874.