

We are indebted to Mr. John Eaton, Jr., Commissioner of Education, for a copy of his Annual Report for 1870. We have read a great deal of this most admirable public document. It abounds in valuable information and statistics upon the present condition of education in the various States in the Union, together with instructive papers upon several specific subjects.

Inventions Patented in England by Americans.

[Compiled from the Commissioners of Patents' Journal.]

APPLICATIONS FOR LETTERS PATENT.

- 11.—CARRIAGE LAMPS, BURNERS, AND BRACKETS.—R. Spaulding Merrill, Boston, Mass. January 3, 1871.
 21.—TUCK MARKER FOR SEWING MACHINES.—J. F. Kellogg, North Bridge-water, Mass., and E. A. Cutler, Providence, R. I. January 5, 1871.
 29.—STEAM BOILERS.—W. B. Mack, Philadelphia, Pa., residing at Glasgow, January 6, 1871.
 32.—REPEATING FIRE-ARMS.—Oliver F. Winchester, New Haven, Conn. January 6, 1871.
 33.—PLUMBAGO PRESSES.—Hubert R. Ives, New Haven, Conn. January 6, 1871.

New Patent Law of 1870.

INSTRUCTIONS

HOW TO OBTAIN

LETTERS-PATENT

FOR

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The American Newspaper Directory, Published by the New York Advertising Agents, Geo. P. Rowell & Co., is the most complete publication of the kind ever issued. Price \$5, bound in cloth.

Business and Personal.

Charge for Insertion under this head is One Dollar a Line. If the Notices exceed Four Lines. One Dollar and a Half per Line will be charged.

The paper that meets the eye of manufacturers throughout the United States—Boston Bulletin, \$4 00 a year. Advertisements 17c. a line.

"507 Mechanical Movements." This book is a complete illustrated table of Mechanical Movements, embracing all departments of Mechanics, and is an invaluable handbook for Mechanics, Inventors, Engineers, Students, etc. Price \$1. By mail, \$1.12. Address Theo. Tusch, 37 Park Row, New York.

A Book of Simple Rules and Formulæ, for the Solution of all Problems in the Application of Steam. By J. M. Derby, Professor at the Ecole Centrale, Brussels. By mail, \$1. A. W. Macdonald, 29 Beekman St., New York.

Apply to J. Dane, Jr., Newark, N. J., for the best hand lathes, slide rests, presses, jewelers' rolls, models, dies, and light machinery to order.

Dickinson's Patent Shaped Diamond Carbon Points and Adjustable Holder for dressing emery wheels, grindstones, etc. See Scientific American, July 24 and Nov. 20, 1869. 64 Nassau St., New York.

Imp'd presses and dies for tin work; special drilling machinery for hardware manufacturers. Ferracute Machine Works, Bridgeton, N. J.

Lake Huron Grindstones. J. E. Mitchell, Philadelphia, Pa.

Amherst Grindstones. J. E. Mitchell, Philadelphia, Pa.

Wanted.—Machinery for making Cigar Boxes. Address Alfred Savage & Son, Montreal, Quebec.

Wanted.—One of Brown & Sharpe's Universal Milling Machines, in good order. Address McBeth, Bentel & Margedant, Hamilton, O.

Shive's Pat. Governor, with Automatic Safety Check, which prevents the Engine from running away, received three highest premiums. A. B. Lawrence, General Agent, 38 Cortlandt St., New York.

Valuable property and machinery for manufacturing purposes, in Poughkeepsie, N. Y. Apply to Wm. H. Crosby, 261 Mill St., or on the premises, Bayeaux St.

Peteler Portable R. R. Co. contractors, graders. See adv'tment.

Peck's Patent Drop Press. For circulars address the sole manufacturers, Milo, Peck & Co., New Haven, Ct.

For small, soft, Gray Iron Castings, Japanned, Tinned, or Bronzed, address Enterprise Manufacturing Company, Philadelphia.

The best place to get Working Models and parts is at T. B. Jeffery's, 160 South Water St., Chicago.

E. Howard & Co., 15 Maiden Lane, New York, and 114 Tremont St., Boston, make the best Stem-winding Watch in the country. Ask for it at all the dealers.

Improved Foot Lathes. Many a reader of this paper has one of them. Selling in all parts of the country, Canada, Europe, etc. Catalogue free. N. H. Baldwin, Laconia, N. H.

"Edson's Recording Steam Gage and Alarm," 91 Liberty St., New York. Illustrated in SCIENTIFIC AMERICAN, January 14, 1871.

English and American Cotton Machinery and Yarns, Beam Warps and Machine Tools. Thos. Pray, Jr., 57 Weybosset St., Providence, R. I.

Self-testing Steam Gage—Will tell you if it is tampered with, or out of order. The only reliable gage. Send for circular. E. H. Ashcroft, Boston, Mass.

Hand Screw Punches and Lever Punches. American Saw Co., New York.

Patent Elliptic-gear Punches and Shears.—The greatest economy of power, space, and labor. Can be seen in operation at our factory, in Trenton, N. J. Address American Saw Co., 1 Ferry St., New York.

The Merriman Bolt Cutter—the best made. Send for circulars. H. B. Brown & Co., Fair Haven, Conn.

To Cure a Cough, Cold, or Sore Throat, use Brown's Bronchial Troches.

Taft's Portable Hot Air, Vapor and Shower Bathing Apparatus. Address Portable Bath Co., Sag Harbor, N. Y. (Send for Circular.)

Glynn's Anti-Incrustator for Steam Boilers—The only reliable preventive. No foaming, and does not attack metals of boilers. Price 25 cents per lb. C. D. Fredricks, 587 Broadway, New York.

Machinery for two 500-ton propellers, 60-Horse Locomotive Boiler, nearly new, for sale by Wm. D. Andrews & Bro., 414 Water St., N. Y.

Cold Rolled-Shafting, piston rods, pump rods, Collins pat. double compression couplings, manufactured by Jones & Laughlins, Pittsburgh, Pa.

Keuffel & Esser 116 Fulton St., N. Y., the best place to get 1st-class Drawing Materials, Swiss instruments, and Rubber Triangles and Curves.

For mining, wrecking, pumping, drainage, and irrigating machinery, see advertisement of Andrews' Patents in another column.

For Solid Wrought-iron Beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

For Fruit-Can Tools, Presses, Dies for all Metals, apply to Bliss & Williams, successor to May & Bliss, 118, 120, and 122 Plymouth St., Brooklyn, N. Y. Send for catalogue.

Belting that is Belting.—Always send for the Best Philadelphia Oak-Tanned, to C. W. Army, Manufacturer, 301 Cherry St., Phil'a.

For the best Self-regulating Windmill in the world, to pump water for residences, farms, city buildings, drainage, and irrigation, address Con. Windmill Co., 5 Colfax Place, New York.

Conklin's Detachable Rubber Lip, for bowls, etc., works like a charm. For Rights, address O. P. Conklin, Worcester, Mass., or A. Daul, Philadelphia, Pa.

Japanese Paper-ware Spittoons, Wash Basins, Bowls, Pails, Milk Pans, Slop Jars, Commode Pails, Trays. Perfectly water-proof. Will not break or rust. Send for circulars. Jennings Brothers, 352 Pearl St., N. Y.

House Planning.—Geo. J. Colby, Waterbury, Vt., offers information of value to all in planning a House. Send him your address.

Manufacturers and Patentees.—Agencies for the Pacific Coast wanted by Nathan Joseph & Co., 619 Washington St., San Francisco, who are already acting for several firms in the United States and Europe, to whom they can give references.

See how cheap Thomas sells Lathes and Drills, in another column.

Ashcroft's Low Water Detector. \$15; former price, \$30. Thousands in use. E. H. Ashcroft, sole proprietor of the patent, Boston, Mass. Steel Castings, of the best quality, made from patterns, at Union Steel and Iron Works, Rhinebeck, N. Y.

Capital wanted to manufacture licensed shuttle Sewing Machines. Address "Inventor," care of S. M. Pettengill & Co, 37 Park Row, N. Y. A Chemist, Analytical and Manufacturing, of many years' experience in the largest chemical factories in Germany and in this country, wants an engagement. Best references given. P. O. Box 172, Hoboken, N. J. Wanted.—Partner to take an interest in an established Foundry, Engine and Machine Shop, in the West. Prefer practical mechanic to take charge. Address S. L. McHenry, 335 Liberty St., Pittsburgh, Pa. To Ascertain where there will be a demand for new machinery or manufacturers' supplies read Boston Commercial Bulletin's Manufacturing News of the United States. Terms \$4 00 a year.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address correspondents by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at 1 00 a line, under the head of "Business and Personal."

All reference to back numbers must be by volume and page.

GEARING CIRCULAR SAWS.—In answer to E. O. T.'s inquiry in regard to running a saw by gear direct from engine, I would say that there would be no trouble with the gear, but it would be folly to run a large saw in that way, owing to the great liability of the saw to be instantly stopped by the springing of timber, turning of logs, and other causes that practical sawyers know. My opinion is that if E. O. T. try it he will some day find his mill a wreck. I would also state that I have a gear of his description 2-foot diameter, 5-inch face, run by water power, that often makes 800 turns in a minute, used with belt for driving a 48-inch saw.—A. O. B., of Vt.

CEMENT.—F. P. B. can make a cement for fastening leather to iron or glass, as follows: To 1 quart of glue, after it is dissolved in good cider vinegar, add 1 ounce Venice turpentine; let it cook about half a day, when it is fit for use.—O. L. C., of N. H.

TURNING LATHE.—If M. C. R. will take a light cut from the bottom of the tail-stock, his lathe will turn true. The tail stock is evidently a little too high for the cone.—R. A. B., of Pa.

J. M. D.—The object of our query column, and column of answers to correspondents, is to benefit our readers at large, not individual readers. If you will send the recipes of which you speak we will publish them, but do not intend to make our office a medium of intercommunication on private business matters. The action of a steel magnet or any other magnet, will not render the air magnetic. A machine kept in motion by the attractive force of a permanent magnet would be a perpetual motion in the same sense as one kept in constant motion by the action of gravity. A water wheel placed in a never-falling stream is a perpetual motion in this sense. What is sought for is, however, a machine that will move itself independently of static force. Have you got such a machine? If so, we shall be glad to be introduced to it.

B. M. & Co., of Ind.—You are on the right track. By admitting air behind the bridge wall in the manner proposed, you will probably consume your smoke. We believe that heated air, if forced in under pressure, is better than cold air. If, however, it go in only under ordinary pressure, what you gain by increase of temperature will be, in great measure, lost by expansion, less oxygen entering in proportion to volume than when it enters cold.

J. A. H., of Ga.—There is no such substance as that you seek. The experiment you propose indicates that you do not understand the first principles of electrical science. Better get some good treatise, and inform yourself, than waste time and money in trying experiments which can not by any possibility teach you anything.

M. Y., of Ga.—We shall be glad to hear from you on the subject proposed, but cannot, of course, promise publication till we read your manuscript. The proportions for Babbitt metal, and method of making the alloy are as follows: Melt 4 parts of copper, and add by degrees 12 parts of best Banca tin, and 8 parts of regulus of antimony. When the mass is melted add 12 parts more of tin.

B. J. of Pa.—Rosner, a Danish Astronomer, first determined the velocity of light in 1675, by observing the eclipses of Jupiter's moons. It seems to require no time at all to pass over any distance of earth; the flash seems to be instantaneous.

E. M. F., of N. J.—You may use soda ash in your boiler to remove scale without any danger of hurting the boiler. In some cases it will loosen the scale, in others it will not. It will do no harm to try it.

G. F. C., of —.—Plaster of Paris is prepared for taking casts by simply mixing it with water to the consistence of cream. The mixing must be done rapidly, or it will set before it can be poured into the mold.

O. W. Y. of Conn.—You will find the information you seek in an article on "Artificial Stone," page 263, Vol. XXIII. of the SCIENTIFIC AMERICAN.

L. R., of N. H.—The motive powers of streams, flowing equal volumes of water, will be directly as their falls. If a stream through which a given volume, at a given point, falls ten feet, produce at that point one hundred horse power, the same volume falling at another point twenty feet would yield two hundred horse power. The horse power of a body of falling water, is the weight in pounds which falls per minute, multiplied into the distance in feet through which it falls, and the product divided by 33,000.

Queries.

[We present herewith a series of inquiries embracing a variety of topics of greater or less general interest. The questions are simple, it is true, but we prefer to elicit practical answers from our readers, and hope to be able to make this column of inquiries and answers a popular and useful feature of the paper.]

1.—**CEMENT FOR LEATHER THAT WILL RESIST WATER AND HEAT.**—I wish a cement for leather that will resist the action of water and moderate heat.—J. A. K.

2.—**FILTER FOR CISTERNS.**—I see some of your correspondents recommend a wall of soft-burnt bricks for cistern filters. Should the wall be laid up with mortar or cement, or simply with the bricks alone?—J. A. K.

3.—How can I render scrap lead (such as accumulates in a plumber's shop) as soft and tough as pure sheet lead or pig lead? I desire to make castings of a peculiar shape, and can do so with pure sheet or pig lead, but the scrap is too hard and brittle. Cheapness is of course an object.—H. W. J.

4.—**HARDENING CAST IRON.**—How can cast iron be hardened after it is fitted and finished, without injury to the finished surface, and so as to render it more durable under wear?—C. D. S.