

## ENGINEERING INVENTIONS.

A semaphore signal has been patented by Mr. William Thornburgh, of Elyria, Ohio. With an upright frame, having tubular standards, sliding rods, and wings, a lantern box and glass sides, are various novel details and combinations for governing and regulating the movements of railway trains at crossings, drawbridges, block stations, etc.

A valve gear for engines has been patented by Mr. Francis C. Simonds, of Kennebunk, Me. This invention covers such special construction and arrangement of parts that the full pressure of steam will be on the engine at all times, and the amount allowed to enter the cylinder will be regulated by the greater or less opening of the valves by the regulator, according to the load.

A railroad signal system has been patented by Messrs. William Hadden, of Brooklyn, N. Y., and Henry Van Hoevenberg, of Elizabeth, N. J. A continuous electric current is employed for holding signal banners in position to indicate safety, and the current is rapidly interrupted to weaken the power of the signal magnet and allow the signal banner to fall to indicate danger, this being effected by a peculiar combination of track instruments, interrupters, and magnets.

## AGRICULTURAL INVENTIONS.

A horse hoe has been patented by Mr. Marcus Hardenbrook, of Marysville, Kansas. It is made with fenders upon the inner ends of the hoes to protect small plants from the soil thrown by the hoes, and there are readily adjustable gauge wheels and standards, the object being to facilitate the cultivation of small plants.

A sulky harrow has been patented by Messrs. Armelder F. Pack and Edwin French, of Emporia, Kansas. This invention covers improved appliances for raising up the harrows to suspend them from the axle when required, and to lower them to the ground again, the object being to simplify the appliances, improve their efficiency, and lessen the labor of operating them.

A cultivator has been patented by Messrs. Fred Hani and Charles A. Billington, of Morrill, Kansas. It is made with curved bars or runners, and inclined beams connected at their forward ends with each other and the curved bars by upright bars having horizontal overlapping upper ends, connected at their rear ends by an adjustable arched bar, and provided with cutters and fenders, the cultivator being especially adapted for cultivating small corn planted in furrows between the ridges in listed land.

## MISCELLANEOUS INVENTIONS.

A fruit and flower stand has been patented by Mr. George W. Fry, of Beaver, Pa. It is formed of a series of bowls or dishes united by detachable standards, a sprinkler and water receptacle being held on the uppermost stem, the whole being so constructed that it can be taken apart and compactly folded.

A tallying attachment for measures has been patented by Mr. James A. McIntosh, of Warren, Pa. This is for vessels employed to measure liquids, to record the number of times the measure is emptied, and consists of a sliding handle, with an index moving in front of a dial, carried by a pawl and ratchet attachments operated by the sliding handle.

A camera has been patented by Messrs. William H. Lewis and Erastus B. Barker, of New York city. This invention covers certain novel features intended to make a lighter and more convenient instrument, and relates particularly to the folding bed, the means for securing the object glass in place, and the construction of the box.

A wagon top has been patented by Mr. Charles R. Parks, of Arkadelphia, Ark. In combination with a wagon box having longitudinal pockets on the sides is a removable wagon top, with base rails adapted to be passed into the pockets to hold the top on the wagon box, the pockets being fixed or removable.

A culinary vessel has been patented by Emily A. Stears, of Brooklyn, N. Y. This invention relates to vessels for cooking various kinds of food simultaneously, a tray, with sector shaped pan, fitting into a larger vessel, with convenient devices for passing off the vapors, allowing of a number of different dishes to be conveniently cooked at the same time.

A mail bag has been patented by Mr. Chas. F. Walters, of Prospect, N. Y. The bag is made of leather similarly to those now used, but has a novel sectional construction at and near the mouth end, and in the fastening, so that when being filled or being dumped the mouth is held open to present a full and clear opening.

An amalgam for filling teeth has been patented by Mr. Walter C. Davis, of St. Petersburg Place, Bayswater, Middlesex Co., England. Amalgam filings are coated, by a special process, with a varnish of gum and gold dust, so that each individual grain or particle of the amalgam is protected from the action of the atmosphere or the acid secretions of the mouth.

A barbed fence strip has been patented by Mr. Elbert E. Hawkins, of Wilkesbarre, Pa. The strip is bent to have a U-shaped cross section, and has tongues at the top edge punched alternately out of opposite sides of the strip, extending alternately in opposite directions, the strip being easily made from sheet metal.

A fire escape has been patented by Messrs. George H. Herrington and Martin Heller, of Wichita, Kansas. It consists of one or more wires or wire ropes attached outside the building conveniently near the windows or doors of the different stories, and having successive guards of stirrups and loops, whereby persons may descend in case of fire.

A pump has been patented by Mr. John J. Bircher, of Wilmot, Ohio. This invention covers a novel construction in double acting pumps with a single barrel and duplicate valvular suckers, arranged to re-

ciprocate toward and from each other, in order to obtain increased efficiency and simplicity, and a better working effect.

A freight elevator has been patented by Mr. Charles B. Paxton, of Vicksburg, Miss. It is more especially designed for loading and unloading boats at low stages of water, the construction allowing the stage, with elevating chains, to be raised and swung to the required height and position for the upper end to rest upon a dock or shore.

A process of making bread has been patented by Mr. Theophile Monierichard, of Paris, France. This process consists in mixing with the flour to make the dough water in which a small proportion of wheat has been previously boiled, then kneading and proceeding as in ordinary bread making, the water used being thus prepared to assist the separation of the glucose from the dextrine, give more body to the remainder of the dough, and increase the product of bread.

An apparatus for distilling has been patented by Mr. Franz Konig, of Asti, Italy. This invention provides a simple and inexpensive apparatus for distilling brandy, spirit, petroleum, etc., by passing their vapors through one or more chambers, over surfaces giving great exposure, and by contact of the vapors with the liquids, it being claimed possible therein to produce rectified alcohol of from 90° to 93° from fermented mash in shorter time and with less expense than by other usual apparatus.

A driving mechanism for clay tempering wheels has been patented by Mr. William Cram, of Raleigh, N. C. It is made with a fixed circular rack and a horizontal shaft rotated by suitable gearing and carrying a pinion meshing with the teeth of the fixed rack, the shaft being connected to the shaft of the tempering wheel, so tempering wheels may be operated with less power.

A safety lamp has been patented by Mr. Robert Mauchline, of Shenandoah, Pa. This invention covers a novel construction and arrangement of parts, making a lamp intended to show double the halo of a Davy lamp, and to indicate gas when the percentage is smaller than will be detected by the Davy lamp, and one that will be extinguished when raised into gas such as would endanger the bursting of a Davy lamp.

A canister for holding or measuring seeds, grain, or other substances has been patented by Mr. George S. Church, of Baldwin, Mich. The lower end of the canister is connected with a bell mouthed spout, to the lower end of which is secured a measuring tube, and by various novel devices the whole may be connected with a grain spout and used for measuring, or it may be used for storing and measuring rations for horses, etc.

A method of transforming Jerusalem artichoke juice into levulose and applying the product has been patented by Mr. Edmond L. J. Boniface, of Changy-les-Bois, par Varennes, Loiret, France. The method covers the application of an acid at a temperature of about 100 deg. Centigrade, either in open air or under pressure, and ways for the use of levulose in making alcohol, the manufacture of sirup, a special beer, levulose beer, and hygienic beverages, etc.

## NEW BOOKS AND PUBLICATIONS.

**DIE KABELTELEGRAPHIE.** (Cable Telegraphy.) By Max Jullig. A. Hartleben, 1884. Wien, Pest, Leipzig. 256 pages.

This interesting work contains valuable information on the construction, insulation, and laying of underground and submarine cables, and a very interesting history of the use of cables from the first attempt made by Lesage at Geneva, in 1774, to the Bennett-Mackey cable of 1884. The electrical functions in cables, the instruments used in transmitting cable messages, and the relative values of insulating materials, have received special attention. The work contains 90 illustrations and diagrams.

**FIFTY YEARS' OBSERVATION OF MEN AND EVENTS.** By Gen. E. D. Keyes, U. S. A. Charles Scribner's Sons, New York.

The writer was for many years on the staff of Gen. Scott, and a great portion of the book is devoted to anecdotes in which that military chief figured, and reminiscences of the times in which he was a prominent figure in public life. The reader is never allowed to forget the personality of the author, and the part he had in military movements before and during the war, but the book is, withal, a sketchy and entertaining volume.

**THREE VISITS TO AMERICA.** By Emily Faithfull. Fowler & Wells Co., New York.

As is well known, Miss Faithfull has for more than twenty years devoted herself to the enlargement of the field of labor for women, and her visits to this country have been for the purpose of studying our industrial methods and organizations in behalf of poor women. She is a warm hearted, practical observer, earnestly laboring for the improvement of the condition of women, and received many attentions while here from leading people in all walks of life. This volume describes, in entertaining style, her experiences in this country.

**THE LEATHER MANUFACTURE IN THE UNITED STATES.** By Jackson S. Schultz. Published by the *Shoe and Leather Reporter*, New York.

There is no other book now offered in the English language presenting anything like a satisfactory treatise on the manufacture of leather. Mr. Schultz comes to his task with advantages rarely possessed by an author, having been himself for more than a quarter of a century a prominent figure in the American leather trade. This volume, however, excellent as it is in its way, is altogether too brief, as it treats almost exclusively of the sole leather manufacture, but on this branch of the subject there is little left to be said. The book has a valuable appendix, giving full details of the methods adopted by the tanners of Pennsylvania and New York for burning wet spent tan, which furnishes abundance of power for operating all our sole leather tanneries.

## Business and Personal.

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Catalogue of Books, 128 pages, for Engineers and Electricians, sent free. E. & F. N. Spon, 35 Murray Street, N. Y.

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Machinery for Light Manufacturing, on hand and built to order. F. E. Garvin & Co., 130 Center St., N. Y.

Curtis Pressure Regulator and Steam Trap. See p. 286. Woodwork's Mach'y. Rollstone Mach. Co. Adv., p. 286.

Drop Forgings. Billings & Spencer Co., Hartford, Conn.

We are sole manufacturers of the Fibrous Asbestos Removable Pipe and Boiler Coverings. We make pure asbestos goods of all kinds. The Chalmers-Spence Co., 419 East 8th Street, New York.

Clark's Rubber Wheels. See adv. next issue.

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Emerson's 1884 Book of Saws. New matter 75,000.

Free. Emerson, Smith & Co., Limited, Beaver Falls, Pa. Hoisting Engines. Friction Clutch Pulleys, Cut-off Couplings. D. Frisbie & Co., Philadelphia, Pa.

Barrel, Keg, Hoghead, Stave Mach'y. See adv. p. 302.

Munson's Improved Portable Mills, Utica, N. Y.

Solid and Shell Reamers, durable and efficient. Pratt & Whitney Co., Hartford, Conn.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 332.

For best low price Planer and Matcher, and latest Improved Sash, Door, and Blin Machinery, send for catalogue to Rowley & Hearnance, Williamsport, Pa.

The Porter-Allyn High Speed Steam Engine. Southwark Foundry & Mach. Co., 430 Washington Ave., Phil. Pa.

Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Vocom & Son's Shafting Works, Drinker St., Philadelphia, Pa.

## Notes &amp; Queries

## HINTS TO CORRESPONDENTS.

Name and Address must accompany all letters, or no attention will be paid thereto. This is for our information, and not for publication.

References to former articles or answers should give date of paper and page or number of question. Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and though we endeavor to reply to all, either by letter or in this department, each must make his turn.

Special Information.—Requests on matters of personal rather than general interest, and requests for Prompt Answers by Letter, should be accompanied with remittance of \$1 to \$5, according to the subject, as we cannot be expected to perform such service without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each. Minerals sent for examination should be distinctly marked or labeled.

(1) F. A. asks: What cement will best stick rubber bulbs to the ends of glass tubes (medicine droppers)? A. Heat the end of the glass tubes sufficiently hot, so that when the rubber is drawn over the tube it will melt slightly, and then adhere to the glass. 2. Do you suppose that the colors put up as dyes by several makers are subjected to any special process, or are they merely suitable aniline colors, put up in small envelopes for the convenience of small users? A. We are informed that the colors as put up in the manner referred to by you are simply small samples, and are not subjected to any special process.

(2) W. W. asks how to harden and color moulding knives on wood working machinery; the smith cannot get them even tempered. A. The profiles, or edges of the knives, are probably of curved form, one portion projecting more than another. No heating and drawing over a smith's fire can be even for such work. Heat the knives in red hot lead; harden in cold water; brighten and draw (in hot sand) to a "pigeon breast" red and blue.

(3) G. M. S. writes: There is something in the water, sulphur I think, which is rapidly eating holes into the feed pump rods and other parts of my engines, and probably ruining my boilers. How can I stop it? A. A little sal soda added to the feed water will probably neutralize any acid that may be cutting the interior of boilers and pump. If you feed from a tank, place the soda in the tank—1 or 2 ounces to 100 gallons. Blow off the boilers every day one or two cocks. You may find that much less soda will counteract the acidity. 2. How can I mend the broken drum of a cast 12 inch by 24 inch pulley? Can I cement it in any way? A. You cannot cement the pulley, but you can make a sheet iron rim for the inside of the pulley, one on each side about No. 16. Fit it in neatly, and rivet the broken pieces of the pulley to the sheet iron, also the parts that are not loose. If this is carefully done, you will not discover that it has been broken by its running. 3. Can I run a steel shaft and disk 100,000 revolutions per minute? Why not? A. It is very doubtful if a shaft and disk can be run 100,000 revolutions per minute. The difficulties are mechanical.

(4) E. E. K. asks: 1. Which is the best and cheapest way to make a water tube boiler of 12 one inch pipes 1 foot long? A. You may make a small upright boiler by plugging or welding heads in one end of the tubes and screwing the other end into the bottom of an iron cylinder, making the tube head five-sixteenths thick, the shell three-sixteenths. 2. Would it run an engine 1½ x 3? A. This will run your engine, but not with much power.

(5) C. G. L. writes: 1. In the SCIENTIFIC AMERICAN SUPPLEMENT, No. 252, there are drawings for a telescope. What is the power of one (in diameters) when the meniscus lens is used with the eye piece as described? What would be the power if the achromatic lens with terrestrial eye piece were used? If by increasing the objective double, will the power of the telescope be increased in the same proportion, and can the same eye piece be used if the focus is the same? A. Find the magnifying power of the telescope by dividing the focal length of the objective by the focal length of the eye glass, all in inches. The terrestrial eye pieces are usually of the equivalent power of a single glass from 1 to 1½ inches focus. A good way is to make a direct comparison with one eye looking through the telescope and the other looking at the object.

(6) J. H. H. writes: I am running two horizontal tubular boilers 42 inches diameter by 11 feet between tube heads, 12 square feet fire grate surface, 33 three inch tubes 11 feet long. I use them for steam heating stoves in winter season, and run one of Otis' hydraulic elevators for one floor at 1 ton of coal per week in summer, including coal to bank fire nights and Sundays. In winter the elevator is run in connection with the steam heating, when I propose to not charge elevator with coal for banking fires, as I have to bank them anyway for other purposes, but only for coal to evaporate water enough to run elevator for 1 floor, which is 175 gallons of water evaporated per day, and 26 days per month. I estimate that 1 pound of coal per 1 gallon of water is as low an amount as I can charge the elevator to the credit of the steam heating in the winter. Approximation is the only method we have at hand for determining the cost of running the elevator in the above way; we would like you to tell us what would be a reasonable estimate. A. You say that it takes 1 ton per week for elevator in summer, and you propose to charge 1.050 pounds by your figures to the elevator in winter. If you had to run the elevator alone in winter, it would take at least 25 per cent more coal than you use in summer. We think that you should charge three-fourths of a ton per week to the elevator in winter.

(7) O. C. R. writes: 1. We have an hydraulic ram working under 8 feet fall, raising water 70 feet through three-eighths iron pipe; receiving tank lined with sheet copper, tinned inside. Slight corrosion has commenced, and small holes are developed,