

**ENGINEERING INVENTIONS.**

A car heater has been patented by Mr. Palmer J. Gurnee, of Rondout, N. Y. It is designed to act as a heat generator, the car being heated through a drum or coil of pipe, while the construction of the generator is such that it is capable of sustaining great shocks, and yet has ample means to retain the fuel in the heater in the event of accident.

A car brake has been patented by Mr. Lawrence J. Zimmermann, of Brooklyn, N. Y. The brake consists of shoes, more or less rectangular in shape, adapted to be positioned opposite the outer peripheral surface of each wheel, to act directly upon the track, making an auxiliary brake, quickly applied and positive in its action.

A relief valve for engine cylinders has been patented by Mr. Walter Vielhaber, of Altoona, Pa. Its construction is such that when water accumulates in the engine cylinder the pressure exerted on the valve causes it to open automatically, while it can also be opened from the cab of the engine by the usual hand lever or rod.

A balanced valve has been patented by Messrs. William A. Short and Eusebe Lalime, of Malone, N. Y. The invention consists of a cage placed in the steam chest, and having a vertical motion, a cylindrical slide valve operating in the cage, the valve being simple in construction and being completely balanced when the engine is reversed.

A foot guard for railway switches, etc., has been patented by Mr. Edward P. Edwards, of Webster City, Iowa. It is made of sheet iron or other material, of different shapes, to fit openings of different widths between the rails, and adapted to be readily fastened in place, so as not to interfere with the working of the car wheels, while protecting the feet of those stepping on the rails.

A safety base for flues has been patented by Mr. Frank Anderson, of Union Springs, Ala. It is designed to prevent the wood surrounding the lower part of the flues in houses from becoming overheated, and consists in a perforated metal casing surrounding the lower part of the flue, and having a central metallic pipe extending upward and built into the brickwork.

A car coupling has been patented by Mr. Philip Riley, of Marion, Iowa. It is designed to allow cars to couple automatically as they come together, or to be coupled by the operation of a hand lever at the side of the car, the coupling being fitted with a brake attachment preventing the withdrawal of the entered coupling link, thereby assuring the dropping of the pin through the link.

A hydraulic lift has been patented by Mr. Thomas Pownall Ford, Jr., of London, England. The invention consists in the employment of means of controlling the inlet and outlet of water to and from the two ends of a cylinder simultaneously and to the same extent, avoiding hissing noise, and, with such valves operating simultaneously, employing a column of water to partially counteract the pressure of water entering through the inlet valve, with other novel features.

**AGRICULTURAL INVENTIONS.**

A cotton chopper and cultivator has been patented by Mr. Horace N. Sibley, of Midway, La. Its construction is such that the machine may be used as a chopper to remove surplus plants and accurately define the row, and may be subsequently adjusted to operate as a cultivator for the plants as they increase in size.

A spring hoe attachment for cultivators, seed drills, etc., has been patented by Mr. Charles R. Hartman, of Vincennes, Ind. It consists of a locking device to hold the shovel of the implement to which it is attached with the requisite rigidity under ordinary strain while at work, but so as to yield to too great strain, to prevent breakage of the shovel or hoe.

**MISCELLANEOUS INVENTIONS.**

A belt shifter has been patented by Mr. George H. Lowe, of Middletown, N. Y. It consists of a suitable frame provided with rollers to receive the belt from the pulley, and one or more rollers being adapted, under a novel form of construction, to be tilted for shifting the belt back upon the pulley.

A leather skiving machine has been patented by Messrs. Fritz Engel, of Worms on the Rhine, and Carl Wagner, of Offenbach on the Main, Germany. It is for thinning the edges of leather, and is especially adapted for the use of saddlers, trunk makers, bookbinders, etc., the invention covering various novel details and combinations of parts.

A billiard cue chalker has been patented by Messrs. Samuel Clare and Edward W. Smith, of Winnipeg, Manitoba, Canada. It consists of a spirally slotted tube containing a cylindrical chalk case, with spiral spring, and other novel features, whereby the chalk dust is retained, and the tips are kept round and uniform in shape.

An egg beater has been patented by Mr. La Fayette Wikidal, of Salem, Oregon. This invention covers a novel construction and combination of parts of an egg beater that is designed not only for whipping up eggs, but which may be used for beating up batter and other substances, or for mixing ingredients of any kind used in making cake or bread.

A center board for vessels has been patented by Mr. Thomas R. Brough, of Gananoque, Ontario, Canada. The center board case contains a series of blades arranged to swing on a common pivot, with cam slots in the blades, and other features, whereby the free ends of the blades may be projected from the center board casing as desired.

A lamp filling can has been patented by Mr. John A. Kendall, of Maysville, Mo. This invention relates to that class of oil cans having an air forcing apparatus by which the oil is discharged through a suitably arranged outflow pipe into the lamp by producing an air pressure, the can being simple in construction and very effective.

A bob sled has been patented by Mr. Joseph P. Kramer, of West Branch, Mich. Its construction is such that there is a slight rocking movement between the runners and the bench, to allow the runners to change position slightly in rising over obstructions in the road without imparting a jolt or jerk to the superstructure.

A standard for logging cars has been patented by Mr. Edmund J. Minnock, of Baker, Texas. It is a pivoted standard connected by links to a lever a short distance from its pivot, which can be readily turned down out of the way when loading, and which when turned up into position will be firmly and securely held.

A copy holder has been patented by Mr. Irvine J. Adair, of Dallas, Texas. It is a novel device intended to hold the paper to be copied almost the same as one would hold a book in reading, all the lines being held the same distance from the eye, and a spring serving to hold the leaf in place when used to copy into a record book.

A thimble skein has been patented by Mr. John E. Young, of America City, Kansas. It is for wooden axles, and has one or more holes through its sides to permit the passage of oil or lubricating material to the wood within to preserve it, and having also near its inner end an internal peripheral groove to receive a packing ring.

A logging sled has been patented by Mr. John Wisdom, of Moose Lake, Minn. It consists of a peculiarly formed runner or shoe, in combination with a cross bar or bolster for supporting the log, and an arrangement of chains for lashing the log to the bolster and for receiving the evener to which the horses are hitched.

A joint for extension handles has been patented by Mr. Charles A. Bartliff, of Memphis, Tenn. It comprises a socket with longitudinal extension and transverse adjustable bands or wires connected at their ends to opposite side edges of the extension, the improvement being more especially intended for use with brooms, brushes, and mops.

Ornamental strips for picture frames form the subject of a patent issued to Mr. Edward Brodhag, of New York City. The strip consists of a solid flexible core or band, as of strip brass, on which is cemented a soft inclosing covering of plush or other soft and fluffy material, this compound strip to be bent as desired, and retaining its shape, for ornamenting purposes.

A grate for stoves and furnaces has been patented by Mr. Pillsbury C. Dolliver, of Augusta, Me. The grate has two oppositely pivoted grate sections, the longitudinal and cross bars of one section being in the same plane and the longitudinal bars of the other section being above its cross bars, one of the sections having support from the other section, in combination with novel operating devices.

A spectacle joint has been patented by Mr. Frederick Scheidig, of New York City. The invention consists in making the temple from a blank formed with oppositely projecting ears adapted to be bent parallel with each other and embrace the eye on the end piece, and with a lug arranged to strike the stop shoulder on the end piece, making a simple, strong, and easily attachable joint.

A galvanic battery has been patented by Mr. Horatio J. Brewer, of New York City. It consists of a porous cup having a flange resting on a shoulder formed in the jar, means for holding the cup and zinc bar in place at the bottom of the jar, and a zinc bar passing through the side of the jar, the invention being designed to prevent evaporation of the liquid and save a considerable amount of zinc.

A combined egg tester and register has been patented by Messrs. Charles J. Mikesh and Homer W. Conant, of Sheldon, Iowa. The object of this invention is to provide a cheap, durable, and convenient device, with the parts so arranged that as the eggs are tested their number will be automatically indicated by a simple mechanism, not liable to become disarranged.

A releasing device for use in connection with horse stables has been patented by Mr. Mortimer M. Shelley, of Brooklyn, N. Y. The invention provides a novel construction and arrangement whereby, in case of fire, all the horses in a given row of stalls may be released at the same time, and will be driven from their stalls by water automatically dashed in their faces from apertures in fixed pipes.

A vehicle top has been patented by Mr. Thomas B. McCurdy, of Lancaster, Texas. Its construction is such that the side curtains may be forced upward to positions beneath the top proper, there being strips to serve as guides upon which the curtain frames slide, and other novel features, the invention being an improvement on a former patented invention of the same inventor.

A door jamb has been patented by Mr. Christian Henricson, of Ashland, Wis. It consists in a facing supported and guided by horizontal rods and pressed forward into contact with the edge of the door by springs, making a door jamb which compensates for the swelling or shrinking of the door and designed to always rest in contact with the edge of the door when the latter is closed.

A saw filing machine has been patented by Mr. John H. Sodee, of Seattle, Washington Ter. The invention consists of an improved form of

file and file holder, and improved form of mechanism for cleaning off the burr made in sharpening the saw, with other novel features, the machine being designed for sharpening or filing either circular or gang saws, and requiring but slight adjustment for use for saw gumming.

An apparatus for aerial photography has been patented by Mr. James Fairman, of New York City. Combined with a camera-carrying balloon are guy ropes for steadying it, the suspended camera having a funnel-shaped shield with its apex attached to the suspension link of the camera, and extending down to partly inclose the sides and top of the camera, the device being designed for locating the camera and taking views from a great altitude.

A feed regulator for roller mills and purifiers has been patented by Messrs. John W. Edwards and Chauncey L. Becker, of Waterloo, N. Y. Combined with the hopper are valve straps pivotally connected with the valve, a hinged spring arm and plate being also applied to the hopper, with other novel features, whereby the pressure of the material in the hopper will act upon the valve to automatically regulate the discharge by the feed roll.

An extractor for pulling roots, weeds, etc., has been patented by Mr. Robert L. Shaw, of Franklin, Pa. It consists mainly of two grasping jaws and a stock or handle to which they are connected, the jaws being of novel shape and pivoted together by a strong bolt, and a chain being connected at opposite ends to the handle and the inner end of a fulcrum bar, limiting the extent to which the points of the jaw may be opened.

**SCIENTIFIC AMERICAN BUILDING EDITION.**

**AUGUST NUMBER.**

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3. Page engraving of an Elegant Residence corner Eighth Avenue and Berkeley Street, Brooklyn, N. Y.
4. The new United States Court House and Post Office, Montpelier, Vermont. Half page engraving.
5. Half page engraving showing Competitive Design for Carnegie Free Library, Allegheny City, Pa., Jas. W. McLaughlin, Architect.
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The Railroad Gazette, handsomely illustrated, published weekly, at 73 Broadway, New York. Specimen copies free. Send for catalogue of railroad books.

The Knowles Steam Pump Works, 113 Federal St., Boston, and 93 Liberty St., New York, have just issued a new catalogue, in which are many new and improved forms of Pumping Machinery of the single and duplex, steam and power type. This catalogue will be mailed free of charge on application.

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**NEW BOOKS AND PUBLICATIONS.**

THE CREMATION OF THE DEAD. By Hugo Erichsen. Detroit: D. O. Haynes & Co. Pp. 264. \$2.

The sanitary and economical arguments usually adduced in favor of disposing of the mortal remains of human beings by incineration, with a selection of facts and sayings touching the subject from far back in ancient history to the present time, are here brought together in a unique volume. The book is embellished with illustrations of many crematories, and gives with some detail the particulars as to the organization and work of the principal societies formed in recent years to advocate cremation and afford facilities therefor. The author is an ardent advocate of the general introduction of cremation as a means of disposing of the dead instead of by burial, and the volume is a plea to the public, calling for a more active interest in the subject, which, it is conceded, the people must be educated up to before it can become popular.

THE GRAPHICAL STATICS OF MECHANISM. By Gustav Herrman. Translated by A. P. Smith, M.E. Pp. vii, 158. New York: D. Van Nostrand. 1887. Plates.

Starting with the simpler problems of the equilibrium of machines, the graphic method is applied to the treatment of all the ordinary problems of mechanics. To all except those peculiarly conversant with the higher mathematics, much of the advance of the last few years in mechanics are of little avail. But by the system so intelligibly explained and illustrated in this work, these higher problems are attacked by graphic methods, that for accuracy, simplicity, and practical utility leave nothing to be desired. Professor Herr-

man has won an extensive fame by his researches in this special line. The merit and value of the book depends largely on his original investigations. After the subject of the equilibrium of machines is disposed of, the subject of friction and hurtful resistances occupies much of the space. Rolling, sliding, journal, tooth, and chain friction, usually complicated subjects, are here disposed of by the wonderfully practical methods of Professor Herrman's graphics. Belt gearing and practical examples with some concluding remarks complete the text. The translator's work is well done, and some notes by him add to the clearness of the text. Eight folding sheets of plates are used to illustrate the problems.

PRACTICAL ELECTRIC LIGHTING. By A. Bromley Holmes. London and New York: E. & F. N. Spon. Pp. 183. \$1.

This book presents in simple form a good many of the most interesting facts touching the especial department of electrical work to which it is devoted, the final chapters discussing the motive power and the cost of electric lighting.

\*\* Any of the above books may be purchased through this office. Send for new catalogue just published. Address Munn & Co., 361 Broadway, N. Y.

Notes & Queries

HINTS TO CORRESPONDENTS.

Names 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 take his turn.

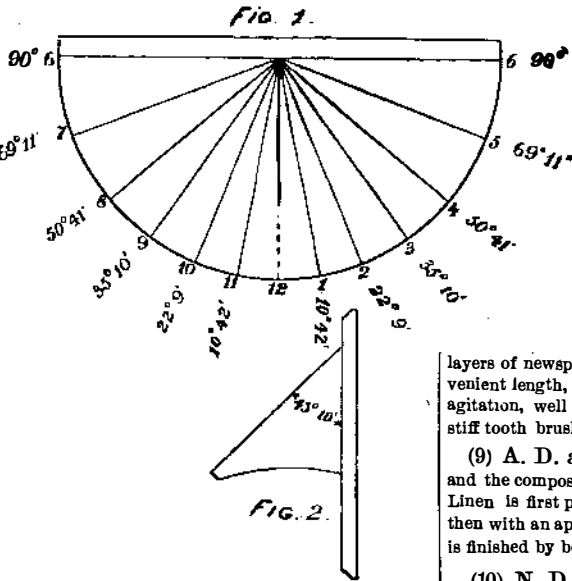
Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(1) F. W. (Vermont) asks (1) the best way to make a sun dial, to fasten on the side of the house. A. The dial must have its plane due east and west, and perfectly vertical by plumb line. The style should correspond with the polar axis of the earth, and for your latitude (44° 50') the style should be inclined to the face of the dial 45° 10'. The hour lines should be laid off with a protractor from the side of the style each way, as per sketch, in which Fig. 1 represents



a plan and Fig. 2 a section through style. Such a dial keeps only mean time, and you will have to consult almanacs as to when the sun is fast and slow. 2. The best cement to mend rubber coats and boots. A. For mending rubber goods, use rubber cement, which can be obtained from the dealers in rubber goods. See SUPPLEMENT, No. 158, for numerous cements.

(2) Carter wishes to know how to free his pond from the little plant called "duckmeat." A. It would be a difficult matter, if not an impossibility, to free the pond entirely from these plants without the addition to the water of some substance that would destroy all plant life. The "duckmeats" are constituted for living in ponds that sometimes dry up, and hence have great vitality, and will revive on the application of moisture after being apparently dried up for some time. They are propagated by lateral buds that form new plants, and hence multiply very rapidly. There is no better method of keeping the plants in subjection than the one that you have used. If you have ducks, give them access to the pond, and they will aid in the work of destruction, since they are very fond of the plant, and this circumstance gives the latter its common name. In the case of a fish pond, the presence of the duckmeats is rather beneficial than otherwise, since they become a depository for the larvae of insects to an extent almost incredible, and thus afford an abundant supply of food for fish.

(3) D. W. F. desires a good receipt to polish pianos. A. Add to 1 pint of shellac varnish 2 tablespoonfuls of boiled oil; the two to be thoroughly mixed. If you want the work dark, add a little burnt umber; or you can give the work any desired shade by mixing with the shellac the proper pigment in the dry state. Apply the shellac, thus prepared, with a small bunch of rags held between your fingers. In applying it, be careful in getting it on smooth and even, leaving no thick places or blotches. Repeat the process continually until the grain is filled and the work has re-

ceived sufficient body. Let it stand a few hours to harden, and then rub your work lightly with ground pumice stone and oil, applied with a rag. A very little rubbing is necessary, and this is to be followed by the cleaning of the work with rags as dry as possible. With a piece of muslin wet with alcohol go over the work two or three times for the purpose of killing the oil. Have ready 1/2 pound of pure gum shellac dissolved in one pint of alcohol (95 per cent). With this saturate a pad made of soft cotton covered with white muslin, and with this pad go over the work several times.

(4) J. H. D. asks: 1. What was the first railroad built in the United States, and in what year was it built? A. The first American railroad was built in 1825-26, and used for the purpose of transporting granite from the quarries near Quincy, Mass., to tide water. 2. How to clean buckskin riding trousers? A. Make a solution of weak soda and warm water, rub plenty of soft soda into the leather and allow it to soak for two hours and then rub it well until it is quite clean. Afterward rinse thoroughly in a weak solution of warm water, soda and yellow soap. When completely rinsed, dry well and quickly in a rough towel, then pull it about and brush it well. It will never, however, be as soft and good as it was at first.

(5) P. C. desires (1) a good receipt for a black bright varnish for harness. A. Grind ivory black into a quick-drying body varnish. 2. How yolks of eggs can be preserved for tawing purposes. A. Drive the moisture off by evaporating them in vacuo, same as the white of egg is prepared. 3. How vegetable court plaster is made? A. The Pharmacopoeia gives many receipts for the different varieties.

(6) W. B. P. asks: 1. Are wall papers containing arsenic usually considered deleterious to health? A. They are. 2. How are they supposed to affect or act on the human system? A. Dyspepsia, neuralgia, pains in the bones and joints simulating chronic rheumatism, headache, general debility, etc., are symptoms which attend chronic arsenical poisoning. See Taylor's "Medical Jurisprudence." 3. Are the dark and olive greens usually prepared with arsenic or arsenite of copper? A. Not generally, but occasionally; analysis is always necessary to determine the presence of arsenic. 4. Is the usual test—dissolving the color from the paper with aqua ammonia, and testing with a crystal of nitrate of silver—considered practically correct? A. It is an inferior test.

(7) F. D. H.—The whole amount of wheat produced in the world in 1885, calculated in bushels of 60 pounds, was 1,998,997,635 bushels. The United States wheat crop for three years past has been between 450 and 495 million bushels each year.

(8) B. M. L. asks how typewriter ribbons are made, such as are used on the Remington and other such machines. A. Take vaseline of high boiling point, melt it in a water bath or slow fire, and incorporate by constant stirring as much lamp black or powdered drop black as it will take up without becoming granular. If the fat remains in excess, the print is liable to have a greasy outline; if the color is in excess, the print will not be clear. Remove the mixture from the fire, and while it is cooling mix equal parts of petroleum benzine and rectified oil of turpentine, in which dissolve the fatty ink, introduced in small portions, by constant agitation. To apply, wind the ribbon on a piece of cardboard, spread on a table several layers of newspapers, then unwind the ribbon into convenient length, and with a soft brush rub the ink, after agitation, well into the interstices of the ribbon with a stiff tooth brush.

(9) A. D. asks how tracing cloth is made and the composition of the varnish put on its tissue. A. Linen is first provided with a coating of starch and then with an application of benzine and linseed oil. It is finished by being smoothed between polished rollers.

(10) N. D. asks: How is the velocity of the cannon ball at the muzzle of the gun ascertained? A. By an electric apparatus, the ball breaking a circuit at different distances, and thus recording the time of passing through certain spaces. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 177, for description and illustrations.

(11) F. B. desires a receipt to make green paint for Venetian blinds that will stand the heat of the sun without blistering. A. Rub 2 parts of white lead and 1 of verdigris with nut oil or linseed oil varnish, mixed with oil of turpentine, and dilute both colors with ordinary drying oil.

(12) F. M. W. asks: 1. Is a brake block pressing against three feet of the tire of a wagon wheel practically any better than one pressing against two feet? A. There is nothing gained, except there is a difference in wear by using a long brake block. The friction for a given pressure is the same, whether the block is one foot or three feet long. 2. Suppose a 30 foot bar of iron lying on the ground. A lifts one end up three feet, B then goes to other end and raises it level with first end. Which man lifts most, and why? A. The thrust of the bar against its ground bearing makes the lift of B a little heavier at starting to raise the bar.

(13) M. & S. desire a receipt for making papier mache and cellulose. A. There are two modes of making papier mache—either by gluing or pasting different thicknesses of paper together, or by mixing the substance of the paper into a pulp, and then pressing it into shape by moulds. Cellulose is woody fiber, and is the basis of paper.

(14) A. C. L. desires (1) good receipt for making plaster Paris casts, in imitation of bronze. A. See answer to query 1 in SCIENTIFIC AMERICAN of April 9, 1887. 2. Please explain the cause of rock salt throwing off water as it does. A. It is due to the chloride of magnesium, which attracts moisture and drains away.

TO INVENTORS.

An experience of forty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequalled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

August 2, 1887,

AND EACH BEARING THAT DATE.

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

Table listing inventions and their patent numbers. Includes items like Adding machine, Alarm, Ammonium sulphate apparatus, Argand burner, Axle and manufacturing the same, etc.

Table listing inventions and their patent numbers. Includes items like Coupling, Cover or lid, Crusher, Cultivator, Dish washing machine, Distilling apparatus, etc.