

ENGINEERING INVENTIONS.

A boiler covering composition has been patented by Mr. William M. Suhr, of New York city. It is a fireproof and at the same time non-conducting boiler and tube covering, consisting of a solution of alum and soda, a mixture of hair or felt, asbestos fibers, mineral wool, cork and sawdust, and plaster of Paris, or other similar substance, mingled in certain proportions.

A rotary engine has been patented by Mr. William L. Tuck, of Bay View, Wis. It has a circular cylinder combined with a non-concentric block having recesses and steam ports, a piston having wings and radially slotted plates, within which the ends of the wings move, a slide valve, exhaust valves, manipulating lever, etc., the engine being designed to utilize the full force of the steam throughout the greater part of the revolution of the piston.

MISCELLANEOUS INVENTIONS.

A head rest has been patented by Mr. George Phillips, of Tilford, Ill. It is a wire frame provided with a cushion for the head, with cords attached which are held by the feet to support the head rest at the desired inclination, the device being simple, light, and portable, for the use of tourists and others.

A cyclometer has been patented by Mr. Gabriel P. B. Hoyt, of Jamaica, N. Y. It is constructed to receive positive, intermittent, or stop motion, from a point, projection, or cogwheel arranged to revolve with the crank, and does not depend upon the force of gravity for its operation.

A duplex brick has been patented by Mr. James A. McAllister, of Frederickton, N. B., Canada. It consists of two ordinary sized brick united by a connecting neck or web, the surfaces of the brick being indented on the upper and lower faces and ends to enable the mortar to obtain a firmer grip.

A brick burner has been patented by Mr. Bernhard Albers, of Conception, Mo. This invention consists in furnaces having interchangeable grates, the furnaces being arranged in pairs, each pair being connected by an arch in which there is a flue, said flue being centrally divided by a solid abutment or partition.

An edge trimmer for walks and beds has been patented by Mr. Thomas Akins, of Camden, N. J. Its construction is such that as the machine is moved along the edge of a walk the cutter trims the edge of the sod to the desired slope, and the plow or scraper loosens the sod and soil cut off and throws them into the middle part of the walk.

A coffee huller has been patented by Mr. Jose Guardiola, of Chocoma, Guatemala. In connection with the hopper and its casing are disks which revolve about two hundred times a minute, the berries being rubbed between projections of the casing and the disks and plates, whereby the hulls are broken and removed.

A wrench has been patented by Messrs. Johann and Patrick Ryan, of New York city. Its handle is in two parallel parts, one being a prolongation of the shank and having mortises, and the other part of the handle having lugs adapted to enter the mortises, the outer end of the adjusting screw being journaled in this part.

A cement for roofing has been patented by Mr. Eldridge J. Burchell, of La Fargeville, N. Y. It is made of coal tar, water lime, coal ashes, plaster of Paris, an oil solution, and a soda solution, mixed in specified proportions, which are variable somewhat, according to the uses to which it is to be put, and adding coloring matter as desired.

An anti-insect fabric has been patented by Mr. John P. Regan, of New York city. It is made by first steeping the fabric in a solution of tobacco and cascarilla bark macerated in benzene, then drying and steeping in tobacco, cascarilla bark, and hot water, the fabric to be used in trunk linings, etc., as a protection from moths or other insects.

A mode of re-enforcing tubular or hollow structures has been patented by Mr. Ebenezer Hill, of South Norwalk, Conn. In vessels exposed to high internal fluid pressures, this method consists in inclosing the vessels in a series of casings, each succeeding outer one charged with fluid, air, or gas of a less pressure than the one next within it.

A stencil has been patented by Mr. Geo. F. Gunther, of Louisville, Ky. It has a metal head piece with wire or rod extension on which letters or numbers may be slipped to form the print to be made, with other novel features, to facilitate the marking of packages with ink and brush by a readily changeable device.

A street lamp has been patented by Mr. Albert F. B. Hennig, of Denver, Col. The construction is such that the gas is automatically turned on by swinging up the bottom gate or door to introduce the torch or other light used for igniting the gas, and the improvement is one that can be applied on any gas lamp and on any burner.

A fire escape has been patented by Mr. Patrick Fogarty, of Milwaukee, Wis. It consists essentially of an elevator car supported by wires that pass over pulleys carried by arms that project from an adjustable bar that is secured within the window casing, with certain novel details of construction, to facilitate the escape of occupants from burning buildings.

A band cutter and feeding attachment for thrashing machines has been patented by Mr. James H. Sheldon, of Warren, Minn. It is designed to carry the bundles forward, cut the bands, spread the grain, and feed it evenly, and when the machine is not in use, and passing from place to place, the carrier can be swung over the chute.

A rosette for harness has been patented by Mr. Ernest F. Püeger, of Akron, O. This invention consists in means for securing the holding loop to the rosette frame more strongly, and is an improvement on

a former patented invention of the same inventor, the ends of the loop being, according to the present invention, embedded in a solid filling of solder.

A gate latch has been patented by Mr. Louis S. Stoll, of Arcadia, Iowa. It consists of a bar or lever, two slotted and tongued plates, a spring and a catch plate with attaching screws and bolts, making a simple and inexpensive latch, which may be readily applied to new or old gates, and one which will effectively and automatically latch the gate when it is swung shut from either side of the fence.

A machine for printing samples on textile fabrics has been patented by Mr. William Mather, of Manchester, Lancaster Co., Eng. Its construction is such that thereby samples can be printed of designs from the engraved copper rollers without the necessity of first mounting the rollers on solid mandrels, thereby saving the great trouble and cost of readjustment for separate trials involved in present methods.

A hoe sharpener has been patented by Mr. Park D. Folkes, of Hays' Landing, Miss. It consists of a pair of jaws pivoted together, a whetstone or sharpening device secured along the inner edge of one jaw, and an anti-friction roller journaled on the other jaw, making a device which can be used on a large variety of tools, or to sharpen mowing machine knives without removing them from the machine.

A machine for hardening seamless felt boots and other hollow felt articles has been patented by Messrs. Walter P. and Nelson F. Hyatt, of Matteawan, N. Y. It has a solid mould with a recess of about the shape of the desired article, with a core which can be placed in the recess and vibrated therein, so that no subsequent stitching, finishing, or felting is required for firmly uniting the bats to complete the article.

A bridle has been patented by Mr. Robert Richardson, of Detroit, Mich. It has two bits, so arranged in connection with straps and rings of the head gear that in driving only one bit will ordinarily be used, but if this is not sufficient to check the horse, an extra tension on the reins will bring the other and smaller bit into the horse's mouth with a force sufficient to curb even the most restive and vicious animal.

A combined breast collar and saddle has been patented by Mr. Christopher G. Calo, of New York city. The saddle tree is made with end loops to receive the top strap, with upwardly projecting flanges to keep it in place, and with other novel features, whereby the use of the ordinary back saddles is avoided, and the harness is made lighter and less expensive to manufacture.

A process of ornamenting wall and other papers has been patented by Mr. William V. Wilson, of Jubilee St., Mile End, Middlesex Co., Eng. It is for producing a finish on previously printed papers, in imitation of silk, satin, or other fabrics, and consists in first coating the fabric with a varnish or compound of nitro-cellulose, and then embossing or frictioning the varnished surface.

An apparatus for electrotyping has been patented by Mr. William J. Ladd, of New York city. This invention relates to devices for suspending the moulds and forming the electric connection therewith in the decomposing trough, the currents being easily disconnected without removing the mould from the bath, there being an indicator to mark the time of deposit, and provision for preventing the deposit of metal on the back of the mould.

A garment lock has been patented by Mr. Anders Ponten, of New York city. It is a small device for conveniently securing coats, hats, umbrellas, and like articles, to supports in dining rooms, cars, and other places, to prevent their being taken by mistake, the lock having hooks to close upon the article, and cap plates for adjustment, so the lock cannot be opened until they are placed at the point at which the lock was set.

A jersey waist forms the subject of two patents issued to Mr. David F. Halsted, of Brooklyn, N. Y. This invention provides for such a construction of ladies' jersey waists that they will have the appearance of being worn over a jacket, and so that the fronts can be readily removed, washed, and replaced, the knitted garment having a space between its front edges and a separate woven fabric front having approximately the contour of the space, and detachably connected at its side edges to the front edges of the jersey.

A process of producing sulphite or bisulphite of sodium forms the subject of a patent issued to Messrs. William O. and William P. Crocker, of Turner's Falls, Mass. It consists in mixing sulphate of sodium with carbonaceous matter, roasting the mixture, leaching out the soluble part, evaporating to dryness, granulating the product, then heating it, and agitating it in contact with air or oxygen until incandescence ceases, and making it into a solution, with other details, by which sulphur and sodium are sufficiently oxidized to produce a practical wood reducing solution.

A process of making bisulphites has also been patented by the same inventors. It consists in suspending by agitation neutral sulphite of calcium in neutral sulphate of sodium solution, and then charging the mixture with sulphurous acid until decomposition has taken place, with other special details.

NEW BOOKS AND PUBLICATIONS.

"The Present Condition of Electric Lighting" is the title of a report made for the Gaslighting Company of Munich, September 26, 1885, by Dr. N. H. Schilling, and republished in this country by Cupples, Upham & Co., of Boston. It gives a brief review of the experience of Munich and other German cities in electric lighting, and in less detail that of several American and British cities, making out a case decidedly unfavorable to electricity. A contract was made with the gas company in 1863, for lighting the public squares and streets of Munich for 36 years. A strong disposition to repudiate the contract has called forth this report, in which the author maintains that both justice and self-interest should support the continuance and extension of the present system of gas illumination.

Special.

LOTTA—PHILADELPHIA'S FAVORITE.

It was always a marvel to the amusement-loving public how Lotta could be so sick that the Chestnut Street Opera House, Philadelphia, was compelled to be closed for one week, about two years ago, and that at the end of that time she was well enough to resume her play of "Nitouche." More than this, it was noticed that her voice had acquired fresh volume, and in "Nitouche," which is a singing play, she could be heard in ensemble as well as in solo. Among all the gifted ladies who adorn the stage, Lotta is decidedly the pet and favorite. Her intense vitality, her beauty, and the versatility of her talents draw all classes to see her. She has been on the stage since her eighth year, and in all that time the breath of scandal has never once assailed her. She is a phenomenally devoted child to her mother, in whose society she is found at all times. Can it be wondered that this little lady returned so soon to her labor at the Opera House, when we remember that this speedy restoration was due to the inhalation of Compound Oxygen? A press correspondent writes: "It was at the residence of Mrs. James H. Heverin, of Delancy Place (wife of the eminent counselor), that I obtained a brief interview with Lotta in reference to the treatment of Drs. Starkey & Palen, which prevented her a great pecuniary loss. The little comedienne was spending the day there, and as she answered my card she came bounding into the parlor, throwing herself into a luxurious armchair, and as soon as the formalities of a visit were complied with, I at once broached my subject.

"I hear you have tried Compound Oxygen treatment, Lotta?"

"Oh, yes! You remember the terrible sore throat I had two years ago—that it baffled the skill of my New York physicians? After burning my throat and positively prohibiting my appearance before an audience for an unlimited time, I was promised great things if I would try the 'Oxygen,' so I immediately came to Philadelphia and put myself under the care of Drs. Starkey & Palen."

"Did you experience relief immediately?"

"It was evident from the first inhalation that I had done the right thing, for it seemed to bring the whole trouble under immediate control."

"Then you do not favor burning the throat or any of the methods usually resorted to?"

"No. I think it a harsh and cruel treatment, and it cannot be long before Compound Oxygen will come to the rescue of all the profession."

"Drs. Starkey & Palen claim that the health obtained by the Compound Oxygen treatment is as genuine and permanent as one's original health. Does your experience confirm that opinion?"

"Yes, it most certainly does. I have not been sick an hour since I used the oxygen. My mother has also been greatly benefited by the use of the Oxygen, and is as great an enthusiast as I. It seems to invigorate the whole constitution, and imparts fresh life to every part of the body. In my profession I am always studying from nature. I observe the expressions, gestures, and ways of the various people with whom I meet, and find that my power of observation has grown more acute and discriminating since my treatment with the Oxygen. In the voice alone there is a most perceptible gain. Long and sustained notes have become easy; and whether talking or singing, I find it now no labor. Persons who sing or talk much on stage or platform feel a certain amount of exhaustion at the end of the season, and to them the use of the Compound Oxygen would be of great value. I wonder these gentlemen have not brought it to the notice of the acting profession before. It is just what we all need."

"Do you think it would have the same effect on the system as change of climate?"

"Yes, and without the disadvantages of long journeys in pursuit of health, such as the loss of home comforts and the interference with regular business pursuits."

"Did you have any unpleasant sensations while taking the Oxygen?"

"No; on the contrary, the sensations were pleasant."

"Do you give your full consent to make this interview public?"

"I certainly do. You are at liberty to say I said so."

Miss Lotta is one of the busiest little ladies in the world. Her engagements are continuously requiring her presence in the cities each season. She owns theaters and real estate in America and Europe and large tracts of wooded land in the Northwest; indeed, she is one of the wealthiest ladies of the stage. Lotta is modest about her own merits. She believes the test of talent is public appreciation. Surely no one has passed this test with greater *éclat* than this gifted lady, who is still young and fresh. Now, if the Compound Oxygen can bring back to the stage each year this favorite and pet, in prime health, the public can but thank Drs. Starkey & Palen. Any who may desire to know more of the treatment of which so kindly words are spoken should write to the office of the physicians, 1529 Arch Street, for the literature on the subject, which is mailed free to all applicants.

Business and Personal.

The charge for insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

Wanted—An experienced foreman for a machine shop in the West, employing an average of 50 hands; must be thoroughly conversant with engine practice and general machine work, with experience in the economical management of men. Give reference and salary expected. Address "J. M. H.," P. O. Box 773, New York.

Catarrrh, Catarrhal Deafness, and Hay Fever permanently cured by a new treatment, in from one to three simple applications, made at home. Send stamp for descriptive pamphlet to

Dixon & Son, 303 West King St., Toronto, Canada.

Send to the *Railroad Gazette*, 73 Broadway, New York, for a catalogue of Locomotive, Track, and other railroad books.

Guild & Garrison's Steam Pump Works, Brooklyn, N. Y. Pumps for liquids, air, and gases. New catalogue now ready.

To Maintain One Lie
you must invent twenty, but truth can never be strengthened by bolstering. The testimony of every lady who has used Dr. Pierce's "Favorite Prescription" for nervous debility and female weakness carries conviction with it. The facts are stated in such a way that no one can doubt them. All those peculiar pains and sinking sensations which ladies suffer from can be overcome by means of this wonderful preparation. If you are a sufferer from female weaknesses, don't fail to employ it.

Wanted—To correspond with a practical door, sash, and blind maker; one who would be fully competent to take full charge of a factory and could give correct estimate of machinery needed, cost of manufacture, probable demand and margin. One that could take an interest would be preferred. Address Mr. H. H. Durkee, 48 Broad St., New York.

Plumb & Webb, Newark, N. J., clockwork, wheels, pinions, worms, and small gearing to order a specialty.

Wanted.—A Mechanical Draughtsman wanted to go West. One acquainted with wood working machinery preferred. Steady employment to a sober and industrious man. Address, with full particulars, stating wages expected, etc., "Western," P. O. Box 773, New York city.

For Sale.—A Patent Boiler Flue Cleaner. A bonanza, Louis Duennisch, Sandusky, Ohio.

For Sale—Patent, dated April 6, 1886, Valve Gear for Reversible Engines. Address Box 65, Cincinnati, Ohio.

Emery Wheels of unusually superior quality for wet grinding. The Tanite Co., Stroudsburg, Monroe Co., Pa.

Wanted—Patented articles of merit to manufacture on royalty. Electric Mfg. Co., 311 River St., Troy, N. Y.

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, polishing compositions, etc. \$100 "Little Wonder." A perfect Electro Plating Machine. Sole manufacturers of the new Dip Lacquer Kristaline. Complete outfit for plating, etc. Hanson, Van Winkle & Co., Newark, N. J., and 92 and 94 Liberty St., New York.

Grimshaw.—Steam Engine Catechism.—A series of thoroughly Practical Questions and Answers arranged so as to give to a Young Engineer just the information required to fit him for properly running an engine. By Robert Grimshaw. 18mo, cloth, \$1.00. For sale by Munn & Co., 361 Broadway, N. Y.

Wm. Frech, Sensitive Drill Presses, Turret and Speed Lathes combined, Power Punching Presses, 68 W. Monroe Street, Chicago.

Order our elegant Keyless Locks for your fine doors. Circular free. Lexington Mfg. Co., Lexington, Ky.

Send for catalogue of Scientific Books for sale by Munn & Co., 361 Broadway, N. Y. Free on application.

The Knowles Steam Pump Works, 44 Washington 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.

Haswell's Engineer's Pocket-Book. By Charles H. Haswell, Civil, Marine, and Mechanical Engineer. Giving Tables, Rules, and Formulas pertaining to Mechanics, Mathematics, and Physics, Architecture, Masonry, Steam Vessels, Mills, Limes, Mortars, Cements, etc. 800 pages, leather, pocket-book form, \$4.00. For sale by Munn & Co., 361 Broadway, New York.

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

Send for Monthly Machinery List to the George Place Machinery Company, 121 Chambers and 103 Reade Streets, New York.

If an invention has not been patented in the United States for more than one year, it may still be patented in Canada. Cost for Canadian patent, \$40. Various other foreign patents may also be obtained. For instructions address Munn & Co., SCIENTIFIC AMERICAN patent agency, 361 Broadway, New York.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J. Iron Planer, Lathe, Drill, and other machine tools of modern design. New Haven Mfg. Co., New Haven, Conn.

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Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 46.

Hercules Lacing and Superior Leather Belting made by Page Belting Co., Concord, N. H. See adv. page 233.

Planing and Matching Machines. All kinds Wood Working Machinery. C. B. Rogers & Co., Norwich, Conn.

A Catechism on the Locomotive. By M. N. Forney. With 19 plates, 227 engravings, and 600 pages. \$2.50. Sent on receipt of the price by Munn & Co., 361 Broadway, New York.

The Windmill as a Prime Mover. Comprehending everything of value relating to windmills, their use, design, construction, etc. By A. R. Wolff. With many fine illustrations. (Shortly.) 8vo, cloth. Price, \$5.00. For sale by Munn & Co., 361 Broadway, New York.

Iron, Steel, and Copper Drop Forgings of every description. Billings & Spencer Co., Hartford, Conn.

See Burnham Automatic Engine adv. last and next week.

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.

Crescent Solidified Oil and Lubricators. Something new. Crescent Mfg. Co., Cleveland, O.

Curtis Return Steam Trap returns all condensations into the boiler without waste. Curtis Regulator Works, Boston, Mass.

Curtis Pressure Regulator for Steam Heating Apparatus, Waterworks, etc. Curtis Regulator Works, Boston, Mass.

New Portable & Stationary Centering Chucks for rapid centering. Price list free. Cushman Chuck Co., Hartford, Conn.

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

60,000 Emerson's 1886 Book of superior saws, with Supplement, sent free to all Sawyers and Lumbermen. Address Emerson, Smith & Co., Limited, Beaver Falls, Pa., U. S. A.

Safety Elevators, steam and belt power; quick and smooth. D. Frisbie & Co., Philadelphia, Pa.

Manufacture of Soaps, Candles, Lubricants, and Glycerine. Illustrated. Price, \$4.00. E. & F. N. Spon, New York.

"How to Keep Boilers Clean." Send your address for free 88 page book. Jas. C. Hotchkiss, 93 John St., N. Y. Barrel, Keg, Hoghead, StaveMach'y. See adv. p. 76. Brass and Iron Working Machinery, Die Sinkers, and Screw Machines. Warner & Swasey, Cleveland, O. Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works, Drinker St., Philadelphia, Pa.

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) J. P. W., Jr., asks the cheapest mode of obtaining a solution with which to charge an electric battery calculated to operate a 6 candle power Edison light. A. There are many solutions used, the particular kind depending on the battery. For zinc carbon battery (Grenet), mix 5 fluid ounces of sulphuric acid (oil of vitriol) with three pints of cold water; after it has cooled, add 6 ounces or as much as it will take up of powdered bichromate of potash. Follow above proportions for any desired amount.

(2) F. G. Z. asks why one can't use covered wire instead of naked for a certain part of the induction coil mentioned in SUPPLEMENT, No. 160. A. You can do so. Economy of construction prompts the use of uncovered wire.

(3) F. P. L. asks how to remove the copper from the electric light carbon. A. The copper can be dissolved in nitric acid. 2. If I should use coppered ones, and the solution be weakened, could I charge it again and get as good current? A. The copper ones would answer. It is a simple matter to add a little more sal ammoniac to strengthen the solution as it becomes exhausted. 3. Which plate does the current come from—the carbon or the zinc? A. The current is assumed to pass from carbon to zinc on the outer circuit of a battery. The electric current is a conventional term only; we know nothing of the actual action.

(4) G. E. C. asks the best kind of soft iron and size of copper wire to make electro-magnets. A. Norway iron is very good. After it has been forged and finished, heat it to a red heat and bury it in forge cinders or in powdered quicklime. The size of wire depends on the available current and other circumstances of the case. No general rule can be given.

(5) H. B. P. asks for a method of drilling holes in glass, and if they can be drilled as large as 1/8 inch without enlarging or running out. A. A hard drill or a file with end broken off may be used in a brace. Apply spirits of turpentine with camphor in solution to the glass, and keep the cavity supplied. A copper tube held in a lathe chuck and supplied with emery and oil cuts a very neat hole. The glass may be held steady by a core cemented to it to fit inside of the tube. Hold a cork pressed against the glass opposite the tube end while drilling.

(6) J. B. McG. writes: Two engines are as near alike as can be made, except size of driving wheels—fired alike, steam pressure alike. Why is it that the one with 3 ft. 2 in. driving wheels will start and haul a heavier train of cars than the one with 4 ft. 2 in. wheels? A. The piston of the engine with 3 ft. 2 in. drivers will act with more advantageous leverage than will the other, as far as hauling power is concerned, but it loses the exact equivalent in rate of running at equal piston speed.

(7) J. T. S. W. writes: I have read that if you make a piece of steel red hot, and touch it with a stick of brimstone, the steel will melt and run like water. Is this a fact? I have tried the experiment, but with no success. A. Your heat may have been insufficient, and you may not have held the brimstone long enough in contact with it. A chemical reaction takes place; the sulphur combines with the iron, forming a sulphide of iron, fusible at a red heat. This is that melts, not the steel as such. Use a stick of sulphur, and keep it in contact with the steel until the result is obtained. The sulphur will probably catch fire, so be careful when you try the experiment, and have water at hand with which to extinguish the sulphur if necessary. The odor of the burning sulphur will be very disagreeable.

(8) A. F. M. asks how to make a cement for carbon to make a box for a battery. A. Try Burgundy pitch or melted shellac. We would not advise you to trust to cement alone. Fasten your plates by metal straps or screws, and make water tight by either of above cements.

(9) C. H. M. asks: 1. How much cold will the fire extinguishing liquid stand, a recipe of which you have given? A. It is supposed to stand the coldest temperature of this region. It is possible that the extreme cold of Dakota might affect it. 2. Is it equal to that used in the hand grenades? A. It is used in them. 3. Is there any objection to running a lightning rod through a barn, following a post, instead of carrying it down on outside? A. It is considered better practice to carry it outside of the building. 4. I have a geared windwheel on one end

of my barn; its upright shaft (1 1/4 inches) extends about 8 feet above the roof, and comes within about 8 feet of the floor. The horizontal shaft runs 24 feet toward the center of barn, the two shafts connecting with pinions. Can I keep the electric current from following the horizontal shaft, in case it was struck, and run it direct to the ground? A. Connect lower end of vertical shaft by a lightning rod or other conductor to a plate of iron buried in charcoal, damp earth, or immersed in a cistern or well. The electricity will not follow the shaft. 5. In rodding the barn, would you connect a point to upright shaft? The barn is 62 feet long, and should have three rods or points. There is a cupola in center of roof, 9 or 10 feet higher than peak of barn. A. If above connection is made, it will be well to have several points connected to shaft. If the shaft is in contact with the wooden frame only, and has no metallic connection with the ground, no points are needed. The connection described in No. 4 under latter conditions is unnecessary also.

(10) W. A. P. writes: In making my dynamo, described in SUPPLEMENT, No. 161, I have wound the magnet with No. 16 wire, cotton-covered, and covered each layer with shellac and red lead; and when I connect one of the terminals with a battery, and touch the other battery wire to either pole of the magnet, I get a spark; what is the trouble? A. Your wire is in direct communication with the core of the magnet. The coating is broken, or the binding screw or terminal may not be insulated.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted, April 13, 1886, AND EACH BEARING THAT DATE.

Table listing inventions with patent numbers, including: Advertising circular, W. Homan; Air, apparatus for drying, J. H. Cremer; Alarm, door alarm; Ale, beer, and porter, manufacturing, Pigeon & Planagan; Alkaline material, apparatus for treating crude, R. G. Neunenschwander; Amalgamator, Beaupre & Meloy; Annunciator and fire alarm, hotel, A. T. Hess; Annunciator and spring jack, combined, T. B. Doolittle; Anti-insect fabric, J. P. Regan; Automatic brake, G. W. Sanborn; Axle lubricator, Hawkins & Allen; Axles, dust guard for car, W. McKenzie; Axles, metallic cup for carriage, E. Jacquelin; Bag holder, W. M. Krure; Balance, molecular pivot, A. Springer; Balance, torsion pivot, A. Springer; Balance, torsional, Springer & Roeder; Balance, torsional pivot, F. A. Roeder; Balance, torsional pivot, Springer & Roeder; Ballot box, registering and canceling, R. G. Wood; Band cutter and feeder, J. H. Sheldon; Bar, See Railway splice bar; Bath, See Steam or vapor bath; Bed bottom, C. Kilburn; Belt, tightener, chain, O. Cooley; Bevel, E. D. Farnham; Bicycles, hood attachment for, H. W. Libbey; Bisulphites, making, W. O. & W. P. Crocker; Bit, See Bridge bit; Blind slats, device for operating, B. D. Stevens; Board, See Switch board; Boiler, See Wash boiler; Boiler covering composition, W. M. Suhr; Boiler scraper, C. A. Rockstroh; Bolt, See Chain bolt; Flour bolt; Bolt, H. A. Wahlert; Book and paper folding machine, A. J. Davison; Book clasp, J. Monch; Boot or shoe, Gascoigne & Royce; Boot or shoe, rubber, G. Watkinson; Bottle filling device, R. R. Stone; Box, See Ballot box; Paper box; Photographer's wash box; Scouring box; Boxes, device for immovably securing, C. Huntley; Brake, See Automatic brake; Cable brake; Car brake; Vehicle brake; Brick burner, B. Albers; Brick, duplex, J. A. McAllister; Brick machine, G. Haut; Brick machines, pressure regulator for, J. J. Koch; Carriage, W. Lang; Car brake, J. Linnoth; Car brake and starter, D. Hall; Car coupling, J. M. Edwards; Car coupling, P. C. Greenawald; Car coupling, J. W. Jackson; Car coupling, J. W. Johnson; Car coupling, C. H. Terry; Car wheel, J. C. Beach; Car wheel fender, railway, A. L. Clarke; Cars, apparatus for dumping coal, Barnes & Laws; Cars, gripping device for cable, G. H. Dodge; Carriage windows, apparatus for adjusting, W. Frost; Cartridge crimper, W. E. Nye.

Table listing inventions with patent numbers, including: Case, See Egg case; Castings, mould for forming, W. H. Harris; Cement for roofing, etc., E. J. Burchell; Cement, manufacture of, H. Mathey; Chain bolt, J. B. Hawes; Chain machine, weldless, M. Jacker; Chair, See Opera chair; Chair seat, R. P. Burkhardt; Chimney cowl, ventilating, M. W. Costello; Chisel, mortising, Peterson & Connelly; Chopper, See Cotton chopper; Churn, J. P. Kelso; Churn, S. Smith; Cigar box, L. Levi; Cigar bunching machine, Bovee & Belmont; Cigarette holder, C. Stoppa; Clamp, See Overshoe clamp; Clasp, See Book clasp; Clipper, hair, Reinhardt & Leberz; Clock, calendar, U. V. Jaeggli; Clock pendulum regulator, W. D. Davies; Clock synchronizing device, C. H. Pond; Clothes drier, J. H. Morlan; Coach platform, A. & C. E. Wnuck; Coat, etc., P. F. Paulme; Coffee huller, J. Guardiola; Coffee roaster, J. T. Johnson; Coffin, R. M. Fryer; Collar, horse, C. Ifland; Conduit, underground, J. Beeler; Copy holder, A. Hayward, Jr.; Copying press, E. M. Haines; Copying press, letter, H. Griffin; Corset, M. A. Waterhouse; Cotton chopper, C. L. Ferriott; Cotton gin, G. L. Rollins; Coupling, See Car coupling; Thill coupling; Cover, See Manhole cover; Cowl, See Chimney cowl; Cracker machine, Crane & Eden; Crackers, machine for arranging, W. Jackson; Crusher, See Ore crusher; Cultivator, T. J. Eubanks; Cut-off for cisterns, water, W. Horn, Jr.; Cut-off valves, automatic device to lock, D. M. Monroe; Cutter, See Band cutter; Paper cutter; Cutter head, C. E. Temple; Cutter heads, counterbalance for, G. W. Hill; Cyclometer, G. P. E. Hoyt; Deodorizing and disinfecting purposes, portable apparatus for use with closets, commodes, and the like for, G. H. Ellis; Digger, See Potato digger; Dish washing pan, H. B. Allen; Disinfectant, Sarmiento & Grimm; Door alarm, C. G. Edwards; Dovetailing machine, J. B. Schmid; Drawer handle, A. H. Jones; Drier, See Clothes drier; Fruit drier; Grain drier; Dump, slag, Bretherton & Colburn; Eaves trough hanger, W. H. Berger; Egg case, T. M. Appling; Electric machine, dynamo, Batchelor & Walter; Electric machine, unipolar dynamo, C. Iering; Electric machines, compensating resistance for dynamo, C. Hering; Electric signal, individual, E. P. Warner; Electric switch, E. Thomson; Electrical conduit, underground, D. N. Hurlbut; Elevating liquids, apparatus for, E. Korting; Elevators, valve for hydraulic, R. C. Smith; End gate and scoop board, combined, G. A. Rauschelbach; Engine, See Rotary engine; Steam engine; Eraser, O. Cate; Exercising apparatus, A. P. Largader; Exercising machine, G. Goldie; Exhibiting devices, electrical attachment for, W. T. Smith; Extractor, See Nail extractor; Fabric, See Anti-insect fabric; Fabric tuffing implement, G. W. Griffin; Fan, rotary, C. Barnes; Fan, rotary, J. Carr; Feed trough, H. Mendenhall; Feed trough, S. A. & J. M. Rine; Feed water heater, H. C. Francis; Feed water heater, E. Green; Fence, J. O. Carter; Fence, A. Newkirk; Fence rail, W. Billings; Fence, wire, J. Taggart; Fiber, apparatus for separating vegetable from animal, T. B. Bowers; Filter, S. W. Lambertson; Filters, draining device for upwardly-acting bone-black, E. E. Quimby; Filters, seamless felted fabric for, T. S. Wiles; Firearm, breech-loading, J. P. Pieri; Fire escape, P. Fogarty; Fire escape, Hargrave, Sr., & Lee; Fire escape, J. A. Neilson; Fish, bait for catching, A. Wakeman; Flour bolt, F. G. Winkler; Fly trap, J. M. Perry; Foot warmer, M. W. Hanley; Freezing or refrigerating machine, J. Csete; Fruit drier, A. J. Hatch; Furnace, See Gas furnace; Tinner's furnace; Furnaces, utilizing the waste heat of, S. M. Lillie; Furniture, household, W. Beale; Gauge, See Scissors cutting gauge; Gas, apparatus for the manufacture of illuminating, H. H. Edgerton; Gas furnace, W. H. Graham; Gas furnace, Head & Kaylor; Gas holder and mixer, C. M. & C. E. Kemp; Gas pressure regulator, L. B. Fulton; Gas regulating burner, Butcher & Wuster; Gate, See End gate; Gate, J. M. Dine; Gate, I. L. Landis; Gate, Oldfather & Grandstaff; Gate, J. Ringer; Generator, See Steam generator; Governor, W. R. Cunningham; Governor for steam engines, electric, A. O. Tengvall; Governor for water wheels, H. E. Jacobs; Grain binder, G. G. Hunt; Grain binder, cord holder, J. G. Leonard; Grain cutting machinery, A. Wemple; Grain drier, L. Gathmann; Grain meter, Taylor & Stockwell; Grain separator, G. H. Ellsbury; Grinding mill, roller, P. Van Gelder; Guano distributor, S. A. Eskew; Gun carriage, H. C. E. Malet; Halter, E. R. Michaelis; Hame fastener, I. Howland;

Table listing inventions with patent numbers, including: Hames, guard and trace attachment for harness, J. Douglass; Hanger, See Eaves trough hanger; Harness, C. La Dow; Harness, J. F. Randall; Harness rosette, W. J. Bitter; Harness rosette, E. F. Pfeuger; Harrow, J. H. Barley; Harrow, seeder, and roller, combined, O. Gravelle; Harrow, wheel, R. Wheeler; Harvester, L. J. Gilman; Harvester, cotton, C. E. Wright; Hay carrier track, P. A. Myers; Hay rake, horse, H. M. Burdick; Hay stacker, L. & T. Soseman; Hay tedder, S. R. Collier; Head rest, G. Phillips; Heater, See Feed water heater; Hog ring, W. L. Caldwell; Holder, See Bag holder; Cigarette holder; Copy holder; Gas holder; Lamp shade holder; Pen and pencil holder; Rein holder; Shade holder; Spool holder; Hook, See Meat hook; Stove hook; Whiffletree hook; Horses, quarter boot for, E. A. Leonhard; Huller, See Coffee huller; Indicating apparatus, pointer for, T. H. Shepherd; Inhaler, G. A. Evans; Insulating wires, composition to be used for, J. Howe; Insulation, composition of matter for electrical, E. D. Kendall; Iron, See Soldering iron; Key, See Telegraph key; Watch key; Kiln, See Tile and pottery kiln; Knife sharpener, emery, W. H. Parkin; Lamp, electric, Macdonald & Woodman; Lamp, self-regulating, V. Di Marzo; Lamp shade holder, F. A. Stearns; Lamp, street, A. F. B. Hennig; Lamps, carbon holder for arc, S. H. Stupakoff; Lantern, dark, W. Benner; Last supporting jack, H. Stockman; Latch, knob, E. Knight; Lathe for the manufacture of artificial limbs, J. E. Hanger; Leather splitting machine, scrap, J. A. Joselyn; Lemon squeezer, G. R. Wilson, Jr.; Letters, blanks, and other papers, device for holding and filing, A. L. Colton; Lifter, See Plate lifter; Lock, See Nut lock; Seal lock; Lock, D. F. Haasz; Locomotive, R. Abt; Log turner, W. W. Coyle; Loom picker, J. W. Barlow; Loom shuttle, R. Shand; Lubricator, See Axle lubricator; Lumber, asbestos, E. A. Hayes; Magneto calls, short circuiting device for, G. A. Mason; Manhole cover, R. Munroe; Meat cutting machine, J. G. Baker; Meat hook, J. Koerberle; Mechanical movement, Crompton & Wyman; Mechanical movement, O. Hufeland; Mechanical movement, A. D. Jeffrey; Mechanical movement, C. B. Maxson; Metal working machines, tension mechanism for spindles of, J. Hartness; Meter, See Grain meter; Milk cans, locking device for, E. Whitson; Mill, See Grinding mill; Roller mill; Sawmill; Mole and gopher trap, F. Stanke; Money changer, C. B. Hopkins; Mop wringer, A. A. Frasier; Mower knives, device for forming, G. M. Williams; Mower, lawn, G. Campbell; Mowing machine, G. L. K. Morrow; Music holder, P. J. Kearney; Music rollers, machine for making and inserting staples in, H. B. Morris; Musical instruments, transposing key board for, A. Larsson; Nail extractor, P. F. King; Nails, machine for making wire, J. T. Kennedy; Name and drop letter plate, W. E. Sparks; Napkin pin, A. McDonald; Necktie fastener, W. B. Kauffmann; Nut lock, G. L. Fowler; Nut lock, J. W. Ganoe; Nut lock, O. D. Harmon; Opera chair, S. W. Peregrine; Ore crusher, roller, S. R. Krom; Overshoe clamp, J. H. Caldwell; Packing for stuffing boxes, metallic, F. Hennebohle; Packing, rod, E. L. Perry; Padlock, C. L. Wheeler; Pan, See Dish washing pan; Paper box, F. M. Oviatt; Paper box machine, B. E. Becker; Paper cutter, W. Jones; Paper, drying frame for sensitized, H. Kuhn; Paper machines, automatic guide roll attachment for, R. Smith; Paper webs, machine for winding, J. J. Manning; Pen and pencil holder, T. W. F. Smitten; Pencils and pen holders, yoke for connecting, T. W. F. Smitten; Perforating machine, J. Schumacher; Photographer's wash box, T. H. Kelley; Photographic apparatus, shutter for, J. K. Beach; Photographic shutter, C. F. Marvin; Picker, See Loom picker; Pipe wrench, D. P. Foster; Pipes, closing the ends of wrought iron, M. L. Ritchie; Pitchfork and rake, combined, A. J. & E. B. Wilcox; Pitman connection, A. M. Blain; Plane, bench, J. P. Gage; Planing machine, W. H. Gray; Planter and fertilizer distributor, combined seed, R. M. & J. M. Brooks; Planter, check rower corn, C. E. Sweeney; Planter, seed, P. Dickinson; Plate lifter, C. A. Crawford; Platform, See Coach platform; Plow, L. C. Jaques; Plow, J. T. Ketchum; Postal card, reply, W. Homan; Potato digger, S. E. Smith; Potato digger, plow, J. McFarland; Press, See Copying press; Soap press; Printing machine, J. L. Poak;