

ENGINEERING INVENTIONS.

Mr. Walter L. Phelps, of Wortendyke, N. J., has patented an improved railroad torpedo. The invention relates to the construction and shape of the plate to which the torpedo is attached, and to the provision which is made for attaching two or more torpedoes on one plate, so as to insure an explosion.

Mr. Arthur G. Leonard, of New York city, has obtained a patent for an improved railroad signal which consists in a novel mechanism by which when a danger signal is set the same mechanism by which the semaphore is raised will deposit a torpedo upon the track. In this way a double safeguard is provided, for in case the engineer from any cause fails to observe the semaphore his attention will be drawn to the signal by the exploding of the torpedo.

A very simple and inexpensive steam whistle has been patented by Mr. Frank McCabe, of Providence, R. I. The steam is admitted into the steam chamber by depressing an ordinary check valve, and the said chamber is provided with a longitudinal slot for the escape of the steam. By increasing or diminishing the size of this slot different tones may be produced in the whistle, and in order to enable the size of this aperture to be varied the inventor has provided the whistle with a movable lip plate which may be adjusted in the desired position.

Mr. John Hought, of Springtown, Pa., has patented an improved compound feed pump for steam boilers. In this invention the force pump which supplies the water to the boiler has combined with it an auxiliary pump, with check valve between them, the auxiliary pump being arranged between the first named pump and the heater, and both pumps working simultaneously in like directions to produce an artificial pulsation and overcome any undue back pressure in the cylinder and supply pipe. This invention is an improvement upon a patent granted to same inventor in August, 1882, and the especial feature of the improvement consists in using elongated plungers in the pump instead of pistons with valves in them.

MECHANICAL INVENTIONS.

Mr. William Lane Hutson, of St. Lawrence, N. C., has patented a lever wagon brake, the simple mechanism of which keeps the brake applied to the wheel without effort on the part of the driver, and by which the brake is instantly released by a movement of the lever precisely like that which engaged the brake, thus greatly simplifying the operation of the brake.

Mr. Joseph W. Davis, of Port Jefferson, N. Y., has obtained a patent for a very efficient road scraper. This scraper is mounted upon wheels and is so arranged that the scraper may be raised or lowered by means of a windlass, so as to avoid any obstructions that may be in the way, and so that the machine will not do any work while passing from place to place.

Mr. Matthew Newlove, of Grand Island, Neb., has patented an improved chain saw, which is especially adapted for cutting mortises. This invention consists in an endless chain composed of links or sections having teeth or cutters at their outer edge, and united together by pivotal connections, and driven by a sprocket or notched wheel, with which the chain saw engages.

A new lever cotton and hay press is patented by Mr. Thomas G. Holloway, of Boston, Ga., in which two combined levers act, the long ends of the levers being connected and moving through the same arc, the radius of which is greater than that of the shorter, unconnected ends. An immense advantage is thus gained over any toggle lever whose unconnected ends are extended from each other.

An improved grinding attachment for valves has been patented by Mr. A. Wells Case, of South Manchester, Conn. The invention consists in a valve head constructed with a square recess in its face to receive the square end of a rod which slides longitudinally through a stuffing box in a screw plug opposite the face of the valve head, thus enabling the engineer to grind the valve heads to their seats without removing them from the valves.

An improved flour and meal bolt has recently been patented by Mr. William Mosher, of Poughkeepsie, N. Y. In this machine the coarse particles are separated first instead of last, as in the ordinary revolving bolt, and in consequence the large flakes which commonly cover the meshes, and prevent the escape of the finer particles will be disposed of at first, whereby the separating will be greatly expedited and facilitated.

An improved evaporator is the subject of letters patent recently issued to Mr. T. L. West, of Palatine, Ill. The improvements consist in the construction and arrangement of the evaporating pan, the means of supplying the sirup to the pan, the means of regulating the application of the heat, and for the management and action of the sirup, and the separating of it from the semisirup, as well as discharging it from the pan. The inventor claims it is more economical in the use of fuel and is better in its application of heat than the evaporators now in general use.

Mr. John Spengler, of Clarion, Iowa, is the patentee of a car mover adapted to move railroad cars by means of a lever power applied to the railway track at one end, and to a frame beam of the car at the other end. The lower end of the implement grasps the head of the rail by means of jaws and a chisel edged lever, and the upper end is attached to the floor beam of a car. A horizontal lever with connecting bars is used to work the device, and it may be used attached to the middle of a car instead of at the end, as the operator stands outside of the track.

An improved annealing furnace has been patented by Mr. Daniel G. Barnard, of Winslow, N. J. In this furnace the machinery is very simple and is designed to reduce to a minimum the breakage of the glass while it is being carried through the tunnel. The glass rests upon a series of parallel bars while a secondary set are so arranged that they may be raised between the stationary set, and thus will carry the glass forward a certain distance when they deposit the glass

once more upon the stationary set, and then are moved back again to the position they were in at first, and then the glass will again be raised and carried forward as before. The invention consists in the improved arrangement of the mechanism.

AGRICULTURAL INVENTIONS.

Mr. G. W. Hunt, of Muscatine, Iowa, has patented an improved wheel plow by which the driver can instantly adjust the depth of the plowshare without leaving his seat, and without interfering with the management of the team. The plow beam holding the share may be raised and lowered, and will be held rigidly in any position by a very simple device that is self-locking, and that may be disengaged by the movement of a simple lever.

Messrs. Louis C. Rummel and Emil J. Fiedler, of Leabetter, Texas, have invented a new and useful improvement in self-packing cotton presses, the object of which is to facilitate the baling of cotton as it comes from the gin. The invention consists in a cotton press constructed with a pivoted double baling box, a pair of rolls and their driving mechanism for packing the cotton into the baling box automatically, and a screw driven follow block for compressing the cotton into bales.

A combined harrow and clod crusher has been patented by Mr. Samuel Miller, of Moweaqua, Ill., which is an improvement on one for which letters patent No. 188,379 were issued to him and Mr. W. H. Kuhn. The machine consists of a series of independent frames carrying the harrow teeth and suspended side by side from a common rod or bar on which they swing vertically. Each frame acts independently of the others, thus adapting the harrow to unevenness of surface, and clods are broken up by the combined weight of the entire harrow and of the driver seated upon it.

MISCELLANEOUS INVENTIONS.

A simple and efficient device for cleaning sinks has recently been patented by Mr. C. R. Turner, of Brooklyn, N. Y. It consists of a suitable brush or scraper for collecting the refuse in the sink, combined with a shovel for scooping it up.

Mr. Elijah Tolman, of Taunton, Mass., has invented an improved form of spoons and forks intended to retard the wear at the convex portions of the articles. Instead of more heavily plating these portions or of forming projections at their points, he flattens the portions slightly, so as to give greater area of wearing surface, without disfiguring the spoons or forks.

When wash tubs are packed for transportation there is often some difficulty in getting them in compact shape, owing to the awkward shape of their handles. Mr. W. H. Parrish, of Richmond, Va., has avoided this objection by an improved metallic handle made of such a shape that the sections of the tub may be packed with the greatest facility.

Mr. J. W. Page, of Rollin, Mich., has patented a wire lock which relates to locks for worm rail fences, in which wire is drawn around the rails to prevent the fence from being blown down or from being pushed down by animals; also provision is made for tightening the lock from time to time, as shrinkage or wears may render necessary.

A patent has recently been issued to Mr. F. S. Gulick, of Bolivar, N. Y., for an improved stove pipe holder, which consists of an extensible hanger and an extensible hoop, contrived in a simple arrangement for suspending stove pipes from the ceiling in a better way than by the wire suspenders commonly employed.

An improvement in table casters for holding condiment bottles is the subject of a patent by Mr. Orin F. Bacon, of Taunton, Mass., which provides an anti-friction bushing, or collar, for the holder, or for the standard, by which the wear of the holder on the pintle and the consequent rattling of the caster when turned are obviated, and the durability of the caster is greatly extended.

A fire escape has been patented by Mr. Richard E. Andrew, of Shepherdstown, West Va., which is intended to lower, by weights, one or more ladders from the eaves of a building to the ground. The entire mechanism, and the ladders themselves (which are flexible, being made of jointed rods or plates), are located in the attic of the house, and the ladders pass out through openings under the eaves, the openings being closed automatically when the ladders are wound up.

A gate has recently been patented which is provided with a long arm, so arranged that by raising this arm the gate itself will be raised in the post rails upon which it is hung. This enables the gate to be swung out readily in snowy weather, and the invention recommends itself on account of its simplicity and the readiness with which the contrivance may be applied to an ordinary gate. The inventor of this device is Mr. Bernard Selting, of Dyersville, Ia.

Mr. P. T. Forsyth, of Memphis, Tenn., has patented a portable fire escape which consists of a belt held to the end of a rope passing over a pulley, and through a sleeve of pliable material provided with a flap. The flap is passed around the strands of the rope when a person is using the fire escape, which sleeve and flap are pressed more or less firmly against the strands of the rope, to increase or decrease the friction, so as to regulate the rapidity of the descent.

Mrs. Augusta Netzer, of New York city, has patented a very strong suspender end. This suspender end is provided with a cord between the two strands of each strap, which cord has its lower end secured at the lower end of the strap, and its upper end secured to the upper part of the strap. This cord is thus made to bear the greater part of the strain and the ends thus rendered exceedingly durable.

Mr. William Gosshorn, of Waterloo, Pa., has obtained a patent for a very convenient gate for use where pedestrians and horses and carriages are likely to pass. This gate is hinged at one end and at the end

opposite the point where it is hinged is provided with a sliding section, so that foot passengers will not be compelled to open the whole gate in order to pass through. The gate is further arranged so that it may be raised at its hinges in order that it may be swung out readily even if the ground be covered with snow.

Mr. Emil C. Eyl, of Jefferson City, Montana Territory, has patented a combined folding fire escape and ladder, the platform or fire escape being a net work frame of iron or steel, hinged against the house in such a position that when lowered it forms a platform just below the window sill, a chain ladder at the same time unfolding from it to the ground. When not in use the ladder is folded into the frame and the frame is turned up against the wall of the house and secured to the window sill.

An improved gate has been patented by Mr. J. L. James, of Forsyth, Ill. This gate is constructed in two sections, only one of which is swung open under ordinary circumstances, but the whole being so arranged that in case the opening is too narrow the two gates may be swung open as one. Further, a long crossbeam is provided carrying pulleys at the ends over which pass ropes arranged conveniently, so that a person riding or driving in a wagon can open the gate without being compelled to alight.

Mr. Lorenzo D. Cather, of White Pigeon, Mich., has patented an improved "stake and rier" fence for farms, the supports of which are two braces crossing each other, with a vertical binding stake which with longitudinal riders are held securely by wires, forming a fence so rigid that it may be moved bodily without falling apart. It has no stakes or posts inserted in the ground, but the leaning stakes may rest upon blocks or stones. It may be put up by unskilled labor and may be made close enough to keep out sheep, dogs, and other small animals.

Mr. Edward A. Hemphill, of Elizabeth, N. J., has invented a new and improved memorandum book, having its covers stitched to each other a short distance from the back, forming a pencil pocket along the back of the book. Preferably both covers are made in one piece, and the pocket is formed by stitches a short distance from the back, and the book is then pasted to the covers. The pencil in the pocket stiffens the book and prevents it from being doubled over or bent, and does not interfere with using the book and turning the leaves, and is entirely out of the way when not in use.

Mr. Walter S. Bishop, of New Haven, Conn., has obtained a patent for some improvements relating to polishing wheels. The object of this invention is to construct polishing wheels in such a manner that they will not become changed in shape from dampness, and will be strong and durable, and Mr. Bishop accomplishes this by providing the emery wheel with a metallic rim and with a web of peculiar form, and in covering the rim of the wheel with a leather band and covering this band with a second band cemented thereto, and sewed together at the ends. A wheel thus constructed will not be changed by swelling or warping.

NEW BOOKS AND PUBLICATIONS.

A SUMMARY OF THE LAW OF PATENTS FOR USEFUL INVENTIONS, WITH FORMS. By William Edgar Simonds, Hartford, Conn. New York: L. K. Strouse & Company, 95 Nassau Street.

This is an enlargement of a volume issued by the author as a manual in 1874, which combined the laws relating to the issuing of letters patent, and the compilation of rulings under the law as it then existed. The present volume may be considered a compendium of patent law and patent law practice, being intended, not only as a guide to patentees, but as a help to patentees' attorneys. The volume, which is neatly bound in sheepskin, is provided with a copious index which enables it to be used as a ready reference book.

FINLAND: ITS FORESTS AND FOREST MANAGEMENT. By John Croumbie Brown, LL.D. Oliver & Boyd, Edinburgh; Simpkin, Marshall & Company, and William Rider & Son, London; Dawson Brothers, Montreal.

The first fifty pages of the book are taken up by descriptions of the lakes and rivers of the country, but a serious mistake was made by omitting an examination into the relations they bear to the climate. This branch of the subject was treated very cursorily. The old practice of clearing the land by burning the forests, the custom being known in Finland as *Swedjande*, is described at length, together with the methods pursued in other countries, and a discussion of the evils following the practice in India and an account of the merits and demerits of the practice as now pursued in France. Several chapters are taken up with forest economy, administration, protection, exploitation, and the kinds of trees. A valuable account is given of the school of forestry, its management, method of instruction, and work it accomplishes; and also of ship and house building, and industries in which wood is made use of. The last part of the volume treats of the physical geography of Finland and its flora, fauna, and climate. The author has contributed a valuable book to the literature of forestry, and his work clearly shows much study and an intimate acquaintance with the labor of those who have preceded him in similar paths.

THE MACHINIST'S AND STEAM ENGINEER'S PRACTICAL CALCULATOR. By D. B. Dixon. D. Van Nostrand, New York City. Price, \$2.00.

The author, recognizing the need of a rudimentary manual for the use of machinists and steam engineers, has succeeded in producing a book admirably filling the want. The ground is very thoroughly covered, and yet no useless subject is admitted. Algebraic formulas and technical phrases are entirely avoided, and all the rules laid down are illustrated by examples worked out in plain arithmetic. The language is well chosen, simple, and direct.

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Improved Skinner Portable Engines. Erie, Pa.

Fossil Meal Composition, the leading non-conducting covering for boilers, pipes, etc. See adv., p. 236.

The Sweetland Chuck. See illus. adv., p. 174.

Hollar's Safe and Lock Co., York, Pa., manufacturers of improved Fire and Burglar-proof Safes, Bank and Safe Deposit Vaults and Locks. See adv. p. 190.

Catalogues free.—Scientific Books, 100 pages; Electrical Books, 14 pages. E. & F. N. Spon, 35 Murray St., N. Y. For Mill Mach'y & Mill Furnishing, see illus. adv. p. 204.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 206.

Stereopticons and Views for public and private exhibitions. Send for catalogue. Queen & Co., Phila.

Am. Twist Drill Co., Meredith, N. H., make Pat. Chuck Jaws, Emery Wheels, Grinders, automatic Knife Grinders. American Fruit Drier. Free Pamphlet. See adv., p. 221.

Drop Forgings. Billings & Spencer Co. See adv., p. 189.

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C. B. Rogers & Co., Norwich, Conn.. Wood Working Machinery of every kind. See adv., page 221

Straight Line Engine Co., Syracuse, N. Y. See p. 220. Lightning Screw Plates, Labor-saving Tools, p. 220.

Notes & Queries

HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at the office. Price 10 cents each

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark and label their specimens so as to avoid error in their identification.

(1) H. W. writes: I have some gutta percha chips; how can I soften them and then make them hard again, like gutta percha buttons? A. Soak the fragments in hot water. It will quickly soften them, and they will become hard on cooling.

(2) J. R. H.—The ordinary solid bluing consists of indigo and starch, or of artificial ultramarine. To make liquid bluing the following is a good receipt: Powder one ounce Prussian blue very fine, add it to one quart of very pure water, to which add one-fourth of an ounce of oxalic acid. This is very powerful. The oxalic acid is poison.

(3) O. T. asks: Can you give me a formula or two for brilliant, quick drying furniture polish? A. The following will dry in a moderate time: 4 ounces shellac is dissolved in 2 pints strong alcohol; to this is added 1 pint linseed oil and 1 pint spirits of turpentine. When mixed, add 4 ounces common ether and 8 ounces ammonia water. Apply with a sponge. For French polishing, shellac varnishes are often used. The following is good: Shellac 2 pounds, mastic and sandarach, of each 1 ounce, copal varnish 12 ounces. Alcohol 1 gallon. Make in the cold in a stoppered can or demijohn, and do not filter. This is for use in French polishing, which involves rubbing in with a rubber.

(4) W. L. T. asks for a receipt for gilding and silvering on wood. A. The wood must be coated with size. To make this boil half a pound parchment shavings with three quarts of water, constantly stirring. This gives a clear solution of gelatine, which must be passed through a sieve. Paint over the wood with this, and while it is still moist apply gold or silver leaf or Dutch metal. Much manual skill is necessary, and you should see the exact details practiced by a gilder. You may also gild wood by mixing bronze powder with copal varnish and painting it with the mixture. Finally, gold paint may be bought all ready for use and this will probably give you the most satisfaction.

(5) E. G. H.—To prevent the rotting of seines, we would suggest the use of raw linseed oil, applied to the seine while it was perfectly dry.

(6) A. R. J. writes: How can I remove the gold gilt and name from the cover of a book that is pressed in one-sixteenth of an inch? Can the indentation be entirely taken out? Also, is there any preparation to renew the muslin or leather covers of old books? Also can the stains of dampness, mould, or other discolorations be removed from the cover and leaves? A. The impressions on the outside of the book cannot be removed. It would also be very difficult or impossible to remove the discolorations you speak of.

(7) D. J. P. asks: 1. Is there any solvent of coal tar other than heat or "dead oil"? A. Turpentine, naphtha, kerosene, benzine, and many other similar liquids will dissolve coal tar. 2. How may the odor of coal tar be destroyed or disguised? A. It is extremely hard to remove or disguise its odor, as we have found by experience.

(8) T. F. asks (1) what two colorless or nearly colorless liquids when mixed will become black. A. Mix a dilute solution of copperas with an infusion of nut galls. 2. What colorless or nearly colorless vegetable or mineral solution will become dark by contact with a metallic solid, and what metal will effect the change? A. Mix a dilute solution of nickel sulphate with a very little hydrochloric acid and add sulphide of ammonium. A piece of metallic zinc will neutralize the acid and cause a black precipitate of sulphide of nickel which will color the solution before settling out of it.

(9) E. C. S. writes: 1. I have a lot of surgeon's isinglass adhesive plaster which is not very proof against water or moisture. What should I apply

to the silk side to render it entirely waterproof, so it won't wash off when slightly wet? A. After applying it give it a coat of shellac dissolved in alcohol, or coat it and the skin surrounding it with collodion. 2. What is the liquid used on muslin drilling, or cotton duck to make it waterproof, and fit for coats, horse and wagon covers, etc.? It gives the material a slightly yellowish tint. A. Linseed oil.

(10) H. C. W. writes: 1. Please give us in "Notes and Queries" the formula for a good liquid shoe dressing; one that will not injure the leather and which will give a luster without rubbing, and which will also answer for harness? A. Many receipts are given. We give the following, as it contains no oil of vitriol, and can be tried cheaply. Ivory black, 1 pound; molasses, 3/4 pound; sweet oil, 2 ounces. Mix well and rub together, then add beer, 1 pint, vinegar, 1 pint. Also see SCIENTIFIC AMERICAN, Vol. 48, No. 10. 2. Can you also give the formula for Day's liquid blacking, an English preparation? A. The formula for Day & Martin's English blacking is thus given: Fine bone black is mixed with sperm oil until a thorough mixture is effected. Sugar and molasses is mixed with a little vinegar, and added to the mass. Oil of vitriol is next added, and when effervescence has ceased vinegar is poured in until a proper consistence is attained. The quantities are not given; they probably run about as follows: Bone black, 1 pound; sperm oil, 1/4 pound, or enough to mix; molasses, 1 pound; oil of vitriol, 1/2 pound; vinegar enough to secure proper consistency.

(11) C. F. S. asks: Is there any way we can keep glue from getting thick after reducing down very thin? What can we put in it to destroy the offensive odor while cooking? A. Add acetic acid to the glue. This will keep it liquid and tend to overcome the odor. Try also muriatic acid or acetate of lead; both are good.

(12) E. Bros. ask if this is intended to make a first class mucilage for gumming large sheets of paper which may be kept for use without curling, and stick well on glass or other substances when wet, viz., paste or glue for paper labels:

- Starch..... 2 drachms.
White sugar..... 1 ounce.
Gum arabic..... 2 drachms.
Water..... q. s.

Dissolve the gum, add the sugar, and boil until the starch is cooked. A. This seems to be a good paste. Try the following, said to be that used on postage stamps: Gum dextrine, 2 parts; acetic acid, 1 part; Water, 5 parts. Dissolve in a water bath and add alcohol, 1 part.

(13) J. W. R. asks how to make green japan for tin, such as is used on toy cups, bird cages, etc. Say what ingredients to use, and how to mix? A. Color the japan green by adding a mixture of King's yellow (or other good yellow) and Prussian blue; also try aniline greens.

(14) F. W. writes: 1. Will you please answer the following questions, and oblige: At what degree of heat will platinum melt? A. 4,591° Fahr. 2. Has it a clear ring like silver? A. It is not nearly so sonorous as silver. 3. What is its worth per pound? A. About \$155.00.

(15) L. R. G. writes: I forward you with this a sample of white quartz sand from a deposit in this State. Would you inform me whether the sample is of a kind suitable for fine glass manufacture, and also if it is likely that the sand would find a market as a commercial article if suitably prepared? Would you also acquaint me through the SCIENTIFIC AMERICAN what are the requirements of manufacturers in their choice of sand for different classes of articles, and wherethe most suitable are found in this country? A. The value of sand for manufacturers in general consists especially in its freedom from iron. The sample you send seems very pure and well adapted for glassmaking. Correspond with some of the large glass factories, and send them samples if they ask for them.

(16) G. W. H. writes: Will you please inform me in your answers to correspondents how steel plate engravings can be transferred to vases and other articles for ornament. Some method by which the ink can be softened and transferred to any kind of hard surface? A. Varnish the surface to which the engraving is to be transferred with copal or dammar varnish. After it has dried for six hours and is still sticky, wet or soak (if necessary) the engraving, using soft water for the purpose. Then press the engraving well upon the varnished surface, carefully avoiding the formation of bubbles. Let the whole dry perfectly (which will take a day more). Then with a wet sponge and the fingers and soft rubber wash off the paper in pieces, and the lines of the engraving will be left upon the glass or porcelain surface. This must then be revarnished.

(17) A. A. R. asks: Can you give a process whereby empty ink bottles can be sufficiently cleaned, so that they may be used without injury to health in bottling and preserving catsup, table sauce, etc.? A. Muriatic acid followed by water will answer we think. It depends on what kind of ink the bottles held.

(18) A. G. asks: Are the colors used in making pastel pictures durable, or will they fade after a time? A. Most of the colors are very permanent.

INDEX OF INVENTIONS For which Letters Patent of the United States were Granted September 25, 1883.

AND EACH BEARING THAT DATE. [See note at end of list about copies of these patents.]

Table listing inventions such as Abrading cylinder, Adjustable chair or seat, Agricultural boiler, Air compressor, etc.

Table listing inventions such as Animal trap, Annealing furnace, Auger, J. Swan, Axle, car, A. T. Peirce, Bag holder, A. Sherman, Bale tie, cotton, W. L. Jones, Baling press, T. G. Holloway, Bar, See Draught bar, Railway splice bar, Vehicle spring center bar, Basin, enameled iron wash, Milligan & Chaumont, etc.

Table listing inventions such as Fence, L. D. Cather, Fence, J. Newton, Fence, J. W. Read, Fences, wirelock for, J. W. Page, Fertilizer, J. B. Beck, Fertilizer distributor, L. Heath, Fertilizer distributor, force feed, C. F. Johnson, Fifth wheel, F. P. Bates, Firearm sight, J. M. Farrington, Fire escape, R. E. Andrew, Fire escape, O. N. Brooks, Fire escape, W. H. H. Doane, Fire escape, E. C. Eyl, Fire escape, J. R. Fell, Fire escape, P. T. Forsyth, Fire escape, Frazee & Culver, Fire escape, W. A. King, Fire escape ladder, S. D. Shattuck, Fire extinguishing apparatus, C. E. Buell, Fires on vessels, apparatus for extinguishing, A. F. Spawn, Fishing reel, H. C. A. Kasschau, Flask, See Drinking flask, Flour and meal bolt, W. Mosher, Flour bolt, centrifugal, Holcomb & Heine, Flour chest and cupboard, combined, T. J. Corr, Folding table, H. A. Tobey, Fork, See Manure fork, Frame, See Caster frame, Grinding wheel frame, Frame, pedestal, vase, etc., decorated, R. Marsh, Frog, W. J. Mordean, Furnace, See Annealing furnace, Glass annealing furnace, Regenerative furnace, Reverbatory furnace, Rotating furnace, Gauge, See Caliper gauge, Gauge for elongation and compression of materials under strain, W. H. Paine, Game apparatus for playing parlor quoits, H. A. De Windt, Gas generator for furnaces, J. E. Bott, Gas lighting burner, electric, D. Rousseau, Gas, process of and apparatus for manufacturing, Hanlon & Leadley, Gate, W. Gosshorn, Gate, J. L. James, Gate, B. Selting, Gate, H. W. Taylor, Gate for sheep feeding yards, J. W. Scott, Generator, See Gas generator, Glass annealing furnace, D. G. Barnard, Glass, composition of matter for the manufacture of, R. B. Shepard, Glassware, mould for pressing articles of, J. B. Lyon, Gold and silver from their ores, apparatus for washing and separating, W. J. Tanner, Governor, engine, G. H. Reynolds, Grain binders, bundle discharging device for, C. M. Young, Grain drill fertilizer attachment, L. M. Watkins, Grate, L. Merriman, Grease trap for sinks, J. Tucker, Grinding mill, J. Fitzgerald, Grinding wheel frame, D. B. Hyde, Guard, See Hatchway safety guard, Saw guard, Hame fastener, A. Niccum, Hammer, atmospheric, J. C. Butterfield, Hammer, power, J. C. Butterfield, Hammers, helve of power, C. W. Willard, Hanger, See Door hanger, Eaves trough hanger, Picture frame hanger, Harness, J. Beha, Harrow, A. Michael, Harrow and colod crusher, combined, S. Miller, Harvester, C. Colahan, Harvester cover, W. H. Hill, Harvesterknife grinder, G. W. King, Harvesters, grain carrier for, J. S. Davis, Harvesting machine, R. Brown, Hatchway safety guard, elevator, J. P. Richardson, Header, J. H. Winn, Heater, See Steam boiler heater, Heating and ventilating buildings, system of, N. Wheeler, Heating apparatus, H. Howe, Heel nailing machine, M. V. Ethridge, Hoe, H. H. & C. Finn, Holder, See Bag holder, Paper holder, Pen holder, Rein holder, Stovepipe holder, twine holder, Hook, See Ladder hook, Suspension hook, Hoop cutting machine, J. A. Grant, Horse-foot, E. Barnard, Horseshoe, J. N. Clarke, Horseshoe, soft ground, L. Brigham, Ice and salt mixing apparatus, A. J. Stoll, Ice machine, W. B. Bushnell, Incrustation preventive, J. B. Hannay, Index, J. H. Wagstaff, Indicator, See Station indicator, Inhaler and irrigator, nasal, J. Keck, Injector, J. H. McPhail, Inlaid articles, manufacturing, G. Hirst, Insulating electric conductors, machine for, H. O. Phillips, Insulating electrical conductors, H. O. Phillips, Intrenching tool, G. F. Elliott, Joint, See Railway rail joint, Joint or coupling for rods, etc., J. E. Langdon, Kiln for burning tiles, earthenware, etc., D. Laemmle, Kitchen utensil, W. H. H. Smith, Ladder, O. V. Flora, Ladder hook, J. F. Manahan, Lamp, C. F. Chew, Lamp chimneys, manufacture of, Willetts & Buttlear, Lamp, electric, E. Weston, Lamp, electric arc, J. B. Tibbits, Lamp, electric arc, E. Weston, Lamp, extension, G. & J. E. Bohner, Lantern, S. B. Pangborn, Lantern, tubular, C. T. Ham, Leather, artificial Russian, E. M. Freeley, Level, spirit, G. B. Youngs, Lock, See Wottle lock, Nut lock, Railway rail lock, Sash lock, Seal lock, Lock, J. Breyer, Loom for weaving moquette carpets, H. Skinner, Lubricator, M. L. Conway, Lubricator, J. V. Renchard, Mail bag fastening, T. H. Smith, Manure fork, etc., wheel mounted, G. H. Howland, Match, friction, F. Gerken, Metal, producing Babbitt, A. C. Mann, Metal tubes, making, E. K. Coas, Milk cooler, D. B. Wooster, Mill, See Grinding mill, Stamp mill, Millstone driver, W. C. Hale