RECENTLY PATENTED INVENTIONS.

Engineering.

FURNACE.—Emilio De Strens, Rome, Italy. Two fire or combustion chambers are provided in this furnace, one above the other, the design being to obtain a high temperature from solid fuel of any kind, especially that containing a large proportion of slag. The upper fire chamber has a front opening for the feed, and ordinarily left open to admit air, and has grate bars of refractory material, downwardly converging openings from which lead to the lower fire chamber. The latter has an ordinary grate extending rearward at a sharp incline, and in a space front of the bridge wall below the lower end of the grate is an opening leading to the ash pit, adapted for the flowing away of fused slag. The draught is downward through the upper fire chamber, and through the lower one to the mixing chamber front of the bridge wall, the ignited and partially burned fuel falling and its combustion being completed in the lower chamber.

BOILER CLEANER.—John L. and William E. Alexander, Hazlerigg, Ind. This invention consists of a pipe adapted to slide into and along the bottom of a boiler, entering through a blow-off valve, and disturbing in its course the impurities in the bottom of the boiler, which are drawn into and blown out of the pipe. From the outlet of the blow-off valve extends a short pipe carrying a stuffing box, through which slides the pipe of the cleaning device, having at its outer end a valve, and clipped to the short pipe is a frame carrying a drum rotated by a crank arm, a rope on the drum being connected with the sliding pipe for moving it in and out. The device is readily fixed in its place for the work designed, and removed after this is effected until it is again wanted.

Railway Appliances.

RAILWAY COACH. — Jesse P. Tillson, Union City, Ind. This coach has a series of doors in its sides, in pairs, hinged at their adjacent edges to open outward back to back, there being a latch for each door operative from within and without the car, with a series of vertically sliding bolts on the inner sides of the doors and a sliding bar having depending arms engaging the upper ends of the bolts, preventing the doors from swinging outward until the bar is retracted or the bolts pressed down. A door is to be located in the side of the car opposite each seat, means being provided for simultaneously locking or unlocking all the doors, and whereby also any door may be unlocked without disturbing the others. This construction provides ample exit in case of accident or fire, and such cars may be used for street railways as well as general railway service, each door preferably having a drop window.

CAR COUPLING. — Gabriel Rohrbach, Del Rio, Texas. This coupling is adapted for connection with one of the ordinary type with a link and pin, and is also designed to afford means to automatically connect cars and disconnect them from the roof or side of a car. The drawhead is spring-supported, and has its lower wall recessed to receive a pivoted jaw plate having depending flanges, so that its inner edge will be held raised by gravity, there being a device movable from the top or side of the car to rock the jaw. The draw bar is slotted and has a hook shoulder at each end, on its bottom surface and on each side, and is designed to interlock with the free inner edge of the pivoted jaw, or an ordinary coupling pin may be passed through the slot.

Mechanical Appliances.

CIRCULAR KNITTING MACHINE.—Max Gernsnym, Brooklyn, N. Y. This invention affords an improved construction whereby part of the tubular fabric is formed with a figured design according to a predetermined pattern, while the rest of the fabric is knitted in the usual manner in plain ribs with Cardigan or other stitch. According to the invention the cylinder or plate, or both, are formed in sections, one of which is shifted to change the relative position of part of the cylinder and plate needles, there being pattern wheels governing the movement of the movable section to reproduce on the fabric the pattern represented by the pattern wheel.

TRESTLE.—Thomas J. Peck, Ballston Spa, N. Y. This is an adjustable trestle or horse for the use of carpenters, masons, and others, to support work or scaffolds at any desired height between two and four feet without the use of blocking. Its main portion is formed of a bar of channel iron, to opposite ends of which are attached castings with sockets into which are screwed pipe legs and a central sleeve through which slides a standard projecting into a cross beam. The sleeves are cut away to receive friction grips, consisting of an eccentric on a pivoted lever, whereby the movable parts of the trestle are readily clamped in fixed position, or released for adjustment to any desired height.

Agricultural.

CULTIVATOR. — Bosil F. Coulomb, Clifton, Ill. This cultivator is capable of use either as a walking or riding implement. It has swinging frames in which are pivoted shanks adapted to receive various styles of cultivator blades, shovels or teeth, the frames being so constructed and hung, and the shanks so located, that the frames may be carried forward or outward in a horizontal line without lifting the blades or shovels from the ground, or pressing them farther in. Any desired degree of inclination may be given to the harrow or cultivator teeth, or to the shovels and cultivator blades, according to the character of the ground and the plants to be cultivated, the frames being carried toward or away from one another to cultivate wide or narrow rows.

PLANTER AND FERTILIZER DISTRIBUTER.—Andrew M. Hanna and Lewis J. Walker, Kosciusko, Miss. This is a combination implement of simple, strong, and inexpensive construction, adapted for attachment to an ordinary plow beam. It is provided with a slide valve capable of being positively and safely locked to permit more or less of the fertilizing material to be fed from the hopper, and its construction is such that one kind of seed may be planted and fertilizer distributed at the same time with the seed, or two kinds of seed may be planted, being dropped alternately, and fertilizer supplied at the same time.

Miscellaneous.

PROJECTILE. — Abraham Martin, Birmingham, England. This is an explosive projectile or shell, in the base of which is a screwed socket for the fuse of sufficient length to prevent the blowing out of the fuse and the consequent failure of the shell to burst under the force of the explosion. A ring or bush is first screwed into the base of the shell, the rear end of which is then closed or contracted behind the ring by means of dies, the closed-in base of the shell and the ring or bush together, or the bush alone, as the case may be, affording the necessary length of socket for the fuse.

PNEUMATIC GRAIN CONVEYER.—Frederic E. Duckham, Millwall Docks, London, England. This invention relates to the means whereby the admission of air in sufficient quantity to the mouth of the suction pipe is insured, so that the individual grains will be suspended or caused to float in the current and thus obviate choking of the suction pipe. For this purpose the nozzle is surrounded by a sleeve inclosing an air passage opening above the level of the grain in which the nozzle is inserted, the sleeve not extending entirely to the mouth of the nozzle, whereby air will be drawn through the sleeve to enter the nozzle with the grain.

FENCE WIRE REEL. — Mendal F. Reagan, Salisbury, Mo. A simple and durable construction is provided by this invention for conveniently and rapidly winding up or rereeling barbed or other wire that has been used on and taken from fences, posts, or other places. It consists of a light two-wheeled vehicle, from which one of the wheels may be readily removed to place and secure a spool on the axle, the spool when filled being as readily replaced by another spool. The vehicle is ordinarily pushed forward to wind the wire, the operator at the same time turning a crank arm near the end of the frame to operate a sprocket chain and sprocket wheel on the axle, or the vehicle may be at a standstill, and the wire wound by operating the crank arm.

HOOD FOR FIREPLACES. — John S. Wallace, Nelsonville, Ohio. This hood is pivoted above the fireplace, and consists of a semicircular or semirectangular cover to which is pivoted a series of flexible strips adapted to close one upon the other, the strips having recesses and stops to limit their movement. The improvement forms a simple adjustable device which may be attached to any kind of a fireplace and folded up so as to leave the fireplace entirely exposed or let down to partially inclose it, preventing ashes and dust from scattering about when the fire is shaken, and also increasing the draught.

BROMINE COMPOUND. — Frank H. Fischedick and Charles E. Koechling, New York City. This compound is designed as a medicine for the cure of nervous excitement, insomnia, headache and neuralgia, and for use in fevers. It is a new composition of matter derived from a combination of certain proportions of aniline, alcohol, and bromine, the solution and crystallization being effected after a specified manner, and the product being designated as bromanid. The crystals are of needle shape, small, white, brilliant, and nearly tasteless, while having a faint aromatic odor.

ALKALINE CARBONATE AND CHLORINE.—Farnham M. Lyte, 60 Finborough Road, London, England. This invention relates to a conjoint process of continuously producing alkaline carbonates and chlorine and their derivatives. The process consists in decomposing sodic or potassic nitrate by heating it with calcic carbonate, lixiviating out the sodic carbonate and converting the nitrous fumes evolved into aqueous nitric acid by the action of air or oxygen and water, dissolving plumbic oxide in the nitric acid, precipitating plumbic chloride by means of sodic or potassic chloride, fusing the plumbic chloride, and decomposing it electrolytically to form chlorine and metallic lead for use over again.

LAMP WICK RAISER.—Martin A. McBride, Woodville, Texas. The wick-operating wheel of this device consists of a cylinder formed with a series of coarsely pitched helically arranged ribs triangular in cross section, the ribs being so pitched that they extend from end to end of the cylinder without making a complete revolution. This wheel is secured on a shaft mounted to turn in bearings in the cap of the burner, the cap supporting in the usual manner the tube through which the wick passes. The device is designed to be of simple and durable construction, effectively facilitating the moving of the wick in the tube without cutting or tearing the wick.

INNER SOLE. — Augustine F. Littlefield, Lynn, Mass. This is a patent for an improved article of manufacture, in which a filling of leather, rubber, or other suitable material is glued, stitched, or otherwise fastened in the channel of the inner sole, a veneer being secured to its top surface and doubled over the edge to cover the channel. The object of the improvement is to produce an inner sole which will be light and flexible, but which will have sufficient strength, while it may be made of lighter stock than the inner soles in ordinary use.

GLOVE.—Isaac W. Lamb, Colon, Mich. This is a knitted glove composed of a main blank having finger pieces narrowed at the bases, the blank being narrowed at the point where the thumb is attached and having its upper portion of uniform width, while the thumb blank is secured to the main blank at the point of narrowing. The object of the invention is to produce a perfect fitting glove of good quality, which will look nicely when off the hand as well as when on.

CHECK BOOK. — Edward North, Newhall, Cal. In this book the stubs of each succeeding check vary in shape, dimensions, or position, so that as the checks are drawn and detached, the amounts of all the checks drawn will be plainly visible in column order, one below the other, thus affording great convenience for adding and footing them. A special stub is also provided for bringing forward check footings, and a leaf is inserted for entering deposits and showing balances.

BOX PULL. — William J. Evans and William H. Kunert, Minneapolis, Minn. This is a simple and inexpensive device adapted for ready attachment to any form of fragile box, especially paper boxes, as it has a large bearing surface on the box, whereby the strain will be so distributed that the box may be readily moved without injury. The pull is made with a back plate having ears adapted to project through the side of a box, while a front plate has end slots to receive the ears and diagonal slots for the insertion of a label, a removable handle being secured in the ears.

LABEL AND TWINE CABINET. — Thomas M. Haynes and William H. Gunning, Palestine, Texas. The cabinet provided by this invention is designed to facilitate the speedy and correct selection of any desired label, and is arranged for the storage of quantities of various styles of labels in a distinctive manner in a neat, compact, and ornamental device. The casing has a partly open front and a drawer below, while the casing is a rotating many-sided label-holding cylinder, glazed doors being hinged to bars on its periphery and springs holding the doors normally closed. There are finger springs for each door, holding the labels so they may be seen.

MUSICAL INSTRUMENT ATTACHMENT. —George W. Van Dusen, Norwood, N. Y. This invention provides a tremolo attachment for string instruments, consisting of a tremolo block adapted to press the free end of one of the levers of the set of levers connected with the unison strings, so that when the hammer strikes these strings, the one connected with the lever pressed on by the tremolo block produces a higher sound, which sound mingling with the rest produces a tremolo sound of the unison string. The device is designed to be very simple and effective, and completely under the control of the performer.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention and date of this paper.

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 the following week's issue.

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.

(3661) W. F. A. asks (1) for a receipt for electro-plating in bronze. A. For general electro-plating we refer you to our SUPPLEMENT, No. 310. We can also supply Watts "Electro-Deposition of Metals," $3.50 by mail. 2. What temperature is required to melt gold? A. 2016° Fah.

(3662) B. J. asks: 1. How can I glue or cement emery dust on wooden wheels? A. You can apply the emery directly to the wood, or you can first cover the wood with leather. Prepare a solution of white glue, to which add a very small percentage of common molasses, say 1 or 2 per cent. Spread the emery out on an iron plate heated to about 200° Fah. Coat the wheel smoothly with glue and immediately roll it in the emery. When the glue is dry, brush off

the surplus emery. 2. How shall I manipulate gutta percha to use it as a cement? A. For a flexible cement melt together equal parts of brown pitch and gutta percha. For a hard cement melt together gutta percha, pitch and sheliac, equal parts. 3. How to determine whether a battery is working? A. If it is a single cell, touch the ends of the wires to the tongue. If there are several cells, dip the wires in acidulated water. Gas will rise from the wires if the battery is active. A galvanometer, however, is preferable.

(3663) C. C. asks: Is there any way of deodorizing the common coal oil used in our lamps? What will do it? I have been using it for ten years as a hair dressing which keeps the hair soft and moist, but its disagreeable odor is a great objection to its use. A. Something can be done in the way of deodorizing coal oil by treatment with a mixture of bichromate of potash and concentrated sulphuric acid. If these are mixed and agitated with it, and the whole is then allowed to settle, the oil can be siphoned off, and after washing with water containing a little washing soda, will be found improved as regards odor. Conduct all operations without heat, and experiment on small quantities. The first named chemicals are very corrosive and poisonous. You might also try simple agitation with bone black. This is simpler, and might be measurably effective.

(3664) H. T. asks: 1. Does the generator in the Bell telephone connect with the main line and ground direct, or does the current pass through some of the other parts than the polarized bell? A. The magneto generator is connected through the bell magnet with the ground, either directly or through an annunciator. 2. Does the continued excessive sparking of a dynamo or flickering of the lamp indicate leakage? A. The sparking shows that the commutator is rough or otherwise out of order, or that the brushes are not correctly adjusted, or that the armature is not properly constructed. 3. What would an eight light dynamo like one described in SUPPLEMENT, No. 600, cost, ready made? A. About $100.

(3665) T. B. asks: 1. What is a magneto-electric machine? What is the difference between one and a dynamo? A. The magneto-electric machine is one in which the armature revolves between the poles of the permanent magnet. In a dynamo, the small residual magnetism of the iron core of the field magnet serves to slightly excite the armature, generating a small current, which traverses the winding of the field magnet and increases the original magnetism until the maximum is reacbed. The field magnet of the dynamo is an electro-magnet. 2. How is the electric system of timing races, as practiced a short time ago at the athletic meeting in St. Louis, managed? A. In the electric system of timing races an electric contact maker is arranged to be operated by a bullet from a pistol. The starter fires the pistol into the contact maker, thus giving the signal for the start, and at the same time causing an electrical impulse to be sent, which sets in operation the recording mechanism. The mechanism continues operative until the runners reach the end of the course, where is stretched a thread connected with tbe recorder, which is broken by the runner and causes an electrical record of the close of the race to be made. 3. What is carbolic acid? Is it poisonous? A. Carbolic acid is a product of coal tar. It is a light liquid which often crystallizes in long needles. It is very poisonous. 4. What is the poison brucine, and how is it made? A. Brucine is extracted from the bark of the *Bruce antidysenterica*. It has also been detected with strychnine in nux vomica. It is made by reducing the bark to a coarse powder, digesting it in ether to remove fatty matter, then with strong alcohol. The alcohol solutions are then distilled to drive off the alcohol. The matter remaining is dissolved in water and subacetate of lead is introduced to throw down the coloring matter. The excess of lead is removed by sulphureted hydrogen. The brucine is then precipitated by boiling it with magnesia. The liquid is evaporated, when a brown granular alkaline mass results. This is saturated with oxalic acid, and the oxalate is wasbed with absolute alcohol. The brucine is obtained by decomposing the oxalate by boiling it with magnesia and water. The brucine is then dissolved in boiling alcohol, which yields crystals of pure brucine when the solution cools.

(3666) A. S. H. asks how much wire, size, etc., and all that is needed to make a battery for shocking purposes, such as is used in the medical batteries. A. For an ordinary shocking coil make a bundle of soft iron wires, 3/8 of an inch in diameter and 3 inches long, of No. 24 wire. Wrap this with two or three tbicknesses of stout paper, glue on a pair of heads to form a spool, and wind on the paper-covered core two layers of No. 20 magnet wire for tbe primary of the induction coil. Wrap this coil with two thicknesses of paper, and upon the paper wind twelve or fifteen layers of No. 36 silk-covered magnet wire. Bring out the terminals of this fine wire secondary coil, and connect them with binding posts for receiving the handles. Provide the primary wire with a circuit breaker, and connect the primary with a plunging bichromate battery. The strength of the current may be varied by sliding over the outside of the secondary wire a piece of brass tubing.

(3667) W. G. G. writes: To settle a doubt in regard to the winding of the armature of electric motor described in SUPPLEMENT, No. 759, will you kindly inform me if the armature is not wound in precisely the same manner as that of the dynamo in SUPPLEMENT, No. 600, with the exception that instead of twenty-four divisions of the periphery of the armature core in the dynamo, the armature of the motor is divided into but 12 divisions on the periphery of the core? A. The armatures are both wound according to the same system.

(3668) J. S. P. asks for the manner of polishing tortoise shell. Would like the successive steps of scraping or cutting down and final fine polishing. A. Tortoise shell is prepared for polishing by smoothing it with a single-cut file, then scraping it with a scraper like those used on wood. If this part of the work is carefully done, the polishing may readily and quickly be effected by holding the work on a thick leather buff charged with calcined Trent sand and oil, or fine pumice stone and oil. The finishing is done with rottenstone and oil, applied with similar wheel, the final touches being given by means of rotten stone applied dry with the hand.

(3669) L. H. & Co. write: We have a 5 inch steam pipe in dry kiln which has a bad leak at a coupling. Can we get or make a solder of some kind to close it without taking out the pipe? We also inclose specimen; please let us know what it is? A. If the coupling is wrought iron, you can calk the leak with a calking iron and hammer. If you are not able to stop the leak in this way, a clamp of wrought iron should be made to fit the place where the leak is, and bolted tightly over the leak with a thick piece of rubber between clamp and leaky place. The specimen is pyrites, composed of iron and sulphur.

(3670) L. M. W. asks: 1. What is the chemical difference between artificial and common camphor? A. Camphor is a terpene, a hydro-carbon ($C_{10}H_{16}$). Camphor contains oxygen. A typical formula is $C_{10}H_{16}O$. 2. How is bisulphide of carbon changed to the proto-sulphide? A. It is said by Sidot to be obtained by exposing the bisulphide to the sunlight in sealed glass tubes. Free sulphur and monosulphide are formed. The latter is dissolved out with bisulphide. 3. Is the protoform a crystal or liquid? A. It is a maroon-colored powder.

(3671) I. K. M. writes: I have a deposit of kaolin, which shows aluminum 40 per cent, silica 45 per cent, and iron about 2 per cent. I have also a deposit of marl, which shows by the analysis 65 per cent of carbonate of lime, and have been informed with these two articles combined, a first-class article of cement can be made. A. You can only tell by experiment what your materials will give. Mix ten per cent of the kaolin with ninety per cent of the marl, knead with water into lumps, and burn in a coal or charcoal fire. Grind and experiment by making briquettes with water, observing time of setting, etc.

(3672) A. W. N. asks for best receipt for dressing over rubber carriage tops. A. The varnish for this purpose is made by digesting orange shellac in ammonia until a solution is effected, which will require several days. Another varnish often used for this purpose consists of refined asphaltum cut in turpentine. It should be applied quite thin.

(3673) R. F. asks: Explain choke boring in a shot gun, the principle on which it depends, the manner in which it is done, and whether guns are choked throughout the entire length of the barrel or only a portion of the length? A. Many systems of choke boring have been tried, affecting different portions of the barrel. It is done by reaming or drilling. The general system is to choke or diminish the bore at the muzzle. This is supposed to deflect the outer pellets inward and to secure a more compact distribution of shot.

NEW BOOKS AND PUBLICATIONS.

ELECTRICITY SIMPLIFIED. The Practice and Theory of Electricity. By T. O'Conor Sloane, E.M., Ph.D. New York: Norman W. Henley & Co. 1891. Pp. 160. Price $1.

This book is designed to give a kind of information much needed by the student of electricity, but heretofore obtainable only by digesting a number of comparatively extensive works. It goes into the theory of electricity and furnishes many apt analogies of electrical action, giving examples of its practical application in every-day life. The analogies are new and well calculated to elucidate points which are generally regarded as obscure. As examples of its treatment of the subject, the sections devoted to the velocity of electric transmission, the relations of static and dynamic phenomena, the meanings of the units, volt, ohm, etc., may be cited The dangers of the current and conditions for the death-giving shock are also explained at some length.

PICTORIAL ASTRONOMY FOR GENERAL READERS. By George F. Chambers. London: Whittaker & Co. 1891. Pp. xvi, 268. Price $1.25.

This little manual is one of Whittaker's Library of Political Science. Itis well illustrated and quite popular in its tone. As it is not written with a view to cramming for an English examination, its scope does not appear subject to the disagreeable limitations that so often mark contemporary English works. It is a review of the celestial world, rather from the old than from the new standpoint. For this reason it will be found to be of more popular cast than if the spectroscopic and photographic methods of the observatory had filled the greater part of the text.

PRINCIPLES AND PRACTICE OF PLUMBING. By S. Stevens Hellyer. London: George Bell & Sons. 1891. Pp. xv, 294. Price $2.

Mr. Hellyer is already well known on this side of the ocean by his other writings on this subject. In the present book the details of sanitary plumbing are treated with numerous illustrations of good and bad practice. The minutiæ of the subject, such as the making of wiped joints, the treatment of the solder, their proper length and size, etc., are given in practical form. An excellent index and a full table of contents, with the numerous illustrations, add greatly to the value of the book.

A Souvenir Edition of the Memphis *Evening Scimetar* presents a notably enterprising newspaper novelty. It is a large illuminated quarto containing reproductions from photographs of the principal churches, schools, public buildings, and private residences of the city of Memphis, with portraits of more than a hundred of its representative citizens. The pictures, as a whole, are remarkably excellent, and the enterprise of the publishers will doubtless receive a high degree of appreciation from Southern people, as they deserve to have. The beautiful buildings of Memphis, as portrayed in this illuminated *Scimetar* number, equal those of many of our larger northern cities, both in number and beauty of design.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

November 10, 1891,

AND EACH BEARING THAT DATE.

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

Adding machine, Blackshaw & Rogers ... 463,027
Addressing machine, G. Brown ... 463,117
Air brake systems, attachment for, A. L. Waite ... 463,085
Air brakes, automatic governor for, M. M. Dodd ... 462,966
Air compressor, F. H. Richards ... 462,776
Alarm lock, J. Huther ... 462,710
Album, B. Branner ... 463,030
Animal trap, J. T. S. Kisinger ... 462,715
Animal trap, H. H. Thiellesen ... 463,011
Annunciator, electrical, J. B. Smith ... 463,001
Armature for dynamo-electric generators, S. H. Short ... 462,881
Armature for dynamo-electric machines, S. H. Short ... 462,882
Auxiliary engine, J. J. Hanlon ... 462,925
Ax, I. M. Spencer ... 463,002
Axle nut wrench, S. L. Bligh ... 463,028
Bag frame brace or stay, W. Roemer ... 462,851
Bale tie, J. G. Farley ... 462,942
Baling press, W. S. Reeder ... 462,930
Baling press, J. Rowe ... 463,076
Baling press, Wiggins & Pollard ... 462,753
Barrel, oblique tumbling, J. Henderson, Jr ... 462,841
Battery. See Secondary battery.
Bearing, anti-friction, C. J. A. Sjoberg ... 462,744
Bearing, roller, C. D. Mensely ... 462,719
Bed, folding, Hopkins & Peterson ... 463,124
Bed, folding, W. J. Mayer ... 462,846
Bedstead brace, F. E. Welch ... 462,853
Bedstead, cabinet, W. R. Forbis ... 462,695
Beehive, R. H. Ewing ... 462,761
Belt, electric, P. E. Petterson ... 462,732
Bicycle oil cup holder, Brower & Stillman ... 463,093
Bicycle speed mechanism, H. L. F. Trebert ... 462,782
Billiard counter, W. W. Harrison ... 462,704
Billiard table attachment, P. T. Kavanagh ... 462,843
Bit. See Teething bit.
Block. See Snatch block.
Board. See Game board. Talking board.
Boiler. See Steam boiler.
Boiler, C. P. Marshall ... 462,718
Bookbinding, C. A. Sullivan ... 462,959
Book cover fastening, M. Vernon ... 463,014
Book, picture, J. McLaughlin ... 462,956
Boring tool, expanding, E. F. Beugler ... 463,789
Bottle stopper, M. Herzberg ... 463,766
Box. See Call box. Fire alarm box. Letter box. Paper box.
Brace. See Bag frame brace. Bedstead brace.
Bracelet, H. U. Wilson ... 462,917
Brake. See Car brake. Flax brake. Railway track brake. Wagon brake.
Brush, H. Berry ... 462,790
Brush, D. K. Ferguson ... 462,943
Buckle, L. Dyer ... 462,939
Buckle, A. E. Winlow ... 462,755
Buckle, shoe, J. H. Smith ... 462,779
Buckle, suspender, G. B. Pilkington ... 462,914
Buildings, fireproof construction of, W. Orr ... 462,773
Burner. See Gas burner. Lamp burner. Oil burner. Straw burner.
Burner, J. Gibbons ... 462,922
Bust and garment supporter, combined, V. E. Harvey ... 463,050
Button or stud, F. E. Williams ... 462,831
Calendar, G. H. McKee ... 463,070
Call box, E. R. Wilder ... 462,785
Camera. See Photographic camera.
Capsule, W. Oppenheimer ... 462,990
Car brake, A. J. O'Neill ... 462,989
Car brake, J. F. Pfetch ... 462,993
Car brake, electric, Collier & Miller ... 462,793
Car construction, G. W. McNear ... 463,071
Car coupling, W. B. Seal ... 462,999
Car coupling, D. Williams ... 462,915
Car coupling, W. W. Windham ... 463,087
Car coupling, J. J. Wisda ... 462,832
Car coupling, electric, Collier & Miller ... 463,067
Car door, freight, E. L. Phipps ... 463,127
Car draw gear, railway, G. L. Harvey ... 463,911
Car dump, automatic, J. Story ... 463,006
Car heating apparatus, railway, C. H. Robinson ... 462,740
Car seats, package holder for railway, S. B. Morss ... 462,723
Car signal, M. A. Gerber ... 463,036
Car spring, L. Pfingst ... 462,958, 462,971
Car step and gate, combined, W. E. Ludlow ... 462,769
Car wheel, B. J. Westervelt ... 462,872
Cars, electrical connection and signal for railway, Collier & Miller ... 462,794
Card table, J. H. Sanderson *et al* ... 462,933
Carpet stretcher, O. Tippy ... 462,781
Carriage curtain fastener, Ritch & Bryant ... 462,737
Cart, road, A. R. Chittenden ... 463,096
Cash carrier apparatus, T. E. Barrow ... 462,816
Cellar, damp-proof and watertight, P. H. Jackson ... 462,953
Chase lock, I. A. Isaacs ... 462,799
Chopper. See Cotton chopper.
Clamp. See Furniture clamp.
Clasp, F. J. Herrick ... 462,706
Cleaner. See Window cleaner.
Clock, astronomical, A. M. Cory ... 463,101
Cloth napping machine, D. Gessner ... 462,697
Clothes line reel, Dennis & Evans ... 462,818
Clothing protector, C. L. Darby ... 462,965
Chuck, drill, C. T. Pratt ... 462,879
Clutch, friction, E. Rivett ... 462,738
Cogged wheel, J. F. Pfetch ... 462,994
Combination bolt and washer, C. E. Weber ... 462,752
Combination lock, J. Whittington ... 463,128
Commutator, S. H. Short ... 462,880
Cooking apparatus, J. Gibbons ... 462,921
Cooking apparatus, Noakes & Gibbons ... 463,073
Cooking device, egg, H. L. Long ... 462,929
Cornets, mouth piece for, C. H. Van Allen ... 463,084
Cotton chopper, N. T. Henderson ... 462,705
Cotton chopper, Tobin & Holman ... 463,012
Cotton gin attachment, I. F. Brown ... 462,890
Cotton gin feeder, R. Hathaway ... 463,052
Cotton gin, roller, J. R. Montague ... 462,722
Cotton gins, belt tightener for, W. S. Reeder ... 462,931
Cotton picker, T. B. Hyde ... 463,055
Cotton spacer, Totty & Choffin ... 462,747
Coupling. See Car coupling. Pipe and shaft coupling. Thill coupling.
Crate, fruit, C. E. Gates ... 463,111
Cultivator, I. J. Scott ... 462,742
Cuspidor, C. Golden ... 462,861
Cut-off and reversing valve gear, automatic, S. T. Bruce ... 462,758
Cut-off, automatic overflow, A. W. Knox ... 462,844
Cut-out, mechanical, H. W. Burnet ... 462,836
Cutter. See Oat cutter. Pipe cutter.
Damper regulator, J. E. Watts ... 462,961
Dental engine attachment, E. D. Eddy ... 462,896
Dental use, pestle and mortar for, F. E. Hansen ... 462,703
Derrick, C. E. Swift ... 463,009
Dishes, drain for, A. M. Jayne ... 463,056
Door spring, W. H. Gwits *et al* ... 462,699
Draught attachment for hames, A. A. Boyd ... 463,029
Draught equalizer, J. J. Prater ... 462,734
Dress form, C. S. Gooding ... 462,700
Drilling machine, Sibley & Ware ... 462,884
Dye, blue azo, G. Schultz ... 463,824
Electric conductor, J. A. Barrett ... 462,681
Electric conductor, F. E. Degenhardt ... 463,107
Electric conductor, C. T. Snedekor ... 463,079
Electric machine, steam dynamo, F. M. Garland ... 463,121
Electric machines, brush holder for dynamo, S. H. Short ... 462,883
Electric machines, brush holder for dynamo, Thomson & Wakefield ... 462,973
Electric safety cut-out device, A. G. Waterhouse ... 463,086
Elevator. See Hydraulic elevator. Water elevator.
Elevators, electrical indicator for, C. G. Armstrong ... 462,835
Elevators, signaling device for, C. G. Armstrong ... 462,834
Embroidering machine, A. V. Deshayes ... 462,858
Engine. See Auxiliary engine. Steam engine. Wind engine.
Engine tender scoops, mechanism for operating automatically, Devinney & Hafner ... 463,109
Engraving machine, pantograph, J. Hope ... 462,874
Envelope folding machine, C. W. F. Thode ... 462,746
Eye, device for removing foreign bodies from the, D. Y. Hallock ... 462,910
Fabric bolding and sewing machine, L. Onderdonk ... 462,729
Fabrics, ornamenting nap or pile, R. Lehmann ... 462,979
Fan, automatic, R. H. L. Arringdale ... 463,089
Feed trough, L. Muller ... 463,069
Fence machine, reversible, W. H. Myers ... 462,724
Fence machine, wire, L. B. Gandy ... 462,898
Fence strand, A. B. Woodard ... 462,887
Filling attachment, F. D. Winkley ... 463,088
Fire alarm box, E. R. Wilder ... 463,786
Firearm safety attachment, R. M. Gallaway ... 462,859
Fire escape, J. F. Hill ... 462,866
Fireplace, heating and radiating, D. Tracy ... 462,748
Fish hook, J. T. Eichelberger ... 463,032
Fishing rod, J. F. Marsters ... 462,822
Flax brake and scutcher, A. Morison ... 463,125
Flue stopper, Z. T. Hall ... 463,043
Foot warmer, W. M. Carr *et al* ... 463,094
Frame. See Spinning frame. Window frame.
Furnace, A. Backus, Jr ... 463,023
Furnace, E. Kerr ... 462,876, 462,877
Furnace, W. E. Selleck ... 462,804
Furniture clamp, J. Benedict ... 462,888
Game board, E. B. S. Mercer ... 462,870
Garbage receptacle, B. F. Wise ... 463,019
Gas burner, Bunsen, T. Boyce ... 462,685
Gas burner, domestic, J. W. Culmer ... 462,893
Gas heater J. Gibbons ... 462,920
Gate, J. H. Miller ... 462,895
Gate opening device, W. R. Chisham ... 462,890
Gate or door fastening, C. Fleming, Jr ... 462,909
Gold saving apparatus, J. H. Hobart ... 462,952
Graders, wheel adjustment for road, J. D. Adams ... 462,679
Grain binders, tension device for, M. Kane ... 462,903
Grain meter, Bachelder & Lovejoy ... 462,680
Grass cutting machine, hand power, M. W. Wright ... 462,788
Grate, basket, J. Lewis ... 463,061
Grinding machine, knife, E. J. Wheeler ... 463,017
Grooving machine, H. S. Grannis ... 462,840
Guitars, etc., bridge for, Mendenhall & Pugh ... 462,869
Gun mounting, Raskazoff & Compton-Breedridge ... 463,075
Halter, H. W. Sisson ... 462,743
Hame fastener, A. J. Sonner ... 463,080
Handle attachment, M. Zabel ... 462,918
Harrow, hand, H. D. McConn ... 462,726
Harrows, pulverizer attachment for, J. P. L. Homedieu ... 462,980
Harvester, corn, N. Fink ... 463,033
Harvester, potato, J. N. Cocker ... 463,098
Harvester wheel, G. G. Hunt ... 462,709
Harvesters, carrying belt for, G. J. Dryden ... 463,110
Hay cap, Satterlee & Kemmerer ... 463,077
Heater. See Gas heater. Hot water heater. Water heater.
Heating and lighting system, R. M. Hunter ... 462,926
Heels, etc., device for burnishing or finishing, W. F. Sampson ... 462,951
Hides or skins, machine for treating, W. Evans ... 462,838
Hoe and rake bandle combined, J. Delvaille ... 463,108
Holder. See Bicycle oil cup holder. Hose holder. Lath holdor. Shaft holder. Spool holder.
Hook. See Fish hook. Snap hook.
Hook, A. E. Monroe ... 462,721
Hoop riveting machine, W. H. Potter ... 462,775
Horse arrester, J. Siebel ... 463,000
Hose holder, J. & R. H. Moore ... 463,068
Hose nozzle, N. P. Stevens ... 463,081
Hot water heater, C. R. Nelson ... 462,772
Hydrant, A. J. Tyler ... 462,885
Hydrant, G. P. Vincent ... 463,015
Hydraulic elevator, A. J. McAdam ... 462,955
Hydraulic motor, P. O. Gosselin ... 463,040
Ice cream freezer, Garretson & Thatcher ... 462,696
Ice from overhead wires, device for removing, G. Hipwood ... 462,707
Ice machine, O. H. Castle ... 462, 9
Indicator. See Station indicator.
Inkstand, J. W. Carter ... 462,856
Insulators, press for moulding glass, L. B. Gray ... 462,862
Intestine cleaning machine, Davis & Aberle ... 462,809
Jack. See Lifting jack. Pegging jack.
Jewelry, etc., link for, H. U. Wilson ... 462,916
Joint. See Rail joint. Railway rail joint.
Key fastener, E. Tupper ... 462,750
Knitting machine, P. P. Olsson ... 462,967
Knitting machine, transverse warp, T. Kiddier *et al* ... 462,878
Lamp burner, C. Pabst ... 462,991
Lamp, electric arc, J. E. Gaston ... 463,035
Lamp, electric arc, J. E. Giles ... 462,698
Lamps, carbon holder for arc, J. J. Wood ... 462,756
Lasting machine, A. Andres ... 463,022
Latch, B. Edwards ... 462,031
Latch, T. C. Mace ... 462,981
Lath holder, T. P. Kinney ... 462,977
Lathe feed mechanism, Z. B. Coes ... 462,792
Lawn sprinkler, M. D. Jones ... 462,902
Leather graining and softening machine, M. M. Scott ... 462,825
Ledger, pocket, J. A. Johnson, Jr ... 462,948
Letter box for collection and delivery, C. H. Picarts ... 462,733
Level, spirit, H. Replogle ... 462,736
Life-preserver, J. Corlin ... 462,892
Lifter. See Pipe lifter. Transom lifter.
Lifting jack, J. Green ... 462,796
Liquid separator, centrifugal, J. Laidlaw ... 463,058
Lock. See Alarm lock. Chase lock. Combination lock. Railway switch lock. Wagon lock.
Locomotive engines, fire box for, G. A. Ayer ... 463,090
Locomotives, traction increaser for, H. A. Giles ... 462,944
Loom, Draper & Northrop ... 462,919
Loom heddle, J. Benazet ... 462,854
Loom shuttle locking mechanism, H. Graichen ... 462,701
Loom stop motion, F. M. J. Grenier ... 462,924
Looms heddle controlled stop motion for, J. F. Kerstan ... 462,927
Lubricator, A. Hendey ... 462,863
Mail pouch fastener, J. A. Pierce ... 462,774
Mat. See Wire mat.
Measuring machine, cloth, F. B. Edmand ... 462,940
Mechanical motor, J. B. Silliman ... 462,817
Mechanical movement, F. Coomer ... 463,100
Metal plates, apparatus for conveying and cooling, H. Aiken ... 462,962
Meter. See Grain meter.
Milk can washing machine, H. L. Flentye ... 462,839
Money changer and cash register, combined automatic, C. B. Boyer ... 462,889
Moss cleaning machine, Von Oven & Panknin ... 462,830
Motion, apparatus for regulating, Terlinden & Van Galen ... 463,010
Motor. See Hydraulic motor. Mechanical motor. Railway motor.
Mower, lawn, W. S. Scales ... 463,078
Mowing and harvesting machines, frame for, S. M. Pryor ... 462,996
Mowing and reaping machine, Sundet & Brekke ... 463,018
Music, sheet, C. F. Pidgin ... 462,972
Musical instrument, F. Allasia ... 462,963
Musical instrument, Foote & Ruby ... 463,034
Musical instruments, tail piece for stringed, W. Van Deventer ... 463,013
Nail machine, C. E. Houghton ... 462,968, 462,969
Nail making machine, Cole & Hastings ... 463,099
Nailing implement, H. McCornack ... 462,848
Netting machine, R. Young ... 463,115, 463,116
Oat cutter, J. A. Laws ... 463,059
Oil burner, G. R. Moore ... 462,770
Oil purifying apparatus, J. J. Lowden ... 463,062
Ordnance, hydraulic brake for, J. Krone ... 462,970
Organs, wind chest for pipe, Votey & Wood ... 462,784
Outhouse and refuse burner, odorless dry, T. W. Carrico ... 462,891
Oven, baking, J. H. Miller ... 463,067
Ovens, atomizer for bakers', W. G. Bond ... 462,864
Overshoe, J. F. O'Brien ... 462,950
Packing, metallic rod, J. B. Houston ... 463,053
Pan. See Soot pan.
Paper box, C. H. Keith ... 462,713
Paper, frame for coating aristotype, E. A. Gilbert ... 463,037
Pegging jack, E. Woodward ... 462,937
Pencils, manufacture of lead, B. B. Goldsmith ... 463,039
Phonograph, W. Bruening ... 462,687
Photographic camera, F. A. Hetherington ... 463,123
Photographic camera, magazine, G. H. Hurlbut ... 462,842
Piano actions, flange attachment for, A. P. Roth. 462,777
Picker. See Cotton picker.
Pipe and shaft coupling, R. Dinsmore ... 462,894
Pipe coupler, G. Collins ... 463,119
Pipe cutter, M. Courtemanche ... 463,102
Pipe cutter, J. B. Danjean ... 463,105
Pipe lifter, W. A. Hanlen ... 463,048
Pipe punch and cutter, J. O. Kafader ... 462,800
Pitman starter, automatic, A. Fahrney ... 462,811
Planter, A. L. Johnson ... 462,712
Planter and fertilizer distributer, W. J. Eason ... 462,759
Planter, seed, G. A. Adsit ... 463,021
Plow, S. Landauer ... 462,801
Plow, M. B. Smith ... 462,780
Plow, V. L. Williams ... 462,787
Plow, rotary, M. T. Hancock ... 463,047
Plow, sulky, Thom & Bailey ... 462,835