RECENTLY PATENTED INVENTIONS.

Engineering Improvements.

ROTARY ENGINE.—C. E. SHUMWAY, Albion, Mich. Mr. Shumway is the inventor of improvements in rotary engines operated by steam pressure. Certain novel details are provided in this engine whereby the construction of the same is simplified. The parts are so arranged as not to be liable to get out of order.

FLUID-PRESSURE BRAKE.—T. J. LEARD, Chanute, Kans. The invention relates to fluid pressure brakes on a train having two or more engineers. Certain improvements are provided whereby the engineer of the first or leading engine has complete control of the entire brake mechanism of the train, and by the air brakes and main reservoirs and pumps of both engines are used to furnish the compressed air for the auxiliary reservoirs. The parts are controlled without requiring any attention on the part of the engineer of the second engine.

BOILER-PIPE CLEANER.—J. H. WILLIAMS, Wilson, Kans. In steam boilers the water pipe that connects the water space of the boiler with the lower part of the water column and water gage, is very liable to become choked with sediment and scale, because the water in this pipe is free from violent ebullition. When so choked up it is liable to make the water level in the glass different from that in the boiler, and by so falsely indicating the amount of water in the boiler, might lead to a disastrous explosion. The object of this invention is to provide means for overcoming this difficulty.

Hardware.

SAW-SET.—O. R. JOHNSON, Escanaba, Mich. An improvement in saw-sets is provided by this invention which consists of a convenient hand tool by means of which, in one operation two teeth may be set in opposite directions, thus reducing the length of time required for setting the saw and assuring a uniform set. The device can be quickly adjusted to saws of different sizes.

FENCE-WIRE FASTENER.—G. H. WRIGHT, Spokane, Wash. The fastener provided in this invention has a peculiar construction, especially adapted for uniting crossing wires in wire fences. The device is adapted to co-operate with the bends of the wires at the point of intersection to hold the wires in proper position, and in such manner that the clamp or fastener will be retained against any tendency to displacement.

NUT-LOCK.—B. R. SWORDS, Ottawa, Ill. The object of the invention is to provide an improved nut-lock designed for use on bolts for ralls, fishplates, locks and other parts of machines and devices. The nut-lock is simple and durable in construction, and is arranged to permit of screwing up the nut to the desired degree and then securing it against accidental unscrewing.

OYSTER-TONGS.—C. K. and W. T. SHAW, Bellport, N. Y. These inventors provided improved oyster tongs which are arranged for loosening, gathering, and securely holding the oysters without requiring undue physical exertion on the part of the operator when dredging for the oysters. The construction permits convenient and quick repair of any of the parts.

CAN-OPENER.—H. SIDMAN, Pomona, N. Y. An improved device is herein provided for cutting the ends from metal cans. The device has a simple construction by means of which the ends or top of the can may be quickly cut out and the edge of the metal turned or crimped to form a smooth surface not liable to scratch a person's fingers.

Mechanical Devices.

PEARL-BUTTON-TURNING MACHINE.—J. LOOG, Brooklyn, N. Y. Mr. Loog is the inventor of a machine for turning pearl buttons which is arranged to permit of turning the face of a button the desired depth, according to the thickness of the stock to be treated, and without removing the tool from the tool-rest.

WASHING-MACHINE.—H. J. LOCKHART, Fostoria, Ohio. An improvement in washing machines is provided by this invention. The articles to be washed are drawn between revolving rollers, one of which rollers has also a longitudinal reciprocating movement to accomplish the necessary rubbing of the goods. The invention provides improvements on a machine of this class whereby the results above specified are accomplished in a more efficient manner.

HEMMING ATTACHMENT FOR SEWING MACHINES.—THOMAS F. DENNISON, 251 Marcy Avenue, Brooklyn, N. Y. Mr. Dennison is the inventor of an improved attachment for sewing machines adapted for making a hem on linen, silk or cotton goods, handkerchiefs, garments, and the like. Means are provided for adjusting the device so that the hem may be of different widths, ranging from about an eighth of an inch upward. The construction of the scroll is such that it may be readily and quickly adjusted to goods of different thicknesses. The attachment is very simple and of a convenient size to operate and to apply to a machine.

LINOTYPE-LEADER.—B. COLE and A. O. WILSON, Lincoln, Neb. This invention forms no part of a machine for producing linotypes. It is a separate and distinct machine adapted to support stored slugs and leads in separate quantities with mechanism operated to feed first one, then the other to a common galley or hopper in interlaid position.

Railway Improvements.

ATTACHMENT FOR RAILWAY WATER-TANKS.—R. T. CUMMINGS and W. W. WYKOFF, Maysville, Ky. Water tanks for supplying water to locomotive tenders are usually provided with a delivery pipe which is attached and hinged in such manner as to be adapted to swing in a vertical plane, but not for movement parallel to the track. Consequently the locomotive must be stopped on the track in such position that the inlet opening of the tender will be exactly opposite this delivery pipe. This is often a matter of considerable difficulty, and in order to avoid this objection Messrs. Cummings and Wykoff have invented an apparatus so constructed as to allow considerable range of movement of the delivery pipe parallel to the pipe.

SWITCH.—A. E. JAMES, Natchez, Miss. In this invention Mr. James provides a novel construction whereby the switch tongue will be held normally in one position by means of a spring, so it can yield from such position to permit the cars to pass in one direction. The switch tongue is thus made automatic and delay incident to the operation of the switch point by the motorman is thus avoided.

Vehicles and Their Accessories.

COMBINED HUB SPINDLE AND THIMBLE.—S. GREGORY, Trinidad, Colo. The purpose of this invention is to provide a combination of hub spindle and thimble which will insure a hub remaining and properly turning upon the spindle in the presence of a lubricant until purposely removed, and which will prevent undue lateral movement of the hub or undue wear and tear upon the spindle and hub-thimble.

SECURING-ROD FOR END-GATES.—H. M. MCGREW, Pickrell, Neb. Means are provided in this invention for detachably securing in place the rear end gate of a wagon body. The invention comprises certain novel details of construction for a securing rod that adapt it for every convenient application and removal and afford means for adjusting the length of the rod to conform with the width of the wagon body it is applied upon.

WAGON-BODY LIFTER.—C. W. NABB, Charleston, Mo. Mr. Nabb herein provides an improvement in wagon-body lifters. The novel construction employed is adapted to lift the wagon body and subsequently to lift the running gear. The several devices provided are in such form and arrangement that almost all of them can be made by a farmer from the timber at hand, thus avoiding the expense and inconvenience of securing the best timber.

Miscellaneous.

HOLDER FOR PEGS FOR STRINGED MUSICAL INSTRUMENTS.—S. A. GREGG, Sedalia, Mo. This invention relates to improvements in devices for holding and regulating the friction of pegs for musical instruments, such, for instance, as violins, cellos and the like. The holding device may be readily attached to a peg and will not scratch or mar the varnish on the peg box. The device is adapted to firmly hold the pegs from turning or slipping under the strain of the strings.

BOX.—H. L. AVERILL, Piermont, N. H. This improved box is adapted to receive and protect butter especially during transportation. The box has an economic form made in hinged sections, which when open will expose the top and a portion of the sides of the contents of the box, enabling the contents to be inspected. Means are provided on the box by which the butter may be cut, and a handle is employed which serves as a lock for the box when closed.

BROODER.—M. J. MAPES, Springvalley, N. Y. The invention provides an apparatus for sheltering young chickens, particularly those which have been hatched by means of incubators. The construction embodies various novel features by which the brooder may be more effectively and uniformly heated without in any way interfering with its proper ventilation.

HAY-CAP.—G. W. SIMONS, Posey, Ill. Mr. Simons' invention consists in peculiar fastening means whereby a series of boards may be secured together in a way especially adapted to form hay-caps, as also roof and other coverings. In carrying out the invention Mr. Simons employs a series of boards of desired length and thickness, and arranges them with lapping edges adapted to be screwed by fastening links.

DIVING APPARATUS.—E. B. PETRIE, New York, N. Y. The diving apparatus which is provided in this invention is adapted for deep-sea diving, withstanding the pressure of deep water without detracting from the comparative comfort of the diver. The invention also provides perfectly articulating water and air tight joints at the connections of the hip, body, and leg sections, and the knee, ankle and elbow sections. Thus affording the diver in a heavy suit the greatest freedom of action.

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

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Inquiry No. 3343.—For manufacturers of ½-inch rubber hose and hose couplings.

"U. S." Metal Polish. Indianapolis. Samples free.

Inquiry No. 3344.—For machines for knitting hose and underwear.

Dies, tools, models. Am. Hardware Co., Ottawa, Ill.

Inquiry No. 3345.—For manufacturers of fly-paper machinery.

Coin-operated machines. Willard, 284 Clarkson St., Brooklyn.

Inquiry No. 3346.—For a pneumatic or other machine for pulling flax.

Sawmill machinery and outfits manufactured by the Lane Mfg. Co., Box 13, Montpelier, Vt.

Inquiry No. 3347.—For makers of the Gravity coal oil burner.

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Inquiry No. 3349.—For makers of a machine for printing several copies of typewritten work by a photographic process.

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Inquiry No. 3350.—For manufacturers of adding and listing machines.

Manufacturers of patent articles, dies, stamping tools, light machinery. Quadriga Manufacturing Company, 18 South Canal Street, Chicago.

Inquiry No. 3351.—Wanted, parties to manufacture a small cast and wrought iron machine in large quantities.

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Inquiry No. 3353.—For practical men to suggest how to lay off dam and canal for county mill.

The celebrated "Hornsby-Akroyd" Patent Safety Oil Engine is built by the De La Vergne Refrigerating Machine Company. Foot of East 138th Street, New York.

Inquiry No. 3354.—For machinery for making pearl buttons.

The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, $5. Munn & Co., publishers, 361 Broadway, N. Y.

Inquiry No. 3355.—For machines for manufacturing articles from the hull of the cocoanut.

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A qualified person desires position as assistant superintendent in machine shop in north or east. For particulars address R. Kreiter, care of Dickson Car Wheel Co., Houston, Tex.

Inquiry No. 3357.—For makers of practical dish-washing machines.

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Inquiry No. 3358.—For dealers in electro-plating apparatus in Chicago or St. Louis.

Gasoline Automobile Batteries. William Roche's "Autogas" used properly will carry vehicle twice as far as any other battery of same weight. William Roche, inventor and manufacturer, 42 Vesey Street, New York, N. Y., U. S. A.

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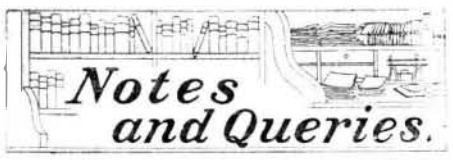
Inquiry No. 3363.—For broom-making machinery operated by electric power.

Inquiry No. 3364.—For machines for affixing stamps to envelopes or cards.

Inquiry No. 3365.—For makers of oil burners for engines.



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

(8733) W. D. S. says: In your "Scientific American Cyclopedia," under the head of "Soaps," is a formula for making "Yellow Soap," the last of the list of soaps. It gives: Tallow, ½ lb.; sal soda, 1½ lb.; resin, 5-6 lbs.; stone lime, 28 lbs.; palm oil, 8 oz.; soft water, 28 gal. Surely this is a misprint. Will you kindly give me the correct formula, as I wish to make a soap with sal soda and lime. Also, could you give me the formula for making bisulphide of carbon for killing gophers and weevil? A. For the manufacture of ordinary yellow soaps, the fats used are tallow, palm oil and resin. These may be used in such varying proportions that a few general facts will be of more value than one specific formula. Fats require from 13½ to 15 per cent of caustic soda for complete saponification. Rosin also requires about 15 per cent. As caustic soda is more expensive than soda ash (carbonate of soda), it is common practice to take soda ash and causticize with lime. An excess of lime is usually used. 100 parts of soda ash are dissolved and heated to boiling; 75 to 100 parts of lime are then added, and the boiling continued for about one-half hour. It is then allowed to settle, and the clear solution is used for making the soap. In estimating the amount of soda ash required, it may be assumed that 100 parts of soda ash are equivalent to 75 parts of caustic soda. The proportion of rosin used is extremely variable; in some cases, equal amounts of fat and rosin are taken, but this is considered excessive. For a good laundry soap the amount of rosin may vary from 25 per cent to 40 per cent of the fat taken. Carbon bisulphide is now largely being made in the electric furnace. It could not be manufactured on a small scale. It can be purchased in any quantities at reasonable price.

(8734) A. B. S. says: I am using large quantities of soft zinc from which I make small stampings, leaving about 30 per cent that I am obliged to put into scrap. This scrap is worth to me 4 cents a pound, whereas the new material costs me 12 cents. My idea would be to melt down this scrap that I have and reroll, but in trying this I find that the metal becomes so hard that it breaks in rolling. I presume that during the process of melting one or more of the component parts passes off in the form of a gas, or perhaps my appliance for melting is not what it should be. I am familiar with the melting of copper and with the various alloys of brass, but this matter of remelting zinc and putting it in shape to stamp properly is something I am unfamiliar with. A. Melt the zinc at the least possible temperature, and pour into heated iron moulds so that the cooling shall proceed very slowly. Avoid introducing any iron accidentally into the zinc during the melting, as iron causes brittleness. Adding 0.5 per cent lead makes the zinc more malleable. It should be rolled out at a temperature of 150 deg. C. to 200 deg. C., at which zinc is most malleable; at temperatures much above or below these limits, the zinc becomes too brittle to roll.

(8735) D. J. B. wishes to know what the back pressure per square inch would be in the cylinder of an engine operated by compressed air instead of steam, and where the air is allowed to expand fully in the cylinder before the exhaust valve opens. A. The back pressure at the exhaust of an air motor depends entirely upon the cut-off point and the initial pressure as with steam in principle, but does not follow the same ratio. See Hiscox's book on "Compressed Air."

(8736) F. M. wishes to know the best chemical used to purify acetylene gas. A. First wash with water to remove ammonia. To remove the other impurities, chiefly compounds of phosphorus and of sulphur, the following chemicals have been used: 1. Chloride of lime: unless all ammonia has been removed, nitrogen chloride may form. 2. Solution of cuprous chloride: one liter of this solution will purify 14 to 16 cubic meters of gas. 3. Solution of chromic acid in sulphuric acid: 5½ grammes of chromic acid will purify 1 cubic meter of gas. 4. Paraffin oil or other hydrocarbon oils. Solutions 2 and 3 give the best results. 4. used in conjunction with 2 or 3, increases the certainty of the purification.

(8737) C. F. H. asks: Can you give me any information as to the mixture used in binding coal screenings together that are made into briquettes? A. The best material for binding coal fines into briquettes, and the one most largely used, is pitch. Asphalt has had a limited use. Starch paste, residues from starch manufacture, dextrine, molasses, etc., have been used from time to time experimentally, but are not practicable. Various mineral substances, such as clays, lime, water-glass, etc., have also been proposed, but naturally have the drawback of adding just so much ash. Occasionally, oxidizing materials, such as niter, are added, when it is desired to produce a very quickly burning briquette for the rapid generation of high temperatures.

(8738) W. J. C. wishes to know how to remove indelible ink marking from clothing. A. Indelible inks are of such variable character that it is quite impossible to reply. Many of these inks have nitrate of silver as a basis; in this case, a solution of hyposulphite of soda might help. Some other inks might possibly be bleached out with javelle water and weak muriatic acid; this can be used only on white goods, as most dyes would be destroyed. Possibly also a solution of sulphurous acid might be of service.

(8739) S. R. asks for a good receipt for making a reliable fire extinguisher in powder form, one that is easy to prepare. A. For a cheap, dry powder fire extinguisher, bicarbonate of soda will serve; it may advantageously be mixed with 5 per cent to 10 per cent in some powdered mineral, as flint, tripoli, chalk, etc., to prevent caking in damp air. A mixture of *dry* bicarbonate of soda with *dry* sal-ammoniac, and kept in a *dry* place, will do better, as it would yield both carbonic acid and ammonia. In a confined space fire extinguishers of a type similar to gunpowder have proved effective; the object being to fill the room with carbon dioxide, sulphur dioxide and nitrogen gases and thus choke the fire. A good formula for this type of extinguisher is niter, 60 parts; sulphur, 36 parts, charcoal, 4 parts.

(8740) W. R. asks what the different gases are which, if introduced into an inclosed arc lamp will turn the color red, green, yellow, blue, etc. A. Colored electric lights are ordinarily produced by coating the globe with an aniline dye, made in alcoholic solution, and mixed with a little varnish. We do not know any gas which could withstand the heat of the arc for any time and which could color the arc. Some color can be imparted to the arc by soaking the carbons in solutions of sodium chloride, strontium chloride, or lithium chloride, and drying them thoroughly before using. The light of the arc itself is so intense that it is very difficult to overcome it with any other colored light.

(8741) H. M. asks: Can you give me information as to what a transformer is and what it is used for? I have been informed that it is much on the scale of an induction coil. If so, can you give me some scale by which to transform a 110-volt current into amperes? A. A transformer changes an alternating current from one voltage to another and from one current strength to another. It cannot change volts into amperes. In that respect they resemble induction coils. An induction coil is a particular sort of transformer, provided with a condenser, interrupter, etc. It is used almost entirely for raising the voltage. You will find a good chapter upon Transformers in Houston and Kennelly's "Alternating Currents." 2. Also please tell me how many volts it will take to each ampere, and a scale of how it should be wound, what size wire to use, and if the fine wire should be used outside or in? A. It is impossible to change amperes into volts. And as to the winding, each one is wound for the work it is to do. There is no general winding.

(8742) G. W. L. asks: 1. What is the most economical method of generating carbonic acid gas—not necessarily pure—in large quantities? A. The commercial sources of carbonic acid, on a manufacturing scale, are as follows. 1. By the burning of limestone. 2. By the action of acids in limestone (calcium carbonate), magnesite (magnesium carbonate) or dolomite (calcium magnesium carbonate). The acid used is sulphuric. This method is used by the manufacturers of bottled effervescing waters. 3. By collecting the carbonic acid gas generated in the fermentation vats of large breweries. This source is largely used in Germany. In addition, the gas coming from many of the natural springs is collected. This practice is also largely used in Germany. 2. Are there any known chemicals, or other substances, that will decompose water, aside from the alkaline metals? A. Besides the alkaline metals, water is decomposed by many of the hydrides and carbides of the different metals. Thus calcium carbides decompose water with the formation of lime and acetylene. Also, vapor of water passed through red-hot tubes of different metals is decomposed into its constituents. Vapor of water passed through red-hot coal is decomposed, with formation of carbon monoxide and dioxide, hydrogen, marsh gas (CH_4) and other hydrocarbons: this is the basis of the industrial manufacture of water gas, which has displaced coal gas in most cities.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending

October 28, 1902,

AND EACH BEARING THAT DATE.

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

Acid, making formylmethylanthranilic, F. Von Belzane 712,246
Air brake, J. E. Norman, reissue..... 12,047
Air brake, J. B. Briggs, Jr..... 712,249
Adjustable switch, E. W. Harden et al. 712,092
Advertising device, C. E. Whitney..... 712,223
Agricultural rake, A. R. Black..... 711,933
Alarm. See Automobile alarm.
Alloy of silver, W. H. Walker..... 712,027
Alum, obtaining, H. H. Wing..... 712,226
Amusement device, A. T. Prescott..... 712,407
Animal trap, J. E. Cox..... 712,182
Apron, W. T. Jones..... 711,976
Armature for dynamo electric machines, J. Burke 712,257
Atomizer, A. H. Tatum 712,213
Atomizer, C. A. Tatum 712,214
Automobile alarm, pneumatic, G. E. Cordeau 711,940
Bag or satchel frame, F. Lau..... 712,459
Bale tie, J. W. Griggs..... 711,961
Baling press, P. C. Southwick 712,208
Barrel or cask, H. P. Lemper..... 711,984
Battery plate separator, storage, R. N. Chamberlain 712,178
Bean cutter and puller, C. H Knapp.... 712,458
Bearing, side, C. H. Williams, Jr..... 712,224
Bed, folding, C. C. Taylor..... 712,017
Belt, distributor or conveyer, J. F. Tinsley 712,020
Belt dressing to belts, device for applying, W. K. Richart 712,417
Belt holder, G. D. Schrum..... 712,098
Bier, knockdown, W. M. Rankin..... 712,152
Billet heating furnace, continuous, H. B. A. Keiser 712,386
Binder, temporary, E. L. Krag..... 712,077
Binder, temporary, E. H. Barbour..... 712,238
Binder, temporary, C. C. Boykin..... 712,247
Blank furnace, M. Gorham..... 712,296
Blower, furnace, H. R. Arthur..... 712,235
Blowpipe, automatic, A. C. Rosenbrook.... 712,097
Boiler fire boxes, ash-pan for steam, J. W. Funk 712,055
Bolt or spike extractor, W. C. Merrill.... 712,082
Bottle brushing machine, C. F. G. Burow.. 712,042
Bottle filling apparatus, C. Hitzl..... 712,454
Bottle lock, W. E. Swett..... 712,444
Bottle, non-refillable, E. Barrath..... 712,172
Bottle, non-refillable, M. M. Beam..... 712,173
Bottle, non-refillable, J. R. De Alfi..... 712,183
Bottle washer, W. J. Cunningham..... 712,265
Bottle washing machine, W. J. Cunningham 712,266
Bowling ball, L. Immen..... 712,192
Box, W. Fiske..... 712,434
Brake mechanism, J. D. Williamson, Jr.. 712,349
Brick kiln air box, J. C. Boss..... 712,035
Bricks for building purposes, machine for laying, J. H. Knight..... 712,075
Brush, cylindrical, G. F. McIndoe..... 712,322
Buckle, tug, T. H. Gardiner 712,291
Bung and faucet for barrels, G. R. Van der Wee 712,108
Burglar alarm, detonating, F. M. Reynolds 712,005
Burial tomb, F. Zarling..... 712,030
Burners. See Hydrocarbon burner.
Busy test system, D. S. Hulfish..... 712,455
Button, J. M. Marks..... 712,080
Button, W. C. Vogel..... 712,426
Cable signal, traveling, M. Norden..... 712,201
Calcium sulfate and by products, obtaining, H. H. Wing..... 712,225
Calculating machine, J. T. Hewieson.... 712,381
Camera, divided bed photographic, Robertson & Hutchings 712,334
Camera, swing-back photographic, C. E. Hutchings 712,301
Cameras, running bridge for extension front photographic, C. E. Hutchings.. 712,302
Can opener, T. H. C. Lofthouse..... 712,396
Candle stick or holder, A. Tevey..... 712,216
Car, aerated, R. M. Pancoast..... 712,327
Car brake, J. S. Sheets..... 712,011
Car coupling, J. Murphy..... 712,319
Car door fastening, freight, H. R. Keithley 712,309
Car door, grain, R. C. Johnson..... 712,139
Car door winding shaft, Welff & Lipschutz 712,227
Car side bearing, railway, F. R. Cornwall.. 712,181
Carbureter, E. D. Parrott..... 712,150
Carbureter, W. Wright 712,169
Carriage nursing bottle holder, baby, L. C. Feld 712,184
Carrying roll, E. E. Hanna..... 712,061
Centrifugal separator, P. L. Kimball..... 712,310
Chain wrench, Brown & McDermott..... 712,253
Chalk line self-chalking holder, W. C. Filson 712,283
Cheek-expanding pad, T. C. Best..... 712,354
Cigar wrapping table, N. H. Borgfeldt.... 712,114
Cigar wrapping table suction valve, N. H. Borgfeldt 712,115
Cigarette forming, wrapping and ironing appliance, F. J. Ludington 711,986
Cigarettes from continuous cigarette rods, making, F. J. Ludington 711,987
Clay pulverizer and separator, J. Elliott.. 712,051
Clock, electric, C. M. Crook..... 711,944
Cloth finishing machine, F. Stiner. 712,209, 712,210
Clutch, F. S. Hawkins 712,133
Clutch operating mechanism for winding drums, S. Barton 712,242
Cock, gage, F. W. Leidecker..... 711,983
Coin receptacle, W. J. & G. S. O'Neill.... 712,087
Column capital and attachment, C. H. Hewland-Sherman 712,299
Combing machine, Wenning & Geganff.... 712,222
Commutator leads, means for attaching, W. F. Dawson 712,046
Compressor valve mechanism, J. A. Coombs 711,939
Conveyer, J. Roger 712,335
Corset, D. Kops 712,312
Cot, folding, Pellettieri & Ponciani..... 712,203
Cotton cleaner, Ham & Shipley..... 712,298
Couch, rocking, J. Gluck..... 712,372
Cream separator, I. P. B. Knudsen..... 712,390
Cultivator, S. Rodriguez..... 712,096
Cultivator, S. L. Allen 712,232
Curd mill, J. W. Frazer..... 712,187
Curtain pole, J. A. White..... 712,163
Cut out, thermal, M. O. Troy 712,107
Cycle, F. S. Willoughby 712,165
Cycle seat, E. J. G. Goerke..... 712,059
Cylinder lock, Voight & Parker..... 712,024
Dentist's electrical and annealing furnace, N. K. Garhart..... 712,057
Diamond cutting, W. D. Seddon..... 712,155
Die stock reaming attachment, J. L. Thompson 712,445
Digester, A. Giesler 712,127
Display device, article, E. Gutmann..... 712,189
Distillers' spent residues, apparatus for the treatment of. Sudre & Thierry..... 712,343
Door, J. L. Young..... 712,449
Door holder, Dilthey & Rock..... 712,270
Dough mixing machine, R. L. MacHale.... 712,144
Draft equalizer, H. Sommangle..... 712,015
Draft preventer, Barnes & Mawer..... 712,240
Dredge, Bondreaux & Eschet..... 712,356
Dress shield, G. M. Grant..... 712,188
Drier, A. Giesler 712,128
Drier for ores, etc., A. G. Campbell..... 712,258
Drying appartus, A. Schiff..... 712,007
Drill. See Seed drill.
Drink shaker, R. Reed..... 712,095
Drinking fountain, poultry, R. J. Beise.. 712,243
Driving mechanism, Gleag & Fletcher..... 712,058
Drum, heating, E. Hinderer..... 711,969
Dump shovel, hand, J. Felton..... 712,126
Dye and making same, brown sulphur, M. Boniger 712,176
Dye and making same, yellow to red acridin, O. Sohst 712,421
Dyeing acid colors, C. Engau..... 711,953
Dynamo, exciting, H. W. Buck....712,041, 712,451
Electric accumulator, F. Loppe et al..... 712,316
Electric accumulators, forming, W. Morison 711,997
Electric circuits, automatic switch for fuse wires in, E. W. Pelton..... 712,204
Electric conductor, telephone, telegraph, or like wire, overhead, R. Hacking.... 712,060
Electric meter, W. H. Pratt..... 712,090
Electric meter, E. Thomson..... 712,196
Electric meter anti-creeping device, C. D. Haskins 712,063
Electric time switch, M. R. Hutchison.... 712,134
Electrical distribution system, H. Edwards 712,050
Electrical distribution system, Erben & Knight 712,052
Electrical distribution system, C. P. Steinmetz 712,104, 712,464
Electrolytic cell, A. E. Truesdell..... 712,218
Elevator, V. W. Mason, Jr..... 711,993
End gate, wagon, C. Fisher..... 712,284
Envelop, M. Stormfels..... 712,465
Envelop, mailing, M. J. Daly..... 711,945
Excavating teeth for power shovels, V. W. Mason, Jr..... 711,992
Exercising device, B. A. McFadden..... 712,000
Explosive engine, C. E. Inglis..... 712,067
Fastening device, W. J. Payne..... 712,003
Faucet, vinegar, J. Ansley..... 712,353
Feed water heater, W. H. Brown..... 712,118
Feed water regulator, Flinn & Aborn.... 712,186
Feeder, boiler, I. S. Davis..... 712,267
Fence, E. D. Carr..... 712,259
Ferrule cover, trap, O. G. Hitchcock..... 712,379
Fertilizer and the product resulting therefrom, converting salt marsh material, etc., into a, J. J. Crooke..... 712,045
Fibrous materials, machine for balling or winding slivers of, W. B. Lee..... 711,982
File, card index, C. W. Scarritt, reissue.. 12,048
File, letter, F. Tramblay..... 712,217
File, loose leaf, L. G. Schult..... 712,008
Firearm magazine, A. D. Marble..... 711,989
Firearm safety catch, Fay & Ferguson.... 712,282
Fire doors, apparatus for automatically operating, C. R. Bumbarger 712,256
Fire escape tilting extension, M. Cody.... 712,262
Fire extinguisher systems, valve for, F. Gray 711,960
Fish hook, F. J. Baker 712,032
Floors, etc., construction of, F. L. Ellingwood 712,278
Foot cleaner, W. S. White..... 712,110
Fuel blocks, manufacturing artificial, A. D. de Michereux 711,995
Fumigator, T. H. McDonald..... 712,321
Funnel, filtering, S. Rudner..... 712,336
Furnace, W. H. Drake 712,271
Gage, S. R. Dummer, Jr..... 712,367
Game, A. F. Knight..... 711,979
Game apparatus, R. J. Graham..... 711,959
Game apparatus, C. W. Wagner..... 712,025
Game apparatus, A. Voege..... 712,159
Game apparatus, A. S. Alexander..... 712,231
Game board, H. Cooper..... 712,044
Garbage can, W. S. Young..... 712,170
Garment support, H. Braley..... 712,248
Garments or the like, strap connection for, M. Dattlebaum 712,363
Gas apparatus, acetylene, E. Bournonville 712,116, 712,117
Gas lighting device, A. Simonini..... 712,156
Gas meter, L. A. C. Letombe..... 712,393
Gear, regulating, W. A. P. Werner..... 712,028
Gear wheel, V. W. Mason, Jr..... 711,991
Gearing, change speed, O. M. Carman.... 711,937
Generator. See Steam generator.
Glass articles, apparatus for the manufacture of hollow, W. Buttler, reissue. 12,049
Globe holder, E. L. Wheeler..... 712,029
Golf ball, F. H. Richards.....712,411, 712,413
Golf club, B. A. Joule..... 712,383
Grab hook, J. Perdue..... 712,151
Grapple, supporting, A. T. Dudley..... 712,272
Gravity feed lubricator, automatic, T. R. Brown 712,254
Greenhouse, C. Ickes 712,135
Gun rack, H. N. Whitcomb..... 712,428
Hammer, pneumatic, C. H. Shaw..... 712,438
Hammock, I. E. Palmer..... 712,202
Handle for bags, satchels, etc., W. Roemer 712,206
Harmonica, mouth, H. Hohner..... 712,380
Harness, Drum & Doyle..... 711,951
Harrow, W. J. Doyle..... 711,950
Harrow, J. J. Furthmiller..... 711,956
Harrow tooth bar, T. R. Wallis..... 712,221
Harvester, J. J. Kennedy, reissue..... 12,050
Harvester, Pridmore & Webber..... 712,409
Harvester attachment, corn, M. F. Hughes 712,382
Harvester, corn, H. H. Bowerman..... 712,036
Harvester grain carrier, W. Foster..... 711,955
Harvesting machine, beet, F. M. Oeder.... 712,086
Hat felting machine, J. S. Taylor..... 712,466
Hay press, T. Shank..... 712,338
Headlight for street cars, etc., adjustable, G. F. Chapman..... 712,260
Headlight operating mechanism, G. F. Chapman 712,433
Hen protector, J. F. Siems..... 712,339
Hinge, F. F. Tryon..... 712,219
Hinge, box, D. L. Hill..... 711,968
Horse checking apparatus, R. Forrest..... 712,290
Horse shoe, B. F. Gosnell, Jr..... 712,373
Horseshoer's box, J. B. Fladby..... 712,289
Hose patch, Thomas & Stumph..... 712,019
Hub, ballbearing, T. R. Garnier..... 711,957
Hub, pivoted, J. H. Genter..... 712,293
Human treatment apparatus, I. J. Hartford 712,375
Hydrocarbon burner, F. L. Carter..... 711,936
Hydrocarbon burner, Kittle & Harpham.. 712,142
Hydrocarbon incandescent burner, liquid, A. Albrecht 712,352
Incandescent burner head, T. Gerden..... 712,130
Index rod lock, card, E. W. Woodruff.... 712,166
Insulated rail joint, G. L. Hall....712,131, 712,132
Insulator, J. L. Shreffler 712,440
Inventory and appraisement blank, F. Shock 712,101
Jar and cover, S. J. Raymond..... 712,094
Jar holder, safety, W. W. Blossom..... 712,355
Jar or bottle press, J. Haley..... 711,962
Joint for pipes, fittings, or other connections, M. Dean..... 712,047
Journal bearing, W. G. Vernon..... 712,425
Knife and fork support and knife sharpener, combined, G. C. Worthington..... 712,228
Knobs to spindles, attaching door, A. B. Vanes 712,023
Ladder, step, S. S. Adkins..... 712,351
Ladle stopper, J. H. Allenderfer..... 712,111
Lamp, M. M. Johnson..... 712,071
Lamp, carriage, I. H. Atwood..... 711,929
Lamp, incandescent, vapor, A. J. Simpson, Jr. 712,341
Lamp socket, electric, H. T. Paiste..... 712,149
Lantern pinion, A. H. Neureuther 712,325
Latch, E. S. Cowan..... 712,120
Latch, adjustable gravity, R. E. Miller.... 712,145
Latch, door or gate, C. J. Moore..... 712,318
Lathe, O. G. Edmond 712,277
Ledger, loose leaf, H. P. Gorman..... 712,297
Lifting machine, W. H. Jordan..... 712,072
Lime, apparatus for draining crystals of sulfate of, C. S. Wheelwright..... 712,347
Limekiln, A. P. Broomell..... 712,251
Liquid brake, Diamant & Margoni..... 712,048
Liquors, dispensing malt, C. A. Bartliff.. 712,431
Live rolls, gear cover and frame for, H. G. Dittbenner 711,947
Lock. See Bottle lock.
Lock, C. Kuebler 712,078
Locking device, drawer, W. D. Meigs.... 711,994
Loom, W. Caldwell..... 712,358
Mail pouch deliverer, H. R. Kennedy.....712,141
Match box filling and closing machine, F. Schafer 712,419
Measure, tape, F. H. Nash..... 712,148
Meat, Making a preparation for preserving, Markovits & Guthmann..... 711,990
Mechanical movement, H. Edmonds..... 712,276
Mechanical movement, F. J. Donoughe..... 712,366
Mechanical motor, J. Cardiff..... 712,359
Mechanical power, D. R. Myers..... 712,147
Medical electrical apparatus, automatic, A. F. & J. C. Vetter..... 712,220

(Continued on page 317)