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.

I wish to buy second hand lathes, planers, drills, shap ers, engines, boilers, and machinery. Must be in good order. Will pay cash. W. P. Davis, Rochester, N. Y.

Acme engine, 1 to 5 H. P. See adv. next issue. Patent Dealers. Street & Fishburn, Dallas, Texas.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J. Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Screw machines, milling machines, and drill presser The Garvin Mach. Co., Laight and Canal Sts., New York. Centrifugal Pumps. Capacity, 100 to 40,000 gals. per minute. All sizes in stock. Irvin Van Wie, Syracuse, N.Y. Taylor's battery utilizes iron or zinc to produce electric current for lamps, power, welding. New cells, one dollar. Circular. 39 Dey Street, New York.

For the original Bogardus Universal Eccentric Mill, Foot and Power Presses, Drills, Shears, etc., address J S. & G. F. Simpson, 26 to 36 Rodney St., Brooklyn, N. Y. Sheet Rubber Packing, 1-16, 3-32, 16, 3-16, and 1/4 inch thick, 71/2 cents per pound. All kinds of rubber goods at low prices. John W. Buckley, 156 South St., New York.

The Bradford Board Trade solicits correspondence with manufacturers about to locate where cheap fuel is an object. Address W. W. Brown, Pres't, Bradford, Pa. The best book for electricians and beginners in elec-

By mail, \$4; Munn & Co., publishers, 361 Broadway, N. Y. Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway New York. Free on application.



HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our

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 This is for our information and not for publication.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.

(3414) L. C. says: Please describe the distribution of light round a continuous current arc lamp? How would you proceed to determine the illuminating power of such an arc in any given direction? What is meant by mean spherical candle power? How is it calculated? A. The light of an arc lamp is distributed nearly evenly, except in the shadows of the carbons. The light of a candle is distributed in the same way. When you compare an arc lamp with a candle, the value of the arc light would be given in candle power. Spherical candle power refers to the average of the emission of light in all directions.

(3415) W. M. B.—Sprinkle around the dried leaves of pennyroyal, or use the essence of pennyroyal for driving away fleas.

(3416) C. B. asks about a pair of permanent magnets I construct d; they are 10 inches long, 1/8 inch wide, 3% inch thick; they are made from best American tool steel and tempered so they will scratch glass, and I had them magnetized on a 300 incandescent elec ric light dynamo, and they will not pick up a good sized needle. Could you inform me where the fault is-in the steel or magnetization? A. The difficulty with your magnets probably arises from having the temper too high: the magnet should be tempered only at the ends. and the temper should be about the same as that of a cold chisel, that is to say, it should be hardened and drawn down to a purple.

(3417) W. F. D. asks: How can I keep copper wire from turning a dark blue after cleaning it? A. Try adding a little carbonate of ammonia to the water in which you wash your copper wire.

(3418) W. H. W. asks: Will you please inform me through your valuable paper the best way to harden and temper circular saws, the same as the samples inclosed and larger, say up to 11/2 inches, and oblige constant reader? The way I harden them is between iron plates with a little oil on the surface and temper them on a hollow spindle with the end turned down so as to fit the hole in the saws; inside of the spin dle is a gas flame, and as the color begins to come on the saws I keep turning them until the required color is obtained, then I lay them on a flat plate with a little oil on it. Even when I get them flat in hardening, they will go out of true in tempering, same as the samples inclosed. One of them is true enough, but the other is very much out. By answering the above you oblige a constant reader. A. In hardening the saws should be carefully dipped plumb edgewise. If they draw or warp, use a smooth hard hammer on a hard steel block or anvil. Carefully hammer the parts that draw so as to make the saw flat. If the center bulges, hammer around the edges. If the edges warp, hammer the center to relieve the strain. The saws will bear the ham mering after drawing the temper.

(3419) A. J. B. asks: What constitutes a perpetual motion? I take it a machine that retains its original power is perpetual motion. My reason for asking you is this: I have a water motor that when set in motion drives the water wheel, and the same water is conveyed back to the original starting point independent of the water wheel, the only loss being by evaporation, which can be overcome by a small feed

pipe. If I have made a new discovery, please inform me in your next issue. A. The apparatus you describe, if operative, would be classed as a perpetual motion. But to us it looks like a no go.

(3420) A. H. M. says: Please give me a good formula for a fixing bath to prevent blisters on best grades of albumen paper. I am troubled some with large blisters that commence forming in fixing bath after they are in it about five minutes and keep getting larger until they are about the size of a dime, and some larger. Toning bath will turn red litmus paper blue. Bath not acid. Very few small blisters appear. A. Make the fixing bath alkaline by adding a few drops of ammonia. It is unportant that the temperature of the fixing bath be warm or the same as that of the toning bath. Blisters are prevented by putting prints, before toning, in a salt bath. Water 10 ounces, salt & ounce.

(3421) J. J. R.—The lamprey eel is both a native of the sea and rivers of Europe and America. They are, as the name indicates, rock suckers and live upon the rock moss and algæ attached to rocks; were once considered a delicacy and are much used for food. Their habitat in the United States is the rocky shores of the Eastern States. We can furnish "Violin Making, as it Was and as it Is. A History." By Allen. 200 illustrations, \$3 mailed.

(3422) E. W. R. writes: Have you any receipt for killing a small fly insect or borer which works in oak lumber, both in piles and in buildings, where there is not much to disturb them? This fly is very small, light brown in color, and between one sixty-fourth and one thirty-sixth of an inch in diameand one-eighth of an inch long. It bores very rapidly, and works in our oak flooring, post- and girders, and in the board floors of our warehouse, where there is not much walking and going to disturb them. They will not work in the floor where we are running trucks or walking through it. We have written to a large number of lumbermen, but they know of nothing absolutely practicable for destroying the insects. A great many had heard of them, but had had no experience with them. We have saturated the lumber with strong solutions of salt brine, both hot and cold, and have also limed the posts and girders. It may be that we kill off a great many of the living insects, but if so, we do not kill the eggs, and the insect seems to increase with remarkable rapidity. A. Reply by Prof. C. V. Riley.—The small fly insect or borer which works in oak lumber, as described in your letter, is a common and widely distributed pest bearing the scientific name of Lyctus strictus Melsh. It isproperly not a fly but a small beetle belonging to the family Ptinidae. The depart ment is frequently in receipt of letters relating to damage by this insect. It is rather a difficult insect to control, and the remedy I have formerly advised, and which is the only one which seems to promise success, is to pain or coat the timbers, buildings, or stored lumber with kerosene. The insect works near the surface of the wood, and the kerosene will penetrate sufficiently to kill the beetles and early stages. Benzine or gaso line may be used in lieu of kerosene if the latter is objectionable for any reason, but these substances will not be so effective on account of their more rapid va porization.

(3423) I. B. asks for a definition of one billion and how many figures it takes. A. In France and the United States one thousand millions 1,000,000,000 or 10°; in Great Britain one million milltons-1,000,000,000,000 or 1012. The word billion is little used in France, the word milliard taking its place.

(3424) L. J. S. writes: I noticed on some colored bank drafts the figures written in a milky white to protect same from erasing amount. Can you tell me how to prepare such a chemical ink with a similar discoloring effect? A. A solution of oxalic acid in water is used for this purpose. A steel pen should not be used, a gold or quill one is preferable

(3425) H. D. G. asks: 1. Can a house be lighted successfully with a current from storage batteries? My idea is to have the secondary battery charged during the day by a gravity battery. A. A house can be lighted in the manner suggested. 2. Is it practicable, and would the cost exceed that of gas after the apparatus is installed? A. We think you would find the cost to exceed that of gas, if you count the attendance and deterioration of the plant as items of ex-

(3426) A. J. C. asks how to make a good strong galvanic electric battery. A. For information on the construction of galyanic batteries we refer you to SUPPLEMENT, Nos. 157, 158, 159, and 792.

(3427) C. W. B. asks: What metals, minerals, or materials come the nearest to insulating a magnet when placed before it? A. There is no sub stance that will insulate magnetism. You can absorb the magnetism by means of a body of magnetic material, but this will always be done with a loss.

(3428) F. S. G. asks: Will you kindly let me know what is the best and latest authority to read on Bessemer steel manufacturing, also something on rolling mill workings, etc. ? A. Howe's "Metallurgy of Steel" is the latest and best work, \$10 mailed. "Iron and Steel," by Greenwood. "Rolling Mill Practice." \$2-mailed.

(3429) B. F. H. asks: Can you give me the formula of making cocoanut butter? Is it manufactured and sold commercially in the United States? If so, by whom is it manufactured? A. For details of the manufacture you may consult the United States Dispensatory. It is made by pressing the moistened ground chocolate nut, or by extraction with a solvent, such as bisulphide of carbon, or by simply boiling with water. It is made by chocolate makers, such as Baker & Co., of Boston, Mass.

(3430) W. E. D. asks: 1. Have you ever printed in this paper directions for making an electric motor to be operated by a primary battery, and having sufficient power to run a fan eight inches in diameter at suitable speed? A. Consult Supplement, Nos. 161 and 641. The dynamo described in Supplement, No. 161, can be used as a motor. 2. What book will give a good idea of the electrical terms in common use as well Car running gear, railway, C. M. Sloan.

as a fair idea of motors and dynamo machines, their construction and operation? A. Houston's "Electrical Dictionary," price \$2.50, is a good work for terms 'Experimental Science" would be a serviceable book for you.

(3431) W. B. S. asks for the ingredients of the enamel used on sewing machines, or some glossy, black enamel that can be applied with a brush to steel, and does not need baking on. A. We know of no perfect substitute for baking japan. You can ap proximate it by mixing refined lampblack with quickdrying copal varnish.

(3432) E. H. asks whether one cell of Fuller's mercury bicromate battery 6 by 8 inches will run the small Gramme ring motor satisfactorily, illustrated in your paper published January 17, 1891. A The Fuller battery is a good one for this purpose.

(3433) W. B. R. asks: Would the boiler nentioned in Scientific American Supplement, No. 182, be suitable for a boat 21 ft. long, 5 ft. beam, 26 in. hold? Engine cylinder 234 by 4 in. stroke. Would this boiler carry 75 lb. working steam pressure and would it be enough to run that size boat, or would it bebetter to add 2 to 3 more flasks? What speed could this engine run? What size screw would be required? What pitch and number of blades? Does the government allow the use of said boilers on rivers like the Hackensack or Passaic? Also, would the boiler inspector have to be informed of the same to be necessary to get an engineer's license? A. The engine will run the boat at 614 to 7 miles perhour, at 300 revolutions per minute. Should have a three bladed screw, 20 inches diameter, 30 inches pitch. The boiler is safe for 75 lb., but would do better service with more flasks. See Scientific Ameri-CAN SUPPLEMENT, No. 702, for other styles of small boilers. The government requires license for running on navigable streams. You can get one license as engineer and pilot for a small boat for private use. The boiler you name will pass inspection.

(3434) J. G. says: Please let me know the ordinary pitch of 10 ft. screw propeller, and what would be the distance it would move forward in one, two, and three revolutions, supposing there was no loss from slip. A. Propeller screws are made with a pitch of 11/2 to twice the diameter of the screw, according to the kind of service. The travel is equal to the pitch per revolution without allowance for slip. One and a half the diameter for your 10 ft. wheel, or 15 ft., would be well for ordinary boats.

TO INVENTORS.

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

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

September 22, 1891.

AND EACH BEARING THAT DATE.

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

Adjustable pattern for draughting trousers, A. McDowell. McDowell. McDowell. McMicox. Alarinito the lungs, instrument for forcing, F. P. Wilcox. Alarin. See Surglar alarm. Low water alarm. Show cas alarm. Armature for dynamo-electric machines and motors, J. Beattie, Jr. Ash can, L. H. Chubbuck. Axie boxes, method of and apparatus for manufacturing, J. Donnelly. Axie nut, adjustable, Sigle & Wenger. 459,785 Axie axie, means for transmitting power to driving, G. R. Lean. Axie nut, adjustable, Sigle & Wenger. 459,785 Axies, means for transmitting power to driving, G. R. Lean. Axies, process of and apparatus for making fantall, W. J. Parmelee. Back stay protector, O. J. Rieley. Back stay protector, O. J. Rieley. Bag. See Feed bag. Knitted bag. Mall bag. Baling press, J. G. Goldthwaite. Bar. See Cutter bar. Bear See Cutter bar. Bearing, noiler, F. Van Bentbuysen. Bearing, noiler, F. Van Bentbuysen. 459,378 Bearing, noiler, F. Van Bentbuysen. 459,378 Bearing, noiler, F. Van Bentbuysen. 459,378 Bed Joding, B. Ringo. Bed, Joding, B. Ringo. Bed, Joding, B. Ringo. Bed, Joding, B. Ringo. Bed slat fastening, H. R. Robbins Beddstead fastening, H. R. Robbins Beddstead fastening, H. R. Robbins Beddsteads, bed drawer attachment for, L. Mabee Bell, slarm, C. E. Carroll. Bench hook, D. Auria Bench hook, M. L. Darby Bircycles scat attachment, Rastetter & Siebold. 459,378 Bins, etc., construction of walls for, J. Wilson. Billiard table, W. Buttery Billiard table, W. Buttery Boller See Steam boiler. Verticalboiler. Boller See Steam boiler. Boller See Steam boiler. Boller See Steam boiler. Boller See Steam boiler. 459,395 Boller See Bed brace. Ratchet brace. Brake. See Car brake. Vehicle brake. 459,395 Bourland, P. Lippert		_
Agricultural implement, J. W. Hammett	Adjustable pattern for draughting trousers, A.	
All mito the lungs, instrument for forcing, F. F. Wilcox. Alarm. See Surglar alarm. Low water alarm. Show case alarm. Armature for dynamo-electric machines and motors, J. Beattie, Jr. Ash can, L. H. Chubbuck. Ash can, L. H. H. Chubbuck. Ash can, L. H. L. H. L. H. Chubbuck. Ash can, L. H. H. Chubbuck. Ash can, L. H. L. H. L. H. L. H. L. L. H. L.	McDowell	59,856
Armature for dynamo-electric machines and motors, J. Beattie, Jr. Axie ton, L. H. Chubbuck. Axie boxes, method of and apparatus for manufacturing, J. Donnelly. Axies, means for transmitting power to driving, G. R. Lean. Axies, process of and apparatus for making fartally. J. Parmelee. Back stay protector, O. J. Rieley. Bag. See Feed bag. Knitted bag. Mail bag. Baling press, J. G. Goldthwaite. Baling press, J. G. Goldthwaite. Barometer, bolosteric, O. Moller. Barometer, bolosteric, O. Moller. Barometer, bolosteric, O. Moller. Bearing, anti-friction, H. T. Shriver. Bearing, anti-friction, H. T. Shriver. Bearing, roller, F. Van Benthuysen. Bed brace, R. J. Morton. Bed Stat fastener, C. N. Rothrock. Bed slat fastener, C. N. Rothrock. Bedstead fastening, H. R. Robbins. Bedsteads, bed drawer attachment for, L. Mabee 460,022 Bell, slarm, C. E. Carroll. Bench dog, L. D'Auria. Bench hook, M. L. Darby. Blilliard table, W. Buttery. Blilliard table, W. Buttery. Blilliard table, W. Buttery. Bloat lowering apparatus, J. H. Throop. Bolt construction of walls for J. Wilson. Bloat lowering apparatus, J. H. Throop. Bolt eseer, M. D. Luehrs. Boot and shoe cleaning and polishing machine, B. H. Cook. Bowling alley, M. Von Oeyen, Sr. 460,032 Bowling alley, M. Von Oeyen, Sr. Bolten Brake. See Car brake. Vehicle brake. Brake. See Bed brace. Hatchet brace. Brake. See Car brake. Vehicle brake. Brick machine, H. Alken. Bord burner. Butter firkin, C. A. Rittenhouse. 460,033 Burnal vault, Wyatt & Williamson. 460,033 Burnal vault, Wyatt & Williamson. 460,033 Burnal vault, Wyatt & Williamson. 460,033 Burnar. See Carber. Butter firkin, C. A. Rittenhouse.	Agricultural implement, J. W. Hammett	160,012
Armature for dynamo-electric machines and motors, J. Beattie, Jr. Axie ton, L. H. Chubbuck. Axie boxes, method of and apparatus for manufacturing, J. Donnelly. Axies, means for transmitting power to driving, G. R. Lean. Axies, process of and apparatus for making fartally. J. Parmelee. Back stay protector, O. J. Rieley. Bag. See Feed bag. Knitted bag. Mail bag. Baling press, J. G. Goldthwaite. Baling press, J. G. Goldthwaite. Barometer, bolosteric, O. Moller. Barometer, bolosteric, O. Moller. Barometer, bolosteric, O. Moller. Bearing, anti-friction, H. T. Shriver. Bearing, anti-friction, H. T. Shriver. Bearing, roller, F. Van Benthuysen. Bed brace, R. J. Morton. Bed Stat fastener, C. N. Rothrock. Bed slat fastener, C. N. Rothrock. Bedstead fastening, H. R. Robbins. Bedsteads, bed drawer attachment for, L. Mabee 460,022 Bell, slarm, C. E. Carroll. Bench dog, L. D'Auria. Bench hook, M. L. Darby. Blilliard table, W. Buttery. Blilliard table, W. Buttery. Blilliard table, W. Buttery. Bloat lowering apparatus, J. H. Throop. Bolt construction of walls for J. Wilson. Bloat lowering apparatus, J. H. Throop. Bolt eseer, M. D. Luehrs. Boot and shoe cleaning and polishing machine, B. H. Cook. Bowling alley, M. Von Oeyen, Sr. 460,032 Bowling alley, M. Von Oeyen, Sr. Bolten Brake. See Car brake. Vehicle brake. Brake. See Bed brace. Hatchet brace. Brake. See Car brake. Vehicle brake. Brick machine, H. Alken. Bord burner. Butter firkin, C. A. Rittenhouse. 460,033 Burnal vault, Wyatt & Williamson. 460,033 Burnal vault, Wyatt & Williamson. 460,033 Burnal vault, Wyatt & Williamson. 460,033 Burnar. See Carber. Butter firkin, C. A. Rittenhouse.	Wilcox Wilcox	150 909
Armature for dynamo-electric machines and motors, J. Beattie, Jr. Axie ton, L. H. Chubbuck. Axie boxes, method of and apparatus for manufacturing, J. Donnelly. Axies, means for transmitting power to driving, G. R. Lean. Axies, process of and apparatus for making fartally. J. Parmelee. Back stay protector, O. J. Rieley. Bag. See Feed bag. Knitted bag. Mail bag. Baling press, J. G. Goldthwaite. Baling press, J. G. Goldthwaite. Barometer, bolosteric, O. Moller. Barometer, bolosteric, O. Moller. Barometer, bolosteric, O. Moller. Bearing, anti-friction, H. T. Shriver. Bearing, anti-friction, H. T. Shriver. Bearing, roller, F. Van Benthuysen. Bed brace, R. J. Morton. Bed Stat fastener, C. N. Rothrock. Bed slat fastener, C. N. Rothrock. Bedstead fastening, H. R. Robbins. Bedsteads, bed drawer attachment for, L. Mabee 460,022 Bell, slarm, C. E. Carroll. Bench dog, L. D'Auria. Bench hook, M. L. Darby. Blilliard table, W. Buttery. Blilliard table, W. Buttery. Blilliard table, W. Buttery. Bloat lowering apparatus, J. H. Throop. Bolt construction of walls for J. Wilson. Bloat lowering apparatus, J. H. Throop. Bolt eseer, M. D. Luehrs. Boot and shoe cleaning and polishing machine, B. H. Cook. Bowling alley, M. Von Oeyen, Sr. 460,032 Bowling alley, M. Von Oeyen, Sr. Bolten Brake. See Car brake. Vehicle brake. Brake. See Bed brace. Hatchet brace. Brake. See Car brake. Vehicle brake. Brick machine, H. Alken. Bord burner. Butter firkin, C. A. Rittenhouse. 460,033 Burnal vault, Wyatt & Williamson. 460,033 Burnal vault, Wyatt & Williamson. 460,033 Burnal vault, Wyatt & Williamson. 460,033 Burnar. See Carber. Butter firkin, C. A. Rittenhouse.	Alarm See Burglar alarm Low water alarm	100,000
Ash can, L. H. Chubbuck. Ash can, L. H. Chubbuck. Axie boxes, method of and apparatus for manufacturing, J. Donnelly. Axies, means for transmitting power to driving, G. R. Lean. Axies, process of and apparatus for making fantally. Back stay protector, O. J. Rieley. Bags. See Feed bag. Knitted bag. Mail bag. Baling press, J. G. Goldthwaite. Baling press, J. G. Goldthwaite. Barometer, bolosteric, O. Moller. Barometer, bolosteric, O. Moller. Barometer, bolosteric, O. Moller. Bearing, anti-friction, H. T. Shriver. Bearing, anti-friction, H. T. Shriver. Bearing, anti-friction, H. T. Shriver. Bearing, roller, F. Van Benthuysen. 459,378 Bed brace, R. J. Morton. 460,039 Bed, folding, B. Ringo. Bed slat fastener, C. N. Rothrock. 459,378 Bed slat fastener, C. N. Rothrock. 450,378 Bedstead fastening, H. R. Robbins. Bedsteads, bed drawer attachment for, L. Mabee 460,022 Bell, slarm, C. E. Carroll. Bench dog, L. D'Auria. 460,037 Billiard table, W. Buttery. Billiard table, W. Buttery. Billiard table, W. Buttery. Binder for papers, etc., Fitzpatrick & Ring. Bins, etc., construction of walls for J. Wilson. Bins, etc., construction of walls for J. Wilson. Blancher for celery, etc., W. A. White. Boat lowering apparatus, J. H. Throop. Boller stay, T. Barrow. Boult nader, M. D. Luehrs. Boot and shoe cleaning and polishing machine, B. H. Cook. Bowling alley, M. Von Oeyen, Sr. 460,032 Bowling alley, M. Von Oeyen, Sr. 460,032 Bowling alley, M. Von Oeyen, Sr. 460,033 Bowling alley, M. Von Oeyen, Sr. 460,033 Bowling alley, M. Von Oeyen, Sr. 460,035 Burner, See Carbrake. Vehicle brake. Brick machine, H. Alken. Brake. See Car brake. Vehicle brake. Brick machine, H. Alken. Bort bowling alley, M. Von Oeyen, Sr. 460,033 Bowling alley, M. Von Oeyen, Sr. 460,035 Bowling all	Snow case alarm.	
Ash can, L. H. Chubbuck. Ash can, L. H. Chubbuck. Axie boxes, method of and apparatus for manufacturing, J. Donnelly. Axies, means for transmitting power to driving, G. R. Lean. Axies, process of and apparatus for making fantally. Back stay protector, O. J. Rieley. Bags. See Feed bag. Knitted bag. Mail bag. Baling press, J. G. Goldthwaite. Baling press, J. G. Goldthwaite. Barometer, bolosteric, O. Moller. Barometer, bolosteric, O. Moller. Barometer, bolosteric, O. Moller. Bearing, anti-friction, H. T. Shriver. Bearing, anti-friction, H. T. Shriver. Bearing, anti-friction, H. T. Shriver. Bearing, roller, F. Van Benthuysen. 459,378 Bed brace, R. J. Morton. 460,039 Bed, folding, B. Ringo. Bed slat fastener, C. N. Rothrock. 459,378 Bed slat fastener, C. N. Rothrock. 450,378 Bedstead fastening, H. R. Robbins. Bedsteads, bed drawer attachment for, L. Mabee 460,022 Bell, slarm, C. E. Carroll. Bench dog, L. D'Auria. 460,037 Billiard table, W. Buttery. Billiard table, W. Buttery. Billiard table, W. Buttery. Binder for papers, etc., Fitzpatrick & Ring. Bins, etc., construction of walls for J. Wilson. Bins, etc., construction of walls for J. Wilson. Blancher for celery, etc., W. A. White. Boat lowering apparatus, J. H. Throop. Boller stay, T. Barrow. Boult nader, M. D. Luehrs. Boot and shoe cleaning and polishing machine, B. H. Cook. Bowling alley, M. Von Oeyen, Sr. 460,032 Bowling alley, M. Von Oeyen, Sr. 460,032 Bowling alley, M. Von Oeyen, Sr. 460,033 Bowling alley, M. Von Oeyen, Sr. 460,033 Bowling alley, M. Von Oeyen, Sr. 460,035 Burner, See Carbrake. Vehicle brake. Brick machine, H. Alken. Brake. See Car brake. Vehicle brake. Brick machine, H. Alken. Bort bowling alley, M. Von Oeyen, Sr. 460,033 Bowling alley, M. Von Oeyen, Sr. 460,035 Bowling all	Armature for dynamo-electric machines and mo-	
Bearing, roller, F. Van Benthuysen	tors, J. Beattie, Jr	59,923
Bearing, roller, F. Van Benthuysen	Asia bayes method of and apparetue for manu-	159,972
Bearing, roller, F. Van Benthuysen	facturing. J. Donnelly	159,999
Bearing, roller, F. Van Benthuysen	Axle nut, adjustable, Sigle & Wenger	159,842
Bearing, roller, F. Van Benthuysen	Axles, means for transmitting power to driving,	
Bearing, roller, F. Van Benthuysen	A wless process of and appearates for making fan-	159,785
Bearing, roller, F. Van Benthuysen	tail W. J. Parmelee	159.765
Bearing, roller, F. Van Benthuysen	Back stay protector, O. J. Rieley	159,766
Bearing, roller, F. Van Benthuysen	Bag. See Feed bag. Knitted bag. Mall bag.	
Bearing, roller, F. Van Benthuysen	Baling press, J. G. Goldthwaite	160,009
Bearing, roller, F. Van Benthuysen	Bar. See Cutter bar	150 972
Bearing, roller, F. Van Benthuysen	Bath. See Electro-ther apeutic bath.	200,011
Bearing, roller, F. Van Benthuysen	Bearing, anti-friction, H. T. Sbriver	59,877
Binder for papers, etc., Fitzpatrick & Ring. 460,908 Bins, etc., construction of walls for. J. Wilson. 459,808 Blancher for celery, etc., W. A. White. 459,804 Boat lowering apparatus, J. H. Throop. 459,804 Boiler cleaner, F. Trowbridge. 459,788 Boiler stay, T. Barrow. 459,954 Bolt beader, M. D. Luebrs. 460,952 Boot and shoe cleaning and polishing machine. 459,808 Bowling alley, M. Von Oeyen, Sr. 460,923 Bowling alley, M. Von Oeyen, Sr. 460,028 Box, D. S. Clark. 460,008 Brace. See Bed brace. Hatchet brace. Brake. See Car brake. Vehicle brake. Burglar alarm, H. T. Wilson. 459,978 Burlar vault, Wyatt & Williamson. 459,978 Burner, See Crucible burner. Gas burner. Burter firkin, C. A. Rittenhouse. 460,023 Camera, F. A. Hetherington. 460,032	Bearing, roller, F. Van Benthuysen	159,774
Binder for papers, etc., Fitzpatrick & Ring. 460,908 Bins, etc., construction of walls for. J. Wilson. 459,808 Blancher for celery, etc., W. A. White. 459,804 Boat lowering apparatus, J. H. Throop. 459,804 Boiler cleaner, F. Trowbridge. 459,788 Boiler stay, T. Barrow. 459,954 Bolt beader, M. D. Luebrs. 460,952 Boot and shoe cleaning and polishing machine. 459,808 Bowling alley, M. Von Oeyen, Sr. 460,923 Bowling alley, M. Von Oeyen, Sr. 460,028 Box, D. S. Clark. 460,008 Brace. See Bed brace. Hatchet brace. Brake. See Car brake. Vehicle brake. Burglar alarm, H. T. Wilson. 459,978 Burlar vault, Wyatt & Williamson. 459,978 Burner, See Crucible burner. Gas burner. Burter firkin, C. A. Rittenhouse. 460,023 Camera, F. A. Hetherington. 460,032	Bed brace, R. J Morton,	160,092
Binder for papers, etc., Fitzpatrick & Ring. 460,908 Bins, etc., construction of walls for. J. Wilson. 459,808 Blancher for celery, etc., W. A. White. 459,804 Boat lowering apparatus, J. H. Throop. 459,804 Boiler cleaner, F. Trowbridge. 459,788 Boiler stay, T. Barrow. 459,954 Bolt beader, M. D. Luebrs. 460,952 Boot and shoe cleaning and polishing machine. 459,808 Bowling alley, M. Von Oeyen, Sr. 460,923 Bowling alley, M. Von Oeyen, Sr. 460,028 Box, D. S. Clark. 460,008 Brace. See Bed brace. Hatchet brace. Brake. See Car brake. Vehicle brake. Burglar alarm, H. T. Wilson. 459,978 Burlar vault, Wyatt & Williamson. 459,978 Burner, See Crucible burner. Gas burner. Burter firkin, C. A. Rittenhouse. 460,023 Camera, F. A. Hetherington. 460,032	Red elet festener C N Rothrock	159.768
Binder for papers, etc., Fitzpatrick & Ring. 460,908 Bins, etc., construction of walls for. J. Wilson. 459,808 Blancher for celery, etc., W. A. White. 459,804 Boat lowering apparatus, J. H. Throop. 459,804 Boiler cleaner, F. Trowbridge. 459,788 Boiler stay, T. Barrow. 459,954 Bolt beader, M. D. Luebrs. 460,952 Boot and shoe cleaning and polishing machine. 459,808 Bowling alley, M. Von Oeyen, Sr. 460,923 Bowling alley, M. Von Oeyen, Sr. 460,028 Box, D. S. Clark. 460,008 Brace. See Bed brace. Hatchet brace. Brake. See Car brake. Vehicle brake. Burglar alarm, H. T. Wilson. 459,978 Burlar vault, Wyatt & Williamson. 459,978 Burner, See Crucible burner. Gas burner. Burter firkin, C. A. Rittenhouse. 460,023 Camera, F. A. Hetherington. 460,032	Bedstead fastening, H. R. Robbins	460,034
Binder for papers, etc., Fitzpatrick & Ring. 460,908 Bins, etc., construction of walls for. J. Wilson. 459,808 Blancher for celery, etc., W. A. White. 459,804 Boat lowering apparatus, J. H. Throop. 459,804 Boiler cleaner, F. Trowbridge. 459,788 Boiler stay, T. Barrow. 459,954 Bolt beader, M. D. Luebrs. 460,952 Boot and shoe cleaning and polishing machine. 459,808 Bowling alley, M. Von Oeyen, Sr. 460,923 Bowling alley, M. Von Oeyen, Sr. 460,028 Box, D. S. Clark. 460,008 Brace. See Bed brace. Hatchet brace. Brake. See Car brake. Vehicle brake. Burglar alarm, H. T. Wilson. 459,978 Burlar vault, Wyatt & Williamson. 459,978 Burner, See Crucible burner. Gas burner. Burter firkin, C. A. Rittenhouse. 460,023 Camera, F. A. Hetherington. 460,032	Bedsteads, bed drawer attachment for, L. Mabee	160,022
Binder for papers, etc., Fitzpatrick & Ring. 460,908 Bins, etc., construction of walls for. J. Wilson. 459,808 Blancher for celery, etc., W. A. White. 459,804 Boat lowering apparatus, J. H. Throop. 459,804 Boiler cleaner, F. Trowbridge. 459,788 Boiler stay, T. Barrow. 459,954 Bolt beader, M. D. Luebrs. 460,952 Boot and shoe cleaning and polishing machine. 459,808 Bowling alley, M. Von Oeyen, Sr. 460,923 Bowling alley, M. Von Oeyen, Sr. 460,028 Box, D. S. Clark. 460,008 Brace. See Bed brace. Hatchet brace. Brake. See Car brake. Vehicle brake. Burglar alarm, H. T. Wilson. 459,978 Burlar vault, Wyatt & Williamson. 459,978 Burner, See Crucible burner. Gas burner. Burter firkin, C. A. Rittenhouse. 460,023 Camera, F. A. Hetherington. 460,032	Bell, alarm, C. E. Carroll	159,778
Binder for papers, etc., Fitzpatrick & Ring. 460,908 Bins, etc., construction of walls for. J. Wilson. 459,808 Blancher for celery, etc., W. A. White. 459,804 Boat lowering apparatus, J. H. Throop. 459,804 Boiler cleaner, F. Trowbridge. 459,788 Boiler stay, T. Barrow. 459,954 Bolt beader, M. D. Luebrs. 460,952 Boot and shoe cleaning and polishing machine. 459,808 Bowling alley, M. Von Oeyen, Sr. 460,923 Bowling alley, M. Von Oeyen, Sr. 460,028 Box, D. S. Clark. 460,008 Brace. See Bed brace. Hatchet brace. Brake. See Car brake. Vehicle brake. Burglar alarm, H. T. Wilson. 459,978 Burlar vault, Wyatt & Williamson. 459,978 Burner, See Crucible burner. Gas burner. Burter firkin, C. A. Rittenhouse. 460,023 Camera, F. A. Hetherington. 460,032	Bench dog, L. D'Auria	450 745
Binder for papers, etc., Fitzpatrick & Ring. 460,908 Bins, etc., construction of walls for. J. Wilson. 459,808 Blancher for celery, etc., W. A. White. 459,804 Boat lowering apparatus, J. H. Throop. 459,804 Boiler cleaner, F. Trowbridge. 459,788 Boiler stay, T. Barrow. 459,954 Bolt beader, M. D. Luebrs. 460,952 Boot and shoe cleaning and polishing machine. 459,808 Bowling alley, M. Von Oeyen, Sr. 460,923 Bowling alley, M. Von Oeyen, Sr. 460,028 Box, D. S. Clark. 460,008 Brace. See Bed brace. Hatchet brace. Brake. See Car brake. Vehicle brake. Burglar alarm, H. T. Wilson. 459,978 Burlar vault, Wyatt & Williamson. 459,978 Burner, See Crucible burner. Gas burner. Burter firkin, C. A. Rittenhouse. 460,023 Camera, F. A. Hetherington. 460,032	Ricycle seat attachment. Rastetter & Siebold	460.031
Binder for papers, etc., Fitzpatrick & Ring. 460,908 Bins, etc., construction of walls for. J. Wilson. 459,808 Blancher for celery, etc., W. A. White. 459,804 Boat lowering apparatus, J. H. Throop. 459,804 Boiler cleaner, F. Trowbridge. 459,788 Boiler stay, T. Barrow. 459,954 Bolt beader, M. D. Luebrs. 460,952 Boot and shoe cleaning and polishing machine. 459,808 Bowling alley, M. Von Oeyen, Sr. 460,923 Bowling alley, M. Von Oeyen, Sr. 460,028 Box, D. S. Clark. 460,008 Brace. See Bed brace. Hatchet brace. Brake. See Car brake. Vehicle brake. Burglar alarm, H. T. Wilson. 459,978 Burlar vault, Wyatt & Williamson. 459,978 Burner, See Crucible burner. Gas burner. Burter firkin, C. A. Rittenhouse. 460,023 Camera, F. A. Hetherington. 460,032	Bicycles, supplemental seat for, F. D. Jones	460,072
Boiler stay, T. Barrow	Billiard table, W. Buttery	459,957
Boiler stay, T. Barrow	Binder for papers, etc., Fitzpatrick & King	46U,UUU
Boiler stay, T. Barrow	Rlancher for celery etc. W. A. White	459.804
Boiler stay, T. Barrow	Boat lowering apparatus, J. H. Throop	459,822
Boiler stay, T. Barrow	Boiler. See Steam boiler. Verticalboiler.	
Box, D. S. Clark 1002 1003 1004 1005 10	Boiler cleaner, F. Trowbridge	459,798 450 054
Box, D. S. Clark 1002 1003 1004 1005 10	Boller Stay, T. Barrow	460.058
Box, D. S. Clark 1002 1003 1004 1005 10	Boot and shoe cleaning and polishing machine.	200,000
Box, D. S. Clark 1002 1003 1004 1005 10	B. H. Cook	459,880
Box, D. S. Clark 1002 1003 1004 1005 10	Bowl handle, P. Lippert	459,933 460 005
BOX, D. S. Clark 460,000 Brace, See Bed brace. Ratchet brace. Brake, See Car brake. Vehicle brake. Brick machine, H. Alken. 458,878 Bulkhead, G. J. Cook. 459,978 Burglar alarm, H. T. Wilson. 459,978 Burial vault, Wyatt & Williamson. 459,888 Burner, See Crucible burner. Gas burner. Por burner. 460,033 Butter firkin, C. A. Rittenhouse. 460,033 Camera, F. A. Hetherington. 460,032	Bowling alley, M. von Oeyen, Sr	200,020
Brace. See Bed brace. Ratchet brace. Brake. See Car brake. Vehicle brake. Brick machine, H. Aiken. Brick machine, H. Aiken. Brick machine, H. Aiken. Brick machine, H. T. Wilson. Burglar alarm. H. T. Wilson. Burglar alarm. H. T. Wilson. 459,936 Burner. See Crudble burner. Gas burner. Vapor burner. Por burner. Cam burter firkin, C. A. Rittenhouse. Cam Can. See Ash can. Oil can. Car Car. J. Fischer. Car brake, J. W. Hartigan. Car brake, J. W. Hartigan. Car coupling, S. A. Cloud. Car coupling, C. M. Cole. Car coupling, S. B. Dover. Car coupling, S. B. Dover. Car coupling, J. L. Weakley Car guard, M. J. Daly Car links, machine for making, M. E. Elliott. Car railway, E. B. Macmillan Car salvay, E. B. Macmillan Car coupling, S. B. Dover Car coupling, C. L. Weakley	Box. D. S. Clark	460.068
Brake. See Car brake. Vehicle brake. 459.878 Brick machine, H. Alken. 459.878 Bulkhead, G. J. Cook. 459.988 Burlal aram, H. T. Wilson. 459.888 Burlal vault, Wyatt & Williamson. 459.888 Burlal vault, Wyatt & Williamson. 459.988 Burlal vault, Wyatt & Williamson. 460.988 Burner. See Cruelble burner. 460.032 460.032 Cam brake, J. A. Retherington. 460.032 460.032 Car brake, J. Fischer. 459.984 459.984 Car brake, J. W. Hartigan. 459.982 459.982 Car coupling, S. A. Cloud. 459.982 459.982 Car coupling, S. B. Dover. 459.982 459.982 Car coupling, S. B. Dover. 459.982 459.982 Car coupling, S. L. Weakley 460.082 460.082 Car guard, M. J. Daly. 460.082 460.082 Car ilnks, machine for making, M. E. Elliott. 459.982 Car malway, E. B. Macmillan. 459.892 Car coupling, M. A. Macmillan. 459.892	Brace. See Bed brace. Ratchet brace.	
Brita Bacton 1. Ake 459.978 Burglar alarm, H. T. Wilson. 459.978 Burglar alarm, H. T. Wilson. 459.988 Burniar vault, Wyatt & Williamson. 459.988 Burner, See Cruelble burner. Gas burner. Va- por burner. Butter firkin, C. A. Rittenhouse. 460,033 Cameras, F. A. Hetherington. 460,993 Car . See Ash can. Oil can. Car and door therefor, freight, O. P. Hix. 459.985 Car brake, J. W. Hartigan. 459.886 Car coupling, S. A. Colou. 459.996 Car coupling, S. A. Colou. 459.996 Car coupling, S. B. Dover. 459.996 Car coupling, S. B. Dover. 459.996 Car coupling, J. L. Weakley 460,993 Car guard, M. J. Daly. 460,993 Car links, machine for making, M. E. Bilott. 459.746 Car motor mechanism, electric, S. H. Short. 459.746 Car motor mechanism, electric, S. H. Short. 459.898	Brake. See Car brake. Vehicle brake.	450 070
Burglar alarm H. T. Wilson Burglar slarm H. T. Wilson Burner, See Crueble burner. Gas burner. Va- Burner, See Crueble burner. Gas burner. Va- Butter firstin, C. A. Rittenhouse. Carmers, F. A. Hetherington. Carmers, F. A. Hetherington. Car and door therefor, freight, O. P. Hix. 459,905 Car brake, J. Fischer. Car brake, J. W. Hartigan. Car coupling, S. A. Cloud. Car coupling, S. A. Cloud. Car coupling, S. M. Cole. Car coupling, S. M. Gover. Car coupling, S. M. Grover. Car coupling, L. L. Weakley 460,936 Car guard, M. J. Daly Car guard, M. J. Daly Car motor mechanism, electric, S. H. Short. 461,958 Car nailway, E. B. Maemillan. 461,958	Bulkhood G. I. Cook	459 074
Burial vault, Wyatt & Williamson. Burner, See Crudble burner. Gas burner. Va- Dor burner. Butter firshin, C. A. Rittenhouse	Burglar alarm H. T. Wilson	459,984
Burner, Sec Crudble burner, Gas burner, Va- Dor burner, Butter firkin, C. A. Rittenhouse	Burial vault. Wyatt & Williamson	459,985
Dor hurner. 460,032	Burner, See Crueible burner. Gas burner. Va-	
Camera, F. A. Hetherington. 460,1995 Can. See Ash can. Oil can. Car and door therefor, freight, O. P. Hix. 459,905 Car brake, J. Fischer. 458,887 Car coupling, S. A. Cloud. 459,994 Car coupling, C. M. Cole. 459,994 Car coupling, S. B. Dover. 459,994 Car coupling, H. M. Grover. 459,994 Car coupling, L. Weakley 460,190 Car guard, M. J. Daly 460,190 Car guard, M. J. Daly 460,190 Car inks, machine for making, M. E. Elliott. 459,744 Car motor mechanism, electric, S. H. Short. 460,190 Car railway, E. B. Macmillan. 458,889	por burner.	460 Naa
Can. See Ash can. Oil can. Car and door therefor, freight, O. P. Hix. 459.95 Car brake, J. Fischer. 458.88 Car brake, J. W. Hartigan. 458.78 Car coupling, S. A. Cloud. 458.98 Car coupling, C. M. Cole. 458.98 Car coupling, C. M. Cole. 458.98 Car coupling, S. B. Dover. 459.98 Car coupling, L. L. Weakley 461.91 Car guard, M. J. Daly 461.82 Car links, machine for making, M. E. Elliott. 459.74 Car motor mechanism, electric, S. H. Short. 451.88 Car railway, E. B. Macmillan 458.88	Camera F A Hetherington	460 (199)
Car and door therefor, freight, O. P. Hix. 459,955 Car brake, J. Fischer. 459,855 Car brake, J. W. Hartigan. 459,855 Car coupling, S. A. Cloud. 459,955 Car coupling, S. A. Dover. 459,955 Car coupling, S. B. Dover. 459,955 Car coupling, S. B. Dover. 459,955 Car coupling, S. B. Dover. 459,956 Car coupling, H. M. Grover. 459,956 Car coupling, L. L. Weakley 450,956 Car guard, M. J. Daly. 460,052 Car links, machine for making, M. E. Elliott. 459,456 Car motor mechanism, electric, S. H. Short. 450,458 Car railway, E. B. Macmillan. 459,856	Can. See Ash can. Oil can.	200,000
Car brake, J. Fischer. 459,876 Car brake, J. W. Hartigan. 459,876 Car coupling, S. A. Cloud. 459,996 Car coupling, C. M. Cole. 459,996 Car coupling, S. B. Dover 459,997 Car coupling, S. B. Dover 459,997 Car coupling, L. L. Weakley 460,107 Car guard, M. J. Daly 400,107 Car guard, M. J. Daly 400,107 Car motor mechanism, electric, S. H. Short. 459,397 Car motor mechanism, electric, S. H. Short. 459,897 Car motor mechanism, electric, S. H. Short. 450,897	Car and door therefor, freight, O. P. Hix	459.905
Car Drake, J. W. Hartogall. \$58,994 Car coupling, S. A. Cloud. \$59,994 Car coupling, S. B. Dover. \$59,994 Car coupling, S. B. Dover. \$69,994 Car coupling, H. M. Grover. \$69,994 Car coupling, L. L. Weakley \$60,994 Car guard, M. J. Daly \$60,994 Car motor mechanism, electric, S. H. Short. \$60,994 Car railway, E. B. Macmillan \$60,994	Car brake, J. Fischer	459,836
Car coupling, C. M. Cole. 459,986 Car coupling, B. B. Dover. 459,987 Car coupling, H. M. Grover. 459,987 Car coupling, L. L. Weakley 460,101 Car coupling, L. L. Weakley 460,101 Car guard, M. J. Daly. 480,885 Car links, machine for making, M. E. Elliott. 459,744 Car motor mechanism, electric, S. H. Short. 480,101 Car railway, E. B. Macmillan 458,884	Car prake, J. W. Hartigan	454.004
Car coupling, S. B. Dover. 459.93 Car coupling, H. M. Grover. 459.93 Car coupling, L. L. Weakley 460,101 Car guard, M. J. Daly 460,102 Car links, machine for making, M. E. Elilott. 459.74 Car motor mechanism, electric, S. H. Short. 460,102 Car railway, E. B. Macmillan 458,888	Car counling C. M. Cole	459,954
Car coupling, H. M. Grover. 459,984 Car coupling, L. L. Weakley 460,101 Car guard, M. J. Daly 480,082 Car links, machine for making, M. E. Elliott. 450,482 Car motor mechanism, electric, S. H. Short. 481,084 Car railway, E. B. Macmillan 458,884	Car coupling, S. B. Dover	459,960
Car coupling, L. L. Weakley 460,00 Car guard, M. J. Daly. 460000 Car links, machine for making, M. E. Elliott. 459.746 Car motor mechanism, electric, S. H. Short. 460,000 Car, railway, E. B. Macmillan 458.880	Car coupling, H. M. Grover	459,914
Car guard, M. J. Daly. Car links, machine for making, M. E. Elliott 459.746 Car motor mechanism, electric, S. H. Short 461.046 Car railway, E. B. Macmillan 459.886	Car coupling, L. L. Weakley	46U, 101
Car motor mechanism, electric, S. H. Short 451,040 Car railway, E. B. Macmillan	Car links machine for making M. E. Pillott	459.74R
Car. railway, E. B. Macmillan	Car motor mechanism, electric, S. H. Short	461,040
	Car, railway, E. B. Macmillan	459,896

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	Car seat, G. W. Cushing Car starter, H. P. Wayman. Car wheel, F. J. Kost	459,881 459,803 459,976 459,845
	Card c tting machine, C. A. Wright	459,945 459,920 460,053
	Carriage wheel shield, D. S. Paine Case. See Show case. Cash recorder, C. J. Pasmore. Cask or barrel, A. Paternoster. Casks, device for sulphuring, J. Mager. Cattle guard, surface, Baleb & Bush. Cjear rolling machine, R. R. Lewis. Cjamp. See Carbon clamp. Clamps, manufacture of, A. A. Strom. Cjasp. See File or wrapper clasp.	459,935 460,026 459,916 459,808 459,771
	Cigar rolling machine R. R. Lewis. Clamp. See Carbon clamp. Railway rail clamp. Clamps, manufacture of, A. A. Strom. Clasp. See File or wrapper clasp. Claner. See Boiler cleaner.	459,756 459,859
	Smith	459,917 460,075
	Collar fastener, borse, C. E. White	459,833 459,824
		459,739 459,820 459,851 459,779
	Commutators, conductor fastening for, S. H. Short Compound engine, C. H. Batchellor Compound engine, F. W. Dean Conductors, automatic disconnector for overhead, A. L. Johnston	459,840 459,953 459,983
	Hose coupling. Pipe coupling. Shaft coup-	
	ling. Thill coupling. Crucible burner, T. M. Painter. Cultivator, Tripp & Venters. Cultivator, cotton, T. W. Brooks. Cultivator, wheel, Lindgren & Luitwieler. Curband gutter, combined, J. King. Curling ion heater, W. V. Baumann. Curry comb, E. C. Goodrich. Curtains, display rack for, J. Strassner. Cutter. See Lead cutter. Mica cutter, Cutter bar, Brack & Coy.	459,990 460,021 459,754 460,055
	Curry comb, E. C. Goodrich. Curtains, display rack for, J. Strassner. Cutter. See Lead cutter. Mica cutter, Cutter bar, Brack & Coy.	460,091 460,043 459,740
	Desk and easel, combined, J. O. Richmond. Drill, E. Pitts. Drill sharpening machine, J. Gutberlet. Dry closet, F. P. Smith.	460,032 460,027 459,931 459,901
	Dry kiln furnace, W. Ketcham Drying apparatus, C. H.Koyl Dust collector, J. Pratsch Dyeing apparatus for woven fabrics, G. Morlot Dyeing apparatus, mechanical, T. A. Clough Dynamos, governor for, M. S. Conly	460,051 460,061 460,024 459,744
		459,811 459,941 460,048 460,087
	Wheeler Electric regulator, J. F. McElroy Electrical energy of alternating currents into me-	460,078 460,059
	converting the, C. S. Bradley	460,046 459,863 460,071
	etc., C. W. Ayton. Electrical transmission of power, R. M. Hunter. Electro-magnetic device, G. R. Lean. Electro-magnetic motor, N. Tesla. Electro-pneumatic tube system, automatic, W. G. Collins.	460,071 459,786 459,772 460,081
	Endectro-therapeutic bath, Holman & van Hou- ten. End gate, wagon, G. S. Majors	459,852 4 60, 052
	Rotary engine. Steam engine. Engine, J. V. Rice, Jr. Engine, Thiebault & Harsin. Envelope blanks, machine for gumming and feeding. S. W. Balch	459,885
	rare register, Jenery & Glering	459,895 459,759 459,883 459,758
	Feed bag, Michels & Pauly Fence making device, G. Littell. Fertilizer distributer, B. F. Martin. Fibrous material, drawing head for, Dunham & McKemmie. File or wrapper clasp, W. H. Bell Firearm, revolving magazine, K. Krnka. Firegescape, portable, Houghion & Brown. Fire iron stand. H. M. Pierce.	
	Firegescape, portable, Houghton & Brown Fire iron stand, H. M. Pierce. Flier, automatic, G. R. Ferrario Fluid meter, C. N. Dutton	459 874 459 963 459 936 459 747 460 084
	Firejescape, portable, Houghton & Brown. Fire iron stand, H. M. Pierce. Fileir, automatic, G. R. Ferrario. Fluid meter, C. N. Dutton. Fly net, horse, W. Kootz. Floeing rack, E. J. Tracy. Flooring joists, bridging for, F. H. Moore. Furnace. See Dry kiln furnace. Furnace, R. M. Weir. Furnaces, apparatus for cooling the walls of blast.	460,088 459,847 459,900
	Fronheiser & Vaughen	460,006
	Game apparatus, A. Cromwell. Game apparatus, J. Flebtner. Game apparatus, F. B. Wood Gas and electric lights, combination fittings for, O. Storn, District	459,952
	Gas and electric lights, combination fittings for, O. Strom. Gas burner, F. Rbind. Gas burner, natural, H. H. Hibberd. Gas engine, rotary, D. D. & J. T. Hobbs. Gas generator, C. F. Cattell. Gate. See End gate. Generator. See Gas generator.	459,783 460,070 459,925
	Gloves, handboard for laying off and finishing, F.	
	P. Merrill Governor, centrifugal, Berger & Noel Governor, steam engine, E. Jones Grain, etc., combined purifying and dust collecting machine for, C. A. Barnard. Grate construction, R. A. Palmer Guard. See Car guard. Cattle guard. Lamp guard. Snow guard.	460,078 459,948
6	guard. Snow guard. Gun, air, R. Aldrich. Gun, automatic, H. S. Maxim. Gun barrel, riffed, J. W. Carver Hair and preparing the same, moth-proofed, J. &	459,732 459,828 460,102
3	Handle. See Bowl handle.	200,001
9	Hanger. See venicle spring hanger. Harness, H. G. Cox. Harvester, com, J. Bardill. Hasp lock, W. H. Pickett. Hat band, magnetized, F. H. Brown. Hearth, asb pan, and fender, combined, E. C. Stewart	459,987 459,978 459,942
5	Heater. See Curling iron beater. Hitching post, portable, R. B. Stewart. Hoisting apparatus, W. J. C. Doyle. Hoisting machine, L. Arthur.	1001034
9	box holder. Tool bolder. Hook. See Bench book.	
740	Horn and producing the same, artificial, W. Harvey Horses' hoofs, weight for, G. R. King. Hose coupling, B. F. Warner. Hydraulic press, L. J. Miller. Ice, manufacture of, E. A. Quisenberry. Lee, method of and apparatus for manufacturing, F. A. Quisenberg.	460,086 460,017 459,951 459,816
2842	lee, manufacture of, E. A. Quisenberry lee, method of and apparatus for manufacturing, E. A. Quisenberry Impact tool, W. G. Scott Incubator, C. & E. Von Cuiin (r).	460,029 460,028 459,891 11,194
5	Impact tool. W. G. Scott. Incubator, C. & E. Von Culin (r). Instand, G. W. Steffens. Insulating purposes, etc., manufacturing a composition applicable for electrical, E. Fahrig Insulator, V. Thomas. Jack. See Lifting jack.	450,000
27064		
84	Joint. See Rail joint. Kiln, S. G. Valentine Knitted bag and making the same, F. Clewley. Knitting machine, Gulick & Humphrey. Knitting machine, circular, B. F. Shaw	459,799 459,866 459,827 460,039
8 0 3	Knittink machines, circular plush goods, T. H. Worrall. Kamp, electric, D. Tommasi. Lamp, electric arc, Logan & Barley. Lamp aurd, incandescent, H. H. Hipwell. Lamp attachment, electric arc, V. Thomas. Lamps. manufacture of incandescent electric. P.	459,902 459,872 459,757 459,740
8	A. Edison Last, H. Carmicbael	. 459,846 . 459,835 . 460,067
8 3 4 5	Latch, sliding door, O. P. Hix	459,906 460,049
3	Latbes, attachment for metal working, W. Humans. Lead cutter, Schraubstadter, Jr., & Schilling Lead, manufacture of white, D. V. Kyte Letter box, J. W. Cutler.	. 459,867 460,035 459,946 . 459,974
5624	Lock. See Hasp lock. Nut lock. Loom picker, Pickles & Horsfall	459,805
104	Loom shuttles, cop spring for, F. A. Wilmot Loom weft stop motion, F. Lacey. Low water alarm, N. J. Tilghman. Mail bar, H. L. Boyle.	. 459,849 . 459,841 . 459,919 . 459,864
G	Mail hag C. F. Lighthouse	459.869

220		
Malt, machine for cooling, scouring, and clean- ing, R. J. Bebringer Marble slabs, machine for cutting oval holes in.	459,777	1
A. H. Miller	459,787 459,870	1
Measuring device for tanks, liquid, W. H. Beecher	450,955 459,865	
Medicine package, J. W. Brewster Meter. See Fluid meter. Mica cut ter and gauge, C. B. Van Arsdale Mine See Spice mil. Olcott. Motor See Electric motor. Electro-magnetic Motor See Multiple without motors	459,773 459,857	,
Motor. See Electric motor. Electro-magnetic motor. Multiple-cylinder motor. Mower, lawn, H. Farmer	460,085	1
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38			
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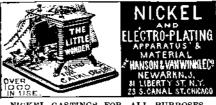
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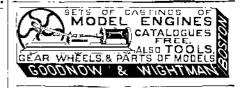
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