salt. It is easier and cheaper to buy it ready coated than to do it yourself. The prepared paper is sensitized by floating on a nitrate of silver bath. 3. What is the best way to separate sulphuric acid and water, after they have been mixed together, so as to retain all of the acid? A. Boil off the water. 4. In what way is needed the metal aluminum got from clay? A. We refer you to our SUPPLEMENT, Nos. 679, 554, 617, 706, and

(2482) O. T. D. writes: 1. Can you answer this question, what is electricity, just the same as if asked what is steam? A. It is not known what electricity is. Human knowledge has not yet gone far enough to define it with certainty. 2. What is the reason storms from the west seem to generally blow harder than from the east? A. Dry winds come from the west. Water is an equalizer of temperature, and the ocean should be expected to act as such an equalizer. At the same time it would take some examination of records to ascertain the relative violence of east and west winds.

(2483) C. E. A. asks how to make rubber stamps. A. Rubberstamps are made from rubber unvulcanized, but mixed with the vulcanizing material The letters, etc., are set up in metal and a mould in plaster of Paris is taken from them. This is brushed over with ground talc. The sheet of prepared rubber is placed on it and pressed down in a small screw press. The whole is then exposed to heat in a vulcanizer. For general manipulation of India rubber we refer you to our SUPPLEMENT, Nos. 249, 251, and 252. Even what is known as "pure gum," a kind of vulcanized rubber, may be made to work as above described without any addition of vulcanizing material. 2. What is the process of zinc etching, and is there any publication on the subject? A. There are many of our SUPPLEMENTS that treat of photo-zincography, Nos. 438, 584, 587, 656, etc. Plain etching may be done with sulphuric acid.

(2484) A. H. H. asks: 1. Where can I get a book on photo electrotyping? A. We have published a great many SUPPLEMENTS on this and related subjects, and refer you to our index for their titles. 2. Is there any good printer's ink eraser that will take print off paper? A. No. 3. Is Edison incandescent light suitable for photo-printing? If so, what candle power is required? A. No. Use Edison arc light on incandescent circuit with resistance lamps. Voltage must be reduced from 120 to 60. 4. Can you tell me what to put with nitrate of silver to make the prints black and imitate black print? A. Tone the prints with the borax and gold toning bath. See Scientific Ameri-CAN, April 3, 1889, page 225,

(2485) G. S. E. asks: 1. In speaking of alloys as so many parts, do you mean parts by weight? A. Yes. 2. Will alloys stand violent treatment, such as violent churuing, pumping, compression, etc., while in the liquid state, without breaking up into their constituent parts? A. Yes. 3. About what per cent of the current is used by the meters to measure the current flowing from the dynamo? A. It varies with different instruments, but is very small. 4. Will magnetic lines cross one another at right angles in a mass of soft iron ? A. No. 5. Will they in a mass of steel, e. g., if the poles of a permanent horseshoe magnet were to be placed at the center on each side of a straight permanent magnet, would magnetic lines cross the center of the straight magnet? A. No.

(2486) E. B. asks: 1. Howmany grains of carbonate of soda and how many of caustic soda will it take to soften one gallon of water of 15° hardness (carbonate of lime 15 grs.)? A. If the lime is present as bicarbonate, add 12 grains caustic soda. If common caustic soda is used, add about 20 grains to allow for impurity. If the lime is present as hydrate, add 15 grains of dry carbonate of soda. This cau be made by drying washing soda at a strong heat (short of red) or use 25 grains baking soda. The last is best. 2. Also is there any precipitate? A. Yes. Decant or filter, or pay no attention to the precipitate.

(2487) J. T. F. asks: What are the colors used in making solid black photogravure ink? A. The best lampblack is the basis of black printing inks. We can supply you with books containing formulæ, for printing inks, but successful inks are in the nature of trade secrets, and their composition is not disclosed.

(2488) F. L. W. asks (1) how to make a good leather cement, such as is used by cobblers on invisible patches. A. It is a solution of gutta percha in bisulphide of carbon. 2. Will oiliness of the leather affect the adhesion? A. The leather has its surface cut or buffed off, so as to bring clean leather surfaces to-

(2489) C. B. asks: How can lantern slides, made on Carbutt's gelatino albumen plates, be colored? A. See Scientific American Supplement, No. 423, and Hepworth's "Book of the Lantern," price \$2.75. Aniline dyes slightly diluted, put on with a camel's hair brush, are largely used.

(2490) A. G. T. writes: I have an electric bell, and have been trying different things with it, and have found that the electricity after having gone through the magnets makes a brighter spark than it does before it goes through them, when connected and rubbed on iron (that is, the wire); could you inform me why that is? A. This is due to induction. The coil of the bell magnet with its iron cores acts as a "spark coil," and increases the potential or sparking power of the current.

(2491) G. L. S. asks: How can a meerschaum pipe be colcred rapidly? A. There is a process used by the makers to do this, but it is a secret. The only satisfactory way is to smoke the pipe and produce the color naturally. Queries No. 2364 and 2474 may be referred to in this connection.

(2492) A. S. B. asks for a recipe for fixing drawings made with carbon pencils, that the drawings will not rub out or be spoiled if touched. A. Immerse the drawing in skimmed milk. A special fixative is sold for the purpose by dealers in art materials.

(2493) S. M. H. asks: Will a man of ordinary intelligence, but without a knowledge of chemdinary intelligence, but without a knowledge of chemlatery, be able to learn the art of assaying gold and silver

Alarm. See Electric alarm.

ores by studying a manual, such for instance as the one you sell by Walter Lee Brown, of Chicago? A. Practice is the great teacher for assaying; chemical knowledge is not absolutely essential for the ordinary work. In volumetric work considerable manipulative power is

(2494) E. E. writes: Wishing to preserve the color of the red bronze hinges of small white metal cases which get discolored (oxidized) by exposure, I would ask you kindly to inform me of any powder or solution answering the purpose. A. Varnish with linseed oil and japan if hronzed; if of real bronze, apply lacquer.

(2495) G. A. S. writes: I have had given me recently the following problem : Given the chord and rise of an arc, to find the radius. I have had also given me the following rule whereby to find the quantity desired, but my man tells me it is not accurate and practical. To four times the square of the rise add the square of the chord, and divide this sum by eight times the rise; the quotient will be the radius. Is this rule correct? A. The rule is correct.

(2496) T. J. W. asks (1) the cause of the blackening of the globes of incandescent lamps. A. No really good theory has been advanced. The successive dissociation and new formation of carbonic acid gas may have something to do with it, if there is any oxygen in the globe. 2. Has the minute quantity of oxygen that it is impossible to get out anything to do with it? A. Possibly, yet some lamps contain probably no oxygen whatever. 3. What is a good paste to cement the carbon filament to the platinum wire? A. Use a fine screwor electro soldering, viz., the deposition of copper about the joint by means of a battery.

(2497) J. S. W. asks whether there are any valves used in a calcium light burner. A. Not in mixed gas burners; sometimes there are cocks on blowthrough burners.

(2499) G. M.D. asks how to make the mixture which is put on the edge of pade of paper to keep the sheets together? A. For fifty parts dry glue take nine parts glycerine; dissolve in water, first soaking the glue alone; color to suit with cochineal.

(2499) E. R. asks (1) a receipt for something to kill fleas on a cat or dog without injuring the acimal. A. Use buhach or weak mercurial cintment. Essence of pennyroyal will drive them off. 2. The address of a technological school, not north of Baltimore. A. The Johns Hopkins University, Baltimore, Md.; the University of Virginia, Charlottesville, Va.

(2500) E. S. McG. asks for a receipt for sticking glass together so that it will hold water. A. Use Canada balsam or dammar varnish.

(2501) J. A. asks: Is there a liquid which will dissolve sulphur and keep it in solution after water is added? A. No. unless a solution of an alkali which combines with the sulphur be considered such a liquid.

(2502) G. M. asks: How can porcelain be cemented to wood? A. Sealing wax might answer, or Davy's cement, made by melting together equal parts of pitch and gutta percha, might be better. The following diamond cement might be tried: Soften eight parts isinglass in a very little water, add 1 part spirit of wine. Dissolve in 3 parts spirit of wine 1 part gum ammonia. cum and 1 part galbanum. Mix. Apply hot.

(2503) D. N. asks: 1. Give a short simple method for finding the area of circle. A. Onequarter of the diameter multiplied into the circumference gives the area. The circumference is found by multiplying the diameter by 3.1416. 2. A recipe for a good liquid shoe polish not injurious to leather. The following is said to be a good formula for liquid shoe blacking. Boil 1 part of extract of logwood, 30 of gall nuts coarsely powdered, with 25 of their combined weight of strong vinegar. Filter, add 8 parts of green vitriol. Allow it to settle for twenty-four hours; stir in 8 parts of gum, 100 of sugar, and 80 of sirup. Strain and add 50 parts of spirits of wine, 40 of shellad solution, and 40 of pulverized indigo. - Techno-Chemical Receipt Book.

(2504) Bristol asks: 1. How to make a good imitation or substitute for horn. A. Try a solution of glue mixed with one-tenth its weight of bichromate of potash, boiled down in the dark, and exposed to the sun. 2. How to dissolve aluminum palmitate. A. It dissolves slowly in benzine, kerosene, turpentine, etc. Heating facilitates solution, but a return condenser must be used. A 10 per cent solution in turpentive is quite thick.

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INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

September 30, 1890.

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

Agricultural machinery, frame for, C. M. Carnahan Adjustable joint for display frames, C. W. Hunt-ington. Air brake, L. Guillemet. 473.48 Air brake, O. B. Martin. 473.80

_		7 1 27 1111
1	Animal trap, S. Dennis	Engine tor
	Armature for dynamo electric machines and mo- tors, F. B. Rae	Etchir Mo Explo
1	Armature for dynamo electric machines and motors, F. B. Rae	Eyegia Fare c
i	Axle boxes, dust guard for car, A. L. Cushman 437,643 A k dubricator, car A. L. Cushman 437,394 Axle, vehicle, J. Tilton 437,263	Fence Fence Fence
١	Axie, Venicie, J. Tillon Bag. See Saddle bag. Balance, A. J. Gaston. 437,379 Baling press, W. S. Reeder. 437,212 Baling press, G. W. Soule. 437,287 Ball court, L. C. Walker. 437,287 Bandage winder, C. L. Bellamy. 437,604 Bar, See Car draw bar. Barber's Rollert. 437,487	Fence Fertili T.
	Baling press, G. W. Soule	
	Bandage Winder, C. L. Bellamy	Filter. Filter. Fire a
١	Barber's chair, Fischer & Rollert	Fire a Firear Fire e
	Barrels, composition for lining, M. E. Spofford 437,258 Bath tub and wash stand, W. S. Carpenter 437,479 Batters, See Calverile betters	Fire in A. Firepi
	Bar. See Car draw bar. Barber's chair, Fischer & Rollert	Firepl Fishw
!	Bee swarmer, N. C. Petrie	Fishin Fishin Flood
	Bicycle, H. C. Goodrich	Flowe Foldit
	Diam testes sein sentselled OlDsten & Cooper 497 009	Forgin Frame From 8
1	Boiler. See Steam holler. Boiler See Steam holler. Boiler feeder, stean, C. A. I. Babendreier	Frog 8 Fuel b Furna
١	plurality of, R. P. Curtis	ing Furna Gauge
1	Box. See Axle box. Fire alarm signal box. Journal box Paper box. Box opener, J. W. Deaton	Galva Galva
	Dua obst Cas Souffuld beatlest	Game: A. Gas bi
	Brake. See Air brake. Car brake. Railway vehicle brake. Wagon brake. Brick kiln, J. T. Cullens	Gas fr ing Gas or
١	Brick kiln, J. T. Culleus 487,577 Bridle or halter attachment, C. Doring 487,181 Brush, black, G. W. Darling 437,475 Brush, steel cleaning, E. F. Shellaberger 487,628 Buckle, back band, D. B. McCall 437,222 Buckle, suspender, W. E. T. Merrill 437,422 Building front, B. T. Mesker 437,671 Building purposes, timber seat and tie for, H. A. 487,672	Gas re Gate.
	Buckle, back band, D. B. McCall	Gearii de Gener
	Building purposes, timber seat and tie for, H. A. Goetz. 487,582 Bullet, W. M. Thomas. 457,282	Glove
	Goetz. 457.ftc. Goetz. 47.2612 Buriat casket lid. C. R. Herrick. 47.3612 Burner. See Fuel burner. Gas burner. Vapor burner. 477.472	Gover Grain Graini
1	burner. Buttonbule strip, J. K. Ross	Grate Grind Guard
:	Buttonbole strip, J. K. Ross	Gun, t
	Can handle, Heisey & Oliver	Handl
	Candie, sulphur, C. H. Shaw 437,232 Candie, sulphur, C. H. Shaw 437,232 Car brake, W. H. Koehler 47,652 Car, combination freight, Campbell & House, 437,352 Car coupling, Dietz & Haar 48,748 Car coupling, Dietz & Haar 48,748 Car coupling, Martin & Friar, 437,482 Car coupling, Martin & Friar, 437,402 Car coupling, Martin & Friar, 437,403 Car coupling, Strathmeter & Gutenberger, 451,534 Car oupling, Strathmeter & Gutenberger, 451,534 Car oupling, Strathmeter & Gutenberger, 457,537 Car, express, F. Bernardin, 465,457 Car, express, F. Bernardin, T. A. Edison, 437,457 Car, stock, S. C. Hicks, 457,537 Car, stock, B. C. Hicks, 457,537 Car, stock, B. C. Hicks, 457,537 Car window sash, w. J. Hall Carborating apparatus, W. T. Thackeray, 457,351 Carborating apparatus, W. T. Thackeray, 457,351 Carborating apparatus, W. T. Thackeray, 457,353 Carborating apparatus, W. T. Thackeray, 457,351	Hange ba Hat to
	Car brake, W. H. Koehler	Harve &
	Car coupling, J. T. Friend 437,488 Car coupling, Martin & Friar 487,400	Нау д Нау р Нау р
. 1	Car coupling, B. S. Redding	Heati Heel t
	Car draw bar, railway, G. W. McGuire	Holdt Holde
•	Car raliway, E. M. Bentley	ho Re mo
	Car sleigh, street, Wardman & Hollister	Hollo Le Hook.
	Car window sash, W. J. Hall. 437.387 Carbonating apparatus, W. T. Thackeray 437.318	Hook
	Carboy holder, A. A. Robbins	Hoop. Hoop Hose
	Carrier. See Cash and parcel carrier. Paint car-	Hose of
	rier. Cart, road, B. Garren. 437.189 Cart, road, J. S. McCoy. 437,446 Cart, road, W. Munro. 437.603	Rubs. Hurd Ice pla
i	Cartridge, blasting, J. E. Evans 437646	Indica
	Case. See Needle case. Packing case. Cash and parcel carrier, F. S. Church	Indigo Ink, V Insula
		Jack. Jail b Jewel
	Casting stereotypes, mechanism for, G. H. Bene-	Joint.
,	Chair. See Barber's chair. Revolving chair. Chair, W. Osw ell. 437,255	Kettle Key. Kiln.
	Chair, W. Oswell 437,25 Check bit, H. G. Cox. 337,576 Chuck, polishing strip, B. H. Teague 437,468 Churn, S. S. Busgett 437,468	Knife Lacin Ladde
	Churn, W. Walter 437,537 Chute, coin, G. A. Ellis 437.585	Ladde Ladde
	Cigarette feeding device, F. S. Kinney	Ladde Lamp Land
	Churn, S. S. Busgett 437.537 Churte, coin, G. A. Ellis 437.537 Chute, coin, G. A. Ellis 437.547 Chute, coin, G. A. Ellis 437.548 Cigarette feeding device, F. S. Kinney 437.288 Cigarette machine, F. S. Kinney 437.287 Circuit system, artificial ground and compound metallic, C. E. McCluer 437.611 Cistern, C. S. Johnson 437.601 Clamp Nacks & Brinkmann 437.403	Lante
•	Cleaner. See Comb cleaner. Clevis and pin. W. I. Wooster. 437.389	Lathe W. Lathe
l	Cloak, J. Davaillon 457,477 Clothes drier, F. F. Rouse 37,247 Collar, horse, W. A. Bennett 487,278 Collars, metal shield for horse, W. E. Thomas 437,281	Lawn Leath Letter
l	Column, niste metal, Mesker & Edwards 457,664, 437,670	Licor
1	Comb cleaner, E. R. Petrit 407,555 Combination lock, J. H. & H. Morris 437,658 Compasses, draughtsman's, D. S. Williams 437,411	Ri Lifter Liftin
	C. J. Van Depoele	Liftin
	Conduit for underground wires, T. M. Morton.	Light Lime Liqui
L	Copper, manufacturing, H. H. Vivian	Lock.
-	Copying sheet, H. W. Brown (r)	Logb
-	ilose or pipe coupling. Thill coupling. Crank pins, device for testing, McDuff & Mrazek, 437,225	Loom
-	Crosing and chamfering machine WP Walter 437 167	Lubri Ca Magn
	Cuff holder, W. E. Bishop. 437,436 Cultivator, J. C. Messer et al. 437,309 Cultivator or harrow, Peterson & Rasen 437,450 Currein fature, window H. I. Hes. 437,450	Meast
•	Curtain flxture, window H. J. Iles. 437,436 Curtain ring J. Berbecker 437,279 Cutter, See Rotary cutter.	Medic Metal Pi
•	Dandellon digger and puller, W. H. Vogel	Metal lor Metal
t		Metal Meter
3	Desk and writing machine table. Brown & Wol-	Mill. Mords Motor
	finger	Ra Necks Neckt
) B	Door check, F. F. Biandin	Needl News
_	Drawer fittings, furniture. G. A. Biddell 4:7.556 Dress lifter, N. Douglas. 437,357 Drier. See Clothes drier.	Nut lo Oil re Oil re
-	Drille manufacture of twist Fannar & Toft 437 187	Ordna E.
-	Dust guard, Twyman & Bird 437,370 Dyeing skeins, apparatus for, C. Corron 487,737 Ear muffle, F. P. Kaiser. 437,602 Eug tester, J. L. Ritter. 437,245	Organ sti Packs
•	Electric alarm, A. 18cmra	Packi
5	Electric conductor, E. Clark 437,508	Paint
	Wilking & Muller	Paper Paper
	Wiking & Muller 437.272 Electric cut-out, Bailey & Galbraith 437.323 Electric cut-out, W. J. Jenks. 437.303 Electric generator, W. M. Mordey 437.503 Electric generator, W. M. Mordey 437.302 Electric hand switch, J. W. Battershall 437.352 Electric lighting systems, switch board for, R. F.	Pasti
	Electric ingning systems, switch board for, R. F. Sawyer	Pen h Pen. i Penci
	Electric meter, R. N. Dyer 437.181 Electric motor gearing, J. J. Sprague 437.259	Penci Petro Phone
•	Electrical switch, F. B. Rae	Phone Phone Phone
	Elevator. See Water elevator.	Photo Photo Photo
-	Electric lighting systems, switch board for, R. F. Sawyer	Photo
2 0	End gate, S. A. Bartlett	Photo Pictu Pictu
0 8	End gate rod, D. Coyle	Pine Pipe Pipe
0	engine. Steam engine. Petroleumor oil motor engine.	Pitma

1		437,580
ĺ	Etching on lithographic stones or sinc, Kraups & Moser. Explosive compound, D. Mindeleff. Expellasses. E. B. Fox. Fare collector, passenger, J. Ring	437,306 437,499
Ì	Eyeglasses. E B. Fox. Fare collector, passenger, J. Ring. 437,522,	437,62
	Fence. J. & C. Sloan	437,522 437,844
	Fence post driving machine, Morden & Hoffman. Fertilizing material, apparatus for spreading, W.	437,500
	T. Butler	437,500 4.37.448
	Filter, E. Mertz. Filter, water, Hegner & Skinner. Fire alarm boxes, lighting arrester for, B. Hudie. Fire alarm signal box J. Young. Firearm, repeating, A. Von Wehrstedt. Fire escape, S. Barry. Fire in elevator shafts, apparatus for preventing,	457,458 437,897 437,897
	Firearm, repeating, A. Von Wehrstedt	437,541 437,562
١	Fire in elevator shafts, apparatus for preventing,	437,229
	Fireplace backing and grate, J. A. Cornish Fishway, R. Hockin	437,575 437,202
	Fishing reel, W. Slote. Fishing reel, C. J. Werner.	437,627 437,542 437,406
	Flower pot, A. J. Byrne	437.585 437.186
	Forging apparatus, electric, Lauder & Simpson Frame. See Satchel frame. From switch V A Tyler	437,654 437 ara
	Fire escape S. Barry. Fire in elevator shafts, apparatus for preventing, A. McLaughlin. Fireplace is. McKenzie Fireplace is. McKenzie Fireplace backing and grate, J. A. Cornish. Fishing reel, W. Slote. Fishing reel, C. J. Werner Flood and stock gate, P. Walther Flower pot. A. J. Byrne. Folding table, A. Everiss. Forging apparatus, electric, Lander & Simpson. Frame. See Satchel frame. Frog switch, V. A. Tyler Fuel burner, liquid, A. H. Calkins Furnace. See tas retort furnace. Smoke burning furnace.	437,354
	ing furnace. See Gas fetoft fifthace. Smole building furnace. Furnace, B. F. Price. Gauge. See Measuring gauge. Surface gauge. Galvanic battery, E. H. Crosby. Galvanic battery, Liebig & Willims	437,452
	Galvanic battery, E. H. Crosby	437,469 437,469
	Games, score device for baseball and similar, W. A. Browne	437,562 437,649
	Games, score device for baseball and similar, W. A. Browne. Gas burner, incandescent, L. Henkle. Gas from hydrocarbon oil, apparatus for producing, J. McKay Gas or oil motor enrine, N. A. Otto. Gas retort furnace, E. M. Mitchell Gate. See End gate, Flood and stock gate. Gearing for continuous motion impression cylin-	437,315
	Gas retort furnace, K. M. Mitchell	437,611
	Gearing for continuous motion impression cylinders, J. Brooks	487,418
	Generator. See Electric generator. Glove fastener. M. D. Shipman	487,254 437,296
	Governor, steam engine. J. T. Case	487,641 437.873
,	Grain drill, Acker & Kirkpatrick. Graining, appartus for, D. Johnson. Grate, dumping, J. Thurell. Grinding machine, G. W. Brown. Guard. See Dust ward.	437,437 437.529 437.640
)	Guard. See Dust guard. Gun, breech-loading. L. Conroy	437 574
	Gun, preech-loading, G. Perrna	437,491
2	Guard. See Dust guard. Gun, treech-loading. L. Conroy. Gun, breech-loading. G. Perrna. Gun, spring air, H. C. Hart. Handle. See Can handle. Hanger. See Picture hanger. Picture wire hanger. Pipe hanger. Hat tray, A. F. Cammann. Hatveyters. raising and lowering device for A.	A - APPL COCK
	Harvesters, raising and lowering device for, A. & E. E. Starbuck	437.461
	& E. S. Starbuck. Hay gatherers, pole for J. G. Archer. Hay press, C. O. Newton Hay press, J. F. Smith lieating ap paratus, water, Maitby & Wallace Heel breasting machine, S. Ross, Jr. llinge mortising machine, S. Ross, Jr.	437,47 487,404
	Hay press, J. F. Schiff Heating ap paratus, water, Maltby & Wallace Heel breasting machine. S. Ross, Jr	437,495 437,666
	Hinge mortising machine, J. A. Mackenzie	437,65 437,29
	Hinge mortising machine, J. A. Mackenzie Holdback, I. H. J. Elisworth. Holder. See Carboy holder. Cuff holder. Pen holder. Plate holder. Railway rail holder, Rein holder, Washboard holder. Watch movement holder.	
,	Hollow bandled articles, manufacture of, W. W.	437,211
	Hook. See Safety hook. Snap hook. Whiffle-	
•	Hoe and eve. H. W. Libbey. Hoop. See Truss hoop. Hoop driving machine, S. L. Wiegand. Hoee coupling, B. F. Levet. Lose or pipe coupling, J. U. Sewall.	437,214
,	Hose coupling, B. F. Levet	437.218 437.518
	Hot air engine, S. Vivian	437, 196
	Hote ar engine, S. viviania. Hurdle, metallic, C. F. Millar. lee planer, W. F. Vernier Indicator, See Cash indicator, Indicator, G. W. Chase Indicator, G. W. Chase	437,444 437,465
•		437,480 437,638 437,588
	Irk, W. G. Fuerth Insulated wire, C. F. Jack. See Litting jack. Jail bucket, D. McDonald	437,632
	Jail bucket, D. McDonald	437,619 437,317
	Journ al box. C. H. Morgan. Kettles, etc., support for, V. C. Driesbach. Key. See Telegraph key.	437,364 437,486
	Key. See Telegraph key. Kiln. See Brick kiln. Knife. W. V. Barclay	
	Kiin, See Brick kiln. Knife, W. V Barelay Lading eye, F. S. McKenney Ladder and truck, extension fire, II. C. Schmidt. Ladder balcony, A. S. Cuff	437,32, 437,22 437,62
	Ladder, extension, J. J. Flynn	4-7,33 437,39 437,174
	Jand roller, D. Kint.	437.502
1	Latter, A. H. Gleason	437,58 437,58 437,59
3	W. H. Lenhart Lathe. turret head, H. Drysdale Lawn sprinkler. portable centrifugal, R. Addison.	437,389 437,297 437,329
	Leatherdressing machine, T. P. Coombs	401,-14
)		437.48
i	Licorice root, etc., to .powder, reducing, S. B.	401,000
-	Rickerson	437,24
3	Rickerson	437,244 437,354 437,354 437,364
3	Rickerson	437,24
3	Licerice root, etc., to powder, reducing, S. B. Rickerson Lifter, See Dress lifter. Transom lifter. Lifting Jack, B. Duez Lifting Jack, L. S. Stringham. Lightning are set er. H. M. Kalbach Lightning protector for oil tanks, H. W. Spang Liquids, testing, T. Clement. Lock, see Bicycle brake lock, Combination	437,244 437,186 437,356 437,356 437,526 437,496 437,356
3000	Licerice root, etc., to powder, reducing, S. E. Rickerson Lifter, See Dress lifter. Transom lifter. Lifting Jack, B. Duez. Lightning arc set er. H. M. (Calba ch. Lightning arr est er. H. M. (Calba ch. Lightning protector for oil tanks, H. W. Spaug. Lime kiln, W. Jones. Liquids, testing, T. Clement. Lock. See Bicycle brake lock. Combination lock. Nut lock. Loco motive, steam, S. E. S. Chapleau Log boom, G. F. Sibley Loom shedding mechanism, L. A. Aumann et al.	437,244 437,186 437,356 437,356 437,526 437,496 437,356
35.55	Licerice root, etc., to powder, requeing, S. B. Rickerson Lifter, See Dress lifter. Transom lifter. Lifting Jack, B. Duez. Lifting Jack, E. Duez. Lightning arrester. H. M. Kabach Lightning protector for oil tanks, H. W. Spang. Lime kiln. W. Jones Liquids, testing, T. Clement. Lock. See Bicycle brake lock. Combination lock. Nut lock. Loco motive, steam, S. E. S. Chapleau. Loom shedding mechanism, L. A. Aumann et al. Loom shedding mechanism, Hattersley & Hill. Loom shedding mechanism, Hattersley & Hill. Loom shuttle driving machanism. C. A. Loud.	437,24 437,18; 437,35; 437,36; 437,36; 437,49; 437,36; 437,57; 437,57; 437,47;
33.33	Licerice root, etc., to powder, reducing, S. B. Rickerson Lifter, See Dress lifter. Transom lifter. Lifting Jack, B. Duez. Lifting Jack, E. Duez. Lightning arrest et. H. M. Kaba ch Lightning protector for oil tanks, H. W. Spaug. Liquids, testing, T. Clement. Lock. See Bicycle brake lock. Combination lock. Nut lock. Loco motive, steam, S. E. S. Chapleau. Loom shedding mechanism, L. A. Aumann et al. Loom shedding mechanism, L. A. Aumann et al. Loom shedding mechanism, L. A. Loud. Libricator. See Axle lubricator. Elevator lubricator.	437,244 437,354 437,354 437,524 437,494 437,356 437,476 437,524 437,476 437,476 437,194 437,216
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	Licerice root, etc., to powder, requeing, S. B. Rickerson Lifter, See Dress lifter. Transom lifter. Lifting Jack, B. Duez Lifting Jack, B. Duez Lightning are set et. H. M. (Calba ch. Lightning are set et. H. M. (Calba ch. Lightning protector for oil tanks, H. W. Spaug Lime kiln, W. Jones Liquids, testing, T. Clement Lock. See Bicycle brake lock. Combination lock. Nut lock. Loco motive, steam, S. E. S. Chapleau Loom shedding mechanism, L. A. Aumann et al. Loom shedding mechanism, Hattersley & Hill. Loom shedding mechanism, Hattersley & Hill. Lubricator. See Axle lubricator. Elevator lubricator. Magnet winding machine. J. J. Wood. Measuring gauge, Angell & Picard. Medicine. remedy for asthma, Iselin & Callahan. Metsl, producing sheets direct from molten, C. M. Metsl, producing sheets direct from molten, C. M. Metsl, producing sheets direct from molten, C. M.	437,354 437,183 437,354 437,352 437,494 437,494 437,52 437,474 437,52 437,471 437,194 437,216 437,51 437,51 437,51 437,51
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	Licerice Foot, etc., to powder, reducing, S. B. Rickerson Lifter, See Dress lifter. Transom lifter. Lifting Jack, B. Duez. Lifting Jack, E. Duez. Lifting Jack, E. S. Stringham. Lightning ar est er. H. M. Kalba ch Lightning protector for oil tanks, H. W. Spang. Lime kiln, W. Jones. Liquids, testing, T. Clement. Lock. See Bicycle brake lock. Combination lock. Nut lock. Loco motive, steam, S. E. S. Chapleau. Locy boom, G. F. Sibley Loom shedding mechanism, L. A. Aumann et al. Loom shedding mechanism, Hattersley & Hill. Loom shedding mechanism, L. A. Loud. Lubricator. See Axle lubricator. Elevator lubricator. Magnet winding machine. J. J. Wood. Measuring gauge, Angell & Picard. Medicine. remedy for asthma, Iselin & Caliahan. Metal, producing sheets direct from molten, C. M. Pielsticker Metalic surfaces, finishing, D. Wheeler. Metalic surfaces, fini	437,244 437,354 437,352 437,352 437,352 437,494 437,522 437,494 437,512 437,512 437,512 437,476 437,476 437,476 437,476 437,476 437,476 437,476 437,476 437,476 437,476 437,476 437,476 437,476 437,476 437,476
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39:57	Licerice Foot, etc., to powder, reducing, S. B. Rickerson Lifer. See Dress lifter. Transom lifter. Lifting Jack, B. Duez. Lifting Jack, E. Duez. Lightning are set et. M. Kalba ch Lightning protector for oil tanks, H. W. Spang. Liquids, testing, T. Clement. Lock, See Bicycle brake lock. Combination lock. Nut lock. Loco motive, steam, S. E. S. Chapleau. Loco motive, steam, S. E. S. Chapleau. Loom shedding mechanism, L. A. Aumann et al. Loom shedding mechanism, Hattersley & Hill. Loom shedding mechanism, L. A. Loud. Lubricator. See Axle lubricator. Elevator lubricator. Meant twinding machine, J. J. Wood. Measuring gauge, Angell & Picard. Meat tenderer, E. J. Severance. Medicine, remedy for asthma, Iselin & Callahan. Metal, producing sheets direct from molten, C. M. Pielsticker Metal working machine, combined, W. G. Budlong. Metallic surfaces, finishing, D. Wheeler. Meter. See Electric meter. Mill. See Saw mill. Mordant, E. O. Fankhauser. Motors, automatic switch for stationary, F. B. Rae Neckscarf, G. L. Dale. Needle case, R. L. Wilburn N. wwspaper vending machine, G. A. Weich Nut lock, I. L. Blakeslee Oil retining apparatus, B. Noppel Ordanace, gas cyllinder for elevating heavy, J. J. E. H. Payne. Organs, mechanism for testing reed, C. O. Hill- strom Packare tie, W. H. Anderson Packare tie, W. H. C. Shaw.	437,244 437,184 437,384 437,385 437,387 437,477 437,523 437,477 437,523 437,477 437,523 437,477 437,523 437,477 437,523
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236		
Plaiting apparatus, C. Lebmann. Planer head, machine. J. Bopp Planter attachment, J. E. Hedges Planter, automatic corn, Richey & Frost Planter, check row corn, M. W. Harf.		W
Plaiting apparatus, C. Lebmann. Planer head, machine, J. Bopp. Planter attacnment, J. E. Hedges. Planter, automatic corn, Richey & Frost. Planter, check row corn, M. W. Hart. Planter, check row corn, C. W. May. Planter, check row corn, N. O. Starks. Planter, seed, W. G. Burchfield Planting, check wire for hand, A. & E. Prebster. Plate holder, W. H. Lewis. Plow, J. A. Martin.	437,220 437,633 437,563 437,239 437,656	W
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Railways, means for preventing longitudinal movement of rails of, F. G. Johnson	437,301 437,613	B B C F
Rattan furniture. E. I. Taft. Reaming and tapping tool, portable, F. Schoff Recorder. See Phonograph recorder. Record sheet, S. A. Smith. Reel. See Fishing reel. Refrigerative apparatus, absorberfor, P. R. Gray,	437,462 437,459 437,256	R ST
Jr. Refrigerators, removable tank for, O. F. Glidden. Rein guide, J. C. Havens. Rein holder, S. G. Bond. Revolving chair and stool, J. W. A. Franklin.	437,192 437,299 437,197 437,560 437,188 437,412	B B B
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Rubber sole boot or shoe. H. T. Marshall. Running gear, F. G. Ohr. Saddle bags, J. N. Anderson Safety attachment, J. A. Armentrout. Safety hook, automatic spring, J. E. Sheehan. Salve, hoof, J. H. Mitchell.	437.608 437.504 437,637 437,550 437,253 437,401	P P R
Sash and belt, combined, D. Olivarius Sash fastener, J. H. Garrett. Sash fastener, E. Walter Satchel frame, A. H. Peterson Saw, drag, W. Turner Saw gumming machine, gin, J. W. Smith	437,340 437,190 437,536 437,366 437,532 437,628	RRS
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Screwdriver, ratchet, Gay & Parsons. Screw threads, machine for cutting, II. Davidson Scythe, A. Huck. Seeding machine, J. Noxon Sewing machine thread tension device, G. H. Fountain	437,297 437,580 437,346 437,234 437,430	a tl n M
Rubber overshoe, E. F. Bickford Rubber sole boot or shoe, H. T. Marshall Running gear, F. G. Ohr Saddle bags, J. N. Anderson Safety attachment, J. A. Armentrout. Safety hook, automatic spring, J. E. Sheehan. Salve, hoof, J. H. Mitchell. Sash and helt, combined, D. Olivarius. Sash fastener, E. Walter. Sash fastener, I. H. Garrett. Sash fastener, A. H. Peterson Saw, drag, W. Turner. Saw drag, W. Turner. Saw wank hing machine, gin, J. W. Smith. Saw smill band, D. B. Hargon. Saw sank hing machine, circular, N. W. Mortorff. Saws, apoliance for circular, E. Benjamin. Saws, apoliance for circular, E. Benjamin. Saws, apoliance for circular, C. Prouty. Scaffold bracket, D. C. Wright. Screw driver, ratchet, Gay & Parsons. Screw threads, machine for cutting, H. Davidson Scythe, A. Huck. Seeding machine, J. Noxon Sewing machine, J. Noxon Sewing machine, J. Noxon Sewing machine, J. Noxon Shears, J. D. Parkinson Shears, W. Richard. Shearing machine, R. L. Renz. Shears, W. Richard. Sheave, F. B. Torrey Sheller. See Corn sheller. Shingle sawing machine, E. Anderson.	437,336 437,515 437,660 437,621 437,530	ir e f
Sheller. See Corn sheller. Shingle sawing machine, E. Anderson. Ship's hunk. A. Conover. Shoe, C. Siegenthaler, Sr. Shoe fastener, B. A. Smith. Shoe fastener, B. A. Smith. Shoe stamping machine, S. Ross, Jr. Shutter worker, E. T. Keener. Shutter worker, E. T. Keener. Skate, C. G. Lamont. Smoke burning furnace, O. B. Martin. Snap hook. C. G. Lundborg. Snap switch, electric, W. Hochhausen. Snow plow J. M. Bouck. Soap, apparatus for making, M. J. Palmer. Soldering machine, can, D. D. Ranney. Spinning machine stop motion, Haigh & Hargreaves.	437,342 437,573 437,316 437,255 437,664 437,603	-
Skate, C. G. Lamont. Smoke burning furnace, O. B. Martin Smap book, C. G. Lundbyrd, Snap switch, electric, W. Hochhausen, Snow plow, J. M. Bouck, Snow plow, J. M. Bouck, Soon, apparatus for making, M. J. Palmer	437.658 437,219 437,380 437,359 437,416 437,448	H a t
Soldering machine, can, D. D. Ranney. Spinning machine stop motion, Haigh & Har- greaves. Spokes. machine for jointing and facing carriage and wagon, C. Seymour. Spring. See Vehicle spring.	437,453 437,194 437,251	re H
Spinning machine stop motion, Haigh & Hargreaves Spokes machine for jointing and facing carriage and wagon, C. Seymour. Spring. See Vehicle spring. Sprinkler. See Lawn sprinkler. Stainways, tool for laying out, J. McDiarmid Stand. See Embroidery stand. Steam boiler, C. Schneter. Steam boiler, R. R. Zell Steam eneine, C. Brown. Steam eneine, E. G. Shortt. Steering apparatus, hydraulic, P. Small. Step, shaft clip, and spring holder, combined, I. Rigdon. Still, P. R. Gray, Jr Stone, artificial building, A. Von Solemacher-	437,313 437,384 437,274 437,353	
Steam engine. E. G. Shortt. Steering apparatus, hydraulic, P. Small. Step, shaft clip, and spring holder, combined, I. Rigdon. Still, P. R. Gray, Jr Stone, artificial building, A. Von Solemacher-	437,460 437,523 437,367 437,193	2.1
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Thompson Vending apparatus, coin-controlled, G. A. Ellie Vise, adjustable beach, G. H. Cole	. 437.527 . 437.584 . 487,572	6

			
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,212	Wagon brake, J. W. Bruce	137,281	П
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243	_ Light	437.440	١í
338	Watch balance springs, apparatus for pinning, E.	2014	1
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	J. Hall Watchmaker's tweezers, R. H. Franklin	4 27 642	ί,
,633	Watchmakers tweezers, R. H. Frankin	4.)~ (10	: 1
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,239	Watches, adjusting, Hunter & Corthel! 437,203,	437,204	ł I
656	Watches, apparatus for adjusting, Hunter & Cor-		. I
217	thell	437,20 0	3
.666	Water elevator and carrier, J. W. Rosborough	137,240	ďΙ
651	Water power utilizer, high grade, A. H. Quain		1
,651 ,289	et al. Weather strip, G. A. & J. E. Capewell Welding regular electrically, C. L. Coffin 437,570,	497 511	ıl
,200	Weather strin G. A & J. E. Canewell	437 476	3
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	Wire straightening and cutting machine, H.		_
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216	Wire stretcher, J. R. Deaver	437,178	3↓
341	Wire stretcher, W. J. Doherty	437,485	δł
341 368	Wire stretching machine, O. M. Mosher	437,61	2
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230	Wire stretching machine, barbed. W. O. McGee Wooden surfaces, ornamenting, N. Hecht	431.648	ŘΙ
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	Bath tuos, cradle for, O. r. Grant	20,10	<u> </u>
.301	Bracket, C. M. Peck	20,177	2
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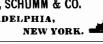
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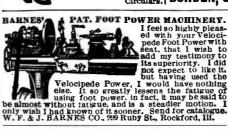
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