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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.

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price.

[Minerals sent for examination should be distinctly marked or labeled.

INDEX OF NOTES AND QUERIES.	No
Carbonic acid gas, absorption of	4050
Rubber, action of kerosene on	4052
Hydrogen, to make	4053
Brick, efflorescence on	4054
Sea, sinking of bodies in the	
Palladium	4056
Storage battery for 10 c. p. lamps	4050
Cool westing of	4060
Coal, wetting of	4061
Simple electric motor	
Grease to bleach	4062
Sewer gas, test for	4065
Sparks in circuit breakers	4068
Bells, closed circuit, vibrating	4071
Wood, to stain and polish	4072
Balloons, small	4073
Ventilation	4076

(4050) H. W. G. asks: 1. Is there any preparation in existence which will produce oxygen gas? If so, what? A. No preparation known gives off oxygen gas without the application of heat to some extent in any practically useful way. 2. Also is there any preparation that will absorb carbonic acid gas, such as we eject from our lungs in breathing? A. Caustic soda, potasb, or lime will do this. To absorb injurious organic matter, potassium permanganate is useful. Simple absorption of carbonic acid gas will not suffice for purification of air which contains products of respir-

(4051) W. A. S. asks: Can you tell me what the actuating element is in the common form of metallic thermometer, and how used ? A. A compound spiral of steel and brass. The differential expansion causes the rotation of the needle connected with it. It is the principle of the Breguet thermometer, described text books on physics.

(4052) O. P. asks: Will kerosene oil penetrate and rot rubber? And if so, is there any that can be prepared so it will not penetrate or rot it? A. Kerosene oil will have some effect upon India rubber, which will be more perceptible in proportion to the time of action. It cannot be prevented. A good quality of vulcanized rubber will be least affected.

(4053) J. M. U. de G. asks (1) for a cheap method of making hydrogen gas. A. Pass steam over white hot iron or copper contained in a tube. 2. How many cubic inches of pure hydrogen gas will it take to lift one pound avoirdupois weight? A. Allow for pure gas, 70 pounds to 1,000 cubic feet, or 14 feet to one pound avoirdupois.

(4054) O. S. E. says: I have laid some

will remove it and other stains from pressed brick. A. The white stains are chiefly due to the presence of salts of magnesia, and no satisfactory cure has as yet been discovered.

(4055) F. W. asks: 1. Does a cubic foot of lead weigh less at a depth of 10,000 feet than it does at a depth of 10 feet under the surface of the sea? A. The lead would weigh slightly less by the decreased gravity at great depths. 2. Which will reach bottom first of two balls, one weighing 100 lb., the other 1 lb.? A. The 100 lb. ball will get to the bottom first, because its weight is greater in proportion to its surface exposed to the friction of the water. 3. Is water harder to penetrate at the bottom or surface of the sea? A. The density of the water at the bottom of the deep seas is but very slightly greater than at the surface. At one mile in depth it is 1-130 more dense than at the surface. 4. Will a small stone or sand sink to a depth of three miles? A. All substances that will sink at all will go to the bottom of the deep sea. Sand, mud and shells are found there.

(4056) C. J. B. asks: 1. To what use is the metal palladium put? A. It has been used for graduated scales. It has very little use outside of the laboratory except as a constituent of alloys used for hair springs of watches. It is the base of a useful reagent and is used in gas analysis to absorb hydrogen. 2. What is its market value? A. It is quoted at \$2 per grain. 3. To what extent is it used? A. In very small amounts. 4. Where is it found? And how extracted from the ore? A. In Russia, North and South America, native or as an alloy. It is extracted by solution in acid and precipitation and ignition. 5. Is the process cheap or costly? A. It is not very costly. An excelent article on the subject is given in Appleton's American Encyclopedia.

(4057) H. G. M. asks: Will loadstone old its power of attraction if not interfered with? A

(4058) O. W. asks: 1. Is the flickering in arc lamps caused by impure carbon or unsteady feeding apparatus, or if neither of them, what causes this trouble? A. Both; and also to variations of E.M. F. and current. 2. Is it necessary to connect arc lamps in series as in the Brush system? What size iron wire would be best for a resistance coil in a line where high voltage is used? A. Arc lamps are generally connected in series. The size of wire depends on the current. Iron has about six times the resistance of copper, 3. Did Wilde (the inventor of the well known Wilde dynamo-electric machine) ever take out a patent on his arc lamp, known as Wilde's candle, in the United States of America? A. We think not. 4. In his apparatus, while burning, the carbons stood side by side, and I should think the current would have jumped across the space near the metal carbon holders instead of going to the points of the carbons, which would throw in additional resistance in the circuit. What is the reason it did not? A. The carbons stand at an angle, the points being nearer together than the clamped ends, hence the resistance of the increased air spac prevented the arc from running along the carbons

(4059) E. S. F. asks: 1. How large a storage battery would be required to light one 10 candle power incandescent lamp for two hours? A. Supposing the lamp to be a 20 volt lamp, 10 or 11 cells of storage battery will be required to secure the necessary voltage; but this number is sufficient to run 10 such lamps. 2. How much would such a battery cost, and would you tell me how I could make one? A. For cost of storage batteries, address the manufacturers and dealers. For directions for making, consult Scientific American vol. 61, page 22. 3. How much power can I obtain from a steam engine with piston 11/2 inch diameter, 234 stroke, with 50 and also 100 lb. steam? A. If the engine is well made, you would realize respectively 🔏 and 1/2 h. r. approximately at a speed of 300 revolu-

(4060) B. I. T. asks whether there is any advantage or gain in wetting down the coal. Some claim the dry coal produces more heat, while others claim the wet coal produces most heat. ting of coalidust is for the purpose of holding it together and preventing waste by dropping through the grate. In this way more heat is obtained.

(4061) M. L. writes: I received your book "Experimental Science," and am well pleased with it. I am making the simple motor described in its pages, and would like to ask a few questions through Notes and Queries about it: 1. How many pounds of wire will be required for motor, when used either as a motor or dynamo with cast iron field magnets, using No. 18 for fields and No. 20 for armature? A. It requires about 2 lb. No. 18 and 1/2 lb. No. 20. 2. Should the wire be single or double covered? A. Double covered. 3. Will the above sizes of wire he light to be used on a dynamo circuit when placed in a shunt? A. It depends on the kind of current used. It would be right for a current of low voltage. 4. How many cells of the secondary battery described on page 418 in "Experimental Science" will be required to run the motor? A. Four. 5. If it requires a stronger current to charge the storage cell than it gives out, what advantage is gained by using it? A. Convenience and constancy. It can be charged at night and used during the daytime. and a stronger current taken from it for a shorter period than was used in charging it.

(4062) G. D. writes: I have taken the liberty of forwarding a sample of brown animal grease, which I am desirous of bleaching. A. Try following processes on it for purifying tallow: 1. Agitate with 5 parts good vinegar. 2. Agitate 50 parts tallow with 80 parts water and 12 parts salt. 3. Agitate 50 parts with part calcined magnesia. 4. Agitate with weak solution of caustic alkali, or with strong solution of an alkaline carbonate. 5. Prolonged agitation with water. 6. Agitate 10 gallons with 1/2 gatlon H2SO4 and 1/2 gallon water. In all cases apply heat during process and then wash, steam well, and remove last traces of

(4063) J. W. C. asks where the gelatinelike composition used instead of glass for holding used. The varnish is flowed on and often not polished the film for plates is manufactured. Also is it a .pa
2. Is there any book published which treats on polishof, I would like to know what causes it, and what tented article? A. The compound is a mixture of gun
| Also is it a .pa| 489,080 | 489,887 |
| Atomize, A. Howard | 489,887 |
| Atomize, A. Howar

cotton and camphor, and is called celluloid. It is made by the Celluloid Company, Newark, N. J., under pa-

(4064) J. L. F. asks: What number cotton-covered magnet wire should I use to make a magnet of about 20 ohms resistance? Also how much of it? A. 4865 feet of No. 16, 1924.2 feet of No. 20, 761 feet of No. 24, 189 32 feet of No. 30, or 47 feet of No. 36. The size of the wire must be in proportion to the current to be carried.

(4065) L. A. P. asks: Is sewer gas odorless? By what chemical process can you detect sewer gas in a room? A. It generally has a depressing odor and usually contains sulphureted hydrogen. In the latter case it can be detected by paper dipped in lead acetate solution. It turns the paper brown. This not at all infallible. It should be tried in the night. This

(4066) A. J. O. writes: I desire to paint my roof with a coat of lead color instead of the customary red mineral paint. Some of my neighbors maintain that there would be danger of lead poisoning from such a roof. Will you kindly inform me if there would be any such danger? A. We should advise the use of ochers, graphite, or similar colors for roof

(4067) J. D. H. writes: In relation to the induction coil described on page 548, "Experimental Science," allow me to ask the following questions: 1. Is it any advantage to varnish the layers of the secondary coil? A. Yes; but the advantage will hardly compensate for the trouble. 2. About how much more than one pound of No. 36 wire is called for? A. It requires nearly 2 lb. 3. Can I purchase platinum-pointed screws of electrical supply dealers? A. Yes; or you can easily insert the point yourself. 4. Are the contact points of the ordinary call bells protected with this metal, platinum? A. Usually. In the cheaper kinds, however, makers are apt to substitute silver or German silver, which are, of course, not so good. 5. Why does a condenser of a capacity of 75 square feet command such a high price, \$20? A. They are carefully made and well mounted and protected, and besides this, the dealer must necessarily make a profit. 6. Should the sheets of tin foil in condenser for above mentioned coil be large or small? Does the size of sheet make any difference? A. The size makes no material difference, but they should not be too small. Make them of a size suited to the base of your instrument.

(4068) C. E. W. writes: 1. I made an induction coil a la Hopkins. Used two one gallon bichromates, made interrupter with platinum points, burnt out fast, made mercury breaker, worse than platinum, mercury vaporized, made condenser, 50 square feet tin foil, bunched together and wired as per directions; this made one-half; run a wire to neighboring tin roof for the other, thus electrically separating the two sections. Sparked as much as before, thought surface must be deficient, so run wire to water pipe, hoping all creation would furnish at least one-half the necessary amount, mercury kept burning up all the same. The books say the mercury breaker prevents the spark, at least decreases it, and the condenser helps considerably, and if I have two large metallic surfaces insulated from each other, why is not that sufficient? A. Try connecting your battery in parallel. Use kerosene oil or alcohol on the surface of the mercury in the contact breaker. Have it deep enough to always cover the platinum point. 2. Is it absolutely necessary that sheets of foil should be piled together in order to secure the best effect? If so, why? A. Yes; in order that they may act inductively on each other.

(4069) G. A. M. asks: 1. Does it hurt the meter or converter on an incandescent system to short circuit the wires? A. It depends upon the way the meter is connected in the circuit. 2. What is the current that is used to execute criminals at Sing Sing? A. A circuit including an E.M.F. of 1500 to 1700 volts. 3. Could an induction coil be made with No. 36 doublewound cotton-covered? If so, how much should be used for the secondary coil? A. Yes; it would take two

(4070) H. K. asks: How many cells of storage battery (such as described in "Experimental Science) will it take to run the motor in SUPPLEMENT, No. 641, also how many cells of gravity battery required to charge the same? A. It takes four cells of storage battery to run the motor, and four cells of gravity battery are required for each storage cell for charging.

(4671) A. C. W. writes: I have been trying to connect two buildings, about 1,300 feet apart. by two bells over one outside wire (No. 18 copper), using the ground as a return wire, so they will reply to each other. I have used three closed circuit. Crowfoot batteries at each end (5 x 7 inches), using 1 pound of blue vitriol to each jar. Used double contact buttons. The grounds are: One pipe about 4 feet long driven into moist ground filled with water, the other is a well pipe about 25 feet long. Can you tell me where I have made my mistake? A. You have probably failed in your grounds; they should have a much larger surface. think a better plan would be to connect all the batteries together at one end of the line and keep the whole line normally closed, simply opening the circuit for signals. If the bells are of the vibrating style, you might make the bell ring by connecting it up on an independent local circuit with one cell. Then when the main line is open, the hammer will fall back and the bell will be operated by the local battery.

(4072) R. A. W. asks: 1. What is the best and quickest mode of polishing ornamental wood turning? Is it possible to mix a color with shellac to make the turned wood appear like mahogany and polish at same time? What process is used to put color on and polish articles such as lead pencils and ladies' toilet brushes and work boxes, such as appear enameled? A. For mahagany stain on light woods use an extract of cam wood. The stain is to be applied to the work while it is in the lathe. It is then removed and allowed to dry. Polish with shellac varnish to which has been added 50 per cent of boiled linseed oil, or better, use French spirit varnish in the same way. Apply with a cloth. For pencils and boxes a logwood stain is often

You will find a great deal on wood stains and polishes in the "Scientific American Cyclopedia of Receipts, Notes and Queries." which we can mail you for \$5.

(4073) A. S. asks (1) how to prepare the cloth for a small balloon intended to contain hydrogen. A. For preparing cloth for balloons see the Scientific American Supplement, No. 726. 2. Can hydrogen be used in a balloon of India rubber? A. Yes; but hydrogen will always rapidly escape. 3. How many pounds will a balloon filled with hydrogen, and with a capacity of 1,000 cubic feet, lift? A. For 1,000 cubic feet pure hydrogen allow 70 pounds of lifting power; from this subtract the weight of your balloon and accessories. A liberal allowance should also be made for impurities, diffusion of gas, etc.

(4074) G. H. L. asks: 1. How can I nake a cheap reliable air pump for experimental purposes, with a bell about eight inches high? A. For this we refer you to Hopkins' "Experimental Science," \$4 by mail. 2. Have carbons been made to show different colors of light? Is it possible, owing to the great heat which they must undergo while carbonizing? A. To the eye the white rays will always predominate, although they have been caused in spectrum analysis to volatilize metals to give the characteristic flame. 4. Would colored carbons be in demand? A. We doubt if any demand would exist for such as could be made.

(4075) C. B. asks: 1. A formula reads solution chloride zinc" (U. S. Pb.), 1 quart. What quantity of zinc chloride gravulated does it require to make proper strength to quart of water, so as to be like above U. S. Ph.? A. For one quart of solution allow about 1 pound of the solid salt. 2. Solution chloride sodium (3 vj to O j), 2 pints. Does this mean 6 ounces sodium chloride to 1 pint water? A. We suppose so; it is not very explicitly stated. 3. Will arsenious acid 1 part, dissolved by using carbonate potassa, 6 parts, remain colorless or turn brown after standing? A. It should remain colorless. 4. What is the best way to make alum mix with arsenious acid solution and remain clear? A. Acidify if necessary with hydrochloric acid. 5. In making solution of bichloride mercury with muriate ammonia, should they be dissolved together in cold water or hot, or separately in hot or cold water? A. Dissolve both together, or the ammonia salt first. Warm the water, do not boil it.

(4076) H. J. S. asks: 1. Will you please explain the latest theory in reference to ventilation? A. The best method of ventilation is that in which the foul air is drawn from the upper and lower portions of the room and in which fresh air enters around the windows, doors, and other openings or through a number of small openings distributed around the room, but not located near the ventilating ducts. 2. Should rooms be ventilated at top or bottom of room or at both points? A. See answer above. 3. Can a school room be properly ventilated (that is not cooled off) by lowering the top of window only? A. Not properly; but this method, when draughts are not created, is better than no method. 4. Does carbonic acid gas settle to bottom of room or rise to top or is it diffused through the room generally when heated to ordinary living temperature, and are there any other gases deleterious to health, and how best to ventilate for them? A. Carbonic acid rises to the top of a room because it is always evolved in a heated condition. It then diffuses all through it. There are other gases and emanations from the body, as well as dust and disease germs, which are carried off by ventilation.

(4077) S. T. C. asks the difference between a square foot and a foot square. A. A square foot is any shaped surface that contains a square foot of area. A foot square is a square surface of the length of one foot on each of its four sides.

S. C. M. I. asks for a waterproof cement.-J. C. says: Will you please tell me how to repair the back of a mirror where the silvering has scaled off?-A. G. H. asks for a receipt for a good hard washing soap.—F. H. W. S. says: I wish a paint mixture for outdoor work on statues, that will stand weather and will neither fade nor turn yellow.—J. J. M. says: Do you know of any way I can get a formula for making a dressing for

Answers to all of the above queries will be found in the "Scientific American Cyclopedia of Receipts, Notes and Queries," to which our correspondents are referred. The advertisement of this book is printed in another column. A new circular is now ready.

TO INVENTORS.

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INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

February 16, 1892.

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

Acid, apparatus for concentrating sulphuric, C.
Negrier 468,891
Adjustable handle for taps, reamers, etc., T. E.
Avery. 469,085
Advertiser, photoscopic, P. Ortega. 489,171
Air brake, E. G. Shortt 489,176
Air cooling and purifying apparatus, I. F. Good. 489,176
Arm, artificial, W. Boardman. 489,115
Armature for dynamo electric machines, M. Depres Acid, apparatus for concentrating sulphuric, C.

<u> </u>			
Awning, F. P. Kirk Axle lubricator, W. W. Smith	468,942 469,100	Filtering apparatus, centrifugal, D. Williamson. Fire kindling, composition of matterfor, H. W. King Fish plate, H. W. Libbey. Fishing leader, G. C. Hemenway. Fishing purposes, snell and gauge for, G. C. Hem-	460 096
Bag holder, Henning & Pigott Ballots, device for facilitating the counting of, I. S. Pear Barrel rack, J. A. Browning Batteries, electrolytes or depolarizing solution for galyanic, S. Miller.	468,972 469,119	Fishing purposes, snell and gauge for, G.C. Hemenway. Flask. See Pocket flask. Floor thimble A. G. Anderson	469,016
for galvanic, S. Miller Battery. See Storage battery. Bearing, adjustable, B. V. Nordberg.	468,887 468,822 469,081	enway. Flask. See Pocket flask. Floor thimble, A. G. Anderson Flooring, fireproof, W. R. Forbush. Flower stand, J. W. Quinn Fluids, apparatus for cooling, B. Rettenmeyer. Flu sing apparatus, automatic, F. Walker. Fly paper, sticky, J. H. Smith. Folding table, T. Crane. Fork. See Mail bag catching fork. Fruit picker, J. W. Cain. Furnace. See Gas furnace. Heating furnace, Zinc furnace.	469,082 469,216 468,919 468,979
Bedstead, metallic, B. R. Barklow Beehive, S. F. Brewer Beer, method of and apparatus for the manufac-	468,862 468,783	Fly paper, sticky, J. H. Smith Folding table, T. Crane Fork. See Mail bag catching fork.	469,021 468,791
Battery. See Storage battery. Bearing, adjustable, B. V. Nordberg. Bedstead brace, E. S. Elliott. Bedstead, metallic, B. R. Barklow. Beelive, S. F. Brewer. Beer, method of and apparatus for the manufacture of, C. F. Lawton. Bicycle, W. A. Hance. Bicycle seat spring, P. R. Walsh. Bicycle support, W. L. Ross. Bit. See evercheck bit.	468,994 469,192 468,920	Furnace. See Gas furnace. Heating furnace, Zinc furnace. Furnace, J. Hinstin.	468,875
Block. See Building block. Paving block. Pulley block. Board. See Ironing board. Multiple switch	;	Furnace, S. J. Miles Furnace for burning garbage, G. H. Warner. Furnace for burning garbage, etc., G. H. Warner. 6 mapparatus, G. S. Parker	468,814 468,851 468,852 469,089
board. Boat detaching apparatus, H. Ashford Boat seat, adjustable folding, E. Hardendorf Boiler. See Steam boiler. Water or steam	469,034 468,873	Garbage receptacle, P. Scanlan. Gas apparatus, G. R. Waite. Gas furnace and producer, regenerative, F. Siemens.	469, 0 00 469,180 468,834
		Zinc furnace. Furnace, J. Hinstin. Furnace, S. J. Miles. Furnace for burning garbage, G. H. Warner. Furnace for burning garbage, etc., G. H. Warner. G. mapparatus, G. S. Parker Garbage receptacle, P. Scanlan. Gas apparatus, G. R. Watte. Gas furnace and producer, regenerative, F. Siemens. Gas furnaces and gas producers, working regenerative, F. Siemens. Gases, producing inflammable, A. Noteman. Gases, producing inflammable, A. Noteman. Gate. See Sewer gate.	468,835 468,956
man	469.087	Generator. See Steam generator. Glassware, device for grinding and polishing.	
Bottle stopper, F. Schmidt. Bowling alley, A. Warth Box. See Letter hox. Measuring box. Miter box. Wagon box. Work box.	469,071	C. Wood. Classware, manufacture of, G. Beatty. Governor, engine, Tompkins & Bigelow. Grate, W. & J. C. Swinsell. Grease and stains, compound for removing, Cox	469,105 469,070
Box bettoms, machine for torguing and cutting, C. H. Fuchs Brace. See Bedsteadbrace. Ratchet brace. Bracket. See Tool bracket. Braiding machine, W. Mundt		Grease and stains, compound for removing, Cox & Lewis tains, Conding mill, S. Hughes. Guand distributer, C. J. Peterson	469,145 468,826
Brake. See Air brake. Vehicle brake. Brake beams, core for hollow, T. Fielden Brake beams, strutfor, C. T. Schoen	468,910 4(8.830 468.830	Gun lock, G. W. Werner Gun sight, W. W. Harris. Hair dressing device, J. M. Sooshny. Hammer, granite, P. Denham. Hammer handles, locking means for, H. A. Brinton.	468,803 469,191 469,040
Brake. See Air brake. Vehicle brake. Brake beams, core for hollow, T Fielden. Brake beams, sirut for, C, T. Schoen. Brewing, C, F. Lawn on. Brick, building, J. Rapp. Brick building, L. A. Steiger. Brick handling implement, C, & C. Hansen. Brick interlocking, L. A. Steiger. Brick interlocking, L. A. Steiger. Brick mould sander, E. O. Leach. Bucket, lunch, A. Miller Buckle plate, H. J. Lewis Building block, W. R. Forbush. Building, portable, W. E. Brock. Buildings, construction of freproof, R. Guas-	468,838 468,838 468,872	ton. Handle. See Adjustable handle. Tool handle. Hanger. See Door hanger. Harness, P. D. Derickx Harness, Boop, H. H. Baker, Jr. Harnow, J. M. Grisham	468,784
Brick kiln, C. Klose Brick mould sander, E. O. Leach. Bucket, lunch, A. Miller	469,151 468,810 469,162	Harness 100p, H. H. Baker, Jr	468,736 468,932 469,000 469,123
Building block, W. R. Forbush Building, portable, W. E. Brock Building, construction of fireproof, R. Guas-	469,083 468,785	Harrow, J. M. Grisham Harrow and cultivator, combined, J. C. Burruss. Harvester, corn, G. & M. C. Pendleton Harvester, corn, J. F. Seiberling. Hasp lock, G. Campbell Hatchet, I. J. Palmer. Hatchway, elevator, J. J. McBride Heater. See Hot water heater. Tire heater. Water heater.	469,174 468,832 469,126 468,892
Buildings, construction of fireproof, R. Guastavino, Jr. Burjal apparatus, F. Haug. Burner. See Hydrocarbon burner. Oil burner. Cake cutter, L. W. Snell	468,871 468,995 468,836	Hatchway, elevator, J. J. McBride. Heater. See Hot water heater. Tire heater. Water heater. Heating furnace, F. L. Sheppard.	469,099
Can mind machine, J. S. Moore	100,000	Heating furnace, F. L. Sheppard. Heating system, J. H. Criffith. Heel nailing machine, F. F. Raymoud, 2d. Chalk Holder. See Bag holder. Candle holder. Chalk holder. Clothes line and clothes holder. Soap	469,209 468,957
Can boat, creaming, P. L. Kimbali Candle holder and shade holder, combined, Kent & Ashby. Caps and fuses for giant powder, coupler for, K. McFarland Car coupling, J. G. Brady. Car coupling, P. H. Murphy. Car coupling, P. H. Murphy. Car coupling, P. H. Murphy. Car coupling, R. M. Tucker. Car coupling, R. W. Tucker. Car coupling, R. M. Tucker. Car coupling, R. M. Tucker. Car quopling, E. A. Yeaton. Car door, grain, J. Pearson. Car, electrically propelled. H. E. Dey. Car motor, street, A. J. Painter. Car step, M. B. Ryan. Car 'colley, electric, J. W. Beebe Cars, traction device for train, W. B. Wright. Card case, coin operated playing, M. Prior. Carding engine, T. S. Whitworth. Carding engine, T. S. Whitworth. Carding engine feeder, J. F. Geb. Carriare, W. C. Hall Carronsel, G. Baum. Cart, road, W. L. Pike. Case. See Card case. Toothpick case. Cash register, E. N. Foote. Cash register, E. N. Foote.	469,189 468,890 469,051	holder. Hot water heater, A. Hallett. Hydrant, fire, S. Brentano. Hydrocarbon burner, White & Reitmayer.	468,993 468,762 469,108
Car coupling, J. G. Brady. Car coupling, P. H. Murphy. Car coupling, J. L. Randolph. Car coupling, Reynolds & Pittman.	469,055 469,166 469,197 468,828	Hot water heater, A. Hallett	468,900 468,970 469,042
Car coupling, R. M. Tucker. Car coupling, E. A. Yeaton. Car door, grain, J. Pearson. Car, electrically propelled, H. E. Dey.	468,846 469,110 468,894 468,948	Inkstand, L. B. Manley Iron. See Curling iron. Ironing board, C. A. Cook. Jack. See Lifting jack.	469,158 468,790
Car motor, street, A. J. Painter	468,824 468,899 468,779 468,860	Tron. See Curing Iron. Troning board, C. A. Cook. Jack. See Lifting jack. Jar cap spanner, H. P. Hobbs. Joint. See Rail joint. Joint for furniture, etc., J. W. Campbell. Kilb. See Brick kilb. Drying kilb.	468,804 468,963
Card case, coin operated playing, M. Prior. Carding engine, T. S. Whitworth	468,827 468,855 469,206 469,031	Joint for furniture, etc., J. W. Campbell	
Carrier, W. C. Hall Carronsel, G. Baum Cart, road, W. L. Pike Case. See Card case. Toothnick case.	469,137 468,962 469,090	Bradley & Hodge. Knitting machines, burring and napping attachment for, H. Eddishaw. Lamp, electric arc. R. S. Dobbie. Lamp, electric arc. H. Sawyer	469,128 469,041
Cash register, E. N. Foote	469,012 469,194 468,944	Lamps, etc., heating attachment for Argand, R. S. Merrill. Lamps, suspending device for electric, J. J. Rene-	469,161
Cash register and indicator, E. Rector. Cash register and indicator, C. W. Weiss Cat the guard, F. C. Seymour	468,957 469,003 469,049	Lamp, electric arc, H. Tawyer Lamps, etc., heating attachment for Argand, R. S. Merrill. Lamps, suspending device for electric, J. J. Rene- hand roller, H. W. Kuhl. Latch, J. Simmons Latch and lock, J. D. Perkins Latch and lock, J. D. Perkins Lathe, last turning, F. B. Gilman Lawn sprinkler, S. Broichgans Letter tox, electric, C. A. Pinkinam Letter tox, electric, C. A. Pinkinam Letter, S. See Transpon lifter. Lifting jack, I. Botts Lifting jack, W. H. Cox	469,008 469,008 469,008
Ceiling, metallic, E. C. Ewing Ceiling, metallic, Ewing & Packer Ceiling, metallic, J. H. Packer Chalk holder, J. W. Klanperich	469,183 469,182 469,186 469,186	Lawn sprinkler, S. Broichgans. Letter box, electric, C. A. Pinkham Level, plumb, O. B. Fuller. Lifter Surffernson lifer.	469,181 469,132
Cheese cutter, O. W. Smith Chest. See Tea chest, Chest protector, W. S. Heinemann. Chimney Can or Cowl Stubbs & Harden	469,195 469,069	Lifting jack, I. Botts Lifting jack, W. H. Cox Light. See Electric search light. Light. See Clup lock Harn lock. Magnetic lock	469,116 468,965
Chest. See Tea chest. Chest. See Tea chest. Chest protector, W. S. Heinemann. Chimney cap or cowl, Stubbs & Harden. Chopper. See Cotton chopper. Chopping knife, F. M. Paliniter. Churn, J. W. Sullins. Clainp. See Rope clamp. Saw filling clamp. Cleaner. See Boiler cleaner. Track cleaner, Cleaner. See Boiler cleaner. Track cleaner. Cleaner. See Boiler cleaner.	468,893 468,844	Light. See Electric search light. Lock. See Electric search light. Lock. See Gultock. Hasp lock. Magneticlock. Loom. E. Hollingworth. Lubricator. See A. Klubricator. Magnetator.	469,210
Cleaner. See Böller cleaner. Track cleaner. Cloth cutting machine, A. Warth. 469,072 to Clother trip, W. J. Kavser. Clothes drier, W. J. Kavser. Options in and clothes holder, wire, W. C.	469,074 468,815 469,018	Mail matter, machine for marking, E. Woodward.	469,028 468,811 694004 468,940
Coal bucket and stool combined W E Weath	409,110	Matric making - 1: 0 T D 10 11 100 000	100,010
erly erly and adjuster, J. J. & W. H. Giesler Coin freed apparatus, J. G. Cumming Collar, harness, A. T. Rutter. Commutator brush for electric motors and dyna-			469,159
mos, T. A. Edison. Composition of matter, P. H. Holmes.	468,950 469,142 469,175	Mortising machines, mandrel and adjustable bit socket for, E. D. De Frehn	469,025
Copying written or printed documents executed in carbonaceous inks, G. H. Ball. Cotton chopper, Kent & Hargett. Counterslink, L. K. & C. A. Williams. Counterslink, L. K. & C. A. Williams.	468,777 469,027 468,857	Motor. See Carmotor. Spring motor. Motor, W. H. Scheer. Mower, H. Lindestrom. Multiple switch board, W. Moseley. Nailing machine, box, F. J. Hawley. Numbering machine, box, F. J. Hawley. Numbering machine, box, F. J. Hawley.	469,094 469,019 468,818
Coupling. See Car coupling. Thili coupling. Cover, extension, C. F. Shaw	468,833 469,131	Traditional Mischines, Consecutive, J. 11. Items	
Crush cr. See Ore crusher. Cultivator, W. T. & J. D. Calton. Cultivator, G. W. Forbes. Cultivator, C. H. Hilbert. Cultivator, W. E. Williams.	. 468,986 . 469,140 . 469,109	hardt. Oil burner for boiler furnaces, etc., D. Kline Oil can and lamp filler, combined, H. C. Atkinson Ore concentrator, G. L. Cudner. Ore concentrator, H. Scovell • re crusher, J. Brumbauch. Ore nulverizer, J. A Pearce	469,112 469,202 468,931 469,120
Cultivator, wheel, A. Lindgren. Curling irou, electric, A. F. Godefroy. Curtain attachment, J. C. Moore et al Curtain rod, H. A. Fowler et al Curtain stack and guide, Balley & Cole	. 469,135 . 469,164 . 468,987	Ore treating apparatus, O. Bilharz. Overcheck bit, H. W. Sisson. Paddle wheel, feathering, F. E. & H. A. Pirrung.	469,037 469,190 469,020
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Drying kiin, H. S. Servoss Bust collector, W. A. Cockrell. Dust collector, O. M. Morse. Cynamometer, E. J. Wood	. 469,067 - 468,964 - 468,935	Planter and fertilizer distributer, seed, T. E. Schumpert. Planter bean, L. P. Thomas. Planter check row attachment, C. M. Furgason, Plastic composition, making, J. H. Amies. Plow, H. F. Jones Plow, J. M. Nichelson. Plow, E. C. Westervelt. Plow, rotary, O. Marth Plow, stock, H. J. Davis. Plow, walking and riding, A. M. Fitch. Pocket flask, A. D. Schlesinger.	469,096 468,977 469,205
		Plow, J. M. Nichelson Plow, E. C. Westervelt.	. 469,111 . 469,147 . 469,163 . 469,1775
dell Earring C. L. Marsters Earth boring apparatus, J. H. Stokesbary. Leg crate, J. P. Berger Electric cut-out, V. A. Thomas. Electric elevator, R. C. Smith Electric machine or motor, dy amo, H. M.	. 469,114 . 469,220 . 468,903	Plow, rotary O. Marth Plow, stock, H. J. Davis Plow, walking and riding, A. M. Fitch. Pocket flask, A. D. Schlesinger Potato digger, Grasham & Moore Potato digger, G. M. Marshall	. 468,909 . 468,966 . 468,989
Byllesby. Electric search light, N. Weeks, Jr. Electric shocks, coin-freed machine for giving, J. Mason	469,193 469,050	Potato digger, G. M. Marshall. Press. See Cloth press. Printing press. Printing press, platen W. H. Price Ir.	. 469,186 . 469,160 . 469,215
Electrical conduit, E. T. Greenfield Electrical heating currents, system of distribution of G. D. Burton	. 469,208 468 938	Pulley, anti-friction, W. H. St. John	
Elevators, electric brake mechanism for C W	. 469,196	Pumps, valve for suction pipes of, W. Bishop	468,926
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Fatty compound, viscid, A. Sonnmer. Feed cutter and corn husker, combined, Morton & Rowan Felt boots, machine for forming, J. Brandy	. 468,937 n 468,817	J. Churchward Railway time signal, A. C. Scarr. Railways, converter system for electric, T. A. Edison.	. 468,928 . 469,066
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File, newspaper, J. L. Deming. Filter, E. Boeing.	468,900 468,790 468,984	M. Hunter. Ratchet brace, G. L. Holt. Reamer, J. M. Chesnut. Refrigerating coverforvessels, J. R. Mitcheltre	. 468,911 . 469,057 e 469,163

	D		
	Refrigerating counter and display case, combined, J. C. Duhm et al. Register. See Cash register. Passenger register.	469,110	I
	Regulator. See Draught regulator. Remedial or medical appliance, M. F. & J. H. Potts		ì
	Reting machine, G. E. Hopkin Rod. See Curtain rod. Engineer's leveling rod. Roller. See Land roller. R pe clamp, J. S. McAnarney. - Wilck, W. Vondersaar.	468,819 468,960	. I
	Roller. See Land roller. R pe clamp, J. S. McAnarney. Mow lock, W. Vondersaar. Ruler for use on desks, W. B. Schofield Saddle, harness, S. A. Marker. Saddle, harness, A. D. Ulrich. Sale and delivery me chanism, prepayment, Sawer & Purves.	468,943 468,848 468,848	1
	Sash lift, R. Gorton Sash, reversible window, A. Culpin Saw, Ottstadt & Wirth Saw filing clamp. I. C. Strong	468,869 469,079 469,172 469,022	E
	Sawmill, circular, J. P. Williams. Saw set, J. McCarthy. Saw set, C. Morrill. Saw, swing cut-off, G. Luppert.	468,856 468,889 468,816 469,156	2
	Sale and delivery me chanism, prepayment, Sawer & Purves. Sash Ift, R. Gorton. Sash, reversible window. A. Culpin. Saw, Ottstadt & Wirth. Saw filing clamp, L. C. Strong. Saw filing clamp, L. P. Williams. Saw set, J. McCarthy. Saw set, J. McCarthy. Saw set, C. Morrill. Saw, swing cutoff, G. Luppert. Sawing machine, band, J. Sperry. Sawing machine, band, J. Sperry. Scale, spring platform, J. P. Chatillon. Screw making machine, J. B. Clyne. Seat. See Boat seat.	468,882 469,177 469,024	7
	Seat. See Boat seat. Seed extracting machine, B. L. Hubert. Seed extracting machine, B. L. Hubert. Semaphore, A. A. Strom. Sewer gate, J. Downs. Sewing machine, Ramsden & Ellis. Sewing machine feeding mechanism, W. S. Brown	469,026 469,002 468 985	.]
į	Sewing machine, Ramsden & Ellis. Sewing machine feeding mechanism, W. S. Brown. Sewing machines, motor for driving, G. Caspani.	469,217 469,199 469,077	1 2
	Sewing machine feeding mechanism, W. S. Brown. Sewing machines, motor for driving, G. Caspani. Shade roller fixture, H. W. Simms. Shaft attachment, vehicle, C. H. Sherman. Shoe fastening, C. A. Harvey. Shutter bower, A. ske. Sickle, rotary, J. E. Wright. Sifter and sorter, centrifugal grain, F. Berg. Sign writing, S. V. Allen. Signal. See Hailway time signal. Switch or station signal.	469,032 468,936 468,988 468,941	! 6
	Signer, rotary, J. E. Wight Sifter and sorter, centrifugal grain, F. Berg Sign writing, S. V. Allen Signal. See Hailway time signal. Switch or sta- tion signal.	468,865 469,033	i
	Smoke consumer, J. N. Merrill	469,212 468,868 468,930	
	Spindle bearing for jacks and mules, T. L. Butler.	468,939	!]
	Spring. See Bicycle seat spring. Spring motor, C. A. Moore.	468,982	1
i	Stables, pavement for, J. Jung bluth. Stamp mill guide, E. Major Stamp, steam, C. W. Tremain Stand. See Flower stand.	469,044 469,157 469,187	1
	Sprinkler. See Lawn sprinkler. Stables, pavement for, J. Jungbluth. Stamp mill guide, E. Major. Stamp, steam, C. W. Tremain. Stamd, See Flower stand. Steam boiler, T. R. Butman. Steam boiler, C. Carroll. Steam boiler, Sectional, W. Scott. Steam generator, A. F. Mead. Steamer, cooking, J. H. Howard. Stealer rails and bars, apparatus for cooling, J. W. Cloud.	469,124 469,038 468,831 468,884	
	Steel tires or rings means for cooling I W		
:	Cloud Stilt, H. C. Swan Stirrup, saddle J. H. Lewis Stirching and barring machine, button hole, C. A. Dabl.	468,789 469,102 469,153 469,008	
i	Stool, piano, A. H. & P. A. Lindberg Stopper. See Bottle stopper.		, i !
	Storage battery, C. P. Elleson. Store service apparatus, A. J. Gillespie. Store service apparatus, L. H. Leber. Stove or range grate, W. M. Shores. Street sweeper, J. Newlove. Sugar, device for cooling and graining maple, J. W. Currier	469,014 468,980 468,958 469,030	
	Dwilliam B. Tt. Branco	100,000	!!'
	switch or station signal, J. A. Erwin. Syringe, A. T. Holt. Table. See Drawing table. Extension table. Folding table. Tea chest, P. Buford Telephone, mechanical, W. H. Eastman. Telephone transmitter, E. A. & T. Grissinger	469,122 469,203 469,085	
i	Folding table. Fea chest, P. Buford Telephone, mechanical, W. H. Eastman Telephone transmitter, E. A. & T. Grissinger Thill coupling, T. A. Watrous Thrashing machine, J. Hershberger Ticket, railway, W. H. Campbell Ticket receiving and delivering apparatus, J. A. Miliken Trabacter W. R. Cullison	469,184 468,927 468,981	į
	Ticket receiving and delivering apparatus, J. A. Mill ken Tire keater, W. R. Cullison Tire, vehicle wheel, A. L. H. Messmer. Tire, wheel, H. Myers. Tires, apparatus for the application and removal of, Ekatromer & Morner. Tires, clamping device for elastic, J. T. Morris, Jr. Tobacco moistening device, G. M. Sherman. Toolarscket, J. N. Hager. Tool bracket, J. N. Hager. Tool bracket, J. N. Hager. Tool handle, W. B. Swan. Tooth, artificial, R. G. Stanbrough. Toothpick case, H. McKay. Tower, T. Critchlow. Toy, figure, F. O. Norton. Track cleauer, J. M. Taylor Trains, device for throwing missives from moving, M. M. Greenwade. Transom lifter, H. MacFarland. Truck, car, W. A. Dutton. Truck, house moving, A. G. Kent. Turn buckles, die for making, J. Bass. Type die, C. I. Redfield. Type writing machine, Cox & Gordon.	468,908 469,029 468,971	
	of, Ekatromer & Morner. Tires, clamping device for elastic, J. T. Morris,Jr. Tobacco moistening device, G. M. Sherman. Tonguesupport, G. W. Lester,	468,797 469,165 469,001 468,879	
	Tool handle, W. B. Swan Tooth, artificial, R. G. Stanbrough Toothpick case, H. McKay. Tower, T. Critchlow	468,969 468,922 469,064 468,792	
	Toy, figure, F.O. Norton Track cleaner, J. M. Taylor Trains, device for throwing missives from mov- ing, M. M. Greenwade	469,169 469,103 468,801	
-	Transom lifter, H. MacFarland. Truck, car, W. A. Dutton. Truck, house moving, A. G. Kent. Turn buckles, die for making, J. Bass.	468,954 469,011 469,148 468,778	
	Type writing machines, type cleaning device for,	460 170	١.
	Urinal, J. Demarest Valve, blow off, F. W. Johnstone	. 469,009 . 468,878	٠.
	valve for radiators of other neating apparatus. G. Hill. Valve, pressure rigiliating G. Kraiss. Valve, steam engine, W. S. Pattin et al. Vehicle, R. Rodgers. Vehicle brake, J. des Georges.	468,915 469,173 469,092 469,013	į
	Velocipede, H. C. Goodrich. Velocipede, E. J. O'Connor. Velocipede saddle, H. C. Goodrich. Velocipede saddle, C. E. McGlinchey.	. 468,799 . 468,825 . 468,799 . 468,998	
	Velocipedes, floating structure for water, W. Wait Ventilator, W. S. Laycook Ventilator and drip tray, A. B. Brown Vessels, rigging for sailing, W. M. Brisben	468,850 468,933 468,786 469,076	3
	Votes, W. Feacock. Votes, apparatus for arranging and counting, J. B. Currier. Wagon box, J. McNaney. Wagon, dunning, Dayennort & Doyle.	469,039 469,169 468,79) ! ? :
;	Valve, steam legitie, W. S. attribute. Vehicle, R. Rodgers, J. des Georges Vehicle brake, J. des Georges Vehicle prace, B. J. O'Connor Velocipede, H. C. Goodrich Velocipede, E. J. O'Connor Velocipede saddle, H. G. Goodrich Velocipede saddle, H. G. Goodrich Ventilator, W. S. Layvook. Ventilator and drip tray, A. B. Brown. Vessels, rigging for salling, W. M. Brisben. Vise, W. Feacook. Votes, apparatus for arranging and counting, J. B. Currier Wagon box, J. McNaney Wagon, dunping, Dawenport & Doyle. Wagon tumning gear, G. W. Loeffler Wagon running sear, G. W. Loeffler Wall protector, W. F. Bowman Warp threads, machine for drawing in, R. H. Ingersoll.	469,99 469,15 469,11	2 ; 7 4
	Washing machine, M. A. Jack Washing machine, D. Updegraff Watch balance, compensation, J. R. Shoemaker. Watch bow fastener, O. Jobanson Water closet valve, A. D. Hoffman.	. 469,146 . 468,849 . 468,968 . 468,806	6 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
	Water heater, G. H. Stahl. Water or steam boller, E. Korting. Well counterbalance, oil, C. Step ans. Wheel See Fifth wheel. Paddle wheel.	. 469,101 . 469,152 . 468,983	2
	Warp threads, machine for drawing in, R. H. Ingersoll washing machine, M. A. Jack. Washing machine, D. Updegraff. Watch balance, compensation, J. R. Shoemaker. Watch bow fastener O. Jobanson. Water closet valve, A. D. Hoffman. Water or steam boller, E. Korting. Well counterbalance, oil, C. Step ans. Wheel See Fifth wheel. Paddle wheel. Whistle, steam chime, F. M. Curran. Window screen, J. F. Appell. Wire stretcher, J. S. Richardson. Wood working machine, Rich & Sondag. Work box, lady's, T. Harper. Zinc furnace, H. G. Tessmer.	. 468,906 . 468,993 . 468,895 . 469,138	5 1 7
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3		o 21,35	6 4 2
3	Cane or umbrella handle, A. Rosenstein21,350 Collar, dog. T. W. Bryant. Fabric, A. Scheffner, Jr. Fabric, E. Stumpf. Organ case, F. W. Hedgeland. Spoon, S. B. Leouard. Spoon, G. P. Tülton. Spoon, G. P. Tülton.	21,34 21,34 21,34 21,34 21,34	3 2 8 7
ĺ	Spoon, souvenir, B. S. Josselyn	21,34	7

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Cane or umbrella handle, A. Rosenstein21,350 to	21.356
Collar, dog, T. W. Bryant	21,344
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Spoon S. B. Leouardi	. 21,348
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Shoon souvenir R S Josephyn	91 347
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Stove, hall, W. J. Copp. Trimming, dress, Lipper & Courts. Watch case, J. C. Dueber.	21,341
Watch case, J. C. Dueber	21,346
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;	nant	
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ο.	and toothache, and dyspepsia pills, Bokschizky	
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