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# HINTS TO CORRESPONDENTS.

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.

Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same.

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Minerals sent for examination should be distinctly

Price.
Witnerals sent for examination should be distinctly marked or labeled.

(6335) W. A. P. writes: We had erected in our office a natural gas stove, giving it a  $3 \slash\hspace{-0.6em} 2$  inch vent pipe; ever since there has been a continual dripping of fluid while the stove is lit. We trust you will be able to advise us with a remedy and explain the same. A. The gas in burning produces water. We would suggest the use of a tee at the lowest point of the vent pipe, with a small drip pipe leading thence outdoors. This should be bent into a trap near the stove and the vent pipe from the stove should pitch downward toward it. The presence of water indicates a cold chimney, which shows that the room is getting the heat, which is as it should be.

(6333) J. A. McC. asks: 1. Is there a single cylinder gas engine made to-day that receives an impulse at each stroke of the piston, or two to the revolution? A. Double acting gas engines have been made, principally in England and in France, and some are still in use. There are some difficulties in the operation of this class of engines that have placed the single acting engines in the lead. 2. What is the best proportion per volume lts in g and air for the he A. The best and most economical mixture is 1 part gasoline vapor to 10 parts of air. 3. If a jet of air and one of gas be admitted into a cylinder at the same instant from opposite sides, in such a manner as to strike each other with considerable force, will they mix sufficiently well to explode in contact with an electric spark, and will such an explosion take place with a considerable degree of certainty if the mixture come in contact with iron at a good red heat? Also at what heat may iron be under such circumstances and the gas be free from danger of explosion while under compression? A. 'The practice is to admit gas and air at any convenient point. They will ignite by electric spark or by a heated tube into which the mixed gases are compressed. The tube to be at a full red heat. Will not explode at a black heat. 4. To what extent is a charge of gas and air compressed at the moment of explosion in the most economical engines? A. There are engines with and without compression of the mixed gas and air. Compression may be from 5 to 10 pounds. 5. What can you say in regard to the relative efficiency of the tube and electric spark as an exploder? Also with reference to safety and economy? A. The electrical ignition system claims high efficiency in the uniformity of explosive effect. 6. Is there a work on the gas engine that would be of real, practical value then place the cell on its side with its bottom raised, as

to a tyro, and if so, what is it? A. There are two excellent works on gas engines. Robinson's "Gas and Petroleum Engines," \$5.50. and Donkin's "Gas, Oil and Air Engines," \$6.50 by mail. 7. Do you think it possible to drive a catamaran whose hulls are 15 inches wide, having sharp lines, round knuckles and flat bottom, 28 feet long, drawing 7 inches of water, at a speed of 12 miles an hour on dead water with a paddle wheel placed between the hulls? If so, at what position in the length of the hulls should it be placed, and what should be the length and width of bucket and what diameter and speed should the wheel have? A. The speed of 12 miles per hour may be obtained; but with the difficulty of overloading the boat with the weight of engines and wheel, 9 to 10 miles may be attained. Wheel should be two-thirds the length of hull from bow. Wheel 6 feet diameter, 4

(6337) C. A. C. asks: 1. What is the afe carrying capacity of No. 30 silk-covered copper wire, such as is used in telegraph relays (in amperes)? A. 0.15 to 0.20 ampere if wound in a tight coil. 2. What should be the carrying capacity of fusing wire to protect the same (in amperes)? A. About the same as g ven above, for they are very safe figures. 3. Also, how can telephones be used on a telegraph line about 1,500 feet long, with three stations on same? We use ordinarily the telegraph line, but wish to use both telegraph and telephones together. The batteries are located as follows: Three at one end and five in the middle. How can it be arranged so that either end may call the middle station (using the telegraph instruments for a call), and the mid dle station be arranged so that he may switch his tele phone on to either section of the line, leaving the other end out or grounded? A. Use back contact keys at middle station, with ground connections there. 4. Also will telephones work through the five batteries without any trouble? A. The batteries will not prevent the telephones from working.

(6338) G. A. D. asks: Does the sun move? Is this earth perfectly round, or is it flattened at the poles? If so, how is it proved? A. The sun moves in space toward the constellation Hercules at the rate of about 16 miles per second. In this sense it moves. It also moves by revolution upon its own axis. The apparent daily motion of the sun through the heavens is not a real movement, but is an optical effect upon our perception, due to the revolution of the earth upon its own axis. The earth's form is a spheroid of revolution, as is proved by measures upon the meridian with their terminals compared with observations for their latitude Also by the force of gravity, as deduced from the vary ing lengths of a pendulum at different latitudes for a given time beat.

(6339) C. H. H.—No one has the right to make a patented article for his own use without the consent of the patentee.

(6340) H. A. W. & Co. say: In Notes and Queries of Scientific American of December 1, J. J. H. asks, "How high above level of its source will an ordinary hydraulic ram raise water?" You answer from 100 to 200 feet. About two years ago we put in a Rife's ram (advertised in your paper). With this ram we raise water to our farm 243 feet high, pipe line 4,360 feet long; our feed pipe to ram is 500 feet long, 5 inch pipe and 11 feet fall, and gives us 60 gallons per hour and sometimes runs up to 90 gallons.

(6341) R. L. H. asks: 1. In what number or numbers of the Scientific American Supple-MENT can I find directions for making instruments for the measurement of the following: Volts, amperes, ohms, and watts? A. See our Supplement, Nos. 353, 398, 423, 440, 552, 556, 563, 603, 604, 618, 734, 811. 2. How many cubic feet of gas can be obtained from 1 gallon of water by the electro analysis process, and how long would it take to decompose it with 20 amperes, if I use 1 square foot for each electrode? A. About 157 feet hydrogen and 78 feet oxygen, requiring about 1,000 hours. The size of electrode is a superfluous statement. 3. Are gold and platinum the only metals from which I can catch the gases separately? If not, please mention other cheaper ones. A. You can use iron or copper in a solution of caustic soda. 4. What is the fractional horse power of the motors described in SUPPLEMENT, Nos. 761 and 641, and how many volts and amperes does each require? A. No. 761 is about one-thirtieth horse power. No. 641 is about one-tenth horse power. 5. How many volts and amperes does the dynamo in Supplement, No. 161, give? About 12 volts and 11/2 amperes. 6. How can I calculate the candle power of a lamp? A. Allow 3.1 watts per candle power. 7. With 10 volts and 5 amperes, can I make an induction coil that will give 50 volts and 100 amperes? If so, how? A. No. It would involve creation of energy.

(6342) P. C. T. asks: 1. What make of storage battery can you recommend for charging by gravity cells? A. For storage batteries address some of the dealers who advertise in our columns 2 What occurs if circuit is closed without cutting out gravity batteries? A. The storage batteries keep on receiving their charge; the circuit is necessarily closed when charging. 3. What causes buckling of plates? A. Too rapid a discharge. 4. What capacity should they be for cauter izing purposes-how many volts and amperes are most practicable? A. This depends entirely on the length and size of the cauterizing wire or instrument. 5. What is the difference between a galvanic and faradic currents Johnson's Cyclopedia states magneto and secondary currents from induction coils are faradic, and yet we read of galvanic medical batteries. A. Johnson's Cyclopedia is correct. In medicine it may be desirable to use a gal-

(6343) L. A. F. asks: 1. How can the danger resulting from the falling of a private telephone wire onto a trolley wire be avoided? A. By guard wires placed over the trolley wires, or by good insulation on the telephone wire. 2. In case of its falling onto the trolley wire, is there any danger to building upon which it is strung? A. There is a certain amount of danger. but the high resistance of the telephone apparatus is to some extent a safeguard. 3. Is there any easy way to remove the crystals that form in a bichromate of potash battery? A. Immerse completely in a tub of water and

### TO INVENTORS.

### INDEX OF INVENTIONS

### AND EACH BEARING THAT DATE.

[See note at end of list about copies of these pate	
Air brake signal apparatus, E. P. Bishop, Jr Air or gas compressor, C. W. Miles	531,584 531.552
alarm. Amalgamator, L. D. Coe	531,611 531,296
Amahamaton and separator, S. Johnson, M. Baney, Anchor, folding, F. Joyner. Animal trap, D. W. Leedy. Animal trap, V. J. Scherb. Artillery, carriage or mounting for, H. Jakobsson.	531,315 531,544 531,571
Son. Axle, car, R. Bettermann	531,417 531,405
Axle, car, R. Bettermann. Band cutter and feeder, F. F. Landis Barrel head turning machine, W. W. Trevor Barrel, pickle, J. Tomlinson.	531,541   531,400
Bath apparatus, shower, H. M. Christopher Bearing for wheel boxes, ball, W. S. Robinson	531,603 531,303 531,564
Barrel head turning machine, W. W. Frevor. Barrel, pickle J. Tomlinson. Bath apparatus, shower, H. M. Christopher. Bearing for wheel boxes, ball, W. S. Robinson. Bed botrom, extensible. A. H. Freese. Bed lounge, A. J. Gautran. Beer carbonating apparatus, C. Barus. Beer forcing apparatus, air pressure, H. E. Bailey.	531,370 531,461 531,356
Beer forcing apparatus, air pressure, H. E. Bailey	531.494
and apparatus for preparing, A. M. Hofmann. Bell, automatic pickle, Bemis & Adams	531,314 531,457
Bailey.  Bailey.  Beer, etc., in receptacles for market, process of and apparatus for preparing. A. M. Hofmann.  Bell, automatic pickle, Bemis & Adams  Bell, signal, I. L. Garsside.  Bioycle saddle. C. T. Rogers.  Bioycle support, C. A. Schloer.  Boiler. See Heating boiler.	531,457 531,373 531,333 531,338
Bolt or screw cap, G. A. Lambert.  Bone and vegetable matter, machine for com-	531,465 531,426
Boiler furnace. O. Friederici. Bolt, J. Dinkelacker, Jr. Bolt or screw cap. G. A. Lambert. Bone and vezetable matter. machine for comminuting E. J. Rocebe. Brace. See Shoulder brace. Brake. See Carbrake. Windmill brake. Brake bandle, J. W. Paterson Brake bandle, J. W. Paterson Brake bandle, H. S. Teal. Brick kiln, C. E. Frest.	501,420
Brake bandle, P. G. Emery. Brake bandle, J. W. Paterson Brake handle, H. S. Teal Brick kiln, C. E. Frest.	531,612 531 596 531,577
Brick kiln, C E, Frest. Buckle, Rufflead & Anthony. Buggy top attachment, Axline & Baillie. Building constructions, composition for, W. R.	531,577 531,371 531,336 531,493
Building constructions, composition for, W. R. Forbush	
Forbush. Burgiar alarm, detonating, S. D. Silver. Burner, See Oil or gas burner. Button, detachable. W. J. Moore. Calking tool, D. Falvey. C. Ryding. Cambering machine, H. C. Ryding. Camera. See Photographic camera.	531,466
Calking tool, D. Falvey	531.411 531,448
Can head forming die, N. Froyer	001,401
tinger, Sr	531,467 531,418
Car brake, R. W. McKee. Car brake, railway, W. Baxter, Jr. Car brake, railway, Dickinson & Warner.	531,550 531,582 531,588
Car brake, railway, A. F. Letson	531,588 531,319 531,510
Car coupling, T. P. Beadle. Car coupling, J. W. Elliott.	531,430 531,497 531,522
Car coupling, D. G. Gross	531,375 531,490 531,492
can lesting machine, J. Black. Candlestick and match box, combined, A. Nittinger, Sr. Car brake, S. S. Leonard. Car brake, R. W. McKee. Car brake, R. W. McKee. Car brake, railway, W. Baxter, Jr. Car brake, railway, J. Bickinson & Warner. Car brake, railway, A. F. Letson. Car cooping, G. W. Bartlett. Car cooping, G. W. Bartlett. Car coupling, T. P. Beadle. Car coupling, J. P. Beadle. Car coupling, J. W. Billiott. Car coupling, J. W. Billiott. Car coupling, J. Worthington. Car ender, W. B. George. Car fender, W. B. George. Car fender, W. B. George. Car fender, A. D. Smith. Car beater and ventilator, L. A. Peckham. Car wife-guard, J. Schneider. Car sanding device, street, W. C. Fisher. Car sear, folding, W. Sutton. Cars, entertic lighting system for railway, M. Moskowit.	53[,374 531,395
Car life-guard, J. Schneider. Car sanding device, street, W. C. Fisher.	531,559 531,391 531.613
Car seat, folding, W. Sutton	531,573 531,421
	531,447 531,447 531,495
Case. See Sales check case. Casting apparatus, H. B. Cox	
Case. See Sales check case. Casting apparatus, H. B. Cox Chafe iron, roller, C. L. Bellamy. Cbain or link belt, conveyer, S. Essex. Chair. See Folding chair. Invalid chair. Cbair seats, spring support for, J. A. Staples. Chisel, subaqueous rock breaking, W. L. Ross. Christ mas tree light, E. A. Uebling. Cburn. C. A. Lorenz. Cinch plate, A. P. Weeks	531,500 531,30 <b>6</b>
Chair seats, spring support for, J. A. Staples Chisel, subaqueous rock breaking, W. L. Ross	531,477 531,334 531,452
Courn. C. A. Lorenz.  Cinch plate, A. P. Weeks.  Clamp. See Ironing table clamp.	531,440 531.580
Cinch plate, A. P. Weeks. Clamp. See Ironing table clamp. Clasp. See Garment supporter clasp. Clothes drier, G. Finkbeiner.	531,524
Clasp. See Garment supporter clasp. Clothes drier, G. Finkbeiner. Coal washer and separator, T. M. Righter. Cock, gauge, C. R. Moore. Coin-actuated lock, J. W. Patterson. Comby J. P. Noyes. Computator, H. L. Reidgman.	531,562 531,593 531,328
Coin-operated mechanism, J. W. Patterson Comb, J. P. Noyes	531,327 531,468
Cooking corn, etc., in cans, apparatus for, H. R. Stickney. Corn sheller separator, J. Q. Adams. Coupling. See Car coupling. Thill coupling. Cover. strainer, and steam guard, combined kettle, Benson & Berslin. Cultivator, Danos & Haydel. Cultivator, B. M. Rolph. Cultivator Warner & Crane. Cultivator fo int, J. H. Knapp. Current motors, starting alternating, L. Bell. Currycomb. C. J. Garvey. Curtain fixture, A. B. Dunkle. Curtain pole ring, etc., J. A. Rings. Cutter. See Band cutter. Pipe cutter. Cutter head, A. S. Spaulding.	531,292
tle, Benson & Berslin	531,300 531,514
Cultivator. Warner & Crane. Cultivator jo int, J. H. Knapp.	531.566 531, <b>60</b> 5 531,592 531,432
Current motors, starting alternating, L. Bell Currycomb. C. J. Garvey. Curtain fixture, A. B. Dunkle	531,432 531,412 531,519 531,563
Cuttain pole ring, etc., J. A. Rings	531,563 531,396
Decorticating ramie or other plants, machine for, A. D. Estienne.	531,397
Disinfecting apparatus. R. P. Pictet Door check, C. H. Cameron	531,397 531,389 531,329 531,361
Doubletree, Winslow & King.  Dredging machine and electrically-actuated bucket therefor C. Unton	531,581 531,486
Drier. See Clothes drier. Drying machine, J. K. Proctor (r).	11.4 <b>6</b> 0 531,517
Dust collector, E. R. Drayer  Dyeing machine, L. Weldon.	531,414 531,350
Decorticating ramic or other plants, machine for, A D. Estienne.  Dish cleaner, F. Rowley Disinfecting apparatus, R. P. Pictet.  Door check, C. H. Cameron.  Doubletree, Winslow & King.  Dredging machine and electrically-actuated bucket therefor, C. Upton  Drier. See Clothes drier.  Drying machine, J. K. Proctor (r).  Dust collector, E. R. Drayer.  Dust collector, I. F. Gent.  Dyeing mach ine, L. Weldon.  Electric cable, T. Guilleaume.  Electric conductor support, J. M. Andersen.  Electric cut-out, H. Hansen.	531,350 531,614 531,354 531,310
Flort rome gnotic machines controlling W I	551,424
Donshea.  Elevater, N. P. • tis.  Embankments, machine for building, W. G.  Price	531,595

by resting on a brick, or completely invert it. It must be kept full of water.	Enamel or paint, marine, C. H. Christman
(6344) W. S. asks: When sailing from New York to Montevideo does the compass point toward	C. Walker. 531.488 Envelope, M. Carey. 531.302 Envelope, m. Oney, C. H. Cameron. 531.502 Excel sior cutting machine, C. G. Smith
he south magnetic pole after crossing the equator? A. The compass is not reversed in crossing the equator. Its	Excelsior cutting machine, C. G. Smith 531,342 Faucet for supplying hot or cold water, G. H. Cole 531,585 Faucet, self-closing, W. A. Turner 531,484
outh pole points to the southern magnetic pole, with variations due to the lines of magnetic declination. The	Fender, See Car fender. Filter, C. M. Keller. Fire escape, S. H. Roper. Fire extinguishing apparatus, household, D. L. Keeler.  531,597
only change that requires adjustment is the dip of the needle, as in north latitudes the north end of the needle	Fire extinguishing apparatus, household, D. L. Keeler. 531,591 Flusher, automatic sipt.on, R. C. De La Hunt. 531,516 Folding chair, G. M. Bennett. 531,583 Folding machine, W. R. Chris. 531,512 Folding machine, W. R. Chris
nust be counterbalanced for the dip, which must be changed or reversed in southern latitudes.	Folding machine. W. E. Curtis
TO INVENTORS,	
An experience of nearly fifty years, and the preparation of more than one bundred thousand applications for pa-	Furnace, H. D. Smith. 531,394 Furniture, revolving, Krabol & Bostad. 531,588 Fusebox, 'L. Ashiey. 531,355 Ganze. See Walchmaker's length gauge. Game apparatus, com controlled, A. L. Pratt. 531,469 Garment hoek, Mason & Cole. 531,442
cents at home and abroad, enable us to understand the aws and practice on both continents, and to possess unequaled facilities for procuring patents everywhere. A	Garment hoek, Mason & Cole
synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons	Glass machine, wire, F. M. Ryon. 531,570 Glassware, mould for the manufacture of, C. E. Rine 531,609
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-	Glove, R. Raymond. 531,396 Grinding device for rotary cutters, J. Miller. 531,547 Guard. See Car life guard. Pin guard.
tensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broad-	Glassware, meulet for the manufacture of, C. E. Blue
vay, New York.	Harrew, I. T. Eyans. 531.308 Harvester, G. W. Ingersoll. 551.555 Harvester, corn. H. M. Cox. 531.512
INDEX OF INVENTIONS	Harvester, corn, H. M. Cox
For which Letters Patent of the United States were Granted	Hinge for electric apparatus, A. B. Davis
December 25, 1894,	Hose mender, A. Van Dyke
AND EACH BEARING THAT DATE.	Hydrocarbon inning system, B. L. Lawton 531,345 leing to pastry, apparatus for applying, Stro- hecker & Hutton 531,345 Indicator, J. H. Scott 531,572 Inhaler, E. Seuchen 531,476 Inkstand, L. N. Thomas 531,345 Inkstand, pneumatic, C. A. Sigelen 531,345 Insulator, L. McCarliy 531,340 Insulator, L. McCarliy 531,340 Invalid chair, S. A. Potter 541,330 Ironing table clanm, Kanfmann & Nimeroff 53, 316
[See note at end of list about copies of these patents.]	Inkstand, pneumatic, C. A. Sigelen 531,474 Insect powder dusting machine, Lousaw & Clarke 531,320 Insulator, L. McCarthy. 531,433 Insulid chair, S. A. Potter 51,323
Air brake signal apparatus, E. P. Bishop, Jr	Journal bearing, I. Corneliussen
a larm. Amalgamator, L. D. Coe	chanism for actuating, C. Gavioli
Anchor, folding, F. Joyner	Kiln. See Brick kiln. Kitchen cabinet, T. E. Smith. 531.341 Knife. See Pruning knife. Knitting machine, circular, W. R. Johns. 531.463 Knitting machine, circular. Morin & Jacques 531.551 Ladder, extension, C. W. Howard 541.534 Lamp, electric arc. E. J. Murphy 531.422 Latch, gate, J. L. Wilson. 531.422 Latch, gate, J. F. Wilson. 531.491 Lathing strip, L. T. Hagan 531.595 Life preserver, J. P. Brown 531.595 Lighting device, B. H. Pendleton. 531.597 Lock. See Coin actuated lock. Time lock. Locomotive for elevated radways, electric, F. B. Behr. 531.499
80n. 531.417  Axle, car, R. Bettermann. 531.405  Band cutter and feeder, F. F. Landis. 531.541  Barrel head turning machine, W. W. Trevor. 531.601  Barrel nikle, J. Tominson. 531.601	Ladder, extension, C. W. Howard       531,534         Lamp, electric arc, E. J. Murphy       531,425         Latch, rate, J. L. Wilson       531,355         Letch, rate, W. Wilson       531,461         Letch, rate, W. Wilson       531,461
Barrel head turning machine, W. W. Trevor. 531,403 Barrel, pickle, J. Tomlinson. 531,603 Bath apparatus, shower, H. M. Christopher. 531,363 Bearing for wheel boxes, ball, W. S. Robinson. 531,564 Bed botrom, extensible, A. H. Freese. 531,364	Lathing strip, L. T. Hagan 531.589 Life preserver, J. P. Brown 531.509 Lighting device, B. H. Pendleton 531,597
Bed bottom, extensible, A. H. Freese. 531,370 Bed lounge, A. J. Gautran. 531,451 Beer carbonating apparatus, C. Barus. 531,356 Beer forcing apparatus, air pressure, H. E.	Lock. See Coin actuated lock. Time lock.  Locomotive for elevated rallways, electric, F. B.  Bebr
Beer forcing apparatus, air pressure, H. E. Bailey	Locomotives. means for controlling electric, Egger & Wessel Loom Jacquard apparatus, O. W. Schaum 531,366
Beer. etc., in receptacles for market, process of and apparatus for preparing. A. M. Hofmann. 531,314     Bell., automatic pickle, Bemis & Adams. 531,457     Bell., signal, I. L. Garside. 531,333     Bicycle saddle, C. T. Rogers. 531,333     Bicycle support, C. A. Schloer 531,338     Bicycle support, C. A. Schloer 531,338	Lubricator, T. G. Howells
Bicycle support, C. A. Schloer. 531,338 Boiler. See Heating boiler. 531,525 Boiler furnace. O. Friederici. 531,525 Boil J. Dinkelseker. Jr. 531,525	Magazine or book holder. F. Barwick. 531,496 Mail bag hanger, J. A. Braniff. 531,360 Mashing machine, A. Schultz. 531,601 Mechanical moyement, A. Sharp. 531,340 Met als, apparatus for extracting. A. Guillaume. 531,339 Minar's exponents of N. F. Wenner. 531,340
Boiler furnace. O. Friederici	Miner's spooning tool, N. E. Varney. 531,347 Moulding apparatus, S. J. Adams. 531,429 Motion for centrifugal or other machines, production of high speed rotury, A. Krank. 531,559 Motor. Spo. Spring rotor.
	Motor charging device, J. T. F. Conti 531,511
Brake handle, P. G. Emery       531,612         Brake bandle, J. W. Paterson       531,596         Brake handle, H. S. Teal       531,577         Brick kiln, C. E. Frest       531,377         Buckle, Ruffhea & Anthony       531,336         Buggy top attachment, Axline & Baillie       531,483	Music box damper, G. A. Brachbausen. 531,553 Musical instrument. R. H. Mayland. 531,323 Nut fasteners, machine for making, W. Dunn. 531,305 Oil cup, C. C. Tyler. 531,401 Oil or gas burner, C. W. Claybourne. 531,503
Building constructions, composition for, W. R. Forbush	Ore concentrator, S. Beer
Burner.       See Oil or gas burner.         Button, detachable.       W. J. Moore.       531,466         Calking tool,       D. Falvey.       531,411         Cambering machine,       H. C. Ryding.       531,448	Ore concentrator, J. M. Montgomery. 531-881 Ore separator, magnetic, C. G. Buchanan. 531,201 Oxids, apparatus for producing. A. Cressley. 631,459 Packing displacer, J. Matthews. 531,546 Pail, dinner, H. M. Holmes. 531.533
Camera. See Photographic camera. Can head forming die, N. Troyer	Pail, liquid seal, G. Higbie
Tandiestick and match bex, combined, A. Nittinger, S. S. Leonard. 531,467  Sar brake, S. S. Leonard. 531,548  Sar brake, R. W. McKee. 531,559  Sar brake, railway, W. Baxter, Jr. 531,559  Sar brake, railway, W. Baxter, Jr. 531,558  Sar brake, railway, A. F. Letson. 531,359  Sar construction. W. E. Coffin. 531,510  Sar coupling, G. W. Bartlett. 531,459  Car coupling, T. P. Beadle. 531,467  Car coupling, J. W. Elliott. 531,250  Car coupling, J. W. Elliott. 531,350  Car coupling, J. Gross. 531,375	Paper, machine for feeding sheets of, J. H. Knowles
ar brake, railway, W. Baxter, Ir.   531,582   ar brake, railway, Dickinson & Warner   531,588   ar brake, railway, A. F. Letson   531,319   Car construction, W. F. Coffin   531,531	E. Barnum
Car coupling, G. W. Bartlett. 531,430 Car coupling, T. P. Beadle. 531,437 Car coupling, J. W. Elliott 531,522	Photographic camera, folding, Hill & Adams 531.416 Picking up pins, etc., apparatus for, A. B. Olson 531,384 Pin gund F. C. Stophenson 531,207
Car coupling, J. W. Elliott       551,325         2ar coupling, D. G. Fross       531,375         2ar coupling, J. L. & J. E. White       531,492         2ar coupling, A. I. Worthington       531,492         2ar fender, W. B. George       531,335         2ar fender, A. D. Smith       531,335         2ar bester and ventilater       L. A. Peckham       531,535         2ar life-Fuard, J. Schneider       531,631         2ar sanding device, street, W. C. Fisher       531,631         2ar seat, folding, W. Sutton       531,573	Pipe connection for fluids T. & W. T. James. 531.615 Pipe cutter, J. J. & J. J. McCarthy. 531.549 Pipe wrench, W. A. Blaisdell. 531.299 Plaiting apparetus, C. L. Seward. 531.470
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Case. See Sales check case.  Casting apparatus, H. B. Cox	son.         531,293           Pruning knife, L. C. & B. Bosley         531,358           Pump, A. F. Hall         531,528           Pump attachment, J. W. Clark         531,508
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	Railway, electric, Macloskie & Brinckerhoff. 531,441 Railway rail, A. J. Moxham 531,441 Railway rails, electrical connection for, A. J. Moxham 531,445 Railway switch G. F. Lappron 531,64
Coal washer and separator, T. M. Righter. 531,562 Cock, gauge, C. R. Moore. 531,562 Coin-actuated lock, J. W. Patterson. 531,238 Coin-operated mechanism, J. W. Patterson. 531,328 Comb, J. P. Noyes. 531,468 Commutator, H. L. Bridgman. 531,466 Cooking corn. etc in cans. apparatus for. H. R.	Railway switch, G. E. Lemmon. 531,439 Railway switch skrnal, J. Wayland. 531,348 Railway track, A. J. Moxham. 581,446 Rake attachment, b and, W. Ashby. 531,295
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Corn Steller separator, J. Q. Adams 531,222 Coupling. See Car coupling. Thill coupling. Cover, strainer, and steam guard, combined kettle, Benson & Berslin 531,300 Cultivator, Banos & Haydel 531,506 Cultivator, B. M. Rolph 531,506 Cultivator, Warner & Crane 531,606 Cultivator of int, J. H. Knapp 531,502 Current motors, starting alternating, L. Bell 531,402 Currycomb C. J. Garrey	Rock drilling machine, M. Beal. 531,431 Rope hauling machine, W. B. Lantz 531,318
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Current motors, starting alternating, L. Bell. 531,432 Currycomb. C. J. Garvey. 531462 Curtain fixture, A. B. Dunkle. 531,518 Curtain polering, etc., J. A. Rings. 531,563	Sales theek case, W. M. Kinnard
Cutter See Band cutter Pine cutter	
A. D. Estienne	Sash fastener, J. B. Lashbreek. 531,542 Sash fastener, I. C. Miller. 531,443 Sash fastener, T. E. Wardwell. 531,453 Saw filing device, M. J. Wilson. 551,456 Serews and followers, means for controlling operative connection between feed, E. J. Roche. 531,427 Senj. F. E. Gutterson. 531,376 Separator. See Ore separator. Spinning rail
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Trolley, C. E. Powell	531,383 531,381 531,380
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Trucks, flexible gear for electric car, Wessel &	501.051
Egger Truss. L. A. Smith. Tug, shaft, A. E. Hart.	531,351 531,343 531,529 531,531 531,321 531,352 531,392 531,304 531,434
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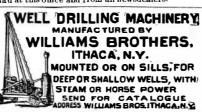
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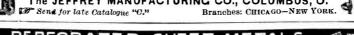
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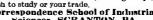






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