to produce 150 ohms resistance will be necessary for reflecting galvanometer described on page 434 of "Experimental Science"? A. This wire is exceedingly fine and needs great care in working. One hundred and forty feet will give approximate resistance desired; 33,333 feet weigh one pound.

(5681) W. B. S.—Answer by Prof. C. V. Riley.—The insects sent are the male and female of the common wheel bug or "devil's coach horse," as the species is called by children in the South, *Prionidus cristatus*, Fab., referred to in most of the older treatises on insects as *Reduvius novenarius*. It is a very common predaceous insect throughout the Southern States, but I have never known it to occur as far north as New York City. Was it collected by Mr. Sargent or was it sent to him by a correspondent? The eggs of this insect are laid upon the bark of trees, the sides of buildings or on fences, and resemble little leather bottles standing on end and side by side in groups of a dozen or more. The young wheel bug, when it first hatches from the egg, is distinguished by a bright crimson abdomen, which it erects in such a way as to give it a threatening appearance. Upon reaching full growth and acquiring wings it becomes a uniformly dark gray color, resembling in general the color of the bark of a tree. It lives upon caterpillars, grasshoppers, and other soft insects, and its strong beak enables it to pierce even a hard-bodied insect. It captures its prey by stealth, as it is a slow and awkward creature.

(5682) W. S. E. asks: 1. Will you kindly inform me how much hydrogen gas will be liberated by the consumption of one pound of zinc in sulphuric acid? A. Two sixty-fifths pound, measuring about 10,000 cubic inches. 2. Would gas so made be as suitable for use in a gas engine as ordinary illuminating gas? A. It would answer, but would be very expensive. 3. What proportions of such gas and air would give the most explosive mixture? A. Two volumes of hydrogen to five of air.

(5683) K. F. asks: Will two ounces of No. 33 cotton-covered wire produce a stronger electromagnet than No. 24 cotton-covered wire, same amount of wire? A. No general answer can be given. It all depends on the conditions. At maximum capacity, with similar cores and potential to suit, the power would be equal.

(5684) N. N. asks (1) how to find about the right time of day by a compass when he knows the longitude. A. For such problems we refer you to Gillespie's "Surveying." 2. Winding an electric motor, say ¾ horse power, to a 110 volt circuit, it would take about 187 watts; the total resistance would be about 64 ohms, if series wound; the field magnet a little less resistance than armature, say field 26 and armature 38 ohms, 26+38=64. If shunt wound, the field magnet would be 14 times more than armature; but as the circuit is divided in two, I don't nnderstand how much resistance field and armature could have to make its total resistance 64 ohms. A. Make your field of resistance sufficient to keep the current within safe limits for the wire used, or make it so as to pass the desired current, giving a resistance in this case of 64 ohms. The winding of the armature is based on the desired speed, not on the resistance. Enough turns must be contained to generate counter electromotive force enough to keep the speed down. In other words, it must be wound so as to generate 110 volts at the maximum speed. Calculate as if for a 110 volt dynamo. 3. One pound of water decomposed into oxygen and hydrogen. What explosive power has it in comparison to common dynamite? A. About 37 atmospheres or 550 pounds per square inch of pressure is given by the exploding gases, about $\frac{1}{1855}$ the power of 75 per cent dynamite. 4. How long a time will it take to decompose one pound of water by a dynamo capable of giving a current of 10 amperes and 6 volts? A. One ampere will decompose 92 micrograms of water per second at 32° Fah. and standard barometer. This is 0·00073 pound avoirdupois. If you use three decomposing cells in series it would give three times this quantity at 10 amperes. 5. About how many vibrations does the armature of an induction coil like the one described in "Experimental Science" make per second? A. 200 to 500 per second. 6. Have you a book about practical geometry, plain and practical for a beginner? A. We recommend and can supply at price given by mail: "First Steps in Geometry," price $1.25; "Plane and Solid Geometry," by Bowser, price $1.75.

(5685) F. F. M., Newton Falls, Ohio, says: 1. Many wells here are dug to the rock and then drilled through the rock, the water rising several feet in the dug portion. What causes the water to become soily before a storm? Soundings show that it is not low water. A. The nature of the soil and methods of finishing the wells should be known to properly assign a reason for the stated action of the wells. It is well known that barometric changes in the pressure of the atmosphere affect some wells. Many blow or draw air and have a disturbance in the water level. As the soil above the rock is subject to water soakage, a change of level in the water by change of air pressure may cause a circulation into and from the soil, carrying the loam into the well. 2. What can be used as sizing or paint for the inside of soft or hard wood pails, so that they will hold gasoline or benzine? A. Coat the pails with glue having 10 per cent of glycerine, all boiled to consistency that will allow it to be elastic when cold. Apply hot with a brush. 3. Does steaming second growth hickory to hasten seasoning injure the wood or make it less valuable for stone cutters' mallets? A. Steaming will not injure the wood, but second growth or young hickory makes poor mallets. Oak is better. 4. Is there any other way to hasten seasoning without detriment to the wood? A. Slow air seasoning in logs with the bark on is best.

(5686) L. C. K. writes: I would like to know the efficiency in foot pounds of the best forms of the steam injector, as ordinarily used in supplying steam boilers with water. That is to say, for a given amount of work performed, will the injector compare favorably or otherwise with a compound or triple expansion steam engine? Or to put it in another form, supposing an injector performs 10 horse power per hour work, what amount of coal per horse power per hour would it require to do the work? A. The efficiency of the injector cannot be stated as a positive amount, from the various conditions of their use. The exhaust injector may be safely quoted on the positive side of 100 per cent, for it not only derives its power entirely from the waste heat of the engine, but also puts the water into the boiler at the usual temperature from other injectors, and when a heater is also used is equal to adding 150 heat units for each pound of water sent to the boiler. The ordinary injector takes from the boiler more heat units than it returns by the amount of radiation and leakage. Its efficiency may be from 90 to 95 per cent. It cannot be compared to a steam engine, even of the best type, which returns no more than from 16 to 18 per cent of the work value of the steam received from the boiler. As a pound of good coal is equivalent to 330 horse power, in heat units, per hour, the 10 horse power injector will represent 1-33 of a pound of coal per hour theoretically or without loss of any kind.

(5687) F. B., Naples, Italy, writes: In all the books treating the dried fruits I read that it is better for a great deal of reasons the fruits be dried with evaporators or other similar means instead to be dried in the sun. Will you kindly let me know through your respectable columns of the SCIENTIFIC AMERICAN your opinion about this question, since I know there are several American firms which have contracts here for dried cherries which must be dried in the sun. A. In all countries having a moist climate or cloudy and rainy weather at the fruit-drying season, a whole crop may be ruined or injured by a few days of bad weather, so that on any extended scale of business the use of evaporators becomes a necessity in the United States and some parts of Europe. In the sunny climate of Italy and the East the dry air and long terms of cloudless skies, as also old custom, has given the sun-dried fruit a reputation, which is no doubt at the bottom of the preference for that method by American fruit houses. We have never seen finer fruit, either in appearance or flavor, than is produced by the artificial driers in the United States.

(5688) M. S. Y. asks: 1. In the small Gramme ring motor described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 783, would not any very soft iron do, instead of Norway iron, for the field magnet? A. Any iron will do. 2. What size wire is to be used on field magnet? A. No. 20. 3. Would solder make a suitable Babbitt metal, and is sheet brass fit for commutator springs? A. Solder would not answer. Use copper for commutator brushes. 4. What horse power does the motor develop? A. It has never been computed. It is a very small fraction. 5. Can the parts be enlarged so that it will run a sewing machine for light work? A. They can, but we do not recommend it. 6. How many cells of plunge battery would be required to run a sewing machine? A. Six or eight cells.

(5689) T. W. S. asks: What size and shape of nozzle will give the greatest power under an 80 foot head, using an 8 inch pipe which is 120 feet long? Would there be any change in nozzle if the head were 100 feet, with pipe 170 feet long? What horse power should we get at 80 feet head? A. The nozzle should be slightly taper, after the form illustrated in SCIENTIFIC AMERICAN SUPPLEMENT, No. 792, 3⅛ inches diameter, which will give you a spouting velocity of over 4,000 feet per minute, and if applied to a 6 foot Pelton wheel should furnish an available 45 horse power. With the longer pipe and higher head a 3 inch nozzle will give best results and about the same power.

(5690) H. T. asks: How high ought a pump lift water at an elevation of 8,000 feet? What is the difference for each 500 feet from sea level up to any height? How many inches of vacuum will an air pump maintain at 8,000 feet, and what is the difference for each 500 feet? A. The loss in pump lift at an elevation of 8,000 feet is 9 2-10 feet with the barometer at mean pressure, or a little over 27 per cent. Assuming the lifting height of ordinary pumps at sea level to be 28 feet, 21½ feet would be the lift at 8,000 feet elevation. The variation is not a constant for each 500 feet elevation. It is a decreasing ratio. The loss of lift at 500 feet is 1·017 feet, at 1,000 feet 1·64 feet, at 2,000 feet elevation 2·84 feet.

(5691) G. A. L., Mont., says: I want to pipe a small spring 6,000 feet away, having a fall 40 to 50 feet. What proportions of pipe would give the strongest flow, ending with half inch, and would it produce any power? A. The flow of water for long distances through small pipes is of no practical value for power, as the friction absorbs most of the value of the head. With a division of the distance into three parts, with 1 inch, ¾ inch and ½ inch, will give an open flow of 1½ gallons per minute, from which no power of any value can be obtained with the low head stated.

(5692) L. G. asks: 1. What change is necessary in motor No. 641 to run on a 110 volt circuit? A. Wind field with 4 pounds No. 25 wire. It would be better to use 5 pounds if you can get it on. The winding of the armature depends on the speed you desire. For a high speed use No. 32 wire on the armature, using the full quantity specified in weight. Finer wire will reduce the speed. 2. Can I make the armature of sheet iron washers with paper between each sheet in place of iron wire? A. Yes. 3. How can I make lard oil out of old lard? A. Purify the lard as far as possible, and extract the oil by hydraulic pressure of 1,000 pounds per square inch, the lard being contained in sacks.

(5693) T. S. R. asks if the brush holder (not the brush) of an electric street car motor were to touch the commutator of the armature, would that necessarily "ground" it? A. If the brush holder of the ground brush did this, it would make a ground; if of the trolley brush, it would make a short circuit. It is not easy to see how any such contact could be brought about except by a piece of metal bridging the interval between brush holder arm and commutator.

(5694) W. H. writes: 1. I have made the small hand power dynamo given in SUPPLEMENT, No. 161, and although it seems to give quite a strong current, it will not run a No. 3 Porter motor with 3 pole armature. Can you explain why I run the Porter motor with 6 cells plunge battery and it gives good satisfaction? I have tried the dynamo on a call bell, and it will ring it louder than the 6 cell battery. Can you tell me whether I can wind the motor so that the dynamo will run it, or wind the dynamo differently? A. It is all a matter of resistance and potential being properly related. We presume that the Porter motor is of too high resistance. Slightly finer wire on the dynamo might effect the purpose. But it may be the other way. 2. How many storage cells will it take to run the Porter No. 3 motor, and how long will they run it and give as much power as the 6 cell plunge battery? The plunge battery cells have 4 carbons, such as are used in a compound Fuller battery and compound Fuller zinc. A. A storage cell will give 2 volts potential and 10 to 35 amperes, according to size of current, for 10 hours. Two cells should run the motor for a number of days. Five storage cells would give about the same voltage and five to ten times more current than the plunge battery on low resistance. It depends on the size of the cell used. 3. Can I make a plunge battery with less cells and larger plates that will run the motor as well as the six? A. We have no data as to your motor, and cannot answer the question intelligently. Possibly a large two or three cell plunge battery would run it. 4. How many storage cells would it take to run five or six 16 candle power lights for three or four hours per day, and how much current would it take to charge them? How large a dynamo and how much horse power if the dynamo were running eight or ten hours per day? A. Allow 60 cells and on charging 1-20 horse power dynamo of 135 volts potential.

(5695) A. B. C. writes: I have just received a splendid Charcot compound magnet. What must I do in order to maintain its present strength? I have heard that it is not good to detach the armature suddenly, yet I would like to do that very thing, for I want to test its strength by adding weight to the armature until it is pulled off? A. Detaching the armature suddenly does no harm. It is the replacing it with a click or jar that injures the maguet. Slide it into place most carefully, and when you pull it off, do so sharply and clearly, so as to prevent any click or jar. Always keep its armature in position when it is laid aside and not in use.

(5696) B. T. S. writes: 1. I am thinking of making a pocket storage battery to last five hours without recharging it, and I would like to know if one gravity battery would be sufficient to charge it. If not, how many would be required, and how long would it take to charge the storage battery? I have some salt batteries which I run on my telegraph line and are as powerful as a gravity battery. I would like to know whether or not they would charge as well as gravity, if so, how many cells would be required? A. Three gravity cells in series will charge your storage battery. How long depends on its size; probably the same time will be required to charge as to discharge. The salt batteries will not answer, as they will polarize too quickly. 2. I have a very powerful magneto-machine, and I would like to know if it would run a one candle power incandescent lamp. If a number of these machines were joined in series, do you think it would light a miniature arc light? A. You can try your magneto on a lamp, but we are certain that it will not light unless specially built to give plenty of current. The effect of joining in series depends on the winding of the armature. 3. How much wire and what number should there be on the receiver of a telephone and state how to make one? A. Use No. 36 wire wound to 80 ohms resistance. See our SUPPLEMENT, No. 142, 10 cents by mail.

(5697) Sister C. asks: Why should the ocean be coldest at the bottom? Why should the Red Sea be warmer than Indian Ocean? A. The waters of the oceans are at the greatest density at a temperature of 39° F. The difference in density causes the warm water at the equator to flow toward the poles on the surface of the ocean, while the return current from the polar regions flows toward the equator along the bottom of the ocean by its greater density. By the great heat of the sun the surface water of the equatorial regions becomes warm, and flowing away toward the poles, allows the cold water at the bottom to gradually rise to the surface and become warm, thus keeping up the continued circulation of the waters of the great oceans. The warmth of the water of the Red Sea is due to the influx of a warm surface current from the Indian Ocean through the shallow straight of Babelmandeb and the return of a denser salt current, from excessive evaporation, along the shallow bottom and out into the Indian Ocean, thus making the entire circulation of the Red Sea to be derived from the surface warm water of a tropical ocean, and isolated from the cold polar waters flowing at the bottom of the deep oceans. Its tropical location adds the full force of the solar heat to the warm water circulation, making it the warmest of all the arms of the great oceans.

(5698) W. F. W. writes: I want to light one or two rooms by a dynamo, driven by a water motor. 1. Suppose the dynamo will light six lamps of 10 candle power each and three of them should be turned off without change of current, will the other three be injured? A. Not if the dynamo is self-regulating to a sufficient extent. But a dynamo at fixed speed only works well at its true capacity. 2. Would not lamps of 16 candle power give an 8 or 10 candle power light and last longer with this current? A. Yes; they will last longer, but cost more to run. 3. How many hours ought a low resistance lamp to give a satisfactory light with a suitable current? A. 600 hours upward. 4. Are lamps of any value after having become exhausted? A. The platinum is worth something. 5. What size wire should I use for carrying the current, the farthest lamp being about 50 feet from the dynamo? A. It depends on the amperage of the lamps, which can be deduced from the voltage and candle power. These factors you do not state. 6. If the wire is insulated in the ordinary way, is it necessary to provide any additional insulation where it passes through wood or plaster? A. Not if gutta percha insulation is used. 7. Is there any simple method for determining the number of revolutions per minute of a water motor? I wish to find the velocity of a ½ horse power motor with a water pressure of 80 pounds. A. Attach a pencil near its center of rotation. Move a paper mounted on a board in front of and touching the pencil. Keep the board moving for ten seconds and count the circles. 8. About how many gallons of water would pass through such a motor per hour? A. About 1,500 gallons. 9. In experimenting with blue prints I find that a dilute solution of ammonia will give them a very fine purple tone, but they soon change to blue or grayish blue. Can you give me any method by which I can fix and make permanent any desired ammonia tone? A. You cannot make it permanent.

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January 2, 1894,

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Gear teeth, machine for generating beveled, G. B. Grant 512,189
Generator. See Electric generator.
Glass crimping machine, W. J. Wilkinson 512,078
Governor, cut-off, G. M. Hull 512,111
Grinding and polishing machine, Delano & Hardy 512,012
Grinding and polishing material, W. L. Kann 511,779
Guard. See Bicycle mud guard. Car safety guard. Snow guard.
Gun barrel pistol attachment, M. W. Fairbanks 511,940
Gun carriages, recoil check for wheeled, F. Mohr 512,120
Hame staple, C. D. Shrader 512,230
Hams, boning and manufacturing, W. E. Brendon 511,927
Hanger. See Door hanger. Pipe hanger.
Harrow and cultivator, combined sulky, T. J. Hubbell 512,110
Harvester, corn, G. H. Schanck 512,124
Harvester, corn, Van Buren & Davis 512,072
Harvesters, frame structure for self-binding, W. Butterfield 512,001
Harvesters, grain conveying device for self-binding, J. F. Steward 512,067
Hat pin, F. Drinkwater 511,762
Hawser and anchor chain fair-leader, A. McDougall 512,209
Hay loader, W. C. Card 512,096
Hay rake and loader, Giles & Maxwell 511,887
Heater. See Gas heater. Hot water heater. Water heater.
Heater, Kingman & Mosely 512,035
Heating apparatus, C. A. Burt 512,000
Heel nailing machine, Hill & Bailey 511,951
Hides or skins, machine for working, G. W. Baker 512,088
Hinge for rules and protractors, J. K. Love 512,199
Hinge for school seats, automatic, E. M. Dennis 511,881
Hoisting block, T. R. Ferrall 511,766
Hoisting machine, G. C. Murrey 512,258
Hoisting tackle, differential, W. Schermuly 511,863
Holdback, vehicle, C. Leiby 512,117
Holdback, vehicle, E. Marleau 512,041
Hoof trimmer, W. K. Fraley 511,885
Hook. See Display hook.
Horses' feet, artificial frog for, L. C. Tiffany 511,91
Horses from running away, device for preventing, N. Birtz 512,149
Horseshoe nail clincher, O. Seeliger 512,228
Horseshoes of aluminum, manufacturing, C. C. Jerome 511,777
Hose coupling, J. S. Blackburn 511,992
Hose mender, E. Kempshall 512,252
Hot water heater, C. T. Wiley 512,138
Hub band, J. Maris 511,783
Hydrocarbon burner, D. W. Cole 512,245
Ice cream mould and cutter, combined, P. Winter 512,080
Ice grooving machine, C. E. Buckley 512,153
Indicator. See Electric indicator. Elevator indicator. Engine indicator. Station indicator.
Indicator lock, J. M. Edgar 512,169
Insect powder distributer, C. H. Leggett 511,781
Insect powder distributer, H. G Schumacher 511,805
Insole, W. W. Glanville 511,942
Insulator, section, H. M. Brockbank 511,928
Iron. See Smoothing and pressing iron. Soldering iron.
Jack. See Lifting jack.
Jack, J. Barrett 511,923
Jack, R. J. Thompson 511,867
Jar. See Drill jar.
Journal bearing, roller, H. C. S. Lutz 511,963
Key. See Telegraph key.
Kiln. See Brick kiln.
Kitchen tool, combination, A. A. Cuddy 512,162
Knee protector, S. Heyn 511,842
Knitting machine, C. B. Sander 512,059
Lace fastener, A. Matchett 512,256
Lacing books to setting devices, machine for automatically feeding, J. J. Norwell 512,210
Ladder and truck, extension, S. M. Graumlich 512,190
Ladder, fire, D. B. McHenry 512,052
Ladder, sectional, H. H. Lang 511,849
Lamp, gas, M. Hicks 512,026
Lantern, bicycle, F. C. Weston 511,981
Lasting machine, T. O'Bolger 511,906
Lasting machine, E. S. Combs 511,835
Latch, S. N. Park 511,907
Lathing, metallic, G. A. Turnbull 511,823
Letter elevator, B. Waldstein 512,075
Lifter. See Transom lifter.
Lifting jack, I. Frank 511,767
Light circuits, regulator for continuous current arc, D. Higham 512,027
Linoleum cutting apparatus, D. N. Melvin 511,785
Lock. See Combination lock. Door lock. Indicator lock.
Locomotive, electric, E. M. Bentley 511,988
Locomotive for elevated tracks, electric, C. H. Roberts 511,862
Locomotive tender box lid, W. A. Stofer 512,236
Log hauling locomotive, H. J. Sullivan 511,975
Loom batten, T. Ebrenberg 512,171
Loom for weaving pile and other figured fabrics, Smith & Barlow 511,913
Loom harness evener mechanism, T. Ebrenberg 512,172
Loom jacquard mechanism, N. A. Woodhead 511,986
Loom pile wire, G. Segschneider 512,063
Low pressure alarm, F. L. Street 511,818
Mail marking machine, W. Barry 511,745
Match splint coiling or winding machine, F. Schafer 512,061
Match splint cutting machine, F. Schafer 512,062
Matrix moulding and drying apparatus, Post & Nevins 512,215
Mattress former and press, Stuart & Delp 512,129
Mechanical movement, I. S. Bryant 512,094
Medical case, W. T. Eastes 512,101
Metal post, tubular, W. Andrew 511,744
Metal tubes, apparatus for drawing, H. Lane 511,900
Metallic sheets, uniting, J. Gould, Jr 512,021
Meter. See Gas meter.
Middlings purifier, D. E. Burner 512,095
Milk can, C. E. Hinman 512,109
Mill. See Quartz mill. Sawmill.
Mining drill, E. P. Warner 511,860
Mitering machine, J. T. Criswell 511,935
Moistening and ventilating apparatus, air, E. Kleiner *et al* 511,897
Mould. See Carbon mould. Casting mould. Ice-cream mould. Stove lid or cover mould.
Mould, A. D. Jeffrey 511,893
Motor. See Electric motor.
Mower attachment, lawn, E. R. Coax 512,157
Mowing machine, H. J. Sykes 512,130
Nail set, C. F. Markley 512,119
Nickel from its oxides, extracting, J. Garnier 511,886
Nut locking device, J. R. Deisber 511,880
Nut, self-locking, W. E. Bunker 511,996
Nut wrench, F. A. Carrithers 512,007
Oil for vapor fuel, apparatus for atomizing petroleum, Edwards & De Neal 512,170
Ore pulverizer, gold saver, and mineral concentrator, B. J. Atterbury 511,871
Ores, cleaning and amalgamating, C. E. Seymour 511,864
Ores, method of and apparatus for the treatment of, G. M. Rice, Jr 511,800
Ores, process of and apparatus for roasting, C. W. Stickney 512,235
Pan. See Baking pan.
Paper box, G. A. Colgan 512,011
Paper cutting machine, C. Seybold 511,972
Paper, wrapping or toilet, S. Wheeler 511,983
Parchment fabrics, making vegetable, J. W. Hyatt 511,891
Partition, plaster board, G. W. Sessions 511,809
Piano, H. Muller 512,048
Piano mute, L. A. Bettendorf 511,747
Pianoforte action, H. N. Moore 512,206
Pin. See Hat pin.
Pipe coupling, lead, F. L. Decarie 511,937
Pipe hanger, E. G. Minnemeyer 512,257
Pipe testing apparatus, gas, W. P. Kesselring 511,848
Pipes, covering wire, etc., apparatus for manufacturing, A. Wylie 512,143
Plane, bench, Wright & Page 512,084
Plane, rabbeting, W. Beddows 512,147
Planter or fertilizer distributer, seed, J. R. Hunter 511,890
Planter, seed, G. H. Willetts 512,079
Plastic compound and making same, W. M. Dawson 511,879
Plating metallic surfaces with silver, composition of matter for, J. W. Skinner 511,810
Pliers, J. V. Ashcraft 512,086
Pneumatic brake, F. M. Speed 512,233
Pocketbook and satchel lock, combined, N. Emert 511,765
Post. See Metal post.
Power, electrical transmission of, N. Tesla 511,915
Precious metals out of their solutions, precipitating, C. Moldenhauer 512,046
Press. See Baling press. Cider press.
Press, E. Jordan 512,251
Printing machines, apparatus for cleaning the forms of rotary, E. H. Cottrell 511,934
Propeller, buoyant screw, A. W. Getchell 512,186
Propeller rail, canal boat, A. E. Schatz 511,911
Propeller, steering, S. Seaburg 511,808
Propelling apparatus, B. Bernstein 511,990
Propelling device, B. Bernstein 511,989
Propelling device, boat, J. F. Bliss 511,748
Pulley blocks, convertible bearing for screw, H. R. Towne 512,071
Pump and faucet, beer, Lowe & Guyser 511,962
Pump, oil can, H. F. & R. H. Roberts 512,220
Pumping engine, E. E. Clark 512,010
Push button, C. D. Hunking 511,953
Puzzle, B. Kern, Jr 511,895
Puzzle, C. A. Meadows 511,904
Quartz mill, T. C. McCleery 512,208
Radiator, T. Holland 511,843
Radiator, A. V. M. Sprague 512,234
Radiator loops, machine for milling and tapping, J. E. Bidwell 511,872
Radiator, steam, J. Walton 511,826
Rail brake, E. T. Wilson 512,140
Railway frog, W. C. Meeker 511,784
Railway signal, electrically controlled, F. McBrien 512,050, 512,051
Railway signal, electrically controlled, J. Wayland 512,077
Railway signaling, interlocking lever for, S. T. Dutton 511,884
Railway special work, street, W. C Wood 511,831
Railway switch, interlocking, J. Wrigley 511,921
Railway weed mower, F. J. Case 511,752
Raisin seeder, W. S. Scales 511,903
Rake. See Hay rake. Stock rake.
Razor, safety, E. Scharff 512,125
Reel. See Wire reel.
Refrigerating apparatus, J. J. Faulkner 512,175
Refrigerating apparatus, W. Mild 511,857
Register. See Fare register.
Regulator. See Electric current regulator.
Road making and repairing machine, M. G. Bunnell 511,997
Roads, streets, etc., and blocks therefor, constructing, J. S. Winter 511,870
Roadway and vehicle therefor, E. O. Evans 512,174
Rock drill, Buzzo & Thompson 512,154
Rock drill tripod, Douglass & Sypher 512,016
Rolling mills, automatic stop for, T. Morrison 512,207
Roofing, L. H. Montross 511,859
Roofing, sheet metal, W. T. Holzbach 511,775
Rope hauling machine, W. B. Lautz 512,040
Rotary engine, F. B. Merrill 511,964
Roundabout, W. G. Schafbirt 511,910
Saccharine solutions, purification and decoloration of, Vander Weyde & Lugo 512,133
Safe, E. N. Gower, Jr 512,022
Sawmill, band, J. Harley 512,107
Sawmill dog, J. H. Miner 511,858
Sawmills, variable frictional feed for, W. E. Dillard 512,099
Scale, automatic weighing, L. Wommer 512,082
Scale, letter weighing, R. A. Dunning 512,168
Scale, platform, L. Wommer 512,081
Screen. See Fly screen.
Scriber, curve, H. Harrer 511,772
Screw head slotter, G. E. Witherell 511,850
Screw making machine, D. H. Church 512,156
Screw making machine, J. Steiner 511,817
Seams upon metal sheets, tool for forming lock, C. E. Eckel 511,764
Seat. See Car seat. Wagon seat.
Seat, M. Miles 512,204
Secondary battery, W. C. Lockwood 512,253
Seeder, C. F. Search 511,807
Sewing looped fabrics, machine for, D. Maus 511,856
Sewing machine, J. L. Follett 512,105
Sewing machine fabric folding attachment, M. Tobener 511,977
Sewing machine presser foot mechanism, H. A. Dodge *et al* 512,014
Sewing machine thread gripping device, W. A. Mack 512,255
Shingle, metal roofing, L. Goodrich 512,188
Shovel, C. Tanner 512,238
Sieve scalper, G. L. Jarrett 511,847
Signal. See Railway signal.
Slat fastener, C. I. J. Barker 511,922
Slate dressing machine, S. D. Van Pelt 512,134
Sled, A. Rogers 512,123
Sleigh, D. R. McLaren 512,259
Smoke-abating furnace, T. M. Gallagher 512,183
Smoke conveyer, K. M. Stahl 511,813
Smoothing and pressing iron, J. Jensen 512,032
Snow guard, G. F. Folsom 512,178, 512,179
Sodawater fountain for the distribution of, W. H. Ricker 512,058
Soldering iron, self-heating, W. Ross 511,802
Spark arrester and ejector, combined, T. E. Austin 512,145
Spinning fibrous materials, apparatus for, N. Cupers 511,878
Sprinkler. See Automatic sprinkler.
Sprinkler, O. C. Retsloff 511,799
Square, self-registering try, G. A. Bates 511,746
Stamping and punching machine, J. Casey 512,097
Stand. See Switch stand.
Station indicator, C. M. Kiler 512,034
Stay, dress, J. Janowitz 512,113
Stay pocket, dress, G. Kendrick 511,958
Steam engine, B. Jackson 511,954
Steam engine, direct-acting, D. F. Nisbet 511,905
Steam engine, triple-cylinder, N. J. Tubbs 511,868
Steam trap, E. H. Gold 511,943
Stock rake, A. Fiscus 512,176
Stone crusher, M. G. Bunnell 511,998
Stone cutting saw, O. W. Norcross 511,965
Stone setting band, C. Betsch 512,093
Stool, milking, T. McMonagle 512,260
Stopper. See Bottle stopper.
Storage battery system of distribution, J. Trumpy 511,821, 511,822
Stove lid or cover mould, F. Kaempen 512,195
Stove or heater, gas, Rogers & Jones 512,222
Strainer, D. B. Gotham 511,770
Street sweeper, M. Crawford, Jr 512,161
Sugar, manufacturing, O. Lugo 512,200
(Surgical.) Appliance for treatment of the uterus, F. W. Haviland 512,024
Suspending device, C. M. Pitel 511,795, 511,967
Switch. See Electric switch. Railway switch.
Switch stand and switch operating mechanism, J. H. Quimby 512,216
Syringe, fountain, H. B. Nickerson 511,790
Tablet for physicians, etc., continuous C. N. Leonard 511,854
Tags, cards, etc., device for counting and separating, C. E. Sawyer 512,060
Telegraph key, self-closing, H. E. Moss 511,787
Telephone exchange system, R. Callender 511,874, 511,875
Telephone registering apparatus, A. R. Duperu 511,883
Telephone transmitter, S. C. Drew 511,882
Telephonic and multiple telegraphic transmission, composite, F. A. Pickernell 512,214
Tetranitro-anthrachrysone, H. L. Laubmann 511,901
Thrashing machine, W. S. Miller 511,786
Tie plate, H. W. Foote 512,180
Timepiece escapement, J. W. Nunamaker 512,054
Tin from tin plate scrap, removing, H. L. Hollis 511,774
Tin from tin scrap, etc., removing, T. G. Hunter 511,846
Tire, bicycle, F Wiechard 511,827
Tire for bicycles, pneumatic, A. J. Burns 511,999
Tire, pneumatic, G. H. Chinnock 512,243
Tire, pneumatic, E. M. Graham 511,771
Tire, rubber, W. Langmuir 511,850
Tobacco cutter, D. B. Conway 511,753
Tobacco, machine for making plug, J. F. Woolridge 511,832
Toothpowder box, W. A. Spalding 512,065
Transom lifter, D. B. Hilton 512,028
Transplanter, Starks & Johnson 511,814
Trap. See Fly trap. Steam trap.
Trimmer. See Hoof trimmer. Wick trimmer.
Triturating and emulsifying machine, W. B. Cowan 511,755
Trolley, W. F. Duncker 511,763
Trolley catcher, Gay & Parsons 511,941
Trolley mechanism for electrically propelled vehicles, C. H. Veeder 511,824
Trolley wire support, C. T. Lee 511,853
Trolley wire switch, overhead, G. W. Mackenzie *et al* 512,201
Trough. See Conveyer trough.
Trousers, S. Rachelman 511,797
Truck, G. Philion 511,793
Trunk, M. M. Secor 511,808
Tunnels, method of and apparatus for driving, P. Kraus 512,037
Turret tool machine, G. E. Witherell 511,829
Typewriter copyholder, E. P. Peacock 512,212
Typewriting machine, E. S. Shimer 511,912, 512,064
Typewriting machine, dummy, W. P. Cosper 511,754
Valve gear, steam engine, J. Dahlstrom 511,836
Valve, hydraulic pressure reducing, W. H. Wood 512,142
Valve mechanism for compound engines, E. W. Harden 512,192
Valve mechanism for water heaters, automatic gas, J. Winterflood 512,141
Valve, triple, W. C. Whitacre 512,241
Valves, machine for reaming and tapping, L. D. Castle 512,155
Vehicle body, C. H. Vorhes 511,825
Vehicle brake, D. Haven 512,249
Vehicle top, C. Rugger 511,909
Velocipede shaft bearing, F. P. Crosby 511,877
Vending apparatus, G. W. Sherman 511,865
Veneers and apparatus therefor, manufacture of, G. A. Oncken 512,211
Vessels, method of and means for closing, T. Klinghammer 512,036
Wagon brake, A. T. Newell 511,861
Wagon seat, C. C. Field 512,018
Waistband for trousers, H. J. Lyon 512,254
Warping machine electric stop-motion, C. Denn *et al* 512,013
Washboard, J. H. Taylor 511,914
Washboiler, A. D. Weiss 511,979
Watch dial, W. B. Learned 511,852
Watch dials, machine for enameling the faces of, F. W. Wetherbee 512,136
Water cooler and refrigerator, F. R. Beal 511,834
Water heater, J. T. Hanrahan 512,191
Water purifier and heater, J. A. Warthen 512,076
Water tube boiler, H. S. Pell 512,213
Well apparatus, artesian, J. Barrett 511,924
Well drilling machine, A. Cameron 512,003
Wheel. See Wind wheel.
Wheel making machine, L. J. Crecelius 511,876
Wheel of fortune, coin-controlled, Lichty & Kennedy 512,118
Whiffletree plate, H. K. Porter 511,796
Whip, M. O. Felker 511,838
Whip, Stimer & Moore 511,816
Wick trimmer, J. W. Lawson 511,902
Wind engine, T. Rogers 511,969
Wind wheel, F. Dalstrom 512,164
Wiper and oiler for piston and brake rods, H. R. Devine 512,166
Wire covering machine, W. H. Avis 512,146
Wire reel, P. Hauck 512,023
Wood embossing machine, F. Berner, Jr 511,926
Wood shredding machine, G. P. Johnson 511,778
Wrapper holder, R. E. Glasgow 512,019
Wrench. See Nut wrench.
Wrench, H. Cooper 512,159
Yoke, neck, M. L. Rogers 511,908

TRADE MARKS.

Anodyne and antipyretics, Phena Tro Cine Chemtcal Company 23,985
Antidotes for uric acid diathesis, A. Stern 23,981
Beer, lager, G. W. Wiedenmayer 23,970
Blacking, shoe, Jas. S. Mason Company 23,993
Blood purifying tea, liniment, salve, and cough sirup, H. H. Hackendahl 23,986
Borax, F. M. Smith 23,980
Bronchial wafers, troches, and lozenges, Stone Medicine Company 23,987
Bronzing liquid or gold paint, King & Rose 23,994
Clippers, hair and wool, American Shearer Manufacturing Company 23,953
Flour, wheat, Minneapolis Trust Company 23,975
Foods for children and invalids, prepared, Imperial Granum Company 23,971
Furniture consisting of beds, bureaus, buffets, chiffoniers, etc., D. Froehlich 23,952
Goods containing wool, worsted, or hair, piece, B. Priestley & Company 23,962
Goods in which silk predominates, piece, B. Priestley & Company 23,963, 23,991
Gum, chewing, W. R. Betham 23,978
Hair tonic, L. P. Federmeyer 23,979
Hose, belting, and packing, Bowers Rubber Company ..... 23,956 to 23,960
Matches, Oshkosh Match Works 23,995
Meat juices and iron, prepared, Frederick Stearns & Company 23,992
Medical compound for use as a tonic, Tilden Company 23,982
Medicine, blood, liver, kidney, and stomach, F. A. Stutz 23,988
Medicines, line of proprietary, A. F. Sawhill 23,984
Oil, lubricating, Galena Oil Works ..... 23,965 to 23,968
Oils, essential, H. G. Hotchkiss 23,964
Packing, belting, and hose, Bowers Rubber Company 23,961
Pastry and confectionery, coloring fluids for, Phœnix Extract Company 23,973
Pastry, buns, cakes, and icing, coloring for, Eggoline Manufacturing Company 23,974
Printed periodicals, North Shore News Company 23,990
Radiator attachments, such as shelves and brackets, A. J. Bennett 23,955
Remedies for constipation and diseases of the liver and kidneys, E. A. Butts Company 23,983
Remedies for dyspepsia, indigestion, and diphtheria, R. W. Johnson 23,998, 23,999
Remedies for rheumatism, neuralgia, and lumbago, S. Klein 23,997
Remedy for the headache, N. C. Young 23,989
Sorghum, Cincinnati Sirup and Molasses Company 23,972
Tires, pneumatic, North British Rubber Company 23,996
Toilet preparations, perfumed, Lecaron et Fils 23,977
Velocipedes, Eagle Bicycle Manufacturing Company 23,954
Whisky, J. H. Walsh & Company 23,969

DESIGNS.

Casket, L. K. Smedes 22,995
Chair, A. Thonet 22,988
Fringe, F. H. Caven 23,000, 23,001
Lamp shade, Curtis & Donnally 22,996
Spoon, R. Turner 22,994
Table leg, L. Welker 22,997
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