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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 This is for our information and not for publication.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.

Inquirles 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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Winerals sent for examination should be distinctly marked or labeled.

(5268) W. P. M. says: I am making a watertube boiler on the porcupine plan. Is there any objection to using pipe for the porcupine as small as half an inch, where the pipes will be two feet long? A. Half inch tubes, 2 feet in length, are too small for a porcupine boiler; the circulation will be sluggish and cause the boiler to lift its water by the accumulation of steam in the small tubes, so fast as to push the water out. The fouling of small tubes is also an objection. Not less than 1 inch tubes should be used, with as large standpipe as possible; will mak the best working boiler. 2. As regarda speed, are hollow or straight water lines desirable for a steamboat? A. The concave bow and stern water lines or wave lines are the lines for speed. 3. I am using in my launch an oil-burning boller. Oil is fed to boller by steam, which is very objectionable for many things, especially noise. Can you tell me a simple way to make a vaporizer so that I can burn oil in the form of vapor instead of spray? A. There is no method of burning oil under a boller better or safer than the jet spray, either air or steam. The air jet makes the clean t fire, but the combined steam and air jet is most convenient and in general use. The steam and air jet has not been considered objectionable when properly regulated; perhaps your st am nozzle is too large and carries too little air into the fire chamber: try a smaller steam nozzle combined with an annular air nozzle for the atomizer.

(5269) N. L. T. writes: 1. In an alternating transformer what will be the relative amperage and E. M. F. of current in the secondary coil as compared to that of the primary, supposing both coils being of the same length and size of wire and both wound alik npon au iron ring or continuous core? A. The relative voltage of primary and secondary is in the ratio of the number of turns of wire in the same. The same number of turns gives the same voltage. There will be a loss in amperage in this case of about 10 per cent. 2. In what ratio does the increase of the frequency of alternations in the primary increase the E. M. F. or tension of the induced current? A. There is no connection. 8. Will a resistance in the secondary circuit have the same effect upon sistance in the secondary circuit have the same effect upon the primary current as if the same resistance were placed in the primary circuit? A. It will have what is practically the same effect by developing counter E.M.F.

4. Will you please explain in an analogous way the meaning of the expression self-induction and capacity?

A. Self-induction is electric inertis. A current requires time to be fully started and time to cease. Capacity refers to the quantity of charge retainable at a given pressure (voltage). This is analogous to storing compressed air. 5. Can you mention any substance transparent to

heat or light waves, or to both, and having some electrical conducting power and which will retain the solid form or withstand beat up to say 200° Fah.! A. There is no such substance. The general rule is that conductors of electricity are not capable of transmitting light waves.

(5270) W. H. F. says: 1. I wish to nake a compaes 12 inches long; can I use a commonhorse shoe magnet to magnetize the needle, and bow should I draw the needle on the magnet? A. Stroke it from end to end. always in the same direction, with one pole of the magnet, returning the magnet through the air. 2. want to make a helix to magnetize a % steel bar, 5 inches long; what number wire must I use and how many layers on the helix, and how many gravity batteries should be used, and how must the bar be fastened in the helix? A. No. 20 wire is a convenient size. There are no fixed dimensions. Gravity batteries are of rather high resistance. The wire may be wound directly on the bar. S. I have a zinc box in a case 12 inches deep. 1016 inches diameter, 214 inches wide, and carbon for same. What preparation can I use for a dry battery of same? A. For dry batteries we referyou to our SUPPLE-MENT, Nos. 157, 787, and 792. 4. A few days ago a consin of mine photographed a kite. In the negative are four perfect kites. A. We should like to see print from the negative. No judgment can be given without this.

(5271) N. L. M. asks how to preserve bird skins. A. Make an incision from the breastbone to the vent with a small piece of wood work the skin from the flesh. When the leg is reached, cut through the knee joint and clear the shank as far as possible, then wind a bit of cotton wool on which some arsenical soap has been pnt round the bone; do the same with the other leg. Now divide spine from root of tail, taking care not to cut too near the tail feathers, or they will comeout. Next skin the wings are far as possible and cut off. The skin will now be entirely clear of the body. The skin must now be turned inside out and the neck and skin gently pulled in opposite directions till the eyeballs are fully exposed. The whole of the back of the head may be cut off and the eyes and brains taken out and their places filled with cotton wool. The whole skiu should be rabbed well with arsenical soap or plain arsenic, and the neck returned to its natural position, when, after filling the body with a little dry grass or wool, the job is done. It is very easy, and the skin of a bird la much tougher than one would suppose, though of course they vary, the night jar being very thin, while humming birds are fairly tough. All the apparatus required is a sharp knife and nair of scissors, or, for large birds, a strong pair of nippers to divide the bones. From the "Scientific American Cyclopedia of Receipts, Notes and Queries."

(5272) W. L. C. writes: To settle a dispute between myself, a city editor, and a learned gentle man, I wish you would answer this: Is the Pacific Ocean along the coas from Lower California to Puget Sound rougher sea, harder to sail on, and more liable to angre waves than the eastern or Atlantic coas of the United States? Ifeo, why? Are the California, Oregon, and Washington ports harder to enter by reason of rough sea than from Maine to Florida? A. The prevailing winds along the Pacific coae of the United States are westerly or on shore winds, while the prevailing winds on the eastern coast are also westerly, or off shore winds. An on-shore prevailing wind makes a rough sea along a coast and at the entrance of harbors, especially so where there are bare at the entrance. Anoff-shore wind insures a comparatively smoothsea along a coast and easy access to harbors. The storm winds temporarily change this condition, but it is the prevailing winds that give the peculiar character o the two coasts as regards the roughness of the sea and the difficulty of navigation along the coasts and entrance to shallow harbors. The month of the Columbia with its bare is a noted example on the Pacific coast.

(5273) D. H. asks how to clean ornanental bronze door knobs and plates, light finish, also how to keep them bright. An The finish of this class of workla done by dipping in strong nitric acid or componnds of dipping acids, then washed in clean hot water and dried. The bright parts are then burnished and the articles lacquered with various colored lacquers for the required shade. Such work should never be cleaned; it destroys the lacquer coat and the recesses of the ornamentation become foul. It should be sent to a finisher of such work for renewal of the lacquered surface

(5274) A. A. P.-To smooth parchment which has become wrinkled, place the parchment face downward upon clean blotting paper. Beat up to a clear froth, with a few drops of clove oil, the whites of sevral fresh eggs, and with the fingers spread this over the back of the sheet and rub it in until the parchment becomes smooth and yielding. Then spread it ont as smooth as possible, cover with oil silk and press for a day. Thenremove the silk and cover with a linen cloth and press with a warm iron.

(5275) L. D. S. asks how to make the tin toet. A. 1. Chloride tin, 3 drm. 2. Nitric acid, 10 8. 8. Piece of zinc attached to copperwire. Put No.1 into a glass vessel with sufficient water to 8 parts fill, then INDEX OF INVENTIONS add No. 2, chake well until dissolved. Now place No. 8 through a cork and insert in solution, so that no part shall touch top, bottom or side of glass vessal. Let the whole rest quietly for a short time. The tree will grow and have a very lustrons appearance.

(5276) J M H asks where the worms we see on sidewalks after a rain come from. I have heard it stated that they fall with the rain, but to my ears that explanation seems hardly plausible. Are there any well anthenticated accounts of rains of froge, etc. ? A. The worms and frogs or toads come from their holes or hiding places in the soil during rain, either driven out by the water filling their holes, or perhaps for a bath. There are no anthentic accounts of the falling of worms.

was simply accidental, as it was undoubtedly attracted to the room by light.

(5278) F. K. J. asks: How can I get the rust outof wrought iron water pipes? They are in the ground about four years, and the water runs through them about half as strong as at first. A. The pipe can-not be cleaned while in the ground; it must be taken up and the rust cleaned out with an iron rod, or lay new galvanized iron pipe, which does not rust.

(5279) R. L. S.—About 166 feet of gas can be made from a gallon of gasoline?

(5280) F. A. K. writes: Please settle a dispute by answering the following in your Notes and Queries: A holds that when a person in Australia or any other place south of the equator is looking at the sun at noon he will be facing north; or in other words, the north side of the street is the shady side at noon. B holds that sun is always south of a person at noon, no matter what part of the earth he is on. Who is right? A. A is partially right and B is wrong. To a person south of the tropic of Capricorn, or in southern Australia, the sun is always north of his zenith and casts his shadow to the sonth; and if he is north of the tropic of Cancer, the sun is always south, and casts his shadow toward the north at noon. To a person within the tropics the sun's shadow may be north or south, according to the sun's declination from his zenith.

(52 1) C. K. asks: How long will it take a storage battery current to decompose a pint of water into its gases? How many volts are required to separate it in five minutes? What is the most convenlent form of apparatus to do this work? A. To decompose water it is well to allow two volts difference of potential. An ampere for five minutes is 800 coulombs. which will decompose 0.86 grain of water. The number of cells required to decompose a pint of water must be deduced from their amperage as given by the makers of the cell. For apparatus use copper or iron electrodes and a dilute solution of caustic alkali as electrolyte.

(5282) W. H. C. says: Will you please explain the way that nails are graded, just what is meant by a tenpenny, a ninepenny nail, also what us the relationbetween the length and name of nall? A. We give the name, size, and weight of nalls as follows:

25 in. long	420 per lb.
1.8 " "	270 " "
1.75 " "	220 '" "
2. " "	175 " "
2.5 " "	100 " "
8 "	65 ""
3.25 " "	52 " "
8.5 " "	28 " "
	1.8 " "

The lengths are standard for all kinds, but the num to a pound varies with different makers and for the different kinds, as ordinary, light, and finishing nails.

(5283) W. L. R. says: We have a horizontal tubular boiler 10 feet long, 36 inches in diameter, with 30 fines 3 inches in diameter. Also a 20 hors power engine, 9×12 cylinder, making 200 revolutions per minute. How many pounds pressure of steam are ne essary to develop the full 20 horse power? A. The boller is nominally 20 horse power. Its effective horse power may be much larger with high pressure. Therequired boiler pressure for 20 indicated horse power of the engine will begoverned by the point of cut-off, which if 1/2 will require 45 pounds boiler pressure. If 1/2 cut-off 40 pounds pressure. If 1/2 cut-off, 35 pounds pressure.

(5284) R. S. asks: If there are fifty incandescent lamps connected up in series, voltage 110, amperes 6-10 for each, resistance in ohms 168 for each lamp, will the last lamp burn as bright as the first one and what is the cause? A. Yes: Decause each passes the same current. The current effects the heating of the

(5285) P. H. H. writes: I have two ammeters, and when I connect them together they do no register the same. Is there any way of adjusting them without having a standard instrument to go by? A. If you can secure an absolutely constant current, then you can determine its amperage by a silver ampere-meter The method, a very simple one, is given in Ayrton's "Practical Electricity," which we can supply for \$9.50. Such a current can be used to standardize your am-

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For which Letters Patent of the United States were Granted

August 8, 1893,

AND EACH BEABING THAT DATE. [See note at end of listabout copies of these Patents.]

آ	Barrel hooping machinery, R. Welch	608,021
Į	Barrel hooping machinery, R. Welch Barrels, etc., manufacture of metal, D. Caird. Batlet7. See Secondary battery. Bearing, vehicle wheel ball. E. A. Jones. Belt, electric, D. P. Andrus. Belt, electric, D. P. Andrus. Bett, electric, D. P. Andrus. Bett, electric, D. P. Andrus. Betting, K. Kachier. Bicycle, O. Schnitedel. Bicycle stachment. T. K. S. McGriff. Bicycle stachment. T. K. S. McGriff. Bicycle stachment. T. K. S. McGriff. Bicycle prace, O. B. Burns. Bicycle prace, O. B. Burns. Bicycles, changeable speed device for, W. B. Wan. Bicycles, changeable speed device for, W. B. Biower, rotary, E. P. Reichhelm. Boller. See Steam boller. Boller furgace, steam, G. H. Watson. Bottle filling apparatus, J. Jackson. Bottle filling apparatus, Bielel. Box. See Paper box. Telescopic box. Tobaccu and Packing box. Fracket. See Dental bracket.	6037846
١,	Bearing, venicle wheel oan, E. A. Jones	502,798
1	Beit, electric, J. F. Rudus	502,778 607,978
	Bicycle, O. Schuledel. Bicycle attachment T. K. S. McGriv.	502,866 503,668
١	Bicycle brake, O. B. Burns	502,949 602,803
1	Bleycles, changeable speed device for, W. B.	602,916
.	Blower, rotary, E. P. Reichhelm Boiler. See Steam poiler.	602,890
'	Boiler furnace, eteam, G. H. Watson. Boilt. See Stay boilt. Thill coupling boilt.	603, T96
.	Bottle filling apparatus, J. Jackson	602,969
1	Boutonniere, H. W. Flahel	602,856
	and Dacking box. Bracket. See Dental bracket. Brake. See Bicycle brake. Car brake. Veloci-	
,	Brake. See Bicycle brake. Car brake, Veloci- pede braka.	
. -	Brick profestor, N. Olson	602,987 602,738
:	Bridge gate, A. Kohler	602,276 602,779
	Broom holder, C. N. Addison Buckle, F. W. Swigart	602,048 602,787
•	Button, sleeve or collar. T. W. F. Smitten	502,834 502,834
9	Can filling machine, J. Baker	508,030 509 907
7	Can dy moulding apparatus, E. Bosenberger	602,864 502,760
-	Car brake, J. W. Schoaf	508,007 608,027
'	Car coupling, J. Fischer Car compling, J. M. Henderson	602,771 603,082
ե	Car coupling, J. Machenheimer, Sr	502,068 503,745
ľ	Car coupling, W.T. Van Dorn Car funder, M.F. Field	603,017 603,969
-	Car fender and brake, combined, F. W. Smith, Car, passenger, H. W. Libbie	502,908
-	Car replacer, J. H. Blomanield. Car ventilating apparatus, C. Knapp.	502,927
-	Car window ventilator, rallway, G. L. Thomas	602,919
r	Carburetor, E. A. Smith.	602.777 602.107
е	Cartridge, F. Mohr	603,098 602,885
f	Centrifugal machine, Lister & Pedersen	002,859
В	and Packing box. Brake. See Bental bracket. Brake. See Bilcycle brake. Car brake, Velocipede braka. Brick profestor, N. Olson. Bridge gate, A. Kohler Bridge gate, A. Kohler Broom holder, C. N. Addison Buckle, F. W. Swigart. Burial apparatus, I. S. May Button, sleeve or collar. T. W. F. Smitten. Cam era. See Photographic camera. Can fling machine, J. Baker. Can bolder, A. L. Whittemore. Can ony mulcing apparatus, E. Rosenberger. Can ony mulcing apparatus, E. Rosenberger. Car brake, J. W. Schoaf. Car brake, J. W. Schoaf. Car brake, J. W. Schoaf. Car counting, J. Fischer. Car counting, J. Fischer. Car counting, J. Fischer. Car counting, J. Fischer. Car counting, J. T. Van Dorn. Car funder, M. F. Field. Car funder, M. F. Field. Car funder, M. F. Field. Car ventilating apparatus, C. Knapp. Car ventilating apparatus, C. Knapp. Car ventilator, J. Hankin. Car window ventilator, rallway, G. L. Thomas. Cars. rotary lipple for dump, I. Barker. Carburetor, E. A. Smith. Carbertage, F. Mohr. Cash register and indicator, J. T. Greene. Centritugal machine, Lister & Pedersen. Chair. See Window chair. Cash register and indicator, J. T. Greene. Centritugal machine, Lister & Pedersen. Chair. See Window chair. Chair. See Window chair. Chill, oscillatory, R. A. Poile. Clock, self-winding electric F. M. Schmidt. College, J. M. Philipe Contents of the storage of, Thil coupling. Thil coupling. Contents of the storage of, Culting, M. R. Moss. Culting, M. R. Moss. Culting, M. R. Moss. Culting, M. R. Moss.	602,994 602,901
9	Clear pipe, Phillips & Linhard Creuit closer, A. J. Ochring	602,992 502,749
t	Clock, electric alarm, W. H. Deane	502,889 502,811
e	Clock, self-winding electric F. M. Schmidt	502,903 502,903
•	Clutch, W. H. Lindsay	502,732
	Coal, grain, etc., pocket or bin for the storage of,	603.097
	Coating ith aluminum or alloys thereof, E. C. Broadwell	602,070
	Coin-assorting apparatus, A. R. Gunther Coin-controlled apparatus, G. F. W. Schultze	602,716 603,891
	Condensing apparatus, N. A. Christensen	502,923 502,039
	Copy holder, J. M. Phillips. Coupling. See Car coupling. Shaft coupling.	002,991
	Coupling of counection, E. P. Warner	502,794
e e	Culinary utensil, J. H. Norton	608.748 604.967
•	Current motor, L. C. Neal. Current motors, regulation of alternating, M. Von	502,981
-	Dolivo-Debrowolsky Curtain fixture, G. A. Crisson	. 608,089 503,087
,	Thill coupling. Compling roof comection, E. P. Warner. Cover, sap bucket, M. R. Moss. Cullnary utensil, J. H. Norton. Cultivator, H. P. Erb. Current motor, L. C. Neal. Current motors, regulation of alternating, M. Von Dolivo-Debrowolsty. Curtain fixture, G. A. Urisson. Curtsin fixture, G. A. Urisson. Curtsin fixture hanger, W. Martin. Cutter. See Rotary cutter, Denatal bracket, E. R. Pettit. Dice-tbrowing machine, coin-con rolled, W. Cahoog, Jr.	800,500
e	Dentalbracket, E. R. Pettit. Dice-throw ng machine, coin-con rolled, W. Cahogo, Jr. Dicebrow ng machine, coin-con rolled, W. Cahogo, Jr. Digger, Bee Potato digger, Displaying stand, carpet, C. Haffemeyer, Ditching machine, T. P. Coucaanon Door cheek, pneumatic, J. W. Wetmore, Door hanger, G. A. Colton Dredging machine, W. B. Pless. Drier, See Clothes drier, Dr Ill. See Grain drill. Drilling machine attachment, J. J. Stevens. Drium, heating, R. Pugh Dust collector, A. P. Gould. Dye, blue alizarin, R. E. Schmidt. Raring, J. Wodiska. Rarth boring and drilling machine, W. E. Everiti Eaves trough, J. Wock. Electric current gene ator, alternating, Sheldon & Booney. Electric generator regulator, E. Thombon Electric generator regulator, E. Thombon Electric switch, J. H. McEvoy Electric switch, J. H. McEvoy Electrode for firing explosives, J. N. & H. J. Harrison	. vuii 1858 272 (11)
-	Digger, See Potato digger. Intelligent stand carnet C. Haffennever	602 778
e	Ditching machine, T. P. Coucannon. Door check, preumatic J. W. Welmore.	602.641
-	Door hanger, G. A. Colton Dredging machine, W. B. Pless.	602,934
f	Drier. See Clothes drier. Dr ll. See Grain drill.	
E,	Drilling machine attachment, J. J. Stevens Drum, heating, R. Pugh	502,999
	Dye, bl ck are, Poirrier & Resenstiehl	502,912
y	Rarring, J. Wodisks. Rarrin horing and drilling machine. W. E. Roost	102.001
), L	Raves trough, J. Wock.	502,800 502,752
5, 21	Electric curr ent gene ator, alternating, Sheldon & Rooney.	502.777
ė	Electric generator regulator, E. Thomson Electric lighting system, C. C. Chesney	502,788 502,702
e	Electric switch, J. H. McEvoy Electric switch, L. Morse. Electrode for firing explosives, J. N. & H. J. Har-	502,983 502,826
	Ployeton Coo Wednesdie clounton Guelon acid	-
ı- ot	elevator, the inverting device the 1 inch	FU6 000
n	elevator. Dee Hydraine elevator. Sudar ros elevator gate operating device, Shaw & Lorio Flevator guard, O. L. Davis Rosine. Bee Expansion engine. Sotary engine. Steam engine. Traction engine. Wild en-	502,965
ď	Steam engine. Traction engine. Wind en-	
r.	Engine operated by the explosion of mixtures of gas or hydrocarbon vapor and air, H. A.	
18	Stuart. Engines, driving connection for compound, H. D.	609,837

gate.

Generator. See Electric current generator.

Steam generator.