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Notes & Queries

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 This is for our information and not for publication.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 bea 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.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

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Minerals sent for examination should be distinctly marked or labeled.

(5231) A. J. D. says: I have a lot of small steel and iron strips which I wish to plate with tin by dipping in the molten metal. I use the following process, but am only partially successful: Allow the strips to remain in a strong solution of sulphuric acid for a few minutes, to remove grease, scale, etc., then rinse in clear water, and dip in a solution of muriate of ammonia, for a flux. The tin adheres very well, but remains lumpy and uneven. Will you please inform me wherein the trouble lies and how I can remedy it? A. We advise a partial polishing of the articles after the scale has been removed. Then dip in hot strong caustic soda water to clean. Wash in hot water, and dip in muriate of zinc and ammonia.

(5232) F. O. J. says: There is a bad echo in the Baptist church here. The audience room is 38×50 feet inside, with a ceiling 21 feet from the floor. About 4 feet of the sides and 6 feet of the ceiling is taken up by a rounding corner, so that the ceiling proper is only 26×38. The pulpit is at one end of the room and slightly raised. Can this echo be destroyed by stringing wi es near the ceiling? If so, kindly indicate the manner. Can wire fine enough to be practically invisible be used? A. The hanging of wires and wire netting closely to ceilings and walls is said to entirely prevent echo. Such arrangement cannot be made invisible, but may be so arranged with fine wire netting put up in panels with rosettes or moulding stripe as to be ornamental.

(5233) J. R. M. says: Please inform me through your column of Notes and Queries if there is any use for hardened copper or brass in the arts or sciences. Enough call that is to make it worth one's while to work for it? A. There is an increasing demand for hard copper and brass. The Eureka Tempered Copper Co., Northeast, Pa., are now making hardened copper. There is plenty of room for new efforts in the production of hard copper and brass for frictional purposes.

(5234) T. C. B. asks: What amount of power can be gained from 1 inch of water running from a reservoir or barrel of 50 gallons capacity with a pressure of 6 feet? And what wheel is the best and most powerful, in this case? A. If a miner's inch is the measure, you will have $\frac{11}{1000}$ of a horse power under 6 feet head and the 50 gallons would last about 4½ minutes. A small impact wheel of the Pelton type would give the best economy.

(5235) G. B. says: I have a friend that has a small shop thoroughly equipped for manufacturing small machinery. He has hard struggling to get enough to do, yet is a good workman. I thought if you could tell me how I could make small cheap fans that could be regulated in speed and operated by a battery, that could be easily attached to the head of a bedstead or any part of a room, and the battery and fan could be made and sold for about $1 or $1.50, I think he could obtain sufficient orders to help him out. Or is there anything you would be willing to suggest? A. Fans such as you describe are made by electrical goods manufacturers and largely in use. Doubtful if your friend can make them for twice the figure you name. He might buy one and make a trial. We cannot suggest what would be best to manufacture. Knowledge of what is on the market and prices is necessary as a preliminary to selection.

(5236) E. L. asks: What percentage of nourishment or nutriment is there in rice of the best quality? A. The analysis of rice is given as follows:

Nitrogenous matter	6·94
Fat	0·51
Starch	77·61
Woody fiber	0·09
Ash	0·45
Water	14·41
Total nutriment	85·06

(5237) G. P. asks: Will you please inform me of a good preparation to put on knives, guns, etc., to prevent them from rusting? I have several fine instruments that I find are hard to keep from rusting. I have given several preparations a trial, but find them ineffective. Please inform me of a good preparation. A. We find nothing better than wiping the instruments often with a cloth and vaseline.

(5238) D. S. P. asks: What is the usual pressure per square inch in the boilers of the three following engines: The decapod on the U. P. R.R., the ordinary eight-wheeled American passenger engine, and the engine on the New York Elevated Railroad. A. The engines drawing the high speed trains on our principle railways are now carrying from 150 to 175 pounds pressure per square inch. The elevated road engines run with varying pressure from 100 to 125 pounds.

(5239) R. I. W. asks: Would it not do to wind both the armature and field magnets of motor described in "Experimental Science," pages 497 to 509, with No. 18 silk-covered copper wire? A. Yes.

(5240) E. H. J., Mich., says: A few years ago, large flights of wild pigeons were to be seen, in the spring and autumn, in almost all of the Northern States. For nearly fifteen years, few flocks of these birds have been seen in the central or southern part of Michigan, and I have been informed that few are now seen anywhere in their old places of resort. Will some of your readers tell us what has become of these birds, which once far excelled in number every other species in America? A. The advance in population, the destruction of our forests and the indiscriminate slaughter of the pigeons during their roosting season is no doubt the cause of their scarcity at the present time.

(5241) O. C. W. asks: Can you suggest a way of painting or otherwise making opaque one-half of a lantern globe so that that part of the globe will act as a reflector? A. A reflector can be made on the outside surface of one-half of the lantern globe by depositing a coating of silver from its solution, as is largely used in silvering looking glasses. The process is a rather delicate one and described at length on pages 502 and 503, in the "Scientific American Cyclopedia of Receipts," $5, mailed.

(5242) R. R. Snowden says: I inclose an insect which is remarkable as being the first of the kind I have ever seen, though I have closely observed insect life in North and South Carolina and Florida since the late war. It seems that insects new to this pa t of the country are occasionally making their appearance. For instance, the electric bug was never seen here before the introduction of the electric light. So also the orange tree has several new enemies. Please give some light on the specimen sent. A. Reply by Professor C. V. Riley. —The specimen sent by Mr. Snowden is an interesting although not uncommon species known as the glassy-winged sharpshooter (*Homalodisca coagul ta*). It is found all through the Southern States and is responsible for a rather common injury to young cotton bolls in portions of Louisiana and Missi sippi. This damage is particularly noticeable where the cotton fields are bordered by streams edged with young growth of cottonwood. The first generation of the sharpshooters lives upon the cottonwood and the second migrates to the cotton plants. They puncture the young bolls, making a fine hole like a bullet hole, from which in part comes the popular name of sharpshooter. They have been found also in Georgia upon the LeConte pear, in Texas upon the mulberry, in South Carolina upon asparagus, and in Florida upon oranges, but they do no marked damage to any of these crops. The nearly full grown and adult insects have a curious habit, in common with their near allies, of ejecting from the anus a considerable quantity of very clear liquid honey dew. The drops are thrown out with considerable force and to quite a distance, and when the insects are abundant they produce the phenomenon known as "weeping trees." A full account of this species, with illustrations, will be found in *Insect Life*, vol. v., pp. 150-154.

(5243) J. T. S.—Reply by Professor C. V. Riley.—This large click beetle or snapping beetle is known in the books as *Alaus oculatus*, and is the largest of the click beetles found in North America. The large eye-like spots on the thorax are not the true eyes, which will be found on either side of the head and which are in reality small compared with the spots. When placed upon its back it will spring to a height of 2 or 3 inches in its efforts to resume its proper position. The larva of this beetle is a hard, yellowish brown, elongate worm, with dark brown spines at the anal end. It is found in burrows in various trees, especially those which are dead and decayed, and is supposed to feed on the dead wood. There is good reason for believing, however, that it is also predaceous and feeds on other wood-boring larvæ.

(5244) S. H. B. says: 1. An outdoor bell circuit contains about 800 feet of wire and an electric bell, and is supplied with 6 cells of carbon battery (sal ammoniac solution). The bell, in short circuit with two cells of battery, rings satisfactorily, but the six cells will hardly cause a tremor in the hammer of the bell, when working over the whole line. The line being O. K., would the addition of two (say) cells of battery cause the bell to ring properly, or would it be necessary to double or triple the number of cells at present used, to cause the bell to work two or three times as strongly? A. The failure of your bell is due to the lack of E.M.F. The resistance of the wire leading to the bell is so great as to use up a large proportion of the energy of the current. If you do not care to put up a line of less resistance, the only remedy is an increase in the number of cells. Without knowing the resistance of the bell and of the line, we cannot say how many cells will be required. 2. What is the probable voltage of an ordinary plain carbon battery (microphone, Samson, Ideal, etc., as named by makers)? A. About 1½ volts per cell. 3. Will you kindly tell me of a book which will be of assistance in such matters? My books are purely theoretical and behind the times. A. For general information we would recommend "Experimental Science;" for specific information on bell hanging we refer you to "The Construction of Electric Bells," by F. C. Alsop, price $1.25; "Electric Bells and All About Them," by S. R. Bottone, price 50 cents; "Bell Hangers' Hand Book," by F. D. Badt, price $1.

(5245) K. A. F.—Reply by Professor C. V. Riley.—The insect sent by Mr. Fichthorn is the common apple plant louse (*Aphis mali*). It is usually abundant and injurious in the early part of the summer and may be destroyed by spraying with a dilute kerosene soap emulsion prepared in the following manner: Take two parts kerosene oil and one part strong soapsuds and agitate violently by churning or by passing the liquid back and forth through a force pump into a bucket until a thick, butterlike emulsion is formed. Dilute one part of this emulsion with fifteen parts of water and spray. The life history of this, as of so many other species of aphis, is extremely interesting, and unrecorded observations would indicate that after a series of parthenogenetic generations are produced upon the apple in the early part of the season, the insects migrate in the winged female form and propagate on the roots of certain grasses during the heat of the season. In the autumn the return migrant revisits the apple, and in due time the sexes are produced and the perfect female fastens her eggs, sometimes in very great numbers, upon the terminal twigs and buds. These, at first greenish, become glossy black and carry the species over the winter. The eggs are not easily killed and the best season to spray is soon after hatching in spring.

(5246) W. S. P. asks (1) how to clean brass and German silver after hard soldering. A. Boil the soldered articles in a weak acid solution, 1 part sulphuric cid, 5 pa ts water. 2. Is there any toxic substance that will kill willow, maple, or fruit trees by making a small hole in the trunk and putting the substance into it? A. An injection of creosote will kill trees. 3. Is there a solder that will fuse at about 700° or 800° Fah., that will solder brass, German silver, etc.? A. Zinc or tin alloyed with a small portion of copper will make a solder for varying temperatures from 500° to 1,000° Fah. Try an alloy of 5 to 10 per cent of copper in the total quantity. The zinc and copper solder will be somewhat brittle. The tin and copper will be tough.

(5247) J. H. N. says: In the SCIENTIFIC AMERICAN about a year ago attention was called to the need of a safety petroleum lamp, as a suggestion to inventors. Could you give the necessary qualifications to be filled in a safety lamp and state if there is a premium offered for it? A. The most essential feature needed is to so construct a lamp in which there can be no admixture of air with the vapor of the oil within the lamp to cause explosion or to so close the communication between the flame and the air space in the lamp that the air- aturated vapor cannot reach the flame, nor by overheat to allow an undue capillarity in the wick, which sometimes overflows and takes fire below the top of the wick tubes. There is no premium offered for a safety lamp.

(5248) T. D. B., Jr., asks: What diameter, pitch, and speed screw should I use on an 18 foot St. Lawrence skiff to consume one-fourth horse power? What speed should the boat make? A. The screw should be 12 inches diameter, 24 inch pitch and make 200 revolutions per minute for a speed of 3 or possibly 4 miles per hour.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

July 25, 1893,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Aerial machine, S. B. Battey ... 502,168
Agricultural implement, A. Caldwell ... 502,032
Air, apparatus for estimating the quantity of combustible gas or vapor present in, Clowes & Redwood ... 502,173
Alarm. See High or low water alarm.
Animal shoeing apparatus, E. Sirois ... 502,054
Animal trap, T. M. Hovell ... 502,254
Animal trap, Martin & Schlaffer ... 501,953
Awning, C. Glawe ... 501,932
Baling cotton, apparatus for, E. M. Ivens ... 502,193
Baling press, E. M. Ivens ... 502,192
Bath. See Electrolytic bath.
Bearing, anti-friction, J. G. Avery ... 502,025
Bed brace, W. H. Fitzgerald ... 502,115
Bed, spring, O. R. Gould ... 502,118
Belt, conveyer, S. Jacoby ... 502,041
Bevel, C. G. Osteman ... 502,199
Bicycle, H. Lind ... 502,232
Bicycle saddle, J. Bethune ... 502,110
Bicycle saddle, L. L. Richmond ... 502,017
Bird cages, food holder for, Shanovski & Rubenstein ... 502,146
Bit. See Bridle bit.
Bituminous rock, apparatus for reducing, E. R. Thomason ... 502,211
Blower for carburetors, C. V. Best ... 502,244
Boiler. See Locomotive boiler.
Boiler furnace, C. H. Allen, Sr ... 501,907
Bolt and nut, C. A. Higbee ... 501,941
Brace. See Bed brace.
Bracket. See Lamp bracket.
Brick kiln furnace, I. C. Wheeler ... 501,990
Bridge, C. H. Ball ... 502,165
Bridge gate, A. Jungmann ... 501,947
Bridle bit, E. T. Sartruff ... 501,987
Bridle blind, L. Loeser ... 502,197
Broom holder, W. Christ ... 502,038
Brush for washing or wiping windows, J. P. Giles 502,000
Buckle shield, F. L. Thompson ... 502,067
Buggy body, C. M. Coutant ... 501,924
Burner. See Vapor burner.
Bushing, I. M. Willie ... 501,982
Butter worker, D. W. Curtis ... 501,933
Button cover, detachable, G. Pilbeam ... 502,201
Buttons to fabrics, securing, H. H. Cummings ... 502,034
Cable arch support, S. D. Stephens ... 501,969
Caddy, measuring, T. C. Keeler ... 502,124
Cake or pudding stirrer, A. C. Bull ... 502,026
Calculating device, mechanical, D. L. Albert ... 502,217
Camera. See Photographic camera.
Can. See Milk can.
Car coupling, J. F. Davidson ... 502,068
Car coupling, J. W. Flynn ... 501,929
Car coupling, C. M. Graves ... 501,933
Car coupling, H. O. Miller ... 502,200
Car coupling, J. D. Ripson ... 502,205
Car coupling, W. J. Walker (r) ... 11,853
Car couplings, wear plate for head blocks of, J. B. Saffo d ... 501,963
Car fender, C. T. Grilley ... 502,087
Car indicator, street, J. W. Dear ... 502,227
Car jack, street, G. F. Pearson ... 502,200
Car sanding device, N. Seibert ... 502,053
Car wheels and dies for same, making, P. Arbel ... 501,909
Cars, chock and guard for railway, W. T. Sears ... 502,145
Cars, jack for loading or unloading, Q. W. Morrison ... 502,049
Cars, steam heating apparatus for railway, P. Reilly ... 502,204
Card, playing, W. O. Bird ... 502,089
Carding engines, apparatus for grinding revolving flats of, J. Edge ... 501,995
Carriage top prop, H. L. Philips ... 502,198
Cart, road, C. C. Bradley ... 502,028
Case. See Cheese case. Jewelry case.
Cash controlling machine, Russel & Brady ... 501,962
Cement, E. E. Hawes ... 501,937
Chair. See Folding chair.
Change making and delivering devi , C. L. Travis ... 502,242
Cheese case and cutter, P. W. Brundin ... 502,170
Churn, W. Edmister ... 502,179
Churn, J. Wylie ... 501,964
Churn dasher, W. H. Evans ... 502,180
Chute, four, J. K. Johnston ... 502,194
Circuit connector, track, E. H. Goodman ... 502,529
Clamp, J. F. Harvey ... 501,996
Clock, illuminated, W. H. Alderson ... 502,161
Clock, self-winding and synchronizing, A. G. Wiseman ... 502,156
Clock synchroniser, electric, A. G. Wiseman ... 502,157
Clocks, electric winding attachment for, A. G. Wiseman ... 502,215
Cloth cutting machine, H. A. Caldwell ... 502,031
Cloth cutting machine, W. S. Salisbury ... 502,052
Clutch, friction, H. C. Crowell ... 501,935
Clutch, friction, F. L. Waterous ... 501,978
Coal, apparatus for handling, W. D. Ewart ... 502,250
Coal for transportation, apparatus for p eparing, W. C. Andrews ... 502,062
Coal, settling or storage pond or basin for pulverized, W. C. Andrews ... 502,063
Cock or tap, stop, J. T. Hallwood ... 502,094
Collar fastener, horse, R. J. Vanderbeck ... 502,213
Commutator brush, H. G. Reist ... 501,960
Cooker, steam, Long & Kline ... 501,952
Cooler. See Wine cooler.
Cork retainer, A. J. B. Laussedat ... 502,126
Corkscrew, E. Walker ... 501,975
Coupling. See Car coupling. Pipe coupling. Shaft coupling. Thill coupling.
Credit balance register, A. L. Norfleet ... 502,133
Cultivator, R. S. Buch ... 502,171
Cultivator, J. A. Parker ... 502,135
Cultivator disk attachment, A. Caldwell ... 501,916
Cultivator disk cleaner, A. Caldwell ... 501,917
Cultivator, listing, J. A. Herdman ... 501,940
Currycomb, E. E. Miller ... 502,233
Curtain fixture, A. W. Herr ... 502,074
Cutter head, rotary, K. Nelson ... 501,956
Damper, stovepipe, C. T. Redfield ... 502,203
Dental articulation cup, G. K. Bagby ... 502,164
Dental plates, apparatus for casting aluminum, W. M. Sharp ... 502,209
Dish cleaner, W. A. Adams ... 502,159
Distilling mash, R. Iges ... 502,079
Drilling machines, electric motor for rotary, R. M. Jones ... 502,098
Drying machine, J. K. Proctor ... 502,237
Dust collector and separator, M. F. Gale ... 502,071
Dust pan, W. S. McCay ... 502,235
Dynamo or motor, R. C. Kintzing (r) ... 11,854
Electric motors, means for regulating, C. H. Richardson ... 501,961
Electric switching apparatus, A. R. Roe ... 502,104, 502,105
Elevator. See Sucker rod elevator.
Electrolytic bath, S. H. Emmens ... 501,998
End gate and scoop board, combined, W. H. Clark ... 502,067
End gate, fastening, F. A. Havens ... 502,095
Engine. See Gas engine. Multi-cylinder engine. Oscillating engine.
Engine boiler, locomotive or other, E. U. Gibbs ... 502,117
Engine foundations, building, P. M. Bruner ... 501,914
Engines, automatic th ottle for, S. V. Rawlings ... 501,959
Engines, steam distribution in multiple expansion, F. M. Rites ... 502,140
Engines, steering gear for traction, G. W. Kramer ... 502,230
Excavating machine, Vollhe ing & Bernhardt ... 502,151
Feed motion, E. J. McClellan ... 502,131
Feedwater heater and purifier, Field & Clark ... 502,085
Feedwater heaters, tube scraper for, G. H. Burpee ... 502,223
Fence, hedge, F. J. Troxell ... 502,068
Fence, wire, I. K. Hollinger ... 502,076
Fender. See Car fender.
Filter, W. E. Caddell ... 502,030
Fire alarm systems, electric signal for, J. Sachs ... 502,207
Fire escape, J. P. Coons ... 501,990
Fire escape, F. J. Fairchild ... 502,070
Fire extinguisher, W. Gee ... 502,186
Fire lighter, P. Peschong ... 502,136
Flax dressing machine, C. H. Norton ... 502,010
Fly trap, T. A. Teate ... 502,058
Folding chair, J. A. Criss ... 502,175
Fork. See Hay fork.
Furnace. See Boiler furnace. Brick kiln furnace. Metallurgical furnace.
Furnace, G. R. Scates ... 502,208
Furnace fuel feeding device, J. W. Wetmore ... 501,979
Furniture joint, L. R. Harsha ... 501,935
Gauge. See Water gauge.
Garment supporter, R. Gemmell ... 502,228
Gas, apparatus for manufacturing, J. J. Kirkham 502,125
Gas cut-off apparatus, automatic, N. Lombard ... 501,951
Gas engine, G. E. Hoyt ... 502,255
Gas regulator or governor, R. R. Beard ... 502,084
Gate. See Bridge gate. End gate. Railway gate.
Gate, A. J. Russell ... 502,206
Gate, M. F. Sheban ... 502,363
Grain binders, belt adjuster for, A. Stark ... 502,210
Grip button, W. F. Whiting ... 501,981
Gun, machine, R. J. Gatling ... 502,185
Gun, magazine, A. W. Savage ... 502,018
Guns, auxiliary valve for pneumatic, J. Rapieff ... 502,016
Gyrating bolt, W. E. Getas ... 502,116
Ham holder, C. C. Umbenhauer ... 501,973
Hame, A. D. Heist ... 502,119
Hame fastener, Cullen & Mulchrone ... 502,176
Hammock, W. Hines ... 501,944
Harrow and cultivator, combination, E. B. West ... 502,059
Hat holder, G. M. R. Twose ... 501,972
Hay derrick, J. F. Hutchinson ... 502,078
Hay fork, S. B. & S. Welch ... 502,155
Hay rack, C. W. Behrens ... 502,220
Heater. See Feedwater heater. Hot water heater.
Heating apparatus, hot water and st m, A. L. Snyder ... 502,055
High or low water alarm, W. Hodgson ... 502,191
Hoisting machine, S. Griffiths ... 502,188
Hollow objects from plastic material, making, Kieserling & Moller ... 502,196
Hoof cleaning tool, R. C. Jenner ... 502,042
Hook and eye, W. S. Seymour ... 502,206
Horse checking device, L. S. Franklin ... 502,202
Hot water heater, W. Vanderman ... 501,974
Indicator. See Car indicator.
Ivory, mould for the manufacture of solid balls of artificial, A. & S. DePont ... 502,013
Jack. See Car jack.
Jewelry case, W. Heatley ... 502,001
Jewelry or plate, article of, W. W. Bradley ... 502,026
Joint. See Furniture joint. Rail joint.
Journal, barrow, A. E. Morey ... 502,082
Jumper and apron, combined, T. R. Chambers ... 502,113
Junction box, E. McEvoy ... 502,083
Kettles, joining spouts to metallic, Milne & Pritchard ... 502,046
Labeling or mailing machine, J. C. Lodor ... 502,045
Ladder, collapsible, A. Leo ... 501,950
Lamp bracket, adjustable, J. Baumgarten-Frauenstein ... 502,01
Lamp, carbureting, N. Finck ... 502,251
Lamp, electric arc, P. J. Barrett ... 502,166
Lamp, gas, C. Kalkkuhl ... 502,123
Lamps, carbon holder for electric arc, S. Bergmann ... 501,911
Lamps, carbon holder for electric arc, F. D. Haselton ... 501,938
Lantern, E. O. Keef ... 502,080
Lasting machine, A. F. Preston ... 502,236