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## 瓝

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or no attention will be paid thereto．This is for our
information and not information and not for publication．
eferences to former artices or answers should
give date of paper and payeor number or question．
geuirea not ansered in reasomable time should give date of paper and page or number of question．
In uir ine not answered in reagonabe time should
be repeated；correspondents will bear in mind that some answers require not a little research，and
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| :--- |

## Battery fluid． Cherry tree， <br>  <br> Ink，to remove．．．．．．．．．．．．．．．． Liquid，high specific gravity．． Pitch and loudness．．．．．．．．．．

（4246）F．C．L．asks：1．Why does grow colder as you go higher $\%$ A．At higher eleva－
tions we are further removed from the heat－radiating surface of the earth，and less protected by the atmo spheric envelope of the earth．2．Does copper wire contract and expand the same as steel wire ？A．Cop－
per when heated from 320 Fah．to $212^{\circ}$ expands $1-588$ per when heated from 320 Fah．to $212^{\circ}$ expands $1-582$
of its length；steel expands $1-846$ its length．3．Is．there anything that will remove ink from paper so it canno be seen and not harm the paper！If so，what is it，and how applied 9 A．Mis equal parts of oxalic and tar－ taric acid and dissolve as needed in a little water．Ap－ ply，and take up the ink and eraser with a blotter．Al cohol will remove the stains of aniline．Red ink can
sometimes be removed with alcohol．4．If a dynamo sometimes be removed with alcohol．4．If a dynamo
and motor were belted together and started，would he resolt be perpetual motion？If not，why not，and run a dynamo is always greater than that developed by a motor driven by the current，consequently such an arrangement as you propose would not runat all． Which is the cheapest－cable or electric railroad ？A Taking the cost of construction and mat
（4247）A．M．asks：1．Will you kindly Inform me，through your paper，regarding the follow－ ing $?$ What is the best compound to use with three
Faller compound batteries，and will they be suff－ （or must I have four）with thirty feet feet No． 18 copper wire？A．The formula for the solution is as follows：Bi－ chromate of sodium is aissolved in water to saturation；to this solution slowly add one－fifth of its weight of com－ mercial sulphuric acid．Three cells of Fuller battery
will hardly be sufficient；use four or five．2．How can I will hardly be sufficient；use four or five．2．How can light a pas jet entirely by electricity，and what amount
of E ．M．F．will be needed？A．For information on electric gas
213 and 446.
（4248）F．E．F．writes ：How much $\mathrm{H}_{2} \mathrm{SO}_{4}=8 \mathrm{smph}$ phric acid theoretically can oe produced
from one pound of sulphur？Can you give mea formala
from the atomic weights to figure the same？$A$ The
atomic weight of sulphur is 32 ，the molecular weight of atomic weight of sulphur is 32 ，the molecular weight of
sulphuric acid is 98 ．Hence we have the proportion 32 ： 98：：1：$x$ ；giving $1 \mathrm{~s} x=3=0625$ pounds sulphuric acid of sul phur．
（4249）J．R．M．asks whether the mag nesium light is yet available for burning for two o lime light，and its comparative cost？$A$ ．The mag nesium light is used to some extent for continuou illumination in a lamp which feeds the ribbon or wir forward as rapidly as it is burned，but its action is un ertain，and it does not compare with the lime light o the electric light．As to cost，we think the expense running such $\&$ ，
the lime light．
（4250）J．G．asks：1．On how long line will the Bell telephone receiver，described in Sur plement，No．142．transmit and recive articulat speech 9 A．Two or three miles，if the line is hung ad
jacent to telegraph or electric line wires． 2 ．Would articulate more clearly if the magnet，bobbin，an diaphragm were increased one－half？A．We think not ．Has the patent expired on the above receiver 9 A No．4．What size and kind of wire is best for a tele－ phone line four miles in length？A．No． 12 galvanized iron or steel wire．5．Through how many ohms re－ sistance will a Leclanche cell ring an ordinary wood
box bell？A．Fify or more．
（4251）W．H．J．writes ：Please explain
the trolley system of electric street railway．The wir－ the trolley system of electric street railway．The wir－
ing is what confuses me．Why is it that the car near－ est the generator does not short circuit the others？ Also the method of lighting them ？A．The resistance of a motor is such as to permit it to take only the amount of current required for running it．The rest of the current goes on for distribution among the othe
notors．The current for lighting is taken from the cir ait in $t$
（4252）J．H．O．says ：A discussion arose recently as to the value of a contrivance in common
use as a ventilator．The same consists of a sheet of in，usually occupying the place of a pane of glass，ou o which is cut a circular hole，within which is a whee
of tin，with flanges set at an angle．The wheel revolve when a current of air passes through it．Does the wheel in any way favor ventilation？Would a hole the ame size without a wheel serve as wells A．The wheel adds nothing to the force of the draught；rathe
lessens it．Its only value is as a diffuser．By its actio lessens it．Its only value is as a diffuser．By its action
the air is spread out，so that it does not become dan gerous to health as a direct dranght upon a person．
（4253）J．I．C．－Tin plates wholly made American metals are at present manufactured to mited extent in this country
（4254）H．S．R．asks：What solution should zinc be treated with to render its surface snita－
ble for pasting labels on？A．Clean the zinc with with caustic potash（lye）or ammonia．
（4255）G．H．H．asks ： 1 ．Is there a so lution or liquid whose specific gravity is $2: 25$ ？A．A solution of mercury iodide in potassium iodide or a so－
lution of cadmum boro－tungstate are the best． 2. Would soluble glass be poisonous to butter if the but glass or would it give it any bad taste？A．It would not be poisonous，but might slightly affect its flavor
（4256）W．A．H．asks ：Is clay consid－ （4257）W．S．writes ：I inclose a piece of the twig of a fruit tree（cterry I believe）infected with
scale．Will you have the kindness to describe in swer to correspondents，the best means of eradicating the affection？A．Reply by Professor C．V．Riley ：In reply to the letter of Mr．William Shackelford of The Dalles，Oregon，I will state that the insect which he sends is the San Jose scale（Abpidiotus perniciosus）． This is one of the wort pests of deciduous fruit trees on he Pacific coast．Many experiments have been tried result that the most satisfactory has been found to be wash made as follows：
Resin．．
Caustic
c soda（70 per cent）
Water to make．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．． $100^{\text {43／6 pts．}}$ gals．

At twice the dilution it will be safe to apply it Ioliage，but it will not then be so effective．This pre－
paration should only be applied during winter or dur paration should only be applied during winter or dur－
ing the dormant＇period；applied in the growing season， ing the dormant：period；applied in the．gr
（4258）W．B．asks：1．The name of the river whose bed is not land，but water，and the name of a large river north of China，which river must be some re－
lation of Shakespeare＇s Othello．A．The Gulf Stream being the Moor of Venice 2 What in the Argentine Republic and in Brazil9 A．In Brazil， Portuguese．In the Argentine Republic，Spanish is the official language，but owing to a iarge influx of Italians a great deal of Italian is spoken．3．Where can I get a good book，not too expensive，on North American en－ omology．A．We recommend and can supply you subject you refer to：＂E Entomology for Beginners，＂ by Packard，price $\$ 2$ ．Packard＇s＂Guide to the Study Bresten price
（4259）W．N．asks：Can common stove （4260）R．H．P．asks ：1．Can you tell ne of any process by which India ink marks may be removed from the person without injury or a scars A．
India ink being composed of finely divided particles of carbon cannot be removed by any chemical means．Try a piece or pamice stone． 2 ．I wish to construct a plunge battery of nine cells，connecting five cells to－
gether and nave the other four so I can turn them on
one at a time．A．You will find description of plunge
nine cells $4 \times 5$ with zincs and carbons $234 \times 5$ be suitable
to use in electrolysis \＆A．They will answer if to use in electrolysis $?$ A．They will answer if
nected in parallel．Larger cells would be better．
（4261）H．H．B．asks ：1．How many 25 volt 1 ecande power lampe could I run at one time ith dyoamo in Supplement，No． 60 ？A．16．2．Ca dynamo？If so，how much power would it have？ The motor was not made for use as a dynamo．It would， however，yield a small current if used that way，pro bably enough for one or two 3 candle lamps．3．Would work better with a Gramme or Siemens armature． ．The Gramme armature is preferable．4．Could light dynamo be run as a plating machine i A．Ye
with the changes described in Sopplement，No． 793 ．
（4262）H．D．W．asks whether a block f charcoal made from pulverized charcoal would hav the same or nearly the same capacity for absorbing and
condensing gases as a similar block made from the atural wood 9 A．It would depend on how the duat pose would interfere unless the mass was subsequently
（4263）H．W．L．asks：What is the com osition of the substance known as＂Frankfort black＂ A．Frankfort black is a high grade of bone black．Yo
（4264）J．G．R asks．1 What will tak red stains from red woolen underclothing out of fin white muslin？A．By a misture of equal parts of will probably resist ifl other applications，thoug javelle water might be tried．2．Will a ball keep it weight in a space where the air is pumped out，the sam
in a space filled with air？A．Yes．3．In pumping the air out of s space，will the pump need more force when the air is nearly pumped out，than in the begin ning $?$ A．Yes．
（4265）C．L．R．asks：Would it be prac－ tical to run induction coil described in＂Experimenta many？A．It can be done by allowing 4 cells of dry battery connected in parallel for each cell of bichro－
（4266）G．A．B．asks：1．What is the difference between the pitch aud loudness of tone？A． The pitch is determined by the number of vibrations per second，while the loudness or intensity depends on
the extent of the vibrations．2．What causes a gun bar
2． el to become hotter shooting a blank cartridge than oaded one？$A$ ．If the increased temperature is a fac nder different pressures．
（4267）F．A．S．asks（1）how to make the solder used for comecting the filaments and leading－in
wires in incandescent lamps \＆A．The filamerts of in． candescent lamps are secured to the wires by means of electric soldering，by copper as the material for form－
ing the connectiou，or by means of carbon． ing the connectiou，or by means of carbon．2．Also A．We unde
but leased．

E．A．B．asks for the table for the removal of spots and stains．－R．L．M．asks for the dimensions of drawings intended for the patent office．－C．C．W in moulding dolls＇heads．－N．P．H．aeks for the sol－ vent power of glycerine．－B．B．S．asks how hams are cured．－T．R．L．asks for remedy for headaches．－C．R． O＇B．wants the composition for hektograph sheets．－C．
W．H．wants W．H．wants information about indicator diagrams
suitable for a beginner．－H．P．J．wants information on catechol and paramidophenol developers．－N．H．S． wants a tahle fordoses of medicine，called a posological
table．－G．M．B．says ：What is the composition of com－ mon painter＇s putty？－P．W．S．says ：Can you give me ormulas for the following inks－vanadium，invisible yellow，silver and autographic $9--J$. McA．asks how to bend glass tubes．－J．J．W．asks：What is the compo－ sition of fuller＇s earth ？－J．T．asks：Of what is glaire composed P－E．D．W．asks：Can you give me reliable receipts for etching glass？－T．J．asks ：What proces

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

## Replies to Enquiries．

The following replies relate to enquiries recently pub－ ished in Scientific American，and to the number
（4205）H．D．H．writes ：Your reply to question No．4205，in your paper of March 26，seems a little behind the times，being based upon the law of
Newtou，which law only holds true of bodies falling in Newtou，which law only holds true of bodies falling in
vacuum．On page 303 of the Smithsonian report for 889 you will find given，from F．H．Wenham，June 1886 he fall of bodies in air to be＂H．Wenham，June， 1866 ， of air set in motion in a given time．＂Professor Lang－ ley，in his researches in aerodynamics，Soirntimic Ambrican，February 13，1892，proves that a body in
motion displaces a body of air equal to its greatest motion displaces a body of air equal to its greatest
diameter transverse to the line of motion，multiplied by the distance traveled in a given time．Accordingly take a cannon ball weighing one pound，and three in a perpendicular line，and the same ball when pro jected 1,000 feet per second．In its vertical fall it over－ comes a weight of air equal to the area of its greatest circle，about seven inches，by the distance it falls，fifteen feet，equal to 1,260 cubic inches，but when projected horizontally must overcome the weight of three inches，
multiplied by one thousand feet，multiplied hy ffteen reet，equal to $\ell, 480,000$ cubic inches of air，to come to ing it acts only horizontally，it is impossible for it to come to the groand in the aame time．

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nore than one hundred thousand applic nore than one hundred thousand applications for pa－
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## INDEX OF．INVENTIONS

For which Letters Patent of the United State were Granted

April 12， 1892.
AND EACH BEARING THAT DATE．





