F. L. G. asks: What should be the dimen-
ons of a pleasure boat, to use an engine and boiler of
1orse power? What sizeand pitch should the wheel

V. G. says: A friend says that he has a mon suction pump that on some days draws wate eet and upwards, perpendicularly. I say that no suc
mp ever did or will do it. Answer: You are right. We. E. says: I have a wash pipe 1 inch in
meter leading from a wash basin, naving a common

 wer: Use a solution of castic
W. B. G. asks: Are not conical bullets for
die and other rifies made by punching, and how fast die and other rifiesmade by punching, and how fast
they be made by the machinesnow in use? Answer: machine in use at our arsenals was invented by a
kman named Snyder, in the arsenal at Waterviliet, We think imatesabout to bunlets a minute, , but
aot tuite certain. Some of ourreaders will doubt. aot auite eertain. Some ofo
correct us, if we are in error.
'. L. O. shys: I have a 2 horse power en-

 rr ued is cheaper than coal. Answer: Probably you
1 not make the change, with the present arrangeL. C. asks: : What will produce a very
t permanent red color on leather, to be polished a hot iron? Answer: Scarlet moroccos and roans
yed with cochineal. B. G. asks: 1. How can I give a fine blue
h brown color to small articles made from sheet 2. How, also, can articles made from sheet brass
onzea? Answers: : After the articles are tem-

F. B. asks: What is the lifting power of
, the snape of which is an inverted isosceles trian10 feet perpendicular, surmounted by halfa a circle
et diameter? Answer: We published on p. 331, It volume, atable of the force of the wind, at dif.
veloctities. Knowing the weight of the kite, and power.
F. asks: How can I make Babbitt metal?
r: Melt 4 lbs. copper, add by degrees 12 lbs. best 3s. regulus of antimony, and then 12 1bs. more tin.
or 5 Ibs. of the last quantity of tin have been
or
reduce the heat to a dull red and sde the re-
rr.
A. asks: 1 . How much power will it
3. A. asks: 1. How much power will it
cut a plate of ron $11 /$ inches thick? w. What
the eftect of expansion and contraction on the at st. Louis, Mo.? Answers: 1 The resistance
 iseand 1 ower the ero
,le structure is rigid.
I. asks: What is the difference in cot $t$ detecte t? Answer: The classitication of dif
rades of cotton is made according to length and of fiber, and is expert work.
when first appearing over the horizon, seem lan when in the zenith? Is it owing to the pe
odition of the atmosphere near the earth?

Says: Chemistry teaches that, when a
of nydrogen and oxysen containg $\mathbf{c}$ common air or nydrogen and oxyen contains common
yitrogen) it will explode when innited. There ie water tor eharging boilers were drawn from
$m$ of a deep tanks, the superincumbeat columi would weigh more than the air (or more than
to the sa are inch) and all air would be
 losives in solution. In the tank containing
ere should be arranged some fiat vessels conlumtna or the ike incombustible substance;
explosives would be neutralized, the water explosives would be neutralized, the water
-ified for that purpose. Answer: We believe nnmittee of the Franklin Institute made experi mpounds, other hain steam. were not formed R. asks: What is oil of citronella?
Citronella is an oil procured by distilling the anarophogo schenanthus, which grows wild
tbundantly in Ceylon, whence this oil is chiefiy

Says: In Culpepper's "Complete
here is mention made of a plant called Christ's tancol name of that plant? Answer: You
refer to the fiower of the bush known as orn, or palinurus aculeatus.
asks: Is the ocean level? How much the city of New York than Liverpool? An-
evel line is one that coincides with the genereveline is one that coincides with the gener zan low tide, were it not for the wind. As it le level of New York and Liverpool, if any, is
P. asks: 1. What is carbon disul Can I make a liquid of transparent color to
e hands when bruised, so as to form a false
-wers: 1 . Carbon disulphide is a compound znd sulphur, made by passing the vapor of
ar fragments of red hot charcoal in a porce idcondensing the gaseous product. It is also iide of carbon, and sulphuret of carbon, and
iof carbon. 2. Collodion is used for the purention. This is made by dissolving gun cot-
xyylin, in a mixture of ether and alcohol. It er for you to purchase the collodion already a druggist. as its preparation involves skill
specially in making the pyroxylin, which, , asks: 1. Have the Bessemer steel considered, over a first class fron rall? 2.
e silicon rail compare with the Bessemer in wers: 1. Yes. 2. So far as we know, vers
dide of the silicon steel have been laid down, 1.8 not
ade.
D. B. P. Says: I wish to run a woven iron
wrecylinderin water, and to protect it from corrosion. Tinning does not answer the purpose, snd galvanizing
fills up the meshes. Can you suggest a remedy? The ylinder will be sube dificulty by constructing the cylinder of wire cloth with a alarger mesh than you require,
so that, when it is galvanized, it will be of the proper size. Or you might have the cloth made of galvanized B. and P. Say:
water for our boiler ; it forms a soft muddy scale, easily scraped off, but it has to be done often. What is the
best thing to hold it in solution thatitmay be blown off? ing, bursts, or cracks it. What is a good cement for the cracks? Answers: 1. Probably your best plan will be to filter the water, before it enters the boller. There
are feed water heaters in the market that are said to are feed water heaters in the market that are said to
remove all impurities which are held in solution. 2. We expect the best plan will be to renewt he pipe. But you might try a cement made of red and white lead and fine
iron borings. Put this over the crack, cover with iron borings. Put this over
piece of tin, and wrap strongly.
F. N. says, in reply to A. R.'s query in reboiler to almost any pressure where there is power suf-
ficient to draw the engine; of course the engine is reversed. I have frequently seen engineers oil their throttle valves by reversing their engines for a few sec-
onds while rolling down hill just after tallowing the cylinders, when there was, perhaps, a pressure of 140
pounds of steann on the boiler. A. R. seems to think that the air would escape by the way it entered. The T. B. J. says, in reply to L. W. : Brass can
be stained a permanent dari brown by placing it in a mixture of iron scales 1 lb., arsenic 1 oz., murititic he solution.
G. M. Says, in reply to A. D., who asked for
remedy for snails other than sait: Put ashes with the seeds into the ground, or outside of them, wherever the
snails may pe found.
F. V. F. says, in reply to G. W. C.'s ques-
tion as to two locomotives: If the wheels were of the same size on the two locomotives, it is evident that they
would both reach the foot of the incline at exactly the ters, it is equally evident that nothing con inf infuence the the friction of the two sets of wheels, which friction 18 found by experiment to be inversely proportional to
their radii. Hence, since the radii of the two sets of nversely proportional to the radii, we have S: L: bein in which Land S indicate the large and smanll wheels reconsequence of their making a greater number of revo
lutions during the descent than the larger wheels, the rodis, shafts, links, etc.., attached to them would move
faster, and hence increase the friction. I conclude from these facts that, since the locomotive with the fou
foot wheels has a little more thin $1 / 5$ s much friction as he other locomotive, the last mentioned locomotive
will arrive at the foot or the incline in a little less than is of the time that it takes the otherto arrive there.
A. G. Jr. says, in reply to J. N. R.'s query
as to coloring photographs: An exact representation of any transparent leaf or plant of any color or shade ca
easily be made by obtainng direct from the leaf carbon negative, then using tissue, of the color desire for positives. You can obtann, from the following s
utions and their admixtures, almost any shade of blu Hutions and their admixtures, almost any shade of blu
green, yellow, and brown. Solution No. 1 , to used as a bath: Dissolve 2 ozs. lead in nitric aci
and evaporate to dryness. Then dissolve 2 ozs. and evaporate to dryness. Then dissolve 2 ozs. of
the resulting nitrate of lead in rain or distilled
water, in a glass or porcelain vessel. In another, dis water, in a glass or porcelain vessel. In another, dis
solve 2 ozz. of the ferrcyanide of potassium (red prus iate of potash, mix the solutions, and fil er into
sultable bath. Then float, upon this, either plain albumen paper, aud dry in the dark. Then use a paper or carbon, or ordinary photographic negatives as J. N. Q describes. After finding the proper time to expose (and
a few experimental failures will soon do it), immerse in the following solution to make a dark green leaf : hichro mate of potash $3 / 2$ oz., perchloride of iron $1 / 2$ oz., wate about one pint. For red : sulphate of copper 1 oz.
water 1 pint. For brown : weak solution perchloride of water 1 pint. For brown: weak solution perchloride on
iron and a litule sulphate of copper. For dark brown
E. J. O. says, in reply to J. N, N.'s query as
a common house fiy, surrounded by a kind of opaque vapor, after death: It isa mold or fungus, and is caused
by the bite or sting of the mosquito. I have watche and immediately following the death struggles of the
fiy. fiy. W. E. H. says, in answer to W.'s question
as to mensuration of circles: I use rules that are not siven in school arithmetic books: To find the cir and divide by 3 . To find the ares of the same circle: To Tof the square of the diameter. Having the circumfer ence, to find the diameter: Divide the circumference bs, 19 and multiply the quottent by 6 .
J. C.S. says: " When our belts slip, we
pour castor oil on them just in front of the pulley an the effect is always satisfactory; we also use tanner's or eats' foot oil on the outside of the belts. We run the
grain side of our lelts next the pulley, preferringalways to use, for our own purposes, large pulleys and long
belts, keeping them soft and pliable. and having them
C. H. R. says, in reply to C. C.'s question on friction, which in this case would be over $1 / 3$, and also ess an am>unt in proportion to the distance the pin for C. M. N. says that A. M. can solder brass $t$
brasb by taking a piece of the brass to be soldered an adding a little silver while melted in a crucible. One piece to be soldered begins to fiow. Two parts brass J. E. E. says, in reply to C. C.'s question on
page 250 , current volume: Disregarding rriction (which will be about $1 / 3$ ), the pressure on $W$ will be $72,8381 \mathrm{bs}$ four times the po
the four pulleys.
Minerals, etc.-Specimens have been re examined with the rowing corresp
R. W. H.-Your
ishing material.
H. S.-The black material is carbonate of iron. J. J.T.-Galena or sulphlde of lead, a valuable ore of
lead, consisting of lead 85 and sulphur 13 parts, the remainder being oxide of iron or other impurity, with sometimes a little silver. Lead is obtained from it by
roasting in a reverberatory furnace. and smelting the residue with coal and lime.
M. E. B.-Nos. 1 and 3 are trap rock, of no value is trap with spangles of plumbago, and perhaps some
J.T. C.
J.T. C.-No. 1 is a veinof trap, of igneousor eruptive origin. No.2, hornblende. No. 3. This is possiblymetal.
iferousat some denth.

## COMMUNICATIONS RECEIVED

The Editor of the Scientific American acknowledges, with much pleasure, the re. ceipt of original papers and contributions upon the following subjects:
On River Navigation. By G. W.
On Sexadigitism. By W. T. R.
On Ecclesiastical Bickerings. By J. R.P
On Insect Nests. By A. B.
On Snake Poisons. By T.J.
On Flying Spiders. By E. F.
On the Proposed Great Telescope By

## Also enquiries from the following

W. A. B.-S.-E. N.-S. B.H.-J. P.-B. W. W.-J.
-T.C.-C.-G. S.-C. E.B.-J.W.P.-S. N.-A. L.B.

Correspondents whowriteto ask the address of certain nanufacturers, or where specified articles are to be had
also those having goods for sale, or who want to find partners, should send with their communications a
amountsutficient to cover the cost of publication under devoted to such enquirles.

## [ofFICIAL.] <br> Index of Inventions

 FOR WHICHLetters Patent of the United Stat were aranted for the week ending November 4, 1873,
and each bearing that date.

## Axle, vehicle, L. Martin...

Axles, sand bar for, Winchell et tal............................
Bage, manufacture of traveling, J. w. Lieb. Balance, E. C. Pickering.
Bed bottom, spring, J. S. Beef,machine for slicing, A. Iske Beefsteak tenderer, J. S. Morris.
Billiard cue tip, G. W. . ickinson Blackboard, J. Reber............... Boiler, steam, Worswick \& Lewis Boiler incrustation, preventing, c. Burfitt. Bolt, seal, J. E. Thomso
Rolt for prison doors, Boot tree, T. Branigan. Bosum and collar, comb
Box, match, M. . Orum Caps, shearing, Cooke et al. Car axle, G. W. Millimo
Car brake, W. Naylor.
Car brake, W. Naylor..........
Car brake, Warwick \& Dugga
Car coupling, W. B. Snedaker
Car coupling, J. M. Wells..
Car coupling link guide, Warriner et
Car heater, Berghausen \& Kiesling.
Car propeller, Steel \& Austin
Car replacer, J. G. Burk harat...
Car spring, volute, P.G. Gardin
Car starter, A. H. Crozi
arriage cover, E. H. Elliot
Carriage offsets die, D. Wilcox..............
Carrage step cover, etc., J. W.Gosling (r) Cattle stanchion, C. W. Sawdey
Chatr, Morrison \& Hutchinson Chair, Morrison © Hutch
Churn dasher, . R1dler....
lock esca pement A. Plat
Clock escapement, A.Platt.
Comb holder, E. E. Wheele
Compound for cleaning metals, etc.,.w. z. Moore Cooler, milk, E. Martin
Cornice and g. gutter, , B. B. C. Cornell
Cotton chopper, etc , M. L. Nearn
Cotton chopper, etc , M. L.
Cultivator, S. Crutcher....
Cultivator
Curtain fixture, H. Marchan
Cushion, etc., spring, D. N. Selleg.
Door check, $J$. Baider
Door check, M. R. Perkins.
Irop light and hanger, Blaisse \& Crites
Eaves trough hanger, T. G. Willams..
Elevator for buldaings, etc., G. Müllar.
Engine governor, steam, J. E. Hugou
Engme. hoisting, F. Murgatro
Engine, condenser, J. Houpt.
Eraser, rubber, G. Stackpole........................
Fats, deodorizing and rendering, H.S.Firman (r)
Faucet, A.D. \& G. W. King.
Fence picket he9ds, cutting, A. Burnh
Fence, portable, G. Robinson
Fender, G F Filley
Fire arm, breech-loading, H.
Hire escape, scott \& Hiltz.
Fruit basket, W. R. Wilcox
Furnace fcr reducing ores, J. ..........
Furnace for reducing ores, J. H. Boyd.
Furnace, hotair, A.Pfund ..............
Furnace, steam boller, U. B. Stribling
Furnace,feeding fuel to, J. H. Boyd.
Furnace, hot air draft, E. Boughton
Furnace, C. Schemloth....
Gage, carpenter's, E. Sahm..................
Gas ittIngs, etc., tapping, c.c. Walworth


## APPLICATIONS FOR EXTENSIONS

Applications have been duly filed, and are now pending
for the extension of the following LettersPatent. Hear ogsupon the respective applications are appointed fo

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