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stant use prove them stronger and more durable than

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## (6)

J. M. will find on p. 17, vol. 30, an article on the examination of engineers.-J. M. P.'s theory of rect. Can he find the angle or number of degrees in the arc?-M. N. will find directions for fastening sheet rub-arct-M. N. win in. 101 , vol. .34. He should use marine
ber to metal on
glue if he wants a waterproof cement. See p. 43 , vol. glue if he wants a waterproof cement. See p. 43, vol.
$32 .-T$. will find directions for polishing wood in the lathe on p. 139, vol. 35.-G. B. will find directions tor
preserving natural fiowers on p. 204, vol. 28.-T. W. will find directions for putting a polish on starched goods on
p. 213, vol. 34.-P. L. L. will find on p. 91 , vol. 36 , an anp. 213, vol. 34.-P. L. L. will find on p. 91, vol. 36, an an-
swer to his question as to marine glue.-W. H. P. will find directions for nickel-plating iron on p. 235, vol. 33
For gaivanizing iron, see p. 346, vol. 31.-D. H. will find description of a pantagraph on p. 179, vol. 28. - O. J. S will find a recipe for a black walnut stain on p. 90, vol.
32. For polishing boxwood, see p. 315, vol. 30.-S. L.M. 32. For polishing boxwood, see p. 315, vol. 30--S. L.M.
will find on p. 330, vol. 26 , directions for making an æolian harp.- E. will find on p. 344, vol. 34, a description of
the fastest trains on railways.-J. J. will find on p. 106,

Tol. 32, a good recipe for rinegar.-McC. Bros. quaries as to mjectors were answered on p .91 , vol. $38 .-$ A. B . wil
find directions for removing inkstans from paper on

 $203, \mathrm{vol} 30$, a recipe for cement for fastening leather to
rubber.-P. T. will find something on making superphosphate of lime from bones on p. 90, vol. 36.-F. B M. etc., on p. 43, vol. 35.-W. A. H. will find directions for making rubber hand stamps on p. 208, vol. 35.-L. M. C. should repair his rubber boots with rubber cement made according to the recipe on p. 203, vol. 30.-W.R. R. ogy, Boylston street, Boston.-S. L. M. should abstain from using hair dyes; but a comparatively harmless one we know nothing of the toughened glass of which he cheap telescopes on p. 186, vol. 30.-S. R.S. can blue watch springs or other steel goods by following the instructions on p. 123, vol. 31.-R. D. R. should thin his shoe polish by adding moreink.-J. M. \& Co. should
read our article on p. 241, vol. 35, and they will find that read our article on p. 241, vol. 35, and they will find that
no decision as to the respective merits of exhibits was made by the Centennial judges.-A. B. W. will find directionsfor soldering all metals on p. 251, vol. 28. We
cannot answer his question as to brick, as we do not cannot answer his question as to brick, as we do not
know the nature of the clays.-H. A. L. will find direcknow the nature of the clays.-H. A. L. will
tions for galvanizing iron castings on p. 346, vol. 31. - s. will find a recipe for waterproofng paper on p. 17, vol. 33 . - . L. T. will find on p. 324, vol. 32 , directions for making salicylic acis,-E. E. K. can make his lightning rod of either iron or copper. See p. 277, vol. 35. Copper is
a better conductor than iron.-O. A. H. willfind directions for vulcanizing rubber on p. 378, vol. 28.-D. H. C. cannot calculate horse power of an engine unless he
knows the mean steam pressure in the cylinder and the knows the mean steam pressure in the cylinder and see p. 33, vol.33.-J. H. B. will find a recipe for a sil ver-plating fuid, for use without a battery, on p. 408,
vol. 32 . To bleach beeswax, see p. 299, vol. 31. For a varnish for polished brass, see p. 310, vol. 35.-P. P. H.
wlll find directions for straightening wire on p. 299, vol. 34, -V. A. S. will find directions for making a cheap battery on p. 43, vol. 35.--T. P. H. will find an answer to W . Wuestion as to molaing rubber on p. 203, vol. 35.W. W. should study the lessons on mechanical drawing
published in the Scientific American Supyement.publighed in the SCIENTIFIC AMERICAN STPYLEMENT.-
E. J. B. will find directions for painting transparencies T. W., C. E. R., C. H. S., C. M. W., F. B., A., L., R. L.,
S. S. M. H. N., F. H., and others, who ask us to recom-
mend books on industrial and scientific subjects, should address the booksellers who advertise in our columns,
(1) W. E. L. asks: 1. Which is the most economical to heat a dry house with, hot air or steam? Our boiler has capacity to supply steam for a fifteen
horse engine, but our engine is but two horse power horse engine, but our engine is but two horse power.
A. If you have the appliances, steam will be best for you to use. Enclose a low coil of pipe in the drying room, and admit cold air below it; have registers in the floor for the air to escape, and conduct it to a fue built
against or around your chimney; this will insure a cir| against or around your chimney; this will insure a cir-
culation. 2. How large a dry house can we heat with culation. 2 . How large a dry house can we heat with
steam from this boiler, without robbing the engine? $A$. This you had better prove by experiment, as so much
dependsupon conditions.
(2) C. M. F. asks: What shall I use in filling the grooves in a ceiling so as to make it smooth
enough for wall paper? A. The usual course is to paste narrow strips of thin cloth over the joints.
(3) S. K. S. asks: How can I easily ascermatter? A. The amount of saccharine matter in a given matter? A. The amount of saccharine matter in a given sively, by means of an instrument called a saccharimeter. If a beam of polarized light be caused to traverse
a solution of the sugar, and is esamined by a thin plate of a solution of the sugar, and is esamined by a thin plate of the mineral selenite, the solution will be found to ha
caused a rotation of the beam towards the right. sugar solution of 6.1 cubic inches ( $3 \cdot 4$ fuid ozs.), conlight, of 7.88 inches length, $20^{\circ}$ to the right with twice the amount of sugar, $40^{\circ}$, etc. The scale is generally graduated to read percentages directly. One of the best
chemical tests is the following: Disolve 61732 grains of sulphate of copper in 2,469 grains of distilled water and add 5.14 ounces of neutral tartrate of potash in a little water, and $11 / 4$ pints of caustic soda ley of specific grav-
ity $4 \cdot 12$. The solution should then be diluted (with disity 412 . The solution should then be diluted (with dis-
tilled water) to $2 \cdot 438$ pints at $60^{\circ}$ Fah.; and 3.1555 ozs . of this solution corresponds to $77 \cdot 17$ grains of dextrose or 73.31 dry sugar. The sugar solution (of known
strength) is added to a sumficient quantity of the reagent and bolled for a few minutes in a glass flask. The sugar reduces the copper to protoxide, which is removed from the solution by filtration, and weighed.
(4) H. N. R. says: I have set up a loom for rag carpet weaving, and have on hand a quantity of un-
bleached cotton warping which green. Will you oblige by giving some rough, ready,
and cheap way of dyeing with the above colors? A. The aniline colors are the brightest and least trouble some to handle. With these, for the most part, wool r quires no mordant. Cotton goods require to be morthe fibers with albumen. You can purchase these dyes,
together with the proper mordants already prepared, with instructions for use from any druggist.
(5) E. J. F. asks: 1. What is the best preparation for promoting the vigor of human hair, and
what will preventits turning gray prematurely? A. See p. 50 , vol. 36. 2. Whatis the best method of restoring
the color to faded switches of human hair without sorting to the use of hair dyes which contain poisonous ingredients? A. The natural color cannot be restored in such hair except by the use of dyes. Wash the hair thoroughly with soap and water, and dye with the ani-
line colors, which may be purchased already prepared, and accompanied with instructions, from any druggist, Do not use these dyes except on loose hair. In general. we cannot re
conditions.
(6) J. N. A. asks: Is there any instrument (6) J. N. A. asks: Is there any instrument A. In the United States signal service observatories, ad very long wires of brass, zinc, and iron; and of the unequal expansion of thin bands of brass and steel, which causes a compound bar of these metals to curve by a
slight change of temperature. Some of these latter are in the form of large springs. Besides these, the old this, the light is caused to pass into a dark box, over this, the light is caused to pass into a dark box, over
the top of the column of mercury in an ordinary ther mometer, where it leaves a record on a moving slip of photographic paper. None of these instrumentsare in photographic
Is steam used as a motor at as low temperature as $212^{\circ}$
Fah.? A. No.
(7) A. W. asks: Is it possible that an ice boatcan travel faster than the wind? A. Yes. On miles an hour, a firstclass ice boat may be sailed sixty
(8) J. L. asks: I am in charge of two 8, 16 feetx 50 fet, with ter. The boilers are suspended at each end by a column. They have been two years in use, using one at a
time. The boilers leak on top of the fire; we had a boilermaker caulk them, but in a short time they were leaking. A friend proposcs to have belts turned to fit
and take the place of the rivets (some of the leaks tak ind take the place of the rivets (some of the leaks take
rivets). I say the nuts coming in contact with the same will burn, and be dangerous. Which is the better not burn; but tolts and nuts would answer and would ivetswould probably be the best plan.
(9) M. P. asks: Where can I have failed in my efforts to produce thefirstclass waterproof blacking, of September 9, 18769 I I have followed the instruction as carefully as possible-both by the aid of heat and without it-I have also varied the proportions of the ingredients given, and all without success; and as I am
most anxious to attain my object, I shall be thankful for any help you will kindly afford me. A. The following are the materials and method employed in the manufac
ture of an excellent blacking, and one which we can vure of an excellent blacking, and one which we can
vouch. Dissolve 18 ozs. caoutchouc in 9 lbs. hotrapeseed oil by constant stirring. Add to this 60 lbs. finest vory black and 40 lbs . molasses, with 1 lb . finely ground gum arabic previously dissolved in 20 gallons vinegar,
No. 24 ; the whole to be triturated in a paint mill until smooth. Then add, in small successive quantities, 12
lbe. commercial oil of vitriol with constant strring for lbs. commercial oil of vitriol with constant stirring for
half an hour. Repeat this half hour daily stirring for 2 weeks, add 3 lbs. gum arabic in very fine powder, and It is then ready for use. Care should be taken to avoid loss of the solvent by evaporation. For blacking in paste, nse only 12 gallons vinegar. A good blacking is also made by mixing 3 ozs. ivory black, 2 ozs. molasses, arabic dissolved in water, and 1 pint vinegar.
Will you give me direction
Will you give me directions for preparing a firstclass oil for watches? It should be free from gummy matter and should neither freeze nor act upon metals, and ye pure olive oil is in general use. For this purpose glycer in has also lately been employed, aud mixtures of glycerin with sperm and olive oils. One of the best watch oils now in use is prepared from finest sperm oil. We concerning the prectise method pursued m its produc tion to warrant us in formulating a recipe for its prepa
(10) M. J. says: We have built a tank house about 40 feet high and 15 feet square at the base, and 12
feet square under the eaves. The tank is in the top story of a building; it is $10 \times 10 \times 8$ feet, and it leaks. We made the tank out of $11 / 4$ inch matched fiooring 6 inches wide; the joints were well tarred, but it was no
good. So we laid another layer of common fiooring inside of the $11 / 4$ inch layer or outside body of the tank, and used white lead on the joints throughout, and had difficulty has presented itself in that the water which comes from the tank tastes very strongly of tar. How can I stop the leaking of this square tank without using
any poisonous substance, as all the water used for culiany poisonous substance, as all the water used for culitank secured with iron hoops, the tank increasing in tank secured with iron hoops, the tank increasmg in
size towards the bottom. Your surest remedy now is to lime your present tank with sheet lead, properly put in a plumber.
(11) G. M. G. says: I wish to make a circular saw arrangement to run by treadle or foot power. to run all right? The saw is 8 inches in diameter; what must be the size of the fy wheel? $A$. Use a 3 inch pul intend using the saw for sawing short stuff or for cross cutting, a balance wheel on the saw mandrel will assist, as the power stored up in the balance wheel will carry
(12) J. J. G. says: 1. If I pump 130 lbs. of in ine eveoing will I have the same and 20 feet long in the evening, will I have the same pressure in the
morning? A. If the temperature of the air is unchanged, the pressure will remain constant. in this case. If the
air becomes heated, the pressure will increase; if cooled, the pressure will fall. 2. Is 130 lbs . of air equal to 130 lbs. of steam, and is expansion of air less than that of
steam? A. There is not much difference between the expansion of air and steam, for constant temperature;
but where there is no gain or loss of heat, the difference is considerable, 3. Has any one invented an air loco motive? A. There have been quite a number of com-
pressed air engines invented. If your device is an improvement over others, it may be worth your while to
(13) H I H
(13) H. L. H. says: I have 6 oscillating en run them 500 revolutions per minute, with 25 lbs. press
re. How large a tubular boiler will I need? How much water will be evaporated per hour at that speed and
pressure? A. It would be best to make some expertments with one of the engines before building the boiler. tat if this cannot consistently be done, it may be well to design a boiler capable of evaporating 24 cubic feet water per hour. You may allow from 30 to 35 square rated per hour.
(14) S. W. asks: Can you give me a methfrom water? A. The fat, so as to get the grease free (see article on p. 22, vol. 36) with dilute oil of vitriol for ome hours, which treatment separates the fat compickle, rises to the surface, where it is allowed to stand for a short time, molten, untilthe water is eliminated by
its superior gravity. By this method the water may be its superior gravity. By this method the water may be
(15) J. E. W. says: I have a piece of land of 100 acres, and I cannot get water by digging wells. Ihave a spring of very best water at the base of a hin force the water 100 feet high into a large tank 1,000 feet from spring, and let half the water into this tank and the other half 50 feet higher to the top ofhill, to another
tank 500 feet from first tank, making in all 1,500 feet tank 500 feet from first tank, making in all 1,500 feet rom spring. Which would be the best, windmille or steam power, to pump the water? A. We judge from pose very well; and we ad
ence to the steam pump.
(16) R. B. G. says: In the Scientific American of September 30, 18i6, I notice a problem given by C. D. S. to find the radius of a circle, the chord
and versed sine being given. The formula given is er roneous. When using the square of 1 and dividIng by 1 , you do not materially change the result. But take anyother number than 1 f for the versed sine, and you will readily perceive the catch in your formule. If C. D. S. will use the following old formula he will be al-
ways right. Thus: Chord $=6$ inches, versed sine $\cdot 2 \prime$. whays right. Thus: Ch
Then. $=\left(\frac{\mathrm{C}}{2}\right)^{2}$

## 20.6\% Your formula gives:

$\frac{\left(\frac{\mathrm{C}}{2}\right)^{2}+\mathrm{V} . \mathrm{S}^{2}}{2 \times \mathrm{V} . \mathrm{S}_{0}}=\mathrm{rad} .237 . \quad$ Now the proof is as you stated. Rad. $-\sqrt[V]{ }$ rad. $2-$ semi-chord ${ }^{2}=$ V. S, which 193 instead of 0.2 . A. The two expressions are allize, nd will give the same value for the radius, ifthe proper substitutions are made. By a slight reduction, either rmula can be changed 1 By the other
(17) G. C. R. says, in relation to the subject testing milk: A solution of subsulphate of iron does the work admirably. I took two wide mouthed bottles
of the capacity of nearly 2 ozs. each. In No. 1, I put 1 oz . milk, added 5 drops of the iron solution, and
mixed them by shaking, merely closing the mouth of mixed them by shaking, merely closing the mouth of
the bottle with my hand. The milk was at once divided the bottle with my hand. The milk was at once divided into water, containing the excess of the solution of ron, and coagulum. On bottle No. 2, I fixed a smal
piece of wire gauze in a box, so as to have a border around the sieve. On pouring the contents of bottle No. 1 on the sieve, the water ran through, leaving nothing but the wet coagulum.
(18) B. asks: In preparing books for sewgi, will a set of saws 8 inches in diameter, each saw
aving 8 teeth, cut the paper to $1 / 8$ inch depth aswell having 8 teeth, cut the paper to 3/8 inch depth as well more numerous the teeth the better, unless they are so small that the paper clogs them.
(19) H. \& F. say: During the recent frosty weather, an upright tubular boiler was caught
ell filled with water, which froze so hard that the boiler sprung the bolt heads and seams; so that when re was again started and steam up, it leaked, and let steam escape from many places. After caulking up
these places, however, the leaks seemed to be stopped, and she now carries her usual head of steam; but the and she now carries her usual head of steam; but the
boiler is very plainly sprung outward, and our anxiety is to know whether she has received any permanent inury from this strain, or been weakened inany manner? . We have known of several cases resembling yours. D personal examination, whether or not your boiler has been permanently injured; but, as far as we can judge
from your account, it seems probable that no serious damge has been done
(20) T. \& H. ask: We wish to put up a steam saw and planing mill run by a 40 horse power en-
ine with governor. At a distance of 150 or 200 feet therefrom is a large building for ginning cotton, requiring, say 10 or 12 horse power, to drive successfully.
Which would be the best way to run said cotton gins, by Which would be the best way to run said cotton gins, by
line of shafting from sasw mill to gin house (the land being level), or to put a 12 horse power engine in the gin house, to take her steam from the boilers 150 or 200 feet distant through $11 / 2$ inchsteam pipe laid on a level with the ground? A. Use the steam pipe, but jacket it thorughly to prevent radiation.
(21) W. S. H., Jr., says, in reply to a corespondent who asked for a soldering fuid that will not
corrode tools: For the past three years, I have used a corrode tools: For the past three years, Ihave used a what actual contact might do, as I do not spatter my
 crystals 1 oz., best alcohol $21 / 2$ to 3 fuid ozs. It keeps best in a glasestoppered phial. I have found the above to work full as well as the old kind, and much prefer it
(22) W. T. asks: 1. Why will not common charcoal do for the carbons for a bichromate battery? It does work fer a short time. A. It will do, butits porous nature and brittleness are great objections to its use. 2. Is it as easy to magnetize a rod of soft iron, 12 inches long, as it is to magnetize one 2 inches long, provided the
same number of layers are used? A. Yes, but greater same number of layers are used? A. Yes, but greater
current is required to produce the same degree of mag. current is required to produce the same degree of mag-
netization.
3. Will No. 30 wire magnetize satisfaetorily
a core $8 / 2$ inch in diameter and 8 inches long? I have
put 4 layers on to a core of that size, intending to put on about 20 , but the result, so far, does not encourageme to proceed. My object was to run a good sized core,
with a very small quantity battery. A. Two to four layers of No. 16 or 18 copper-covered wire will answer your purpose better. No. 30 is used only when the recomparatively great. 4. Why is platinnm used for brating tongues? I have some of brass and copper that work very well. A. Because it is less oxidizable than most other metals. 5. How is sheet brass toughened? A. By rectro-maguets? A. By heating it red hot and then allowing it to cool very slowly.
(23) J. M. M. asks: What metal will expandand contract the most by heated air How much would a bar of metal 10 feet long and $\frac{1}{2}$ inch square
expand for each degree of heat? A. Lead, zinc, and tin are among the most expansible solids, their coefficients of linear expansion per Fah. degree being
abont as follows: Lead $0 \cdot 000016$, zinc 0000017 , tin $0 \cdot 000015$.
(24) E. S. says: In answer to your correspondent P. J. S., who having read "that the seed of shorses in winter and spring, half a pint a day keeps them in health and spirits, with sleek coats, and more nimated than any other find in prevents heaves and some other disease," and he inquires if there is any
truth in it. I have a large number of horses under my care, and had the ahove feed recommended to me. gave it a trial, and found it to do good, it bringing horse into a good condition in a short time. The seed contains an oil which the horse seems to relish, when the seed is mixed with other food; and given in half pint
doses, it aids digestion and acts as a mild laxative, and doses, it aids digestion and acts as a mild lazative, and disorders arising through constipation. I have never lief to horses afficted with them. I have also used it rith good results on a horse whose lungs had been left impaired by a severe attack of pneumonia, and whose re spiration wasdifficult and laborious, and it afforded considerable relief. The following is also a very good food for horses, and may be used for the same purposes as the
above: It is composed of 2 quarts oats, 1 bran, and 16 above: It is composed of 2 quarts oats, 1 bran, and $3 /$ pint flasseed. The oats are first placed in the stable bucket, over which is placed the flaxseed. Add boiling with an old rug and allowing it to thus rest for 5 hour when it is mixed and ready for use. The bran absorbs while retaining the vapor, and the flaxseed binds the oats and bran together. A greater quantity of flaxseed would make the preparation too oily and less relished. One
feed per day is sufficient; it is easily digestible and is especially adapted for young animals. It also tends to atten.
(25) H. F. B. asks: Can I return the condensed water of a coil of pipe into the boiler without the use of a pump? A. With properly designed heaters,
you may possibly be able to return the water; but it will be better to use a trap specially constructed for the pur
(26) O. O. M. says: I have a model sidewheel boat 45 feet long by 12 feet beam; it draws 14
inches of water. I want to put two direct connecting engines in it. What size will I need? What size single engine will I need? What size wheel should I use? A inches diameter, 1 to 18 inches stroke, or a single engin with some cross section of cylinder
(27) D. B. T. says: In the open air, water boils at $212^{\circ}$. In a boiler having an air pressure of six atmospheres, it will not boil at less than $320^{\circ}$. What atmospheres of steam, if we turn air of seven atmospheres pressure into it, without allowing the tempera-
ture to rise? Would all the steam be condensed or would the air be diffused through the steam according to Dalton's law of the diffusion of gases? If so, why? A. If the temperature of the air was not raised, none of the low Dalton and Gay Lussac's laws. This follows for the deflnition of a perfect gas. You will find a good discussion of this
the Steam Engine."
(28) T. S. S. says: I wish to build a governor, the arms of which, from the centers of motion, shall measure 6 inches, the balls to be 21 bs . weight each.
Howmany revolutions per minute will be required to raise the arms to a horizontal position? A. You cannot raise the arms to a horizontal position, at any rate of speed, but you may approzimate the position quite close ly. A full explanation is given on p. 389, vol. 31 .
(29) H. H. H. asks: I have a horizontal bar suspended from two wire ropes and guyed to the floor should the suspension rope and guys be fixed to the bar so that itwill not turn, andwill be perfectly stationary A. The manner in which the bar is set up by profes sional gymnasts is probably as good as any. The bar is prigh to two uprights, so that it cannot turn. These them.
(30) J. B. asks: Why is it that the low pressure cylinder of a compound engine is made larger
in diameter than the high pressure? would not fect be the same if the terminal pressure in the high pressure cylinder acted upon a piston of the same size instead of a reduced pressure (due to larger space occu pied) acting upon a larger piston? A. One of the objects of the compound engine is to obtain a high grade of expansion; auother is to employ a comparatively low ing action of the cylinder which is exposed to the cool generally to have the equivalentmean pressure the seme, in each cylinder. We think these are the principal rea sons for making one cylinder larger than the other, whe
only two cylinders are used.
(31) C. J. A. says: 1. I have two low press re boilers, 18 feet long and 40 inches in diame jress
two flues each. They have a two foot brick wali
between them and are not connected together. I heat $125 \operatorname{largc}$ rooms with them, that do not have regular heaters in and only have a large quantity of piping hung on the walls in a eigzag form. The steam passes directly through about 280 or 300 feet of piping before reaching my return pipe in every room. Those
that are close to the boilers get the most steam and return steam or foam into my boilers; while those at a distance retain the water so that the lower part of the pipes have water in them all the time. Ihave no pump, and have to depend on my condensed steam for supply of water. Is it safe to set boilers without having a
pump, injector, or other reliable way of supplying
them, or can I sarely depend on condensation for supply? A. Without knowing the size of rooms and character of building, we could not form a very definite opinion a the economy. We think it would be well for you to thech a trap of the kind that is made for returning
andensed water from heating coils. 2 . In starting steam in the morning, there is a continual cracking and thumping noise until I have a complete circulation. I have about 35 drip cocks to assist in letting the air out, besides two main air cocks. A. To get rid of the cracking and thumping noise, it will be necessary to re-arrange your heating apparatus, so as to secure better circula
(32) J. J. says: 1. $\Lambda$ reservoir $\frac{1}{\frac{1}{2}}$ mile square in surface, 20 feet deep, 2 miles from town, and 200 feet ength. One is inserted at foot of reservoir, the other is inserted 19 feet above the first, or as near the surface as practicable without admitting air. Both pipes are
brought to the same level in town. Wonld there be any difference in the pressure or amount of water discharged? If so, whyp A. As long as the proper level was maintained in the reservoir, there would not necessarily be any difference in the action of the two pipes beyond what would be due to their difference in length and shape. 2. What wonld be the effect if the last mentioned pipe was fed from a box three feet square, the water being kept at the same height as the reservoir! A. The box, under the conditions named, would answ
(33) H. S. P. says: 1. I have a small cop per boiler 12 inches high and 8 inches in diameter; it has a funnel inside, 8 inches in diameter at the bottom and $11 /$ inches at the top. The copper is $\frac{3}{3}$ of an inch thick. $\begin{array}{ll}\text { How much pressure will it stand? } & \text { A. You can carry a } \\ \text { pressure of } 201 b s \text {. per square inch: } & \text { 2. How large an en- }\end{array}$ gine will it runs. A. Make one $1 \times 1 \frac{1}{2}$ inches.
Minerals, etc.-Specimens have been received from the following correspondents, and xamined, with the result stated:
H. $\Lambda$. S.-Your precipitate consists principally of organic matter and sulphur, together with a small quantity of silicic acid.--J. D. R.-It is galena, sulphide of lead, and contains, in 100 parts, lead 87 , sulphur 13 parts (by
weight). - M. T. D. - No. 1 is a silicate of ahumina and weight).-M. T. D.-No. 1 is a silicate of alumina and
lime, together with carbonate and sulphate of lime, lime, together with carbonate and sulphate of lime,
blende, and sulphide of lead. No. 2 is jamesonite ( 3 Pb $\mathrm{S}+2 \mathrm{~Pb} \mathrm{~S}_{3}$ ), and contains in 100 parts, lead $43 \cdot 6$, sulphur, $56 \cdot 4$ parts.-G. S. M. - Nos. $1,2,3,7$ and 8 are impure clays (silicate of alumina) containing considerable
quantities of lime and sesquioxide of iron. They might be employed as material for the manufacture of bricks. No. 4 might be called a low grade of potter's clay. No.
5 is clay slate, of no particular value. No. 6 is clay, containing a large quantity of carbonaceous matter,
etc. No. 9 is red hematite (sesquioxide of iron). If in large quantities, it is valuable as an ore of iron.-W. little magnesia and iron, some fine sand, and a considerable quantity of alumina and silicate of alumina, or clay. The greater part of the alumina, clay, and sand
may be removed from the water by slow filtration through gravel, and the iron and bicarbonate of lime by the addition of the proper quantity of clear lime water. The quantity of lime water requisite may be de-
termined by experiment with known volumes of water and reagent.

## COMMUNICATIONS RECEIVED.

 The Editor of the ScientificAmerican acknowledges, with much pleasure, the receipt of original On Transporting Ships Overland. By E. R. On Brushing the Teeth, etc. By S. M. A. On Nature and Life. By E. S. N. On the Coast of France. By P. G.On a Cavein Pennsylvanis On a Cave in Pennsylvania. By P. M On the Geographical Distribution of An:mals, etc. On the Fright of Birds. By F. B.
On the Diagonal and the Side of a Square. By T. F. Also inquiries and answers from the following: G. W. E.-J. B--J. W.-P. T. C.-M. M-J.G. G.-
G. M. W.-J. J.-E. F.Y.-R. A. J.-E.M. E.-G. K. - L. A. S. - C. F. P. - M. M. C.

HINTS TO CORRESPONDENTS.
Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude address of the writer should always be given. Inquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste hasket, as it would fll half of our paper to print them all; but we generally take pleasure in an
is given.
Hundreds of inquiries analogons to the following are Who sells lithographic stone, and what is the price per lb. 9 Who sells barometers? Who sells screw propellers, suitable for small boats? Who sells a machine for making fishingnets ${ }^{2}$ ". All such personal inquiries are printed, as will be observed, in the column of "Business and Persutal," which is specially set apart for that purpolumn. Almost any inge mentioned at the head of that column. Almost any desired information can in this

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