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A. K. will find, on reference, that the per petual motion absurdity in moot of its forme is disoused in vols. 2 za and $24-\mathrm{R}$. J. J. Will And form
ueq for caloulatitig the strength of boilers on pp loga by following the direotions on 235 col J. . can olean marble by the method detailed o
 books on industrial and eolentiffo subjects, should address the booksellers who advertise in our col-
umns, all of whom are trustworthy firms, for cata umns, al
logues.
(1) R. M. C. says: We have an engine 7 aches diameter by 20 inches stroke. The steam We use 60 lbe. steam boiler pressure, cut-or at stroke, and run at 150 revolutions per minute, using 94 to 1 cord hard wood per day. We have
written to a frm in regard to a governor for th written to a firm in regard to a governor for the plpe should be not less than $21 / 6$ to 3 inches, as th ateam now has to travel through $11 / 6$ inches pip
 is too small if you wish to get full power out o the engine. Under the circumstancee, it seems
to be large enough, and you could probably carto be large enough, and you could probably car-
ry a lower boiler pressure, and open the throt cle a little more.
(2) C. C. E. asks: What time of the yeari best f or cutting oak tmber for fence posts? A
There is some diference of opinion on the sub ject, but we thing the weight of authority is in fa vor of cutuing the timberin spricg or autumn.
(3) C. L. M. asks: 1. What proportion has
the focus of deld lens of an Huyghenian negative oyepiece to the eyeglass, as used in compound mi oroscopes? A. The field lens has about double the focallength of the eye lens, and their distance apart is one half the sum of their focal lengths. . What proportlon has the aperture to the focus A. The
length.
(4) W. O. asks: During the first quarter revolution of the driving wheel of a locomotive (the wheel pressing upon the rail), does the point
in the circumference marking theeract top thereof move a greater distance forward than the ex of move a greater distance Porwa.
act bottom of the same? $\mathbf{A}$. Yes.
(5) W. G. eays: I have tried zinc in my
boilers fur preventing incrustation, and fad it very good. I wind strips of copper around it. put in a $a$ feet by 10 feet bofler about 20 lbs. in 3 to
4 lbs. Incots. I pul some on the bottom, 4 lbs. ingots. I put some on the bot
on top of the flues, near the heads.
(6) M. B. M. asks: 1. How much water would Montgol-ier's hydraulic ram discharge at
the spindle valve in raiding 100 gallons 25 feet above the spindle valive in raising 100 gallons 25 feet above
the supplying fountain? $\mathbf{~ I}$. It would depend on the head and the efficiency of the ram. 2. Would the same amount 50 feet high? A. Yes, other things being equal.
(7) J. H. H. says: Our town is situated on it; and when the water runs over the dam, the windows and doorsof the houses within a quarter of a mile of it shake. Is the shaking caused by the water faling in the same strata of rook that the foundations of the houses stand on, or by concussion of the air caused by waves, etc. ? The fall of
the water is about 12 feet. $\quad$. We incline to the oret hypothesis.
(8) C. G. B. asks: How much water is evapyards) in the course of a year, and how much dally in warm weather? A. In general practice, the average evaporation per 24 hours is taken at 18 for
of aninch in depth. This only gives an approximation for estimates. Of course, for any particular locality, it must be determined by experi-
(9) H. F. S. asks: Would two half circles lots made to slots made to receive them, bear a sudden and
great force, tending to separate two blocke congreat force, tendiog to separale by them, without straighteniog? A. Thus arranged, they would form a very strong conneo-
tion.
(10) I. L. B. asks: 1. What effect is pro pressed? A. It is increased. 2. Is this effect intensilied by the extent of compresaion? If so,
what is the law? A. See p. 123, vol. 33. 3. How what is the law? A. See p. 123, vol. 33. 8. How
much can air be compressed? A. It is onlylimit ed by the strength and durability of the machine ry. 4. What would be the effect of hoating or
cooling air, when compresed, alter it is permitted to expand? A. Heating increases, and cooling deoreases, the volume or the pressure. 5. Has any automatic device heen contrived by which air can be compressed, so as to give it an expansive power of two or moreatmospheres, and where can a desoription of such device be found? A. There are
numerous machines of this kind. You can obcbinery.
(11) D. C. S. asks: 1. Is zinc paint as good come in contact with the water? A. Our experience, which is, however, quite limited, is rather against the use of zinc paint under sucb circum. stances. 2. What is the best composition to use in with oll answers very well. 8. What compoition With ollanswers very well. 8. What composition
is the best to put on ironwork of a boat to give it a smooth black surface that will last? A. Black varnish made from petroleum is very good.
(12) H. M. W. says: 1. I am making a small engine,with a cylinder $13 / 1$ a inches. What
should be the size and weight of fly wheel? $A$ Make it 10 inches in diameter, to weigh wheel? A. 15 lbs 2. I wish to make a horizontal boller 14 inches in
diameter and 2 feet long, with a flue 8 inches in didiameter and 2 feet long, with a flue 8 inches in di-
ameter, using the flue for a tireplace. Would this cast tron heads do? A. We do not recommen cast iron
(18) J. J. says: 1. You state that some kinds by friction and we casenardened to a high degre ure of cast iron that will become thus casehard ned? A. All cast iron casehardens by friction. The harder the metal is, the more it casehardens. . Is there any known method of casehardening any substance while in motion? $A$ No.
(14) H. P. M. asks : I am making a pair ngines with live steam Jackets on chading.
there any better mode of effecting economy by rantageous in some cases, and in others it is doubt ul whether their use is benetlicial. Much depends upon the conditions under which the engine is oprated, and more, probably
(15) L.H. F. says: 1. We often see, in the morning and evening, when the sky is partis clear them? Ther ar rom the sy artion of the sun's rays passing through openirgs in the oloude, while theadjacent portions a re obstructed by the olouds. 2. Why does more snow fall after sunse than during the day? A. The heat of the sun re-
tards its forming. 3 . Some say that a noon mart for the summer season will not do for winter, that the sun is farther west. Is this true? $A$ There are but four times in a year in which th sun will be on the noon mark at noon. Thesear The sun is either fast or slow the rest of the time . What causes a o!rcle around the sun? A. These are called parhelia, and are caused bs the sun ight being refracted by moisture or frost in the

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1010
$$

(16) H. J. W. asks: Is there any acid that wlll burn iron platiog as deep as $3 / 6$ an inch o more ? A. You may try a hot mirture of muriatio
and nitric aoide with water. We do not, how. prove very succesaful.
(17) J. H. H. asks: Does the tirtue of gyp sum for fertilizing land consist in the amount of sulphuric aoid combioed with the lime? If so, in two different parcels? A. It is generalls be lieved that the favorable action of gypsum upo is gielded up. Putridity gives rise to the forma is yielded up. Putridity gives rise to the forma-
tion of carbonio acld, which combines with the lime of the espsum, leaving carbonate of lime and eulphate of ammonia. This explanation of the eficacy of gypsum-dunging, as it is termed, is
however insufficient. The inveetigations of Mayer however insufflient. The investigations of Mayer
have shown that in clayey soils the oride of iron, ave shown that in clayey soils the oride of iron,
etc., afords larger and better combinations with ammonia than gypsum. The quantity of gypeum realizing at the most $22_{18}^{2} \mathrm{owts}$. of carbonate of am monla. Mayer's researches, however, show that in an acre of field land there are 272 , and in chalky oril 158,0wts. of carbonate of ammonia contained. According to Liebig's late researches (1883) it. apportion of its lime in exchange for magnesia and potasea. But it must be borne in mind that pulverizedgypsum, as well as unburnteypsum, when brought into onntact With a solution of potassa,
sets into a difficultly soluble mass. We must, sets into a diffloultly soluble mass. We must,
then, wait for an adequate theory untll the sevethen, wait for an adequate theory untll the se
ral reactions have been more closely studied.
(18) C. R. C. says: I wish to convert waste ing twisted, it is almost ueeless. Is there any ohemical procese by which the twist may be disengaged and the substances converted into floss? A. We know of none.
(19) C. A. B. \&\& B. ask: How can we make a peratures, but which can be softened by heat? A. Melt together in an iron por equal parts of pitoh and gutta percha; apply while hct.
How can we make artificial camphor, described
by Dr. Ure? A. Transmit the dried hydrochloric by Dr. Ure? A. Transmit the dried hydrochloric aoid gas into the artiflially cooled essence of tur-
pentine sc long as it is absorbed. As soon as this pentine so long as it is absorbed. As soon as this
absorption ceases, the compound must be submitted to the action of a freezing mixture of snow and salt, by which it is separated into two por tions, one of which orystalilizes while the other re
mains liquid even at $0^{\circ}$ Fab. The production the liquid compound is favored by elevation of temperature. If the temperature of the essence be raised to 218 Fah. during the absorption of the
hydroohloric acid, the liquid compound only is formed. Both the solid and the liquid are found, on analysis, to poseess the same composition. The solid bodyhas been termed hydrochlorate of camphene or of dadyl. It crystalizes in white prisma, Which havean aromaticsmell and taste resembling
those of ordinary campho:. It is insoluble in water; alcohol dissolves one third of its weight of it. boils at $329^{\circ}$, at the same time undergoing partia
(20) H. L. asks: How can I make gasoline, Por burning in a stove which I am constructing? A. Gasoline is obtained as a product of the dis-
tillation of petroleum. It is among the lightest olls that come over on the frst application of heat, its volatility and inflammable nature ren dering it a dangerous substance in inexperienced
hands. It would be cheaper and fafer for you to purchaseone of the stoves in question, and with it
explicit directions for its manipulation, rather than attempt the construction of one from any
directions that we could give you. This answer veral other cor condents.
(21) A. B. says: We are using inkstand
nadeof zinc plate, but the ink will not keep in hem, as the logwood falls to the bottom, and above $s$ clear water. How can I remedy this? $\mathbf{A}$. The ommon merals are col 1 lab the construc on of inkstands, no matter what variety of ink
(22) S. P. says: I desire to get a light roman oll lamp or a coal gas fiame, tbat bas n tand that a yellow light has no such activity, and hat photographers use a yellowlightin their dark cooms without its exerting any apparent efrect on the negative. How can I do this? A. The actin mof lamp or gas lame is almost imperoeptible. not require the colored glass you mention.
(23) J. P. O. asks: What chemical will deA. Trv mercurv
(24) W. J. F. says: Please give me a form and red oxide? A. Yes. The monozide is thrown down from its solution as a bulky, whitiph hydrate, by
theaddition of a little solution of potagaa; it soon the addition of a little solution of potaza; it soon
becomes brown, however, if allowed to remain in contact with the air, by the absorption of oxy en.
(25) C. D. M. asks: Can dynamite be dilu perties, so that it can be experimented on by in xperienced persons without dapger of serio result, and at the eame time retain its character such experiments could not possibly be made fre rom danger. The dilution you suggest is no
rom dang
MINERALS, ETC. -Bpectment have been re seived from the following correspondents, and oramined, with the revalte etated:
D. F. M.-It contains no silver.-J.C. H.-The inorganic constituents of the sample are alum. ina (considerable), potases, soda, lime, and traces
of iron and strontia. It would require a complete analysis to determine theorganic constituente, whish form a very considerable portion of the inclsa. We cannot eay whether this contains any irjurious matter or not; but many of the gums of the same species have acid and inteneely poisonous properties. We cannot clasify No. 2 withou
an analysis. Nos. 3 and 4 are Floridg bean. an analysis. Nos. a and 4 are Florida beans.

## COMMURICATJOAS BECEIVED.

cowlediee with much pleasure the recoitpt orlotinal papere and contributions upon the follow ing subjeota:
On a Telescoplc Eye. By J. H. H.
On the American Flag. By C. E. N.
On a Boat Protector. By A. M. G.
On the Confederate Banner. Bys. D.
On Canine Sagacity. By 8. 8 .
On the Flow of Liquids. By C.
On the Erie Canal. By W. J. A.
On a Picno-Hydrometer. By H. W
On the Wear of Railway Rails. By J. L.
On a Torpedo Expertment. By A. B. R.
On a Torpedo Experiment. By A. B.
On a Remarkable Ege. By J. MoM.

## Aloo inquirles and answers from the following:

## B. B.-E. L. L.-A. M. S.-G. B. R.-P. B.-J. K.- T. B. - N. W.-J. W.-0. A.-T. R. V.-G. W. B.- C. B. - -G. \&. R. - D. B.

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may conclude that, for cood remons, the Editor declines them. The addreen of the writer ehould 2ways be given.
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bility of inventions, asedgnments, eto, will not be bility of inventions, asedgamenta, eto, will not be
publiahed here. All such questo ans, when initial ouly are siven, are thrown into the waste baaket, as it would fill half of our paper to print them all; but we generally take pleanure in answering briefy by medl, if the writer's address is given.
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