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## 

S. asks for the best mode of preparing
caustlcive, for soapp making trom aod F. E. H. asks for the best means of clean
A. R. asks: What can be mixed with clay
that wil harden tt, without nalng are? F. D. H. asks: How can I make good liquid A. H. G. A. . Aks: How can I stereotype from
wood cute? What is used for molds and how 18 the metal poured so that all the lines will be perrect?
W. H. . asks: How can I make a water on unexpected shower?
 Fith their various colorr be trangeferred to hard wood? S. asks: Why will a piece of cold iron covofed
melted iron, whle a p plece that 1 t to the top?
A. A. asks. Is it safe to carry a pressure of
20 1be. to the aquare tinch in $\&$ boller well made or 11.16 tnch copper, the dimenitons of the botier belng 12 tinch E. H. R. says: $I$ have just finished building
brick kllin, and $I$ would like to know what degree ot ,
R. B. says: I I want to paint an engine. There
 to stay on where tit 19 hot? What
to make new englineslook glosy?
J. P. H. asks for a practical plan for boring
or scraping out the cylinder of a poriable engine, without detaching it from the boller. "Cannot gerapeerl be set tna wooden shaft and on paper backing to ralse them
to their work, the shast belng turned to to the cylinder which 18 of $6 \%$ nches dlameter?
J. M. asks: What is the cause that we cannot keep the wing on a blower which we ue for clean-
ling graln? t 1 ta a auction blower, 1 foot diameter x
 9 Inches square. The winge are of heays sheet iron,
 G. W. K. says: I have a number of heavy
 that When they are folded and packed a way, theystlck to-1
gether ro tightis that tit requirea the strength of severa
men to pull them apart. What can be put on and mixed
Fith the ofl to prevent ttickling and yet keep them goot enough to bear foldang without Injury? Is there any.
thing that ta chearer and hetter than the oll
W. \& Co. ask :Can any of your orrespon-
denta give ua a rectipe by which we can make a aningle
 ti has been on for 5 years and 18 so much bother to keep
tight that we have to put on a new roof.and would much prefer shlngles provided we can make them so that the
danger trom tre tin not increased danger from fire 18 not Increased. We propose
or dippling the annugles before they are lald.
C. J. H. asks: What is the best thing to do

Lowing gre the clrcumgtances: The bore shows about 10
feet of soll, then $f$ rom 7 to 15 feet of sand saturated with feet of soil, then from 7 to 15 feet of sand saturated with
petroleum, then various strata of gravel, gand, clay, each

 and cial continue. TTe sand y fields on distillation about 30 gallons, and, from the bore, a barrel or so of oll 18
pumped dally. should the bore be continued? be pra superlor oll. The chalk oll at 60 Fah. Fhowed 222 , but

 on refnning, $2 \cdot 5$; by actds and alkalles, 85 ; by ditatilation

## 

H. S. will find full directions for making
laska acenery on p. 123, vol. 28. c. . C. can work out hrs problem by following the 1ngtruction on p . 257, vol. 28.
The Boundary Line Betwe arithene to consist of conditions belonging almply to the feld of arth. metic, require for their solution the algebralc mode of calling the unknown quantity by some stgn, say $x$, and tresting the resulting expreaston efter the regular rules taught by alfe ora; then the oolution, which otherwise 18 highly latricate ecomes a mork of mere manipulation of signa A problem orin Whe who etaes that some persons chim the 11 Cas. terly tnsoluble, while others think that there is a solution, only they could find 1 t ; he says further that the Norma School at Oabkosh cannot solve it, meaning, we presume, tion 1 A the tis : "A merchant has two grades of wheat with 25 cents diff erence in their value; a customer buys onedollar: worth of each grode, mixes them, and find that he has es
 Call the price per bushel of the cheapest wheat $x$ cents, then that of the everer quality io $x+25$ cents, whlch, when ex the quantities obtainced for the sameamount of money ar In an inverse ratio of the price, the relative quantities of
wheat which the customer buys for one dollareach will be $\frac{100}{x}$ and $\frac{100}{x+25}$, and as the two quantities are stated to be
2 busbels, we have the equation $\frac{100}{x}+\frac{100}{x+25}=2$. Bringing these two fractoona under the aame denominator, by mul and of the second by $x$, we obtain $\frac{100 x+2500}{x^{2}+25 x}+\frac{100 x}{x^{2}+25 x}$
$\frac{200 x+2500}{x^{2}+255}=2$. Nultiplying each term of this equation by $x^{2}+25 x$, we obtain: $200 x+2500=2 x^{2}+50 x$; divlde by 2 $100 x+1250=x^{2}+25 x$, or $x^{2}-75 x=1250$. This reduces the
whole problem simply to the solution of this equation of the second degree, which we do by adding to each number the
 his equation is $x-87 \cdot 5=\sqrt{2656 \cdot 25}=51 \cdot 54$, and $x=51 \cdot 54+$ $37.5=89 \cdot 04$ cente, which is the price of the inferior wheat
per bushel; while the better पuality costs $89.04+25$ orr11404 centa. We have given the operation hero with much mor detall than is customary in such solutions, but this 18 foa放
 Sushel, which can be had for one dolar or 100 cents, 18 evi-
 hese two fractions under the eame denomination we obtain

J. asks: Will heat affect the attractive
power of a permanent magnet? 2 . Are oxygen and ni
 ea the attractive power of magneta. 2. Oxygen sup.
ports
combuation. .
C. J. C. asks for a process for tempering raswing the temper, and the beat metrod of heating
WM11 a common blackemith's forge answer, or will Lehlghare do?" Answer: Heat to a bright cherry red elther in a furnace, so constructed that they will not
come in contact with the coal orfame, which are liable Come tn contact with the coal orfame, which are liable
to contaln sulpaur or other base minerala, or they may to contatit bulpaur or other base minerala, or they ma
be heated over a charcoal or cor coke firc. Harden by

 allow, and you may add 1 lb . plne pitch. Melt the rost
arrs, then add other tingrealents, and melt together, and stri into the oll when hot. The vessel cortaninng the hardening bath should be gurrounded with cold water to prevent overheating. Be sure that the spring almag
 dust, brushing of that which remalins loose. Then draw the temper slowly untll the onl 18 all burned offand stopp
gmoking. Thla may be done beat in an oDen wire cyllider vore a charcoal Ire tin a heet Iron furrace, smimlar It may be done in a well conatructed hot blast oven, or even over a charcoal or coke blaze. Let them cool offin the atmosphere. The mixture for harcenning can be evep


dead bue, or unt1 the oll is burned off. Four years
expertence in temperng cavalry asbers and swords aught me thas -J . E. E.
M. P. The idea of propelling canal boats
 logs consequent upon felling with the common axe, or
 have been published In the SoIrNTIITIO AXMRICAN, and S. B. E. asks: When did James Wait com.
plete his arrat engine, and when aud to whom was the arat patent given for a steam ooller? Auswer: James Watt completed and patented his arrat engine in the
year 1768-9. Papin used a steam pre sare boller in 1465, and Savory patented a ateam engine with a pressure H. A. B. asks: What proportion of burnt
clay should be mixed with quick llme arter the llme is Slaked, to make good water lime cement? Answer: Our
correspondent should read page 411 of Miller's : Elements of Inorgante Chembatry," The subject to too
large to be discused 1 o our columns. L. R. asks for further instructions on tem-
pering stel, asking us to select a rectpe sulted to mis case. Thls we are unable to do, as we have no know.
ledge of his requirements. We have lately given much
 W. A. S. says. 1 . I enclose a piece of scale
trmm our boiler. Will you please tell me of what th is composed, and mat 1 had better use to prevent 1 it? 2.
Howlongoughta atationary boller to last with caretul How long ought a atationary botier to last with carerul
use? We blow of twice a week and clean out twice a jear. 3. Can you give me a rule for finding the etrength of any gection or malleable castligs or for cast iron?
Which 19 the atronger? 4. What 1 ta the cheapeat and most conventent article for maklng cloth or rope are-
proof? 5. I have also a ittue Invention on hand. Is Theren phace in Boston where I can get access to the new? Answers: 1. The scale ts composed of sulphate of llme princtpally, with bome magneesa, , and, clay, and
 um ta a good preventite of ite deposition in this dense Hhere the depoit 1 ge gealing hammer, properiy ued, uall and dexpexpentyely. 2. We have known nteam boilMarine tubular bonliere are expected to last 6 or 8 yearg, but somettmee are kept runnIng more than twice that
length of time. 3 . The beest cast ron, unch asitu ued for
 nch, or more. Ordinary metal has about two thirda that streng th. Malleabletzed cast 1ron has a strentth of
rom 25,000 up to 45,00 pound p per Bquare tich according
 M. H. B. Says: : I have a litlle engine with a
cylinder 3 Inches In dameter and 6 inch giroke; ought
 high and 26 Inches 1 d diameter, with 22 two tinch fues. How many horse power would that be? Is it a good
dea to have nothing but athn place toovercome the up and downmotion? How long ought a boller and the engine, made as above stated, to last?
answer: The ought to run, without load, with four or flve pounds of steam. The eccentric rod is often so made and answers
very well on very small engines. A plain boller, well taken care of, should last many years, and the engine
much longer than the bofler. Some of James Watt's enGines
G. T. R. says: A friend states that an ordiplattom, over whice a layer of three feet of yellow clay
 by atmospherlc presure, which ti thls case would be
partly or mill
pemoved. Which 1 s right?
Answer: partly or whilly remoed. Whith 19 right? Angwer:
If the well were made aboolutely air tight, the pump
oudd arrauged a d deecribed, unflctent alr would enter the
well through the surrounding soil or the top to allow of 1 ts operation.
C. M. D. asks: Is corn a profitable fuel at
20
centa a buahel, when wood 18 s5 per cord, say for a 10 horse power engine? Answer: It requirea about 50
buahele
ot
 cal conatitution of wood and greln is about the bame,
and they therefore ehould be of about equal heating hat, it pound for pound. We can therefore cosin

I. W. F. . asks: Can you inform me how Cheeg grind odd razor, and what the machnnery y ued 19?
Angwer: By meana of nine stonea, the eame as other cut. $\stackrel{r}{\text { ery. }}$


 nal while pouring of the Babbitt metal Now as we ar runnIng quite a numbero saws, large and smali, should 50 tnch sam on a s fnch mandrect, makling $82 y$ revolutions per minute, in boxes lined prectsely as you advise, in Which thas been running for several montha, during a single day, though the box on the other end of the The power for driving the asw fa obtalined by al 12 inch
ind belt on a 23 nach pulley at the $\begin{aligned} & \text { ilde of the last named box. }\end{aligned}$ and the one on which the welght, caused by the teniton IIned three or clur times in two years, and always with
 ased. Answer: Saws unevenly ground or tiled out or
use sawe end of the mandrel to heat. When the saw is in the
cut, there 1 illtte or no welghton the lower part of the oox, unlessthe belt draws downward ; or, in other word When the saw teeth are in the cut, the tendency is to lift
the mandrcl and throw the pressure againat the cap or apper part of the box; and the pressure of the thmbe

