## Business and Eersonat.

Old Battery Zinc Bought-7c. per pound pald for old zinc battery plates. Partles out of town
willplea $\varepsilon$ esend the above stock C.O. D., and It will re.
celve prompt attention. Thos. B!nns, 243 Leoonard St., celve prompt attentlon. Thos. B'nns, 243 Leonard St.,
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furnaces in a malleable iron foundry; must be able to ive reference, and atate where and how long be has
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Lathes, screw-cutting, back gearel, turn
12 in. ala. and 3 ft lonk, wt. su0 bs, treadle: rdova, 111
Wanted-The address of manufacturers in
ohio who will manutacture and sell, on royalty, a cheap and uefulu agricululturartl lmplenenent. If If pereferred, Cheoun-
ty RIghts will be sold. Jas. P. Parsons, Batavia, N.Y. Manufacturers of small stetl wares, wieh-

To Engine Builders and Boiler Makersshop, or would purchase an interest in one already
established. Address J.C., P O. Box 2728 , St. Louls, Mo. For Sale, Cheap- One 18 in. Engine Lathe,
12 ft. bed, nearly dew. For particulars, address Thos. E. Wet's, sandy Hill, N. Y.

Lyman's Universal Screw Cutting Table,
with rule for Comoound Gearing, Price 10 cts. Address Lyman, C. E., Ne $\begin{gathered}\text { Haven, Conn }\end{gathered}$
A Situation wanted as Foreman of a Boiler
Shop, by a mın of 12 years' expertence. Address John McMahon, 176 Hamilton Avenue, Brooblyn, N. Y.
H. Beloo, Sacramento, Cal., wishes to com-
muncate with makers of knife sharpeners and other H. Beloe, Sacramento, Cal., wishes to com-
muncicate with makers of knife sharpeaers and other
small arttcles of resty sale. Inventors! I wanta small saleable machine. on a royalty. William A. Sweetser, Brockton, Mass.
Safe Investment.-For Sale-Big Muddy
Coal. Timbrir, and Farm Ianois. The whole or one inter. est in 74 mbis Acres of tbe BIg Muddy Smelting Coal Lands, in Jackson County, Illinots. Velo 3 and 6 feet in 80 feet fences; Timber. such as White and Purr Oak, Walnut,
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temattcally arranged collection of 2000 spectmens, one constating of 1.500 spectmens of large size for a Pub.
lic Institutlon, many foesilis, gems, etc., on the appratelic Institutlon, many fosesils, gems, etc.., on the appratse--
ment of Judges. Apply to Lewfs Feuchtwanger, 180 $\underset{\text { Deseane s Strictly tirst cla ss and rellable. Send forclrcular- }}{\text { Dit }}$ F. L. Chase \& Co., $95 \& 97$ Liberty St., New York.
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Tools. D. Frisble \& Co., New Haven, Conn. $\underset{\text { Whitingille }}{\text { Spinning }}$ Singing of a $k$ ang Co., Whithasville, Mass. Diamonde and Carbon turned and shaped
for Sclentific purposes ; albo, Glaziers' Dlamonds manu-Wanted-The Manufacture of "Specialties" I am now furnishing Iron Roofing, coated
with the best Metalle Paint, for only (7) Seveu Dollars
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ary. Keystone Portable Forge Co., Phlladelphia, Pa. Roilers and Engines, Second Hand. Egbert
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Makers. Send for free tllustrated Catalogue.
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sdureas sillo, feck $\&$ Co. New Small Tools and Goar Wheels for Models
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$\underset{\text { Mrigating Machinery, for }}{\text { Minge Bale or rent. }}$. Dree advertiseent. Andrew's Patent, Inside page.
Automatic Wire Rope R. . conveys Coa A F. Havens Lights Towns, Factories, Ho Beat Philadelphia Oak Belting and Monitor
titched. E w. Arny, Manutacturer sol 3033 Chery t... Phliadelpha. Pa. Send for circular. Temples \& Oilcans. Draper, Hopedale, Mass Buy Boult's Paneling, Moulding, and Dove
alling Machlne. Send for circular and sample of work. B. C. Msch's Co., Battle Creek, Micc.. Box 227.

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E. T. C. can remove rust staing from calico
by the process deecribed on 0 . 118 , vol. 27.-G. jne his ale by the rectpe glven on p. 75, vol. 31-G. W.
 p. 346, vol.30.-S. will find drectlons for maktig gutta
percha varish on p. 379 , vol. so.-I. M. W. does not


 S. T. B. says: A French chemist says: "By
fabricating coke, introgen can be made." fabricatIng core, nitrogen can be made." What it the
meaning of fabricatingcoke? $A$. It means the making of coke by expelling from coal the princtpal gaseous and
lquid matters that It con tiony
 F. B. C. Casks: What are ocher and umber
C Ocher is a ariety of ine clay contaling Iron. Th A. Ocher is a variety of ine clay contan ning 1 ron. Thi
ommon colors are yellow and red, the latter beling col
 the hydrated sesyutoxlde. Umber it an ocherous ore
of tron, of a brown or black kisu brown color, conatisting of oxlde of fron, oxide of manganeese, sillca, alumina. and water. Thes sire found princlepally In Europe, al.
though they are widelydstributed. The ocher 18 found
 oze eands, more or less ferruglinous, and are accompa-



 quantitlee. They are uad as plaments, and as dry
In. varnish $;$ aliso, somettmes, In coloring porcelatn. J. C. W. asks: 1 . When a person is writing
J. dryling so near him, does he recelve into the lungs
 deleterlous effect apon the heart or any other organ?
A. Not trom any of the common Inks. 2 . If only pure water evaporates from tok, would that molsture b
 According to the sense of smell, when tink 18 free-
Iy ued, the Indicatitons are that somethung more than pure water rises from ink in drying. It In jurious to
health, what would be itt specinc effect? A. Not injurlus to health any more than minute particles of dust and salline matters, or trac.
celved from other Bources.

 laze of compactneess with the abillty to turnish cheaply the contlinu ua d owof gases neceesary.
How can a pattern of a pot be dra
To be 7 tinches in dlameter the ton $3 x$ Inwn, the boton
 Assistant.
Can col
Can colored candes be made to burn mith a fame
of the amme color? For tnatauce, for red nitrate
 green. Can the colors be tntenitied in any way? A.
We doubt very much as to whether the oblect destred We doubt verymuch as to whether the oblect desired
can be accomplishec, ,or various reasong, and certalnly
 umnitrate 18 nearly insoluble tn alconol, consequently
very 1 Ittle effect would be produced by wick steped


 dis8olving In nitro-murlatic acid? A. Your best meth
od would be that of electroplatiog; the beet solotion to


 wrre ti connection with the 2 linc or negative pole, aud also placed In the solutton. If the battery be not too
strong, in a few miluute the object will be coated witl
W. H. C. Sr. Aays: There is a man in our
nelgboriood who says that. 1 f a boller with both heads at were set up on end In a body of water (1t matter
ot of what depth provided the upper end 18 above wa er and the lower end sunk tin the mud d deep enough to revent water from leak (Ing in), when the boiler
umped clear of water, the boiler will rise from the mud tmmediately after betng pumped out and refill.
contend the ccntrary. Who te right? A. We Incline to contend the centrary. Who is right A. We incline t our oplinion. It 18 an experiment
y be made with a plece of tlo plpe.
D. K.S. says, in answer to J. J.K.'s question bout 1747 : I would state that th has been vistited by
ivers for several successive years ; with what success isers for several successive years; with what succese
to money obtalned, I cannot tell. It ts buited dee the mud anddift cult to get at, and can only be vlsi din good weather and at certaln times of tide. I have
everal relics in my possession which were taken from
J. O'D. asks: I have often felt the wan J. he evil. But I am not surprised now, havtog read your article on the subject in a recent number. I was do wat that mo many methods had been tried withou era prize for a euccessful invention, that would bring an the inventive talent to bear on the subject? We
hould then, I belleve, soon have a good method of entilation. A. The suggestion of our currespondent ooffring a prize say of afly thousend dollars, and J. H. McD. asks: The follower on a steam asteam boat), pulled off the follower bolta, nuts, and astentngs with it, and broke the cylinder, as the pist on was coming up with the steam under it, and a vacuum
of 26 Inches over it (on the follower). It is a dispute nestion whether the vacuum on the top of the follower had any tendency to pull the follower, or in ayy way
remove it off its scat. A. It did not havc any tendency o pull the follower, but did render it easter for the fo S. F. R. asks : If there is a certain quanti onverted into steam, would there be the same mou of water when condensed if there were no means of escape? Is there any decrease in water by bollng it? A
Tnere would be the eame amount afterwards as before corcurstances.
H. L. K. asks: 1. Is an artesian well sunk rive well? A. Not generally. Arteslan wells ar wisually of such depth as to require the hole to be bored by a bring designed for the purpose ; whereas the hole
of a drive well is commonly made by driving the tube no the ground. 2. Is the same kind of plping used in
ooth? A.No, the plpe for artesian wells ts put together in sectlons, in consequence of the extreme length; the
ipeforadrive well, being short,is usually in one plece, neendbeng closedsand polnted so as to enable it to ingan artestan well? A. The stize varies from 2 to 5 W. H. K. Jr. asks: What ought be the. ing
ng an 8 Inch square tue for the entre hight? A. For on 100 feet stack, make the walls 8 feet thick at bottom
A. L. D. M. asks: I have a boiler 56 inches nches diameter; thedome is $16 \times 20$ inches, of Iron $1 / 4$ nch thick. How many pounds steam will be safe to work at highcst rate? A. About 50 libs. per square
M.H. R. says: To become a surveyor, is it
necessary to study ata unlversity ? necessary to study at a university? If not, what thould
I do to become one? A. It would be hetter for you to do to become one? A. It would be hetter for you to But many surveyors learn their profession by actual
practice in the field (which, of course, would be neccs. ary after leaving school) without the prellminary ed cation of which you speak. If you are determined to
become a good survey or, youare pretty certaln to suc
H. C. T. asks : I wieh to supply a tank, situated on top of a levee, with water from a river, the
ank belng 100 feet from the rlver, the levee sloping Cank belng 100 feet from the river, the levee sloping
at anangle of 450. What will be the cheapest way of steam pump, if the quantity of water required is small,
and a centrifugal pump, or well dealgned pumplng enand a centrifugal pump, or well dealgned pumplng en F , for sman quanties.
F. G. H. asks: If a toy balloon were cut loose ro go whither in would be blown, what would be
the result? Will balloons burst if they rise as high as
possible? A. Yes; but they seldom reach a sufliclently igh altitude, becauee of the loss of gas,
R. K. asks: The lightning rol on my house
uns underground several feet. Gantage to put a wheelbarrow full of wrought or cast iron turnings at the end of the ro:, letting it bed itself
in them? A. It would undoubtedly Increase the safety of your house if you place a mass of conductlag material, as you propose, into connection with the lower
end of your lightning rod. Better dig a trench and nd of your lightning rod.
pread the iron along in it.
J. J. S. asks: Is magnetic iron sand worke mont we could obtain large uantitles dally in very pure, it would be an inducement to establigh
valt works. A. Not to any cxtent. Much ron sand is titaolferous, and it would be necessary before mining to
see whether it wasall magnetite, or contaiued an induE. C. M. asks: Would a boiler be subject
damage by having a slight blast underneath? If bo o what extent? The blatit 18 to bc used for the purpose
of smeltingore. A. It to not usual to empioy blast in this manner; aenerally the blast is employed to clean themselves. First, that the blast would tnerease the rapldty with which the boller would burn out. Second, that if your blast weremixed with tbe products of combubtion, it would be injured so faras its further
employment in the smelting of ores was concerned.

You agann write to us without glving your name and $\underset{\text { egard to }}{\text { M. P. Shatning red }}$ rode lead me to ask your advic hrough your coluinns upon the following potnts: have erected at my conntry residence a water tank and
intures of rather novel construction. A tone corver of thehouse, I have placedan old cyllnder boller, about 30 fcet long and 3 feet dameter, standing on end. reating on brick foundation. The upper head has beenl re
moved, making huge wat-r 1 ank. The top projects
bove the eaves of the ronf, but not higher than then peak. It 18 encased in an oruamental frume tower connecting with the mann building. I propose to keep this
tank flled with water by force pump from the well. It s now cmpty, he wever. From this tower, Iron wate he cast tron force pump in the well, and probably 10 feet down into the water. The house has two ordinary
liphtning rods on chimneys, leading to the ground ou the opposite elde of the house. 1.Is this arrangemen to be called exactly dangerous, but might be mad nuch better by a little chauge. 2. Would lightuing b attracted by the large mass of tron of the boiler, ryther
thau by the llghtniug rods, whtch are hlpher ! A. If, as with the pround it is quite possible that likhtaln mightstrike it or some of the plpes running tromit in the house in preference to the lighting rods. 3. If
struck, would the lightning tollow the mase of gron to the ground, or pass through the plpes tato the well, or the tank or tim consectloos were struck, the Hightnitn would, without douct, po to the earth and not into th ouse. 4. Would it be advisx ble to put a lightning rod
on the outside of the to wer leading to the ground? A. Allghtntng rod on the tower slould beput into perfec metallic connection with the tank, and need not extend
belowlts upper edge. Let the tank ard water plpes, in belowts upper edge. Let the tank ard water plpes,
other words, be the lower part of the rod. 5. Would not this last tend to attract the lightuing, and in fuch
case would not the electrictity be likely to leave the ro and enter the boller with same effect as if no rod were
there? A. Joih your supposit tons in th1s paragraph re correct. 6. Will not this large mass of trou reating
 wellisin pet or rust or cementjolnts. Red lead 18 an admirable in all yourlightningrodstogether, and also to your iron
tank and water, gas, or other plpes, not by beparat
 Weer allas high as posstible. If you have a metal roo good stzed conductor running along the ridge of the oof. Bear in mind that, to carry off the heavtest light
 a shes are of very rare occurrence, they may com higla up. Read our art icle in vol. $29, \mathrm{p}$. 26 , and our edi-
tortal remarks upon a letter, p. 141 of the same vol. ume.
J. E. J. asks: Will acid dissolve resin with out destroying its uatural fiualliles's If so, what kind
of actd? if not, what will? A. Rosin, or colophone, ylvic, colophontc, and somettmes also plaearic act It ts soluble in nitrlcacid, but in dissolving sufters d d
composition. It is ooluble in alconoland may in tit S.C.J. asks: In your book of instructions Yor obtalning patents, ihere 1 a a rectipe for making ma
Ine glue: Take 3 paris gum shellac, 1 part cautch ou the glue: Take 3 parts gum shellac, 1 part caoutch ouc,
dispolve in separate veseels in ether free from alcohol, odor of cther is inhalct), it will produce etc., und great caresaould be taken not to pour it ou dangerous character might ensue. "Mived with certaly proportions of air, it forms a highly explosive com.
pound."-(Zell's Eucyclopectia). I wish to make some marine glue, but must confess I am afratd to use ether If it ts so dangerous, and would the greatly obliged to
hearfrom you further about 1 t . A. There is no necesity in thisexperiment of pouring ihe ether out over flame, or of inhinling it in large enough quantittes to
produce any effict. Place the ether in bottles, into which drop, respectively, the requiste quantitles o
Ci. F. akks in Why is it that when
 cure) will still stick to the magnet when I break the
cIrcult? $A$. Because of the residuary magnetlem in lowed to touch the poles of the magnet. In ordinary elegraph sounders, set ecrew are ueet, to limit the ward motion. 2. If, as sou bay in a late number of your paper, short, thick cores in electro-magnits give
greaterattractive power, why are such cores uted in tclegraph Instruments? A. They are usedforthe very reason stated,na moly, becauee of the better results ob-
tained. 3. In making a blue vitritol solut ton for a Dan iell's battery, how much vitriol should I use to a quart
of water A. As uuch as th whid dissolve. t. Will a battery make more electricity? A. The porous cup is
only an acceesory to the bat tery, and takes no part in the generasting of the current. A cell to which the cup is of unolled leather is sald to have less interual re-
istance than one in Fhich an ordingry earthen ware cup
sused.
S. F. says: I wish to suggest a form of balbelleve has nnt yet been proposed. I have frequently
ber obscred that metallic shell ware, and all descriptions
of sheet metal work constructed with a view to light. of sheet metal work constructed with a view to light
ness and strength, are dependent upont hense of cuived, auted, or corrugated surfaces for thetr power to sustaln pressure. Itis wonderful what an ensrm us pres.
ureasimpleconvex 111 or covering for any litht tin essel will sustaln. It is of coursc possible to esilmate given thickness, and proportion of arc of circle-and to ascertalu the relative restisting powers of various
metallicshells. Now thls appears to me to be a feastnle suggestion to make: That a balloon be constructed in the globular or ovalform, from sheet metal ae thin nected by aploe to an atr pump. Yump out the air to a
degrec of rarity euch that the spectifc gravity of the alloonandtis contents be less than that of the sur
ounding air: and if the shellbe strong enough not?




 demonstrated by experiment, then the greatest diff.
culty in ieronquitc science is removed. After this ballon contructel on some such plan as to be
easy to manage an any alltude, belleve we shall go
ahead with acronautices, and not before. 4 . One of the earllest flylng machitues cver made had four sheet cop
D. M. asks: What can I coat sheet innc
with (that wlis not be thesolve oby water) to take amay the smell and tute whith It given to water and other
 partn may aloo ve used.
V. L. T. asks. 1. I have a horizontal boiler
 are braze.. 2. The safety yalve has a hole of 8.15 nch th
dianneter, and wth the wright at the end of the lever it

 J. II. B. asks: How can I clean off the rust froma revolver, and prevent it rustlug hereafter? A.
Clean the usty parts with brick duat, then brown the
.

H. (G.L. asks: 1. In a ytcent issue, I have power of an engine, and tin some coses sou answer that
 an engle that has 36 Inches strose and 16 it nches thame.
ter of cyluder. runalng t 55 , evolutions per minute with 0108 steam. Wrat 18 lacklng to enable yon to estlmate the horie power of the same? A. The mean effiective
pressureof the stenm ou the plston. 2. Willyou plesse glve us the formula and work out the following example
for the lenentit of your readers: what would be the nomtay horie po wer of an engline of 17 inchesbore of
 examole, to upply the uecessary atat A. The ordina.
ry rule tor tuding the nomlar horse power of a non. ry rule for inding the nominal horse power of a non-
condentIn eug eue la as follows : Nominal horse power $-{ }^{3} 1$ stroke in feet $\times$ (dianneter in incllee $\left.)^{2}\right)^{2}$. Hence wuthclent data are given. The actial horse power, however,
lepends upon inittal pressure, point of cut-ofi, amount of wire drawtng, back pressure and compression, none
of which data are furnisherlby you. 3. In a recent tseue you say that an engine with $\geqslant 1$ inches stroke running 90 revo ntlous per minute has a piston speed of 240 feet
per mitute. In this reply I differ with you. Then 24 per mlitute. In this reply I differ with you. Then 24
$\times 2=4 S \div 12=4 \times 90=3100$. $\Lambda \mathrm{m}$ I right? A . You arc
right. Sorex $x: 2$ ins hes stroke, with lifting block fattached to piston rod) welghing $1,9 \mathrm{CO}$ ibs. What would be the force
of the blow in lbs. struck? If \& welght welghng sc5 1 br . be elevated 25 feet and let fall (of ths own wetght), you give us the formulf forthesexamples? A. Wedo
not know of any formula by which you can solvc these
G. M. asks: Dors clearance between piston
head and cylnder, more than suffletent for the saie working of the engine, belp to keep the engine from
knocking whea it passes the ends, or docs it do any gnocking when it
S. D.Jr. asks: What gre the rules for pro-
portioning engines? Will a boller of 33 Inches dlameter $\times 15$ tneh's length be oi sutticlent capacity to drive
anengine of 11 Inches bore $x$ 2 Inches stroke? The
ioller is heated with 3 or 4 gas burners. A. It is dititcult to give de $\begin{aligned} & \text { nitte rules for such smail bollers, as a great } \\ & \text { deal depends }\end{aligned}$ upon the manner ta which they are con. structed and Ret. Allow from 15 to 20 square feet of
efictent heating surface for each horsep 3 werof the eneffictent heating surface for each horsep $\jmath$ werof the en-
gine.
W. T. W. asks: If a pendulum 39 inches
ong sirkes once tn a second, how long would the penlong strike once in a becond, how long would the pen-
dulum have to be to strike once tin a minute? A. 11,000
C. D. asks: Please give me a simple rule
for callulating the pressure on satety valves of steam bollers. For tnstance, what would be the pressure of fulcrum to wetght $23 \sqrt{2} /$ taches, from fulcrum to center
of val ve zys inches and welg ht on lever 201bs.? A. You do not send enough data, the weight of the valve and
stenn and the position of the center of gravity of the ley.r belug requited. But neglecting the weightof the be mid way betwern the fulcrumand wetght : Pressure
on valve $\times 2!=4 \times 110:+2 n \times 2!$.
ficiai horizon, st to be used with the sextant on arad, nctal horizon. to be used with the sestant on land, plac. 'd on the ground and leveled by a sma llepprit level? A. Wht itvergence from the propcr level in measuring
slle altitude of sn object millions of miles away, and
the rem'mbers that it is very probable so:ne tnaccuracy of
adjuatment will occur. he will be very llkely to agree with a frlend of ourc, who sald that the method re-
minded him of the farmer who guessed at the welght of
plg.
$\underset{\text { J. A. H. Jr. asks: Is it necessary that par- }}{\text { J. }}$ thetr own pleasure or conventence, and not as puhitc
carricri) should comply witn the seamboatlaw requtr ing the employment of a cap
glincer? A. We think not.
G. R. C. asks: What would be the eftect
on a voume of sleam golng through a pipe if it came on a voume of sleam golng through a pipe if it camp.
to a place where the plpe turned a rlght angle? A The
pressure would be relluced, on account of the restst. ance due to the bend, and, some of the stean would,
in general, be condensed.
H. P. C. says: I have made a very nice kind potash, and prustate of potash, and for a mhile 1 t.
works well. Butnow ithas grown thick as mud, and molds. What can i put in it to keep it thn and llau'd,
to prevent Its molding? A. The thickening 18 probabl due to eraporation. Your bottles should be kept we oppered. Tryal Mecarboncas
H. B. T. asks: What power of engine will
it take to force a atream of water 4 tnches tin dameter to a ditance of 85 feet through a plpe, the irst 60 fee
to be forced at an angle of $45^{\circ}$, and the reme
. feet, to be forced perpendicularly tnto a tank? A. It
 will always be anamerable to the capacity of the pump
nd $1 t \mathrm{~s}$ number of strokes per minute ; this be regulated by the proportlon bet ween the area of the
pump platon or plunger as compared to the area of the steam piston. The more the area of the latter exceede the area of he former the engthb of herl strokes $b$
 cing, the steam area may be made twice or three tlmes
the pump ares. Your irst element is therefore the the pump ares. Your first element 18 therefore the
quantity of water perminuterequired to be forced up he plpe.

1. D. MCC. says: Suppose that a boat is
floating on perfectly stil water, and that the boat as a sallt the fore partand a large bellows in the back
part. Now if alr 18 forced upon the sall from the bel. lows, would $t$ t cause the boat to move? A. The boat
would But by remoring the eall and dis charging the atit from
the bellowa agalne the atmosphere, then the boat whl
C. W. J. asks: In the case of mill rocks, When the lower rock 18 statlonary, the epper dotng the
work, 18 the attraction of gravitation dimmatished when che rock is to motion? Does tr realre a greater
strength of support to sustatin the welght of the upper
 matntaln thelr argument by citing, as an tillustration, centrifugal motion desfor welght of the governor. A. The welght to the saine, G. A. N. asks: 1 . Would a boiler made
 power to drive an engline of 2 Inches bore and $\overline{\text { Inches }}$
stroke? A. No. 2. What will be the fire surface ot
 the tubes and one end of the boller, and may
surface ti the shell of the boller, In addition.
E. V. asks: Is it possible to compress
steam of a low temperature, say
$20^{\circ} 0^{\circ}$ Fah., by any of the known means (for example, by a pump) to a press
ure of say 901 bs. per square inch, without tacreat ure of say 9 onb. per square nch, without Increasing
the temperature, and have any such esperlments ever bcen made? A. It can be done by making provision for removing the heat of compresslon by bome methon
of refrigeration. We do not know of any experiment
P.R.asks: In case of shutting down for 1 or

 talns minerals In solution, it ts better toblow of ant
clean the boller. 2 . Which ts the best t time to blow of With a presegure of steam or not? A. The best plan, 11
the water will run out without pressure, is to let it tand foriz hours after hauling the are. 3. What effect

 Ihave unfered for the last elght years with a bunton or somethlng of the kind on my foot. How can I get
rellef? A. Sloes made by a man whe undertands the anatomy of the
of thls ktnd.
 king a stith simmar to hand seqing be more popular
than the present kind? A. Some people might pre
Suph ite I had a hollow tron ball, 1 foot dameter with
 tends ot ofrcelt up.
 pracilcal experlence tn the matter.
Is there a reward offered for an apparatus for detect. Ing cheating on the part of conduct ors on raliways and
street care? street care? If bo, by whom, and how much 18 it?
There $\begin{aligned} & \text { n } \\ & \text { no reward publicly offered; but the manager }\end{aligned}$ of rallwaycompanies will doubtless be willing to com.
nenaste any one who brings them a useful Invention for the purpose set forth y your fuestion.
Would it not be a good 1 deat ouse

Where can I get a book on chemlotry for beglanera? our advertusting columns.
J. S. S. asks: : Is it economy to keep 60 lbs .
presure

 zend suffctent data.
englne, 11 would be
engine, it would be more economical to malntann the
S. R. says: A man was killed in a well last gummer by gas. The well was completed, betvg latd tn
brick and waterlime mortar ; the plank curbing and
 between two planks. The frst cold snap that came,
eharp whistling sound could be heard are puphertintitous. We thought the air contracted tn
are the well and the outside air rubbed tn through the
crack. We placed straws across the crack, and they sucked down. Can you explatintit? $\Lambda$. The crack proo.


 One lundred horse power, and orer. 2. How much
ore can a rallway englie draw than a road engine of more can a rallway engline draw than a road engine of
the emme horse power? $A$. From 8 to 10 times as much. 3. What is the average cost of a narrow gage rallirond engine, and how much does 1 c cost, more or les, than
aroad engine?
A. It 18 about the same as the cost or
B. G. says: I have a pump barrel, $3-16$ inch
解 rom 20 to 25 lbs.
T. S. S. asks: Do the drive wheels of some
 wheels are made t it thls way, but we are not sure wheth-
er the plan tomployed in the case of olocomotive
arl
 Which 18 so hard that we cannet run more thas three or ourdayg without blowing out ary and inking up tbe
boller agalu. Willa littlellme in the tank from which Heed the bonier be of any use in checkLug the botler
rom foamma? If not
 erviceable in thls case.
W. R. asks: Will an iron wire $\frac{1}{\text { inch }}$ in di mhich wolldrequire the strength of onc horse to pull? The wite ta to be supported on rollers 100 feet apart, each
coller to be removed as the load reaches tit ; the wire to be wound around a large st t tonary wheel turned by
waterpower. If the 4 wire will ot at answer. what tize will $\Lambda$. It would be better to use a wirc rope is inch
C. F. D. asks: Will yougive me a rule for
Hing up propeller shatta?
A. We cony the tollowing ule from the "Cadet Engtneer," by Long and Bucl:
 besond the shatt. Set a 1 square on one of the stralkut
dges, making one cdge of the blade cut the center
olnt. Then erecta a perpendicular, at the center of the haft, to the line previously run, by locklig it out ot hat, when viewed from a distance, tt covers the edge oo the $T$ square for the whole length: Then swing the
crank, dleconnectell from the rod, on the centers and Inf entes, andmeasure the custavces of its face from
 ances are the eame for all point of the revolution.
I have heard engineers speak of workiug up tndira. or cards. What working up ts there to do after the ard has been taken? A. It t 18 usually destrable to as-
Gertaln themean pressure, back presare, point of cut-
$\mathrm{H} . \mathrm{B}$, asks: : Is there such a thing as a
ackie or solution, capabe of removing the sand that dhheres toiron castligg? A. Place your castlngs in
equal parts of oll of vitrol and water; and after they ater,and the sand wwll be removed.
A. C. says: I have now in use a steam


 it an the long one, with less fuel. 1 drive now 2 engines
tin
 thons, cuttig offat 2 stroke: but I have th burn ton
much fuel. One boller maker tells me that the thort
 Whn a great deal less fuel, and another boller maker
3 ys that the short boller is too emall and will have to be crowded too much to do the same work as the long
two fue boller. Plesse give me your oplanou. $\Lambda$. We adrise yout ocontlinue to use the old botiler as 1ong as
tis serviceable. we tincline to the opln "on of " "nother"
G. L. D. L. asks: What would le the proper speed of an emery whel, 13 Inches 12 dameter,
with 2 Inches face, to do the most effclent service wth
J.E. P. asks: Would not a single cylinder steam to expand to atmosphertc pressure be se econo.
mical and effective, otherthing being equai, sa one ot he compound system? A. Yes.
J. A. says: I have at my house a large un-
derground brick clstern. Water comes from a Frt nch
 pipe tn the ground. The water is dramn oun of a t tight brick box, serving as a aliter, through a block tla plpe.
When the cistern was bullt, the top of the roof had had sereral coats of lead palit. It then bad all the palnted In and palated eaves troughs covered with one of the
patented olate palita, which covers well und appears to

 in usivg the water for drinking without fear of polion
trom tbe roof? A. The water ts probably affected by partcles dat tategrated from the brick and cement mor-
tar: probably the tand ued tin the mortar was loamy tar; probably the sand ued In the mortar was loamy.
We do not thnk that the lead palitt, if covered with We do not thnta that the lead palnt, if covered with a
coat of slate palint, stince become hard and firm, can much affect the water. An addittonal illter at the dis chartlug end of the plpe might be used to advantage
and the present titer cleaned out and supplicd with J. T. J. asks: What is the percentage of pressure per sinare tnch to6010.? A friend contends
toat toere ti no lose, proviling the engine is large enough for tht work. A. if you suppose oteam of 190
ibs. presure: (1). To be expanded In the cyllinder, so as
 the cyllider without expanalion: The loss from wire
drawling will be the difference $i n$ the amounts of steam required In thetwo cases, which you can readiliycticu-
late forany given case. In late forany given ease. In buch a case the loss from
wrre.trawng would he excessive. In general, how. ever, the steam 18 expanded,as well as wiredrawn,whlch nodilae the loss, though 1 t 18 almays more economical
ooxpand the tieam than to redice the pressure
I. E. W. asks: How many square feet are
there in a spiral screw, winding 5 tlimes around a shat 15feet long and $3 \%$ inches dlameter? Toe deth or
Width of the screw is 8 toches, and the diameter of crem and snaft together 19:5 Inches. About 10
L. \& J. ask: Shauld an architect charge
 by the archltect? We have a case tn hand on our new
ffice, and thntik there ts no fuatice in the attempt he architect 1 , charge for such service not hat on rendered any. The work disputed on on ta such as the dig.
ging of clatern, catch basin celling aroond elevator
 erbal agreement was a certatn percentage on con catlons to archtitect. We feel that having ordere and superintended the work ourselves, we soould not
pay commmasion on 1 It. Yuur answer will sette the pay commisilon on it. Yuur answer will settle the
question satisfectorily to both of us. A. You do not say whether the archtect superintended the building
and
 endence, from $2 \%$ to $33 / 2$ per ceat for the former and percent for the whole. oftce work 18 consddered the
furntish ing of plaus and spectifcations, and somettme

 na addttoont plan and sivectitcation for satd atdultor rom other pritled. But in reapect to superintendence
Hie case ts different; that part only should be taxe J. S. W. asks: I amp constructing a bath
,ouse in running stream of fresh water; ain I bulld he foundation wills and the bortom with bricks and Le wallst to thoroughly dry before tornng tn the wa
Cer, so that it will be sound and substantlal? I know hat there is a cement used for walls whtch are to be ti practicshle. A. It will not be sife touse common 11 me nortar for brick krork uulcr water. Tou should use a
good hydraultc ce cinent and clean, sharp sand, ree trom oam. It will be the mort conomical in the end. Tresh, breen $\%$ tich plank, will its edges shrink? In other word 3, will the hole become larger, or remaln of
he same size? A. The board w wil shrink withont ref rence to the hole, and the result will be that the hole
D. ©. W. P. E. say: Our houses are sup.
 depostrs in oolution, contunues to taste very disagree the tunk supilyng the water, which will remove the oucandowisthnot that will be tuccessful with the
 hare veen opened by the sun in large cracks; as our
mill is close crouzh to be burnt 11 tuls bullding was
 frost?'. 1. There are several patent compounds in the

 toside nud tois with Roendale cement (2 parts cement ement on the top and sides, making the reservolr leak Ike a steve. What would be best to do to make it
light? $\Lambda$. It will probably be necessary todraw off th water andrelas the stones.
(i. W. C. says: G. Y. Y. S. can straighten a
 barrel must be smooth and clean. Hold it up, and let The byw hangunder the barrel; and you call easily see
where the crook 19 , and with a blacksmith's hand ham. mer. ou an an 141 or hthe end
tralghten your barrel
G. M. says, in answer to H. E. K., who asks
for the beet way tomake putty of the colors of differ entwoods, walnut, ash, etc.: In my experlence, I harz
ound that the best way was to soften up white patty
 mail quantriey asth is needed, wth veryittie trouble.
R. W. says, in reply to H. P.: If a mixture
in the pro portion of a quarter of a pound of litre, made
 O. H. says, in reply to C. L, who asks how
can
crean corn: The following method cannot be ei.: of this solution, use onc tablesponfult to every Dint of corn whlle the corn 18 at bolling heat. Wben
pened foruse, add one teaspoonful sodat to every three

Minerals, etc.-Specimens have been re ceived from the following correspondente, and examined with the results stated:
J.s. NcC.- Yo. 11 a readlly fustle amphibole, with
 -The powder contalns common sala and a nuinber of less for the yurposes or whth it is sollt. A At it does not
 s. -We are unable, without having the entire plant, t俍 ydrate A. F. P. C. says : I
reserving ish whe not succeeded in
is ofly, on nccount of the oll be

 ract the oni, but t It might perhaps be neuralized witb
oit destroylng the fav or or 1. What kind of sealing wex is beet to use in sealling glas jars? I have lost much fralt by the wax not ad
hering to the glass.
. Why


## COMMUNICATIONS RECEIVED

The Editor of the Scientific American acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects :
On Tempering Steel and Copper. By J.S.M. On the Nickel Plating Patents. By A. D On the Atmosphere. By H. W.
On Moles. By W. S. N
On Hardening and Tempering Tools. By J. P .

Also enquiries and answers from the following:
A.D. II.-W.E.K -F. L.-F. A. R.-W.D.P.-A.J.Q.
-N. M.-A.D. - R. Y.

HINTS TO CORRESPONDENTS. Correspondents whose inquiries fail to ap-
pear should repeat them. If not then pubished, they may conclude that, for rood rea sons, the Editor declines them. The address of the writer should always be given.
Enquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initialsonly are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.
Hundreds of enquiries analogous to the ollowing are sent: "Please to inform me where I can buy sheet lead, and the price? Where can I purchase a good brick machine? Whose steam engine and boiler would you recommend! Which churn is considered the best? Whomakes the best mucilage? Where can I buy the best style of windmills?" All such personal enquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, sulbject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

## [0FFICIAL.] <br> Index of Inventions

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APPLICATIONS FOR EXTENSIONS.
Applications havibeen dulynled andarenow pending ngs upon the respective applications are apponted for
30,398.-BURGLAR Proor SArrs.--J. R. Floyd. Sept. 30
$30,594 .-$ Door LATCB.-T. Slaight. October 21.

## EXTENSIONS GRANTED

29,137.-Car Co
29,162. -PLow.
29,180. - Hoistima Apparatus.-I. Lemman.
29,20.-Strifing Vrbsils.-F. E. Stickels. DISCLAIMER

## 29,180.-Hoistin APA DESIGNS PATENTED.

 7,538 to 7,540 - La AP Brackets.-F. R. Seldenaticker, 7,541 to 7,546.-CARPETs.-R. R. Campbell, Lowell, Mass. 7,541 to 7,546.-CARPET8.-R. R. Campbell, Low7.547.-CARPET.-C. S. Llley, Lowell, Mass.
7518 .
 7,550 \& 7,551. LLAseware.-D. Bennett, Baldwin town-
ship, Allegheny county, Pa. 7,552 to 7,557.-CARPET8.-R. R. Campbell,Lowell, Mas


## TRADE MARES REGISTERED

## 1,8i2.-HATB ANDCAPB.-J. S. Fsyerweather \& Co.,

bury, Conn.
1.873.-ALE.-C. P. Hawking, New York city.
1,874 - BEVERAGE.-G. N. Irtigh, Brooklyn, N. Y.
1,87t-BRVERAGE.-G. N. Irtinh, Brooklyn, N. Y.
1,8i5.-Flovr.-Metzger \& Co., Platte CIty, Mo

1,87i.-CIGAR8.-C. Brewer \& Sons, Boston, Mase.
1,83.-CHEwing Gum.-Curtis \& Son, Portland, Me.
1,899-FLovr.-Ba!n et al., St. Louls, Mo.

GCHEDULE OF PATENT FEEE On each Caveat.
On each Trade Ma
On Allng each application for a Patent (17............. On tsaulng each orlginal Patent...
On appeal to Examiners-In-Chief.
On appeal to Examiners-In-Chlef.....
On appeal to Commisaloner of Patent
On application for Refsaue.................
On application for Extenalon of Patent
On application for Exten
Ongranting the Exten
On filng a Dlaclatmer
On annga disclaimer......................
Onapplication for Destgn (7 years)...

## CANADIAN PATENTS

## Ligt of Patents Granted in Canada

July 16 то 20, 1874.
3.658.-D. M. King, Mantua Station, Portage county, $O$.,
U. \$. Improvements on potato diggers, called
"KIng's Potato Dlgger." July 16, 1874.
3659.-L. Dauze, Montreal, Mentreal Dtst., P. Q. lm.
3659.-L. Dauze, Montreal, Mentreal Dtst., P. Q. 1 lw-
provements on cooktag stove, called "Mechanic Stove." July 16, 1874.
3,660.-D. Zelgler, Lewtstown, MIflin county, Pa., U. S. "Zeigler's Improved Mechantcal Movement." July 16,

3,661.-W. G. Dunn, Greensburgh, Decstur connty, Ind.
U.s. Improvements on Jolnts of rails for rallways
called ""Dunn's Adjustable Combination Rallway
Jotnt." July 16,1874 ,
s.662.-E. E. Bean, Boston, Suftols coutt, Mas., U. S.
Improvements Ingasilghting apparatus,colled "Bean's Pneumattc Electric Gas LightIng Apparatus." July
16, 1874. 16, 1874.
3,663 .-J. C. Todd, Toronto, ${ }^{\circ}$ nt. Improvements in toy guns, called "Todd's Improved Dog Gun." July 16, B7664.-W. Brigge, Montreal, Mcntreal Dist., P. Q., and L. Senécal, Coteau St. Auguetin, Hochelaga county,
P. Q. Improvement on manureand hay forks, called "Briggs' Combtnea Manure and Hay Fork." July 20, 3,665.-E. A. C. Pew, Welland, Welland county, ©nt. Improvements on poation Coal Machine." July 20, 1874.
3,666.-G. Stacy, Montreal, Montrcal Dist., P. Q Improvements on chisel polnted cut nais., and mathines
formaking the same, called "'stacy's Cnisel I'olnted Nat1." July 20, 1874.
3,667.-T. W. Shaler, Brooklyn, Kings county, N. Y.,U.S. nal Lantern.", July $20,1 \times 74$.
n,668, -W. Baxter, Jr., Newark, Esscx county, N. J.,U.s. Improvenents oncompound englaes, callea Baxter's Improved Compound Envine." July 20,1874 .
,669.-W. E. Kelly, Ncw Brunawlek, Middlesex
369.-W.E. Kelly, Near Brunswick, Midiesex county,
N. J.,U. S. Improvements on steamgenerators, called "Kelly's Sectlonal Boller." July 20, 187 .
3,670. $G$. Foreyth, Seaforth, Huron county, Ont. Im. 3,670.-G. Forsy th, Seaforth, Huron county, Ont. Im-
provements in the manufacture of picket fences, called
pro 1974. $3,671 .-$ R. Dunlop, St. Thomas, Elgincounty, Ont. Improvements on, steam and gas Attting wrenches, called
"Dunlop's Improved Steam and Gas F'tting Wrench." "'Dunlop's Im
3,672.- J. E. Harriman, Bangor, Penobscot county, Me..
U. S., asigignee of M. L.Norton, same place. Improve ments on lath machines, called Norton's improved Lath Machine." July 20,1874 .
1mprovements on a macutne for destroying potato bugs, called "Palmer's Potato Bug Killer." July 20 ,
1874. 1874.
3,674.-C. E. Patric, Springfield, Clark county, e., U. s.
Improvements on a machine for sowing grain broadcast, called "Patric Brcadcast Seeding Machine." July 20, 187 .
3,675.-R. Benner, Hamliton, Wentworth county, Ont.
Impravements on Improvements on the art or process of veneering,
called "Bennett's New Processof Vencering." July 20 , 1874.

3,676.-A. Mccannel, Caledon, Pecl county, ont. Im.
provements in self- oponing gates provements in self-opaning gates for rallway cross
ings, called "McCannel's Self-Operating laalway inge, called McCanel's self-Operating
Gate.", July 20,1874 . 3,677.-L. O. Cantin, Montreal, P. Q. Mmprove 'Cantin's
machine for burntinng photographe, called 'Cantin's

 3,679.-J. F. St.ura, Halifax, N. S. Improvements in material for calking,
Oakum." July $20,1874$.
3,680.-T. J. Blakc. Plttsburgh, Alleghany county, Pa. back shovels, called "Blake's Smooth Back Shovel." July 20, 1874.
3.681.- G. B. C.
3,681.- G. B. Cornell, Chicago, Cook county, Ill., U. S.
Improvements in wrenches for insering bung
 3,682. -C.L. Jerome, Chicago, Cook eounty, IIII, U.S. Im provements in moth proof fur cases, callicd " Jerome's Mcotb Proof Fur Cases." July 20,1874 .
3,688.-R. P. Colton, Gananogue, Leeds county, Ont.
Improvements on harrows, cultivators, and analogous Implements, called "Gananogue Improved Harrow." July 20, 1874.
3,684.-J. M. Fo8s, St. Albang, Franklin county, Vt., U Improvements on rallway locomotlve engines, called 3.685.-T. Ford, Plattaville, Oxford county, unt. Ma-
chine for cutting the tapering plug end of well tube " July 20, 1874.
$3,686$.
U. S. Improvements on spriogs, called " litulard Bon's Tenstle Sprlng." July 20,1874.
3,667.-J. Rulhven, Levis, Levls county, P. \&. Improve-3,687.-J. Ruthven, Levis, Levis county, P. Q. Inyprove.
ments on carbureters, called " Ruth ven's Improved Gas Machine." ${ }^{\circ}$. West Cnany, Clinton county, N. Y
 Harrest Separator," July $20,1874$.
, $699 .-0$. K. Wood, West Chazy, Clit
U.S. Second extension of No. . 5254. for "The Queen
of the Harvest Separator." July 20, 1874.
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