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chinnery will please end Address to B. B. Kupec, Bank of



 des, of which the most extenstive and rellible is that of
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to instruct five small children; and, when not turus en-
 A New Thing !-I will furnish any Machine, and
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Yorthumberland County, ra. References: Sunbury (Pa.) Gas Light Co.; Mahanoy City (Pa.) Gas Light Co.; Ash
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Engines, 2 to 8 H.P. N. Twiss, New Haven, Ct.
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ments arc invited to communicate with the Electro-Magments are invited to oommuncate with the Electro-Mag-
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Machine. Send for circular and sample of work. B. $\mathbf{c}$. Yach'y Co., Battle Creek, Mich., Box 227.
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 of price. F. C. Beach \& Co., 263 Broadmay, New York. For Solid Wrought-iron Beams, etce, see adver-
tisment. Address
Union Iron Mills, Pltsburbh, Pa., for

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L. D. will find a recipe for polishing furnifor coatink iron with black enamel on p. vox, vol. D. can utilise the tin on tinned plate scrap by the process described on p. 319, , vol. $31 .-A$. M. ©. can
temper gun springs by the method detailed on $p$. temper gun syrings by the method detailed on p.
10. vol. a5.- C . P. MeF. will tind a recipe for japanning on tin on p. \%5, vol. 33.-W. D. Gi. will find recipe for bronz. on iron on p. 2x 3 , vol. 31.-C. H. S.
can whiten ivory by the process detailed on p. 10 , plained on p. liz, vol. 31.-W. S. will find an explauation of two lines approaching each other and
never neetink on p. 138, vol. $31 .-$ H. W. M. cun nake composition molds by following the directions on p. 5x, vol. 24. Cement for cracks in cast iron is desiption of the manufacture of sulphurous
 directions for stuffing animals on p. 350, vol. 30.W. H. will fill directions for silvering glass by
Oraper'sprocess on p. 2fí, vol. 31.-C. A. G. will nd an explanation of sailing faster than the wind on p. 132, vol. $99 .-\mathrm{J} . \mathrm{C}$. C. will find directions for putting a black finish on gun work on p. 20k, vol.
20. - C. E. D. G. will find a deseription of a gaslight dipe for on p. 3i9, vol. 30. f. S . will find a formula for a red indelible ink on p. 129, vol. 28 , and for a black, on p. 112, vol. 27. -Q. R. N. will tind directions for etching on glass on
p. 409, vol. 31.-J. H. will tind directions for bronzng cast iron on p. 2k3, vol. 41 .
(1) O. S. asks: Will sawdust, placed under a printing press or other machinery, absorb the
waste oil, produce combustion : A. There will be some danger of such a result: but the occurrence is not very fre
dinary care.
(2) J. W. W. asks: Does the hydraulic or or four feet than it will elevate to a hight of 12 eet? A. Generally, yes

1. Can the blaze from a kerosene, alcohol, or air of 30 lbs . per square inch, the air escaping and rest air being supplied all the time? A. Yes. 2. How much will air expand by heating? A. About
tity of its volume at $32^{\circ}$ Fah. for each degree Fah. 4ty of its volume at $320^{\text {4. Fab. for each degree Fah. }}$
that $i$ its temperature is increased.
(3) C asks: 1. Which is the right name for the coal that is called sometimes candle coal and
sometimes canal coal? A. The coal was originally sometimes canal coall? A. The coal was originally
called candle coal, and cannel coal and canal coal called candle coal, and cannel cool and canal
are corruption of this name. The term cannel has obtained such general currency that it would yet that this is the proper name is evident from the fact that it was frrst so called because the coal
burnt with a clear, long. yellow flame, like a candle. burnt with a clear,long. yellow flame, like a candle.
It is a very compact coal, with an even texture and a smooth, clean, and nearly dull surface and conchoidal fracture. The dull luster gives it the as-
pect often of being impure, when not so. The proportion of bitumen is large, as may be seen from he following analyses: The cannel coal of Bog 31 per cent fixed carbon, und 3 per cent asb. That
of Breckenridge $K y$, has from 56 to $\tau 2$ per cent of Breckenridge, Ky., has from 56 to 72 per cent and $\bar{i}$ to 12 per cent ash. Ultimate analyses, to dexcluded, have giver, for the Boghead cannel xcluded, have given, for the Boghead cannel
coal, carbon $80 \cdot 49$ per cent, hydrogen $11: 24$ per cent, oxygen 6.73 per cent, nitrogen 0.87 per cent; for the Breckenridge, carbon $82: 36$, hydrogen $7: 84$, oxygen $\tau: 05$, and nitrogen $2: 75$ per cent.
(4) R. H. H. says: I am building a jig saw piston and piston head above the saw to lift it sing air for a spring in the cylinder? I want to run the saw at 600 13/3inch strokes per minute. A You can run it in the way you propose. It is
doubtful whether you will be able to attain that speed by force applied to a treadle. We shall be glad to hear from you
pleted the machine.
(5) E. M. asks: 1. How many pounds of
team will it take to make one horse power? A.It
varies from 15 to 200, according to the kind of en-
gine. 2. Would thick glass be strong enough to grne. 2. Would thick glase be strong enough to
make a small steam cylinder, to see how it opermake a small
ates? A. Yes
(6) B. H. R. asks: Is there any difficulty in putting a circular one horse power upon the
ground, and running into a second story to ground, and running into a second
printing press?
A. Ordinarily, no.
(7) W. F. S. says: I use steam heating und water pipes. My boiler has not been running or
had a tire underit for sometwo or three weeks, had a tire underit for sometwo or tree weeks,
and the shop has had no fre in it for several days of severe cold weather. The water in the pipes was frozen, but did not burst a pipe or start a leak anywhere until I had steam around the shop long enough to materially affect the temperature. Why
should the pipes not burst till the room became should the pipes not burst till the room became
warmi? supposed that 1 square inch of water, if it warm 1 I supposed that 1 square inch of water,if it
were frozen,would require considerablymoreroom Is this so? A. This is a very common occurrence There is often air in the pipe, that allows the wate
to expand in freezing. When heat is applied, how. ever, some of the ice melts, and the water, expanding rapidy as its temperature is raised, encounters resistance from the ice, and so bursts the pipe. More frequently, however, the pipes do
burst during the cold weather, and are held together, or prevented from leaking, by the ice tha is formed. When the latter melts, however, the
leaks are at once discloved.
(8) J. H. W. asks: 1. What is your opinion in regard to blast pipes under boiler furnaces: Do
they materially affect the burning out of the boilers? A. No. .. Would their use result in a savin useof the blast, an inferior quality of coal can of employed.
${ }^{(9)}$ W. H. asks: How can $Y$ remove dirt and A. Oil unswers in many cases, suyplemented by A. Oin onswers andicany cases, supplemented by some cases, sand or corn meal; but there are doubtless peculiarities of thesh that render it impossible to kive a metbod which is generally applicable readers who can furnish yaluable intormation on this subject, and we hope to hear from thein.
(10) J. W. F. says: I am thinking of build ng a boatsizfeet long with 15 feet beam, to draw from sif feethight to $1 \%$ feet loaded. I war think 15 of putting in an enkine 15 inches diameter by and 11 feet pitch Biler (low onotive) isto be 1 fe 6 inches diameter, with a fire box 4 feet 4 inches by 3 feet 10 inches, with 55 tubes, 3 incher diameter and 1 feet lony, using stean at 80 lbs. The boat drive her? A. If the boiler steams well, the boat should go from 15 to 16 miles an hour. For a spee of 10 or 12 miles an hour, use an engine $12 x 12$.
(11) I. D . savs: I have a steam pump) w
(11) IT. D. savs: I have a steam pump, with nch deep; the hole was cut in by the cataract The rod is of brass When that hole passes
through the stuffing box, the steam comes out. Can you tell me what I can till the hole up with A. Screw in a plug, and finish of the surface.
(12) F. H. D. asks: 1 . Why is it that small drive wheels are used for climbing steep grades or
drawing heavy loads, and what advantage has a small wheel over a large one? A. With a small pressure on the piston; but the locomotive doe not move as fast for same piston speed as the
one with larger driving wheels. 2. Is a wheel more liable to slip when the crank goes under the axle
(13) W. H. S. asks : In your reply to W. B. C. you say "the silver being extracted fron
the pig lead and not from the ore." By what prothe pig lead and not from the ore." By what pro-
cess is this accomplished without burning the lead, as some do, since both have very nearly the same sists in a concentration process, based upon the phenomenon that, when a certain quantity of lead that contains silver is melted in iron cauldrons, ensues a formation of small octahedral crystals, which are a great deal poorer in silver than the metal originally taken; while the portion of the
metal remaining fluid is found to contain an increased quantity of silver. It is clear, therefore, and cooled uniformly, another concentration will be obtained, and that the operation can be repeated until a lead is obtained rich enough in silver to admit of undergoing a reflining process. In all
cases, however, the quantity of lead operated upon is always large, generally 200 cwts., to cause the cooling to proceed slowly. 2. Is the method as adopted in this country?
A. We are not familiar with the process you speak of.
(14) G. W. B. says: In our coal stoves, there is a hard substance adhering to the fire brick, apparents. What is this substance, and can it be removed by any better method than by the use of the cold chisel? A. No doubt you are right as to
its being composed of impurities. By cleaning it out at short intervals, so that the quantity will not be great at a time, it can readily be removed. (15) L. E. F. asks: What colors take best
photography? A. Blue takes very light, in some cases appearing as if, in the original object,
the blue portions were really white. Yellows,reds orange, and various shades of green take dark. What is the best position to lie in during sleep as the position in which the organs of the body are least liable to
upon one another.
(16) M. T. says: The natural oil in rose-
unite them with glue. Cannot a strong acid or alkali, being trst applied to the wood or united with and cause the wood to unite more readily? $A$ Try the action of a warm solution of potash, ap plied for a short time and carefully wiped off.
The water in my well has a singular cttcet tea, causing it to tucn to a wine red color shortly
fter steeping. It first turns in streuks orcol of red : and before the meal is tinished the bever age "giveth its color in the enp" and causes a lack of relish for it. Uur pump has a cucumber wood pipe. Can you gratify our curiosity by an expla nation? A. We cannot give you any satisfactory
answer without having first made an examinutiul of the water. send us a quantity of your water and a sample of the tea, and we will endeavor to solve the problem for you.
(17) E. L. asks: What do licenses fior o they last? A. The license for the buat long $\$ 2 \pi$, license for enkineer $\$ 3 ;$ they are renewable (18) M. T. K. asks: How man I makr petruleltu and gas sar unite. . . Niy dissolving the
ar in the petroleum with the nill of henzole muid noderate heating.
(19) H. A. S. asks: 1. At what werd shonid Sis inch band saw on 16 inch pulleys run, usiume
wo horse power? A. It is quite common to win such sawsata a speed of $\bar{f}$, vou feeta minute. "? Would it be site to run this saw on such simall
pulleys?
A. Your pulleys are too smull (20) A. R, anks: Is mi ara, as used for stove. Mica is found in inarge crystals, mate up of a sreat number of tine sheets. The stave mica is made bs:
imply dividing the crystals so .is to sheets of the required thickness.
(21) W. J. C. asks: 1. Will a properly con of a boiler indicate whether the steam is dry? The. vapor evolved frim a fluid being always of the temperature of the fiuid itself, so lonk as it ry.
mains in contact with it, aum led to doubt wheth .r mains in contact with it, ann led to doubt wheth $\cdot$.r
thernometer would show any difterence ba thernometer would show any difference
tween steam dry and steam cuntaining particles of water in mechanical suspension. A. The thernometer would not strow any dufference unless thesteam were superheateri. $z$. If the dryness of steam cannot be thus indicated, how can it be de--
termined? A. For a method of determining the mount of water in the steann, see p. $\mathrm{x} 5 \mathrm{~F}, \mathrm{i}$, vol. 31 . (22) J.P.F. asks: I.C'an a silver plate brest in a man's skull where there is a hole broken in it
(23) A. M. asks: 1 . Whrtw is icw formed, at butom or on thp of water: A. On top. :2. Will tom, in water ${ }^{\prime}$ A. No.
(24) I. E. H. says: Wr have a double steam inp of the following dimensions: : Tinch plunger. used to pump water through a 4 inch pipe into a eservoir about in feet above the level of the Mump. If a stopcock were put in the pipe near the reservoir, und near the stopeock 4 tire plug. hose with sufficient force and to a sufficient hight To extinguish fires, part of our town being 100 feet above the level of the pump\%. A. It would proba-
by be necessary to increase thi steam pressurt (2j) C. C. W. says: 1.1 understand that red a train run from London to Liverpmol, the our, inc of which is an averake of 4 i miles per may beluning stops. Is this practicable? done. 2. . I understand that an Engrish tocomotive as made the extraordinary time of $\&$ miles per hour, drawing coaches. Is that possiblet 1 .
There is such a report, but it is not well authentiy a locomotive? knowledge was about ti3 miles an honr.
(26) W. McB. asks: 1. How many cubie eet of hydrogen gus (manufactured from zinc anत lb. to a higat of 10 feet? A. You must first stat" whether you wish to know the ascensional fort"
of a bulk of hydrogen, sufficient to raise thr weight mentioned, or the mechanical force equiralent to the heat given out in burning a certain
number of cubic fcet. 2. What are the propornumber of cubic fcet. 2. What are the propor-
tions of zinc and acid to make gax with, and what tions of zinc and acid to make gaw with, and what
is the best way of generating the gas: A. Th. zinc is used in any quantity that is convenient, and mixture of oil of vitriol 4 parts, water 4 part.
poured upon it, in a suitahle bottce provided with cork and a n exit tube.
(27) J. H. P. asks: I have air slaked lin!. and pure carbolic acid. How can I impregnate
the lime with the acid so as to make an effective insect-repelling mixture for garden vegetables: This compound may be obtained bydigesting yous.
lime in the acid. It is a very unstable salt, easily. decomposed.
(28) N.Y.asks: 1.Can the nerve of a tooth ly after the nerve is destroyed? $\Lambda$. If the tooth is properly tilled after the operation, it will last. in ost cases, a very long time.
(29) J. McL. asks: What acid will eat zine the quickest and bite the sharpest? A. Sulphur
acid, diluted with from 3 to 5 pints of water.
(30) L. K. D. asks: Is there anything that will make plaster harder than it is whendryafter
being mixed with water? A. 'se a strong solution of alung instead of pure water.
(31) H. 13. P. asks: How can I plate with old, silver, and nickel upon steel and nickel silver without first using a coppering solution: A. Iron
