Busimess and Eersonal.

## Dry steam dries green lumber in 2 days, and is the

 Agricultural Implements, Farm Machinery, Seed $\underset{\text { Magic Lanterns, Stereopticons of all sizes and }}{\text { prict Parlor Entertainment and Public Exhibtions }}$ Pays well on small investment. Catalogues free. McA Wanted, two sets Flour Mill Machinery, secondhand ; Ju Cotton Spind les; Shingle Mill. Isaac E. Sharp, Evening Shade, $A \mathrm{rk}$.
Wanted-Parties to manufacture a tirst class Sec
Hona, Wanted-Parties to manufactur
tiona: Safety Boiler. Terms liberal.
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Wanted A party with large capital to manufac-
turc patent articlee in great demand. Address N. Hotz, Piano and Oryan Wire Work of all kinds, Valve
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## Model Engine Wanted-Address "Engine," Wor- cester, Mass.

Agents Wanted-Sec Illustration, page 3!ヶ, De-
cember 9.1874 , of thik paper; or address $G$. E. Coppen, Manufacturers and Dealers in Cotton Mill Mua-
chinery will please send Address to 13. O. Kuppet, Bank of Clarksvile, Clarksvile, Temnessee.
Wanted-Men of Capital to build a Manufactu-
ring Town. Address Jotun $\lambda$. Hall, Jomesthoro Jefferson Chis is an andertising ase Every nam who is up
To the times takes care that the wirld knows it. A trade
cande is not hidden under a bushel, but placed upon cothde is not hidden under a busher, but placed upon
a hill. Business is found to Increase In direret ratio with
the amount of money judiciously expeuded in letting the public know where you are and what you have gut to sell.
The great difticulty ty to know when, where, and how to
do it. This led to the establifliment of adrertising agen-
 a success unparalleled in the history of similar
takings. They are the largest customers the news takinge. They are the largest customers the newspapers
of the Cutred states have, and have so managed to slim-
pllfy and arrange the advertisink system as secures the pllify and arrange the advertising system as secures the
greatest amount of publictry, for the lowent amount o
money. More than tive thousand Anerican periodical are received regularly, and kept on the at their othce,
which is located in the New York Thines' building, it
Park Row, and we are fnformed that theircorps of unsist-
 home, for it must be a secluded spot which is not repre
seuted by a paper on thetr extensive thles, which are
alwass open to free inspection.-l पavenport (Iowa) Dem-

Wanted-A middle aged Baptist Lady; compctent
to instruct five small children; and, when not tlus entto instruct tive inall chindren; and, when not that ent
saged, to assist in house hold dultes. Adress, with
recommendations, R. A. Douglas, Bennettsville, s. C. A New Thing !-I will furnish any Machine, and
Driving Power, or a complete set of Machnery for any
kivd of Mill or Factors, at the Manufacturer's lowest kivd of Mill or Factory, at the Manufacturer's lowest
prices: set tt up, if wanted. Send cn yourorder. Address
P. H. Wait, Sandy Hill, X. I. Parties wishink me to Wanted-Machine for testing tensile streugth of
Bar Iron. William Morehouse, Buffalo, N. Y. Send to Atlas Works, Indianapolis, Ind., for a
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used in any situation. Pricce very low. Send for a cata-
loguc. Bailey, Farrell \& Co., Pittsburgh, Pa. Mould Maker Wanted-Competent to act as fore-
man in a Glass Works Muuld shop. Also, a yood Vise man in a Glass Works Mould shop. Also, a kood Vise
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K. Woodman, 50 Sudbury St., Boston, Mass. Patent for Sale-On a Small Household Article.
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Vorthumberland County, fa. References: Sunbury (Pa.) Gas Light Co.; Mahanoy City (Pa.) Gas Light Co.; Ash-
land (Pa.) Gas Light Co.; Philadelphia \& Reading RR land (Pa.) Gas Light Co.; Philadelphia \& Reading RR.
Co., Reading, Pa; ; Bloomsurg (Pa.) Gas Light Co.
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Engines, 2 to 8 H.P. N. Twiss, New Haven, Ct.
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the "Lockwood Hoe." Send for Sample and Price List. Peck's Patent Drop Press. Still the best in use.
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Corner Grooving Machines, send to A. Davis, Lowell, Hotchkiss Air Spring Forge Hammer, best in the Price only $\$ 3.50$. -The Tom Thumb Electric
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titement. Address Enion Iron Mills, Pittsburgh, Pa., for

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L. D. will find a recipe for polishing furniture on $\mathrm{p.11}, \mathrm{vol}. \mathrm{31.-C.T}. \mathrm{R}$.will find directions
for coating iron with black enamel on $p$. 308 , vol. D. can utilise the tin on tinned plate scrap by the process described on p. 319, vol. 31.- $\lambda$. M. C. can
temper gun springs by the method detailed on p. temper gun springs by the inethod detailed on $p$.
10 vol. $25 .-($. P. MoE. will tind a recipe for japaning on tin on p. 75 , vol. 32.-W. D. (i. will find a recipe for bronze on iron on $p .2 \times 3$, vol. 31 .-C. H. s.
can whiten ivory by the process detailed on p. 10 , volained on p. 112, vol. 31.-W. S. will find an expla-
plat nation of two lines approaching each other and
never meeting on p. 138, vol. 31.-H. W. M. can nake composition molds by following the directions on p. is, vol. 24. Cement for cracke in cast iron is described on p. 409, vol. 31.-B. will tind a
description of the manufacture of sulphurous or indelible ink on p. 129 yol 18 -F. J. H . will tind directions for stuffing animals on p. 350, vol. 30.W. H. will find directions for silvering glass by
Oruper's process on p. 2ní, vol. 31.-C. A. G. will nd an explanation of sailing faster than the wind n p. 132, vol. 29.-J. C. C. will find directions for putting a black flish on gun work on p . 20x, vol.
26.-C. E. D. G. will find a description of a gaslight dipe for on p . 379 , vol. 30. Wer on p .33 , vol 30 a w H. 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 find directions for etching on glass on
p. 409, vol. 31.-J. H. will tind directions for bronzng cast iron on p. $2 \times 3$, vol. 41.
(1) O. S. asks: Will sawdust, placed under a printing press or other machinery, absorb the ome danger of such a result: but the occurrence not very fr
dinary care.
(2) J. W. W. asks: Does the hydraulic or
water ram waste more water with a four feet than it will elevate to a hight of 18 or four feet than it will
feet? $A$. Generally, yes.

1. Can the blaze from a kerosene, alcohol, or common oil lamp exist in a receiver of compressed air of 30 lbs . per square inch, the air escaping and fresh air being supplied all the time? A. Yes. 2.
How much will air expand by heating? A. About How much will air expand by heating? A. About
$\frac{1}{4} \pi$ of its volume at $32^{\circ}$ Fah. for each degree Fah. $\frac{1}{4.53}$ of its volume at $3 z^{\circ}$ Fah. for
that its temperature is increased
(3) C. asks: 1. Which is the right name for he coal that is called sometimes candle coal and sometimes canal coal? A. The coal was originally called candle coal, and cannel coal and canal coal are corruptions of this name. The term cannel be thought singular to speak of candle coal, and yet that this is the proper name is evident from the fact that it was first so called because the coal burnt with a clear,long. yellow flame, like a candle.
It is a very compact coal, with an even texture and It is a very compact coal, with an even texture and
a smooth, clean, and nearly dull surface and cona smooth, clean, and nearly dull surface and con-
choidal fracture. The dull luster gives it the aspect often of being impure, when not so. The prothe following analyses: The cannel coal of Boghead, Scotland, has 66 per cent bituminous matters, 31 per cent fixed carbon, und 3 per cent ash. That of Breckenridge, Ky., has from 56 to 72 per cent
ituminous matters, 28 to 44 per cent fixed carbon, and 7 to 12 per cent ash. Ultimate analyses, to deexmine the proportion of the elements, the ashes xcluded, have gives, for the Boghead cannel
coal, carbon 80.49 per cent, hydrogen $11: 24$ per cent, oxygen 6.73 per cent, nitrogen $0.8 \%$ per cent; for the Breckenridge, carbon $82: 36$, hydrogen $7 \cdot 84$, oxygen $\tilde{\tau} \cdot 05$, and nitrogen $2 \sim \pi 5$ per cent.
(4) K. H. H. says: I am building a jig saw piston and piston head above the saw to lift it using air for a spring in the cylinder? I want to run the saw at $60013 / 2$ inch strokes per minute. A You can run it in the way you propose. It is
doubtful whether you will be able to attain that peed by force applied to a treadle. We shall be plad to hear from you
(5) E. M. asks: 1. How many pounds of
steam 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 gine. 2. Would thick glass be strong enough to
make a small steam cylinder to make a small steam cylinder, to see how it oper
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 turn a ground, and running into a second
printing press? A. Ordinarily, no.
(7) W. F. S. says: I use steam heating and water pipes. My boiler has not been running or
had a tire underit for sometwo or three weeks, had a fire under it for some two or three weeks,
and the shop has had no fire 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 warm? 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 to expand in freezing. When heat is applied, wow ever, some of the ice melts, and the water, expand ing rapidly 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 that is formed. When the latter melts, however, the
leaks are at once disclowed.
(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. $\because$. Would their use result in a saving
of fuel? useof the blast, an inferior quality of coal can of employed
(9) W. H. asks: How can 1 remove dirt and A. Oil answers in many cases, supplemented by vigorous application of soap and water, and, in 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. We do not doubt, however, that we have many
readers who can furnish valuable intormation on this subject, and we hope to hear from thein.
(10) J. W. F. may: I am thinking of build ing a boat kiz feet long with 15 feet beam, to draw from s feet light to 132 feet loaded. I was think ink of putting in an enkine 18 inches diameter by and 11 feet pitch Boiler (locomotive) is and 1 feet 6 inches diameter, with a fire box 4 feet 4 inches by 3 feet 10 inches, with 55 tubes, 3 inchen diameter and 10 feet long, using steam at 80 lbs . The boat's 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) T. D. savs: I have a steam pump with
(11) IT. D. says: I have a steam pump, with
a hole cut in the piston rod a cuarter of an 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 comesout. Can you tell me what I can thl the hole up with A. Screw in a plug, and finish off 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 wheel the tractile force is greater, for the same pressure on the piston; but the locomotive does
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
than when it goes over the axle.
(13) W. H. S. asks: In your reply to W. B. C. you say "the silver being extracted from
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
specificgravity? A. This method essentialys 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 inmetal remaining
creased quantity of silver. It is clear, therefore, and cooled uniformly, another concentration wil be obtained, and that the operation can be repeat ed until a lead is obtained rich enough in silver to admit of undergoing a refining process. In ull
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 practised at Swansea in wales a secret, or is it
adopted in this country? A. We are not familiar with the process you speak of.
(14) G. W. B. says: In our coal stoves, brick, apparently the result adering to the fire brick, apparently the result of impurities in the
coals. What is this substance, and can it be re moved 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 no begreat at a time, it can readily be removed.
(15) L. E. F. asks: What colors take best some cases appearing as if, in the original object, orange, and various shades of green tellows, dark. What is the best position to lie in during sleep A. Physicians frequently recommend the left side,
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-
wood or satinwood of teu renders it difficult to
unite them with glue. Cannot a strong acid or alkali, being tirst applied to the wood or united with the glue, be made to destroy the effect of the oin
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 effect tea, causing it to tucn to a wine red color shortly after steeping. It first turns in streaks or clours.
of red: and before the meal is tinished the beverage "giveth its color in the cup" and causes a lack of relish forit. 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 examination 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 for oo they last? A. The license for the boat long $82 i$, license for engineer $\$ 5$; they are renewable (18) M. T. K. asks: How can I makr petro-
 moderate heating.
(19) H. A.S. asks: 1. At what pered should Si inch band saw on 16 inch pulleys run, using
wo horse power: wo horse power: - . It is quite common to
un such saws at a speed of $\mathrm{f}, \mathrm{du} 0$ feet a minute. Would it be sat'e to run this saw on such small pulleys? A. Your palleys are too small.
(20) A. R. anks: Is mica, as used for stove
ghts, found in its natural stats in thet Mica is found in large crystals, made up of a great number of fine sheets. The stove mica is made by 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 from a fluid beiny always of the temperature of the fiuid itself, so lonk as it ru-
mainsin contact with it, 1 am led to doubt wheth $\cdot \mathrm{r}$ mainsin contact with it, 1 am led to doubt wheth $\cdot r$
thermometer would show any difference the a thermometer would show any difference b-
tween steam dry and steam containing particles ween steam dry and steam containing particles
of water in mechanical suspension. A. The therwater in mechamical suspension. A. Une ther
mometer would not slow any difference unless the steam were superheatedi. 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 steam, see p. 25i, vol. 31 . (22) J.P.F. asks: I.C'an a silver plate b. st 1 in a man's skull where there is a hole broken in it . Yes. 2. Can a silver bridge be put in a man':
(2:3) A. M. asks: 1. Whrte is ice fommed, at bottom or on top of water: A. On top. ... Will (om, in water: A. No.
(24) .I. E. H. says: We have a double steam ump of the following dimensions: $\tilde{\text { inch plunger. }}$ ased to pump, water through a 4 inch pipe into a eservoir about io) feet above the level of the pump. If a stopeock were put in the pipe near the reservoir, and near the stopeock y tire plug. hose with sufficient force and to a sufficient hight to extinguish tires, part of our town being 100 feet above the level of the pump? $\Lambda$. It would proba-
bly be necessary to increase th. steam pressurt. (25) C. C. W. says: 1. I unterstand that rere is a train run from London to Liverpool, the card time of which is an average of 4 miles per hour, including stops. Is tbis practicable: may be practicable, but we do not think that it is
done. 2 . I understand that an English locomotive has made the extraordinary time of 82 miles per hour, drawing 5 coaches. Is that possible't 1 . cated. 3. What is the best hour's run ever made by a locomotive? A. The best of which we have knowledge was about tis miles an honr.
(26) W. McB. asks: 1 . How many cubie cid or vitriol) are required to raise from zinc and b. to a higat of 10 feet? A. You must first stat" whether you wish to know the ascensional fort " weight mentioned, or the mechanical force equivlent to the heat given out in burning a certain number of cubic fcet. $\%$. What are the propor-
tions of zinc and acid to make gas with, and what is so zinc and acid to make gas with, and what
is the best way of generating the gas: A. Thezinc is used in any quantity that is convenient, and a mixture of oil of vitriol 4 parts, water 4 part:poured upon it, in a suitable bottle provided with
(27) J. H. P. asks: I have air slaked lime and pure carbolic acid. How can I impregnate the lime with the acid so as to make an effective. This compound may be obtained bydigesting lime in the acid. It is a very unstable salt, easily. decomposed.
(28) N.Y.asks: 1. Can the nerve of a tooth ly. med A. Yes. 2. How long will the tooth has fter the nerve is destroyed? $\Lambda$. If the tooth is most 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 ofing mixed with watcr? A.
(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
(32) C. W. . . sks: Will you please tell me seed oil? A. The purity of the fixed oils may be determined approximately, and the admixture of
cheaper oils detected, (1) by observing the peculiar cheaper oils detected, (1) by observing the peculiar
odor of the oil when pently heated by a spirit lamp in a smax will resemble that of the plant or animal from "r animan from which it is ontained. In this way detected even when used to adulterate another oii. (a) 1 ly mixing concentrated sulphuric acid with oil
(i) or 2 parts acid to 100 oil) the termperature rises
and und the wistrurer becomes colored. If a plate of Thite glass be placed on a sheet of white paper, and 10 or 15 drops of oil be placed on the glass and
a small drop of acid be added, a color will be produced which raries with the oil employed. With rape oila, greenish blue ring forms at a certain dis-
tance from the acid. while towards the center tance from the acid. while towards the center
light yellow brown streaks may be observed. Olive light Yellow brown streaks may be observed. Oive
oil instantly becomes pale yellow, and afterwards oil instantly becomes pale yellow, and afterwards
yellowish green. In linseed oill a beautiful dark browish red web is formed, gradually changing
into trownish hlack. Tallow oil or oleic acid be into brownish black. Tallow oil or oleic acid be-
comesbrown. It seldom ocecurs that a better oil is used to adulterate an inferior one. Oil of al monds, olive, and codtish oil will, therefore, never
be used to adulterate rape oil, but probably train or perhaps linseed. and sometimes poppy oil. I we are led, therefore, by the odorto infer an adul
teration, for instance, for train oil, which occurs most frequently, it is only nevessary to place from
mor 10 to 15 drops of rape oil, the purity of which is pqual guantity of the oil whose purity is suspected and add to each of them a drop of sulphuric acid From the color produced an inference may be formed of the purity of the oil; and by the different tinges of color the extent of adulteration may oe detected. (3) By the olevmeter, indicating the
specific gravity of oil in such a way that pure rape specific gravity of oil in such a way that pure rape
sered oil is indicated by $35^{\circ}$ to $38^{\circ}$, hemp oil from $30^{\circ}$ to $31^{\circ}$. There are various other tests; that by the capillarimeter indicates the quantity of the on
which falls from a certain sized point under give which falls from
(3:3) (i. M. R. sars: A daily journal give termine its auriferous character: "After being well ground and calcined, it should be treated with a bath of iodine or bromine water, and allowed to
digest in it for some time. Then a piece of filter paper shonld be soaked in the solution, dried, and
hurned to ashes in a mutlie. If gold is present, the ash is purple. One pennyweight of gold to the tur may thus be detected. "Please five me de
tails of the preparation of the iodine or bromin water. 1 . The solution of iodine or bromine is readily obtained by placing a sulull quantity of ty of pure water.and shaking. The color of solution, if bromine has been used, will be orange yel
low. The bromine is more soluble in water than the iodine, which is very slightly soluble. Both the solutions dissolve gold, to form either iodid or bromide of gold. These are readily decommosed upon application of heat, and give the char acteristic color mentioned in the test.
(34) T. H. W.asks: 1 How can 1 keep my zinc in a lead and rinc battery from getting cov-
ered with a black substance: A. You cannot help its turning black, except by covering it with mer cury. 2. Does the substance have any effiect on
(35) (i.S.P. asks : Huw can I arrange a uag
neto-electric machine that is used in medical pur neto-electric machine that is used in medical pur A. One lole is negative and the other positive
(36) J. E. (t. asks: What size of copper
wire will do to convey the same amount of electricity as the common telegraph wire? A. Copper fore a copper wire one sixth as large would con-
duct as much electricity as the iron wire now used duct as much electricity as the iron wire now used.
(37) W. C. (. asks: How can I construct a safe and cheap kerosene lamp for blowpipe solder-
ing purposes? A. For this purpose a small lamp of glass is hest. Thetop should be composed of small brass disk (alout $3 / 4$ inch in diameter) through supported by a metal frame, into which it fits loosely, in such a manner that, while in its normal positiou, it prevents the air from entering the lamp;
it also acts as a safety valve, makinu it impossible for an explosion of any kind to occur. The lamp
whould be furnished with a brass cup which screws whould be furnished with a brass cup which screws
over the top, thus rendering it portable, prevents the spilling of the liguid in case the lamp
turnofl, and also deters evaporation whe use. This, we believe, is the simplest and best
form of lunp for this flamp for this purpose
(38) F. asks: Does it make any difference
in an induction coril, which way the wires of the coarse helix run, in respect to the flne helix: rection, or in different directions? A. It makes no difference, which way you wind them.
(39) W. T. B. asks: How can I dissolve sulphur in water, so as to make a strong permanent
solution: $A$. Free sulphur is insoluble in water under any condition. Many of its compounds,
however, are soluble, some extremely so. The affinity existing hetween sulphuric acid (which is a compound of sulphur with oxygen) and water is
so great that. by its absorption of the aqueous so great that, by its absorption of the aqueous
vapor from the air, when freely exposed, it soon doubles its own volume. The ordinary "sulphur water," as obtained from what are known as sul-
phur sprines, is simply a solution in water of gaseous sulphuretted hydrogen, which, as its name
denotes, is a compound of sulphur with hydrogen. This gas may be artificially obtained, cheaply and in large quantities, by the action of dilute oil of ritriol on sulphide of iron. A solution of the $g$
is easily obtained by passing it through water.
(40) C. A. M. asks: How should the electro
nagnet of a small telegraph be constructed? Hnd copper wire, insulated with silk, around (41) F. H. M. asks: 1. Is there any way in which silver can be applied to plastered molding
ther than as leaf? A. We do not know of an other method. 2. What is the best mixture for lac quering silver to make it like gold? A. Amber of turpentine 16 ozs. Dissolve separately the e num lac,and then add the amber, prepared and pulverized, with the linseed oil and essence, very warm.
when the whole has lost a partof its heat, mix in relan the whole has lost a part of its heat, mix in
relative proportions tincture of annatto, of terr merita, gum gutta, and dragon's blood. This var-
nish, when applied to white metalls, gives them a eautiful gold color. 3. Can bronze be burmished
A. No. 4. Can leaf be applied on a French polA. No. . . Can leaf be applied on a French pol
ished surface? A. No. 5 . Which plaster is bes
for
(42) H. F. N. says: I have a galvanic belt find out what the actual electric or galvanici tind out what the actual electric or galvanic in
tensity is, if it has any. How can I arrive at it? A. Attach itstwo poles to a tangent galvanometer and note the defection. Then connect the cell of
a Daniell battery to the same calveoneter a Daniell battery to the sume galvanometer. The
detlection of the galcanic belt will be to the de lection of a Daniell cell as its intensity is to tha of a Daniell cell.
(43) W. F. P. askss: 1. What are the proper ties of crude petroleum: A.The name petroleum
rock oil) is applied to certain bituminous fluid rock oil) is applied to certain bituminous fluids
found in the earth. Solid bitumen or asphalt difter but little in chemical composition from petroleum oth being compounds of hydrogen and carbon. Many varieties of petroleum, and perraps all, be
come thick by exposure to the air, and fnally solid, resembling asphaltuum. The fluid petroleum has been collected in Burmah for at least tifteen centuries. It is used by the inhabitants for light
and fuel. In this country petroleum is not, as and fuel. In this country petroleum is not, as
many suppose, a new discovery. Years ago springs many suppose,a new discovery. Years ago springs
of it were known in many localitites, but its use was very limited. No method for purifying it was nown, so that it was looked upon as valueless, an on uccount of the oil rendering the water impure. In 1861 it was purited, and introduced extensively as an illuminating oil, to take the place of burning
fuids (camphine and alcohol), the price of which fuids (camphine and alcohol), the price of which
was greatly enhanced qualities of their vapors, were causing many sever accidents. The trade increased, new wells were
bored; and some of them yielded several hundred barrels per day, mak ingpossessors at once wealthy Petroleum
position of urface of orpanic substances as petroleum to be due to the e ubberraneous distillation of remains of sea plants and marine animals, and that the petroeum is forced upwards by water, always present In crevices, und through the substance of the rock. erroleun is much lighter than water, of a green or back color, with a peculiar and, to most perinto two kinds, the heavy or lubricating oil, and the light oil; the former is more dense, and some-
times of the consistence of thin molasses. It is times of the consistence of thin molasses. It is
used, without preparation, for lubricating machinery, for which it is admiriably suited. The light purifying processes, the most impor nt of which is distsillation. 2. What is the simplest method of
2. ascertaining the degree of fire test of reflined petrowith benzine or heavy oil. To detect the former, pour a few ounces into a small tin cup, and put it
on a stove or over a lamp, placing the bulb of a on $a$ stove or over a lamp, placing the bulb of a
thermometer in the oil. Then as the temperature rises, try with a lighted taper when the oil gives Fah. the oil is dangerous to use ss ite or 10 Fah. the oil is dangerous to use, as its vapor, be
coming mixed with air in the lamp, may take fre and explode. The adulteration with heavy oil is shown by the dimness of the flame after having burned for some time, accompanied by the char ted? How are the adulterations to be detected? A. Yes; ; it is largely adulterated with the lighter oils, such as benzine, etce, which may be reydily
(44) R. R. B. asks: 1. What are the cheapest and best ingredients for making paste in large quantities, for paperhangers' and paper bag man-
ufacturers' use? I want a paste free from lumps ufacturers use? I want a paste free from lumps
and as adhesive as possible; how should the innd as adhesive as possibe, how should the be used in each barrel, and what should be its consistence before and after cooking: A. The following has been hif hly recommended; for besides
possessing the merit of cheapness, it has the advan age of preventing the paper from separating or peeling off. It may be prepared by frrst softening
18 bls. of tinely powdered bole in water, and then and a quarter pounds of glue are next to be boiled into glue wator;and the bole and two pounds of gypsum are then stirred in, and the whole mass forced through a sieve by means ofa brush. This is after-
ward diluted with water to the condition of a thin paste or dressing, when it is ready for use. This aste is not only much cheaper than ordinary lour paste, but it has the advantage of adhering
better to
whitewashed surfaces, especially to walls that have been coated over several times and from which the coating has not been care fuy removed. In some cases, it is advisable, when means of this paste with a ground paper, and to apply the paperhanging itself to this with ordi-
(45) A. B. H. asks: 1. Is hot air lighter than cold . A. Yes. 2. Are noxious gases Hghter, or
heavier than pure air? A. Some are lighter, some
are heavier than
they are heavier
lace, and does slacking injure it? A. By exposure to the air and damp, the coal loses some of its
valuable ingredients, and is injured 2 Does reezing coal injure it? A. It is also somewhat disintegrated and injured by freezing weather.
(46) . B. says: I have been trying to elec trotype a
c. in you
so brittle in your issue of February 6, but my deposit
brittle that I can hardly get it off the wax whole, and there are minute holes in the wo
(47) W A B asks: Does the rinc heLeclanché battery require to be amalgamated
(48) A. W. M. suys: In Baker's work on the team engine, p. 35 , if find the following formula r thegraduation of the lever of the safety valve
$\pi r^{2} l \mathbf{P}^{\prime}-1 / 2 L w$
he center of valve to fulcrum, $\mathrm{P}^{\prime}=$ the pressure of team on boiler, $L=$ length of lever, $w=$ weight lever, $\mathbf{W}=$ weight of ball. I have just put in a set
of new boilers. The area of the valve is $5 \cdot 41189$ of new boilers. The area of the valve is $5 \cdot 41189$
inches, $l=3 \cdot 125, \mathrm{P}^{\prime}=80 \mathrm{lbs}$., length of lever 29 inch es, weight of lever $81 / 2 \mathrm{lbs}$. , and weight of ball 83 bs. D $\frac{\pi r^{+} l P^{\prime}-16 L u}{W^{2}}-\frac{5 \cdot 41189}{} \times \frac{3 \cdot 12 \pi \times 80-14: 3 \times 8: 5}{3}$ $=14 \frac{k}{5}$. $D=14 \frac{x}{1}$. inches from fulcrum to place where the weight should be placed on lever to car
y 80 lbs. steam. But when we fred up, we were surprised to find that, instead of placing the weight at $14{ }^{\text {A }}{ }^{\text {a }}$ inches from the fulcrum, we had to place it 19 inches; we therefore conclude that the formula is incorrect. Can you explain this? A. The for well for ordinary cases. We think it likely that you have made a mistake in estimating the area of
the valve, or that your steam gage is incorrect. You will find an experimen 1 method described on p. 23 , vol. 31 .
(49) W. I. L. says: I wish to make a tele with liquid. What is the best flling? A. Only two
with a inch objective, hollow, to be tilled kinds of objectives repay the labor bestowed on ilvered glass reflector, mounted either according to Newton's or to Cassegrain's form.
(50) W. H. S. asks: What is the propor the Newtonian telescope the focusbeing six time the diameter? A. Minor axis of elliptical plane mirror is one fifth the uperture of the speculum.
The focus should be nearly twelve times the aperture
(.51) R. W. K. says: You state that a gen ining of casks and wooden vessels, to prevent ab sorption of their contents by the wood, or their escape through the pores. The diminishing evap-
oration being of great importance to the vineyard districts of Virginia, I applied atsome of the larges an applicants in Philadelphia, and found that such hem. Would it not be expensive? A . It is suc
cessfully used in coating smaller vessels; its appli cation to larger is a matter only of expense and
(.52) J. F. D. asks: What is the best meth od of bleaching rosin? A. We do not know of any
(53) E. F. asks: Can any simple ingredient be used to throw down the foreign matter in very hard water? A. This may be accomplished either tion of the proper quantity of lime water, whic will precipitate or carry down with it the excesso
(is) U. H. asks: 1. C'an I gold plate stee
pens with the Tom Thumb battery? A. Yes. pens with the Tom Thumb battery? A. Yes. 2
Must I plate the pens with copper first? A. It i not necessary.
How can 1
rubber hose? A. See n. 203
What is the freezing point of mercury? A.Mer cury solidities at-390 Fah., and is then soft and malleable; but if reduced to a much lower temper
ature, it becomes brittle. It boils at about tif2 Fall, and slowly volatilizes at all temperature
( 55 ) W.I. B. says: Rain water 6 ozs., car mine 24 grains, aqua ammonia 240 drops, and gum urabic water 30 drops make red ink which has an
offensive smell. What will remove the smell of the ammonia without sioiling the

## \section*{You give a} <br> Ye parts by weight? A. Yes.

(56) W. C. R. asks: I. If I take a tube, say 6 inches long and $1 / 2$ inch in diameter
and tlll it about half full of the heads of the sulphur (blue headed) matches, with half an inch of stick to each head, and then seal the two ends of the tube over a blowpipe without igniting the hot enough to consume the wood: What gase will I have in the tube: A. The gases will be vapo of sulphur, a small amount of sulphurous acid structive distillation of the wood. 2. Will they be of disagreeable odor, or injurious when inhaled A. They will be both disagreeable and injurious.
(57) M. J. S. says: We have a well forty into the earth, through which the water is drawn. and the water drawn therefrom is clear as crystal; but on being heated it becomes red, and precipi dry. Why is this? A. The water contains iron in

Upon boiling, the carbonic acid is driven off and the iron precipitated
as an insoluble body.
(58) J. G. asks: What impurities does shee zinc contain, and how may they be removed so as
toleave it comparatively pure? zinc is always more or less contaminated with ar senic, cadmium, lead, iron, and carbon. The black residue remaining when zinc is dissolved in acid (oftenmistaken for a carburet of zinc) is a mixture in various proportions of iron, lead, and carbon.
The more impure the zinc, the more readily it is assolved in acids; but by careful distillation zin may be
metals.
In a
In a Leclanché cell (1 quart), how often do the contents of the porous cup and of the outer jar require changing? A. This depends altogether upon the use that is made of it, or in other words,
the number of times daily or monthly it is brought into requisition. The outer solution simply need to be kept saturated with sal ammoniac, and wate to replenish that lost by evaporation. This battery
cannot be used on closed circuit, because of its apid polarization
(59) L. W. K. asks: 1. What is the differ ence in the combination of a portrait and a land
scape lens for photography: A. The portrait len is constructed to work rapidly; the front pair len sists of a crown double convex and tint plano-con cave, the back pair a flint negative meniscus and crown double convex, of longer focus than the front pair. Theview tube is a singlepair, a double
convex crown and a double concave flint. 2. Why convex crown and a double concave flint. 2. Why are two sets of lenses used in a camera tube?
For wider angle of aperture. 3. Can goci land For wider angle of aperture. 3. Can gocd land
scape and portrait photography be done with an scape and portrait photography be done with a
achromatic object glass of a telescope? A. No For experiment, put a view tube its own focallengt or long focal length make any difference for cithe kind of work? A. A lens works the slower the longer its focus is. :. How is a telescope fixed for viewing the sun:- A. Claret and apple green sex-
tant glasses are superposed inside the eycpice cap, tant glasses are superposed inside the cycpic
or the image is received on a Bristol board.
(60) J. E. N. asks : 1 . What is the hest com position for covering the insulated wires for an in
duction coil? A. Cover both wires with silk. Is a bobbin 6 inches long by $21 / 2$ inches in diameter with a $1 / 12$ inch cylinder (for the wire rods), a well proportioned one? A. Yes. 3. Which gives the best results with a weak battery, a coil of two wires (of the same size) wound side by side, or a
cill of flne over a coarser wire? A. Use No. 40 for the secondary and No wire? A. Use No. 4 Are the induced and the inducing coils wound in the same direction (in the coil of one wire over the
other)? A. Yes. 5. In what proportion of each can the induced be increased without increasing the inducing coil ? A.Almost any extent. G.About required for the above sized bobbin? $\Lambda$. Use a few turns of the coarse wire and a thousand turns
of the fine wire. of the fine wire. $\%$ Can iron covered wire be used
place of copper in anypart $\%$ A. Not to good adantage. 8 . What work on electricity is recom nended? A. De la Rive, Wood, Jenkins, Harris,
(61) W. R. H. asks: 1. How can I best sol der platinum foil to brass and make a good electrical
connection? A. Use pulverized rosin and good connection? A. Use pulverized rosin and good
solder. 2. Will powdered peroxide of manganese solder. 2. Wis powdered peroxide of manganese
(62) F. B. S. says: 1. I have a small battery nade on the Daniell principle, using zinc and sulphate of copper, but it is not constant. What can
do to keep it more uniform? A. Probably the water needs changing in the porous cups. When water needs changing in the porous cups. When
it becomes supersaturated with sulphate of zinc, crystals form on the zinc and stop the action. You can use nitrate of copper instead of sulphate if you wish, but sulphate is cheaper and better. 2.
Howcan I make an induction coil? A. An induction coil is made by winding a helix of coarse insulated copper wire, and surrounding it by a helix of
fine insulated copper wire. The battery is conare obtained from the fine wire coil, when the circuit of the coarse wire coil, which is called the primary circuit, is broken and closed. The fine wire
coil is called the secondary circuit. and receives its ectrical effects by indu
(6i3) W. E. J. asks: How can I make a bat ery suitable for plating, and how one that will run a small telegraph instrument? I have a glass jar that will holdabout 2 quarts, and wish to make it
into as powerful a battery as I can. A. Put a late of copper in the bottom of your jar and atthe junction with gutta percha. Put a couple pounds of sulphate of copper (blue vitriol) on the copper plate. Suspend a disk of zinc in the jar near the top and fll the jar with water. Connect
the upper end of the copper wire with the zinc isk, and leave it so for 48 hours, and your battery will then be ready for use. If you need more
power, make a second cell in the same way and connect the copper plate of one with the zinc disk of the other. One cell of this kind has a force of one volt, two cells two volts, and so on. This is
called the gravity orCallaud battery, and is one of hebest and most constant in use.
(64) W. S. S. asks: Is there a chemical proeating or springing it: A. $W_{\text {f }}$ do not know of (65)
(65) J. H. B. cays: I have a ittle engine of inch bore by $21 / 2$ inches stroke. I had some trouMechanism,", by but your article on "Practical go) corrected the mistake. I now run with steam ibs. pressure at the rate of about 800 revolutions
minute

## Kiln, brick, w. Bull........... Kin, brick, w. L. Greg...

(66) E. B. K. says, in reply to J. C. M., who
had trouble with pipes connected to his boller in connection with the steam. If one end of no wen wh the generated would rscape to the boiler and form racuum, and the water would follow. The size of the pipe makes no differe
pump through such pipea.
Minerals, etc.-Specimens have been re ceived from the following correspondents, and examined, with the results stated :
C. H. W. Jr.-It is a fragment of a small bexa yonal crystal of rock crystal or quartz.-G. H. M
-It is a decomposed muscovite, which is a rariety of mica, and consists of a bydrated silicate of with a small percentage of oxide of iro and about 10 per cent of alkali. Numerous spec probably on the supposition that the bright yellow scales owe their color to the presence of gold. This mistake was made with sad consequences by the first settlers at Jamestown, Va., who,instead of devoting themselves to cutting down the forest, col England, where it was pronounced worthless.-D. -No. 1 is bornite or variegated copper ore, com posed of sulphur ${ }^{2} 5$ per cent, copper $i 3$ per cent and iron 12 per cent. No. 2 is epidote,and consist of 37 per cent of silica, 23 per cent of alumina, 14 per cent of oxide of iron, 23 per cent of magnesia,
and 3 per cent of water.-T. M. T.-It is a mixture of augite, epidote, and quartz. If it oontains an much larger than the mieroscopic fragment yoce nueh langor than the wier ourmine this fact you has no ralue, apparently, as an ore.-N. H. S.-We bave tried your specimen for manganese, and find it present, althougb in what quantity we cannot say from a preliminary examination. The cost of an assay is $\$ 10$; and if there is a deposit of the mineral, it is worth the agay.-G. McI.-The pill is probably a propriftary article; it has all the indi-
cations of being for sweetening the breath only. J. K . - No. 1 is marcasite, and is composed of 46 per cent of iron and 54 of sulphur. It is not valuable as an iron ore. No. 21 s a clay slate, containingoxide of iron, but not in sufficient quantity ti render It raluable. No. 3 is an impure steatite or soaptone. In large blocks, it is used in lining the in terior of blast furnaces. No. 4 is a yellow oxide
of iron, mixed with clas and a large amount of of iron, mixed with clar and a large amount of
silex. It is an inferior iron orn.- T . and K .-'The pecimen containa gold, of the rites. It is full of cubical crystals-sllghtly de omposed-of iron pyrites, which is a compound of sulphur and iron.-P. C.-The white particles are not sulphur, but sulphate of iron arising from the decomposition of pyrites. The vitriol bas probably ber.n made in the same manner, and a larger beled mineral of a bright metallic luster, unla sellow tint, broken on the side with a fibrous frac ture, and having an appearance at the ends of having undergone fusion, has been received. It is sulphuret of iron.
J. \&J. T. ask: What is the proper speed for the periphery of a bolting reel?-J. H. asks How can I dye skins of muskrat, fox, etc., black ?
-R. M. asks: How can I prepare Prussian blue for R. M.iling, to be used, moistened with water, with a brush ?-R. S. asks: What is a hit and mis valve ?-J. C. C. asks: 1. How can ginger ale with cre the component parts of the Belfastginger ale -T. W. B. asks: If four men can pack a bale of onttonwelghing 500 lbs . on an iron screw 4 inches in diameterand, with 1 round, witblevers 15 feet long, how much can fou and 7 inches pitch in the thread to the round, with lever. 20 feet long? The incline on the wood screw is as 7 to 699 , and the incline on the iron screw is a $11 / 2$ to 1212 , that is, the incline on both is nearly the and, hut the $r$ 'se on ono is i inches to the round

## COMMONICATIONS RECEIVED

The Fditor of the sctentiric Amrracan ao iginal papers and contributions upon the followin subjects:
On Ifoiler Explosions. By W. H.
On a Mrsterious Fire. By J. H. G
On Lubricating CyHnders. BrJ. H. s. and bs On a

On Nitro-Gly Pincom Motor C On Amalsum Filling.. By F. F. H. on a Man-Eating Tree. By K. L. On Ints. By.J.f

## Also enquiries and answers from the following:



HINTS TO CORRESPONDENTS

## Correspondents whose inquiries fail to appear

 may conclude that, for good reasons, the Editor de clines them. The address of the writer should a Ways be given.Enquiries relating to patents, or to the patentabillty of inventions, assignments, etc., will not be published bere. All such questions, when initial it would fill half of our paper to print them all but we generally take pleasure in answering briefl by mall, if the writer's addrese is given. Hundreds of eaquiries analogous to the following
are sent: "Who sells eccentric grinding mills? are sent: "Who sells eccentric grinding mills?
Who sells a gold plating liquid? Who sells match-
makes pocket door locks? Who bussils? Wh All such personal enquiries are printed. as will be bserved, in the column of "Buanness and Person subject to the charge mentioned at the head of that column. Almost anydeaired information can in this way be expeditiously obtained.
[OFFICIAL.]

## index of inventions

 Letters Patent of the United States were Granted in the Week ending January 26, 1875,AND EACH BEARING THAT DATE. [Those marked ( $\mathbf{r}$ ) are relssued patents.]

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Sewing machine, E. Kapppeyer
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Sewing machine table support, R $\quad$. Whitnes
Sewing machine wax thread, F. E. Bean.......
Shaft support. S. Nellts.
Sheep scratoh box, L. B. Dilling case, C. P. Ellis
Shoe
Shoe horn, $\Lambda$. M. Cushing.......
Shoe nail blank, Blake and McKa
Shoe nall blank, Blake and McKay..............
Shoe tips, machlnery for forming, J. H. Huese
Sletgh, T. F. Moore.....
Spark arrester, D. Allard
Spark arreser,
Spark arrester, J. W. W. Buel
Splnning frame, bolster, J. $\Lambda$. Matte........
Spoke socket and felly,
Spoke socket and felly plate, g. T. Brig.........
Staple blanka, making, J. W. Shannou...
Stone, wheel for dressing, P. B. Laird...
Stool support, C. J. Woodward.
Stove, cooking, X. D. Seward.
Stove, heatlng, N. $\Lambda$. Boynton ( 5
Stove, magazine. J. E. Tallmad
Stove pipe collar and thimble,G. F. Brinkerhof
stove pollsh, S. J. Wilson...
Strainers, constructlon of, R. J. P. Goodwin
Street sprinkler, A. A. Jere.
Street sprinkler, I. A. Jeremiah....
Street sweeplng machine, J. Edson
Syringe, hypodermic, J. Lelte
Table, folding, H. B. Sinclai
Tea pot handle, T. Shaw..................
Telegraph pole, metallic, , D. D. Radcliffe
Tiles, manufacturing, E. L. H
Tobacco, coloring, O. Knab
Toy cartridge exploder, J. B. McHarg.
Trap, anlmal, L. F. George...
Twine cutter, C. P. Ellis.....
Tyre tightener, H. B. Robbin
Umbrella, w. Tetley
Valve, automatle rellef,
vafety,. . C. Bull.
Valve, safety, G. H. Crosby
Valve, steam, J. H. Cores
Valve, steam, G. McNaughton.....
Valve, adjusting cut-oftr H. C. Bull
Vehicle wheel, J. M. Stephenson..
Vehicle wheel hub. W. Teegarden.
Veloc.tpede, J. A. Vander Waag (r)
Ventllating and warming drum,
Ventilator, car, E. Korting.
Wagon hodes, ttay iron for, A. A. Livingston Wagon jack, s . Chard

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Wnahere, machine for for
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Waahlng machine, S. W. Holbrook...
Watch case bezels, making, F. H. Winhy........
Water,removing obstructions under,
Whip tip ferrule, E. R. Light.
Windmill, W. D. Parson
Wood, machine forpolish
Wrench, S . E. Robinson....
Wrench, plpe, H. C. Stouffer.
Wrench, plpe, J. B. W'estwlck
Toke, neck, I. B. Relyea...
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,191.-Mintral Watrrs. - H. A. Benjamin, San Frad
192.-Braids.-H. N. Daggett, Attleborough, Masg
193.-SILKS, ETO.-Passavant \& Co., New Yor
194.-SuAPs.- Strunz et al., Pittsburgh, Pa.

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On each Trade mark
On each Trade mark.... ............................
On Issung each original Patent.
On appeal to Examiuers-nn-Chief........
On appeal to Commissloner of Patents.
On application for Rets
On an application for Design ( $3 \neq$ y yea
n application for Destign

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Winchester, Windsor, Essex county, Ont. Improse. monts on apparatus for elevating and conveying coal,
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310 .-(i. M. Holune
S310.- (i. M. Holunes, Gardener. Keanebec county, Me.,
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Improvements on smoke ftacks, called "Allard's Smoke Stack.". Jan. 25, 1875 .
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Ont. Improvement on spring bed bottom, called Ont. Improvement on spring bed bottom, call
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$\Lambda$ leaf gupporter for sewing machines, called $\because$ Web sters Leaf supporter. Jath. 25, 1siJ. Improvementa in spiting hoe seeding machide, callped Ont. Improvements in the unann, of coupling and uncoupling rallroad
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