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Buffalo, N. Y. Address F. H. C. Mey, Buffalo, N. Y.
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ticulars, address L. A. Lawton, Herkimer, N. Y. Skinner Portable Engine
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Lansdell's Steam'Siphon pumps sandy and gritty wa-
ras easily as clean. Leng \& ogden, 212 Pearl St., N. Y.

## 3 Whles Wurvis

(1) J. M. S. asks: Have chemists ever an lyzed the juice of the India rubber tree ? What are it ngredients? A. Yes; the pure juice is essentially meric with turpentine oil $\left(\mathrm{XC}_{5} \mathrm{H}_{4}\right)$. Consult Watt Dictionary of Chemistry
(2) G. E. B. writes: What causes the needle of the compass to point north and south, electricity or culation of electric currents around the earth in a cirection about parallel with its equator, and the tendency of the needle toarrange itself at right angles to the diShall I proceed in the same manner to make an elec rotype of a wooden medallion as I would in taking from a plaster one? A. Yes.
(3) J. N. L. asks (1) for a recipe to pro mote the growth of the human hair? A. The health
and vigor of the hair depends in a great measure on he general vigor of the system. Brush the scalp well with a stiff brush daily (with care not to strain the hair)
nd wash it with pure water, to which a little colo water or tinctureof cantharides may be added. Avoid the use of pomatums, oils, etc. 2. Also, one that will
cause it to cease growing? A. See answer to R. E. F.
(4) T. J. H. writes: How can I remove the rust off a nickel or silver plated surface, and make it
appear as good as new? A. By buffing or polishing unppear as good as new? A. By buffing or polishing un
til a new surface is obtained, which must then be replated.
(5) A. V. P. writes: 1. Can I coat an ordinary glass jar with tinfoil? A. Yes. 2. How can I asten it to the glass? A. With shellac varnish. Then, in order to drive off all moisture from the inside of the at that heat for about one hour; then seal the jar air tight, with sealing wax. 3. Can I make a plate machine by using thick window glass for the plate, cutting
it 8 or 16 -sided, putting a hole through the center and it 8 or 16 -sided, putting a hole through the center and
clasping it between wood disks on a wood shaft for turningit? A. Yes. 4. How thick should the glass be . Make it of crown glass $\frac{1}{17}$ of an inchnesses do best? A. Not for a small machine. 6. Can the collecting
combs be connected directly with the jars? A. Yes. combs be connected directly with the jars? A. Yes.
See Supplement 105, p. 1669 . 7 . Of what is it best to See Stuplement 105, p. 1669. 7. Of what is it best to
make the cushions? A. Of chamois leather, and make the cushion
stuffed with hair?
I would like to know my best method for procuring oxygen gas, not too expensively, for trying a few rainary experiments; using say 2 or 3 gallons at a time?
A. Make a retort out of a piece of iron gas pipe 8 inches ong and of about 1 inch bore; on one end of th is have a gas fitter screw on a cap airtight, and on the other
end a reducer, connected airtight with about 2 feet of $1 / 4$ inch gas pipe: now it would be well to placethe reort in the fire, so as to burn of any oil that may be in ; then remove it from the fire, and when it is coo black oxide of manganese and chlorate of potash; then heat the retort gradually, and the oxygengas will escape the end of the $1 / 4$ inch pipe, where it may be collecte over water or by simply bending the $1 / 4$ inch pipe into
lass jar, so that the oxygen gas (which is heavier the glass jar, so that the oxygen gas (which is heavier than
air) may settle in the glass jar. A little splinter of ig-
nited charcoal held near the mouth of the jar will indicate(by burning brightly) when the jar is full.
(6) E. M. asks what can be put on carpets while sweeping to lay the dust, and which will not in
(7) In answer to J. S. H., who asks for a good recipe for vinegar madeby chemicals, Supplement
(8) R. E. F. asks for a safe and simple method or preparation that will permanently remove
from the upper lip a slight down, which being dark is unpleasantly apparent? A. Bottger recommends the ollowing: 1 part, by weight, pure crystallized sodium sulphydrate, and 3 parts of fine purified chalk; rub well together, moisten with water, and apply a layer the
hickness of a knife blade. It should be allowed to remain in contact with the flesh not more than two or may be stained.
(9) J. B. M. asks: At what degree of heat will green oak staves take fire in a light dry house 10) S. For a short time probainly $600^{\circ}$ Fah.
(10) S. B. G. writes: The magnetic needle ity parallel to the igut angles to a current of electricthe variation of the magnetic needle or the current of electricitys A. Perhaps you will understand this if you bear in mind that the magnetic equator does not
coincide with the terrestrial. The former is a somewhat sinuous line, not differing much from a great cutting it on two points almost exactly opposite , and other, one in the Atlantic and the other in the Pacific. These points appear to be gradually moving their posi-
(11) L. A. B. asks: Will a sun $d_{i a}{ }^{1} \mathrm{sh}^{h_{o w}}$ correct timethe year round \& A. As regards solar time,
(12) E. R. G. asks if our common red clover seed is used inthis or foreign countries for the purpose of coloring or making colors of any kind A. purpose; and, jualging from their chemical composition, e should say that they could not be-
(13) S. B. G. asks: Where will a body on the opposite side of the earth from the moon and on the opposite side of the earth from the moon and
sun, or at right angles to the center line of attraction,
which would be at low tides A. It would weigh heavier,
of course, on the opposite side of the earth from the of course, on the opposite side of the earth from the
moon, where it is less influenced by the attraction of the latter, and in a downward direction.
(14) A. P. B. says: It is a well known fact that in some sections of our country water does not lie
at the same depth, that is, a well may be sunk one hundred feet before findingwater, while but at a very short distance water may be found quite near the surface. Is there any means by which these veins of water can be
found or their depth determined? A. There can be no found or their depth determineds A. There can be no
means of determining the matter, for the reason that means of determining the matter, for the reason that
the presence or absence of water, at different depths, epends wholly on the structure and inclination of the (15) C. W. K. says: In the pubtisher's proStates," that this is the oldest of the continents." He seemsinclined to doubt this, and asks our opinion. A. Webe-
lieve that the most prominent scientists all concede lieve that the most prominent scientists all concede
America to be the old world, geologically speaking. From our own reading on the subject we cannot think herwise.
(16) C. M. R. asks why paper immersed in water in absorbing the water swells, and why, if it had been immersed in oil, although it absorbs the oil, yet it
does not swell. I refer particularly to linseed oil. A The paper originally consisted of exceedingly fine fibers mixed with water in the form of a pulp, to which there was added a small quantity of glue. When it is soaked
in water the latter di sintegrates it and causes the fibers to separate and to again assume a semi-pulpy state; the paper can hardly besaid to swell. Oils have not the
property of causing such a disintegration any more property of causing such a disintegration any more
than they have of dissolving certain things that are oluble in water.
(17) I. J. I. asks: What chemicals must I use to make a freezing compound? A. Any of the following will answer the purpose: Snow or powdered ice
2 parts, common salt 1 part; snow or powdered ice parts, crystallized chloride of calcium 4 parts; or sul phate of soda 6 parts, nitrate of ammonia 5 parts, di-
lute nitric acid 4 parts. The parts referred to are by weight.
(18) G. W. K. asks: Is soda injurious as a ooth powder? A. Yes.
How can I make jap
pan)? A. Gamboge, 2 drachms; cape caloes 3 drachms pale shellac, 4 ozs.; alcohol, 1 quart.
How can I melt gold dollars in a common blacksmith's forge? A. Gold coin may be readily melted in the heat
of an ordinary backsmith's forge. You will need a crucible, made either of graphite or French clay, in ch to melt them.
(19) A. H. C. asks for a recipe for darkening the color of the hair, not instantly, but by gradual
aice of the bark of green walnuts (Paulus cegimeta).
(20) X. askse: What mineral or chemical substance would be best to deodorize the fumes of gas ine smoke? Could the fumes be precipitated or conbad smelly If so, by what chemical substance? A.
The truble is due to the difficulty of securing complete combustion. The vapors may be condensed by passing hrough cold water, or thoroughly oxidized by conduct ing them through a column of granular potassium biphromate kept constantly moistened with strong sul
(21) L. A. asks how to cement a hard rubber triangle, such as draughtsmen use? A. Melt together equal parts of pitch and gutta percha, apply hot
and press the parts firmly together until quite cold. If properly applied, the lines will be only very slightly out
(22) R. W. S. asks: What can I use to cleanse and burnish my lamp burners to prevent their
smoking? I have tried various preparations, all to no advantage, and am obliged to throw them aside and get new ones, which only last a few weeks, until they smoke as bad as the old ones just laid aside. A. To
clean unlacquered brass work use a stif brush, plenty of hot soapsuds, and a little fine sand; dip in clean watime by applying a light coating of shellac in alco for with a little dragon's blood to color. Lacquer may be emoved by strong hot solution of borax.
(23) L. A. L. asks: 1 . What is the price of aluminum in Europe? A. About $\$ 1.30$ per ounce. 2 ,
Can it be had in amounts suitable for manufacturers usep A. Yes. 3. Where is the metal mostly prepared? A. In France. 4. Is any made in America? A. Not
commercially. 5. What are the best sources of supply? A. The minerals or oresfrom which metallic aluminum may be economically extracted by methods in use at
present are: Bauxite, found, in notable quantities,
only in France-at Beaux and Revese, and cryolite, oconly in France-at Beaux and Revese, and cryolite, oc-
curring in abundance on the western coast of Greencurring in abundance on the western coast of Green-
and and in the Ural Mountains,Russia. (See Scientricic AMERICAN SUPPLEMENT No. 62, p. 990.) Most of the commercial aluminum is obtained from bausite: that fom cryolite is usually impure. (See Scientific Amer-
ICAN Supplement, pp. 798 and 1213, and Scientific American, vol. 37, p. 153.)
(24) J. K. S. writes: In the Scientific Ambrican, vol. 1, new series, p. 38, you give a rule for
constructing cone pulleys. Will you please explain constructing cone pulleys. Will you please explain
how to multiply by the angles? I have tried it and I cannot get the same answer as you give. A. The ar-
ticlereferred to does not give rules, but merely contains aew illustrative examples, the method of solving which is not explained. You will find simple methods
(25) N. O. P. writes: Does such an article exist as a bullet-proof jacket, or has there yet been invented a covering for a man's body capable of resistpurchased. If not, what substance, metallic or other wise, best resists the penetration of leaden bullets? A A.great many patents for such garments were taken out
during our late unpleasantness, and possibly you can
obtain what you want from a dealer in weapons of ofe and defense.
(26) R. H. M. writes. 1. I want to build a steamboat 50 feet long, 12 feet beam, to draw not over
16 inches, as the water is very shoal in places where I wish to run. She will be of fair model, but quite flat amidships. How large an engine will I need? A. An $8 \times 10$ will answer. 2. What pitch ought the screw to have? A. It will be better to use two screws, with a
pitch of $41 / 2$ to 5 feet. 3. What will be the speed? A. or 6 miles an hour.
( 27 ) G. W. writes: I have an engine $2 \times 2 \frac{1}{2}$ inches; boiler, 9 square feet of heating surface, con-
taining about two buckets of water, carrying 100 lbs . taining about two buckets of water, carrying 100 lbs .
of steam and running 600 revolutions per minute. What of steam and running 600 revolutions per in mate.
power is developed? A . If the boiler is capable of furpower is developed A. If the boiler is capable of fur-
nishing steam for running the engine at this speed, you
(28) W. R. B., query No. 20, January 19, asks for a method to clean sponges used at the Aquari um. I would suggest in addition to your information is to work the sand into the sponge by a kneading pro cess, and when sufficiently worked rinse in warm (not hot) water, which loosens and removes the dirt and (29) E. K. a
(29) E. K. asks: What will take a stain of coals oin, about six feet in diameter, out of a dark Brus sels carpet? A. Try heating the spot very hot before a If that fails, probably wetting with puri fled benzine will effect the object.
(30) R. C. asks: What is the latest estimate of the zero of temperature, and upon what considera-
tions is that estimate based? A. Assume a cylindrical tube, closed below and open above. Further assume the air in the tube is conflned by a piston which has no weight and moves without friction. As the tempera-
ture rises or falls, of courseour assumed piston would rise or fall in the tube, following the expanding or contracting of the conflned air. Mark the point at which the piston falls at the temperature of freezing water $0^{\circ}$, and the point to which it rises at the temperature of boiling water, $100^{\circ}$. Lastly, divide this piston into 100 equal parts, and continue the division of the same size
above $100^{\circ}$ and below $0^{\circ}$. It will be found that almost exactly $2 \% 3$ such divisions can be made before reaching exactly $2 \pi 3$ such divisions can be made before reaching
the closed bottom of the tube. These divisions corre spond to centigrade degrees, so that the absolute zero is $273^{\circ}$ below the freezing point centigrade, or $459^{\circ}$ be ow that of Fahrenheit.
(31) L. A. W. asks for the number of power looms in the United States and Europe? A. According to the compendium of the ninth census of the
United States, issued at the Government printing office in Washington, D. C., there are in the United States 157,310 power looms used in the manufacture of cotton
(32) R. W. asks: Can an ice boat sail faster than the wind which blows it along? A. Yes. See
Scientific American Supplement Nos. 54 and 61 , for Scientific Ame
(33) With regard to destroying lice on attle and not injure them, G. B. says: Take 1 pint flsh oil, pour it on the animal gradually, from the back of the horns to the root of the tail. To cure the cow itch or
scratches: Paint the pastern joint well with white lead and oil; ans kind of vegetable or animal al will answer Keep the cow haltered so she cannot lick her feet or go into water for one week. One application of each remedy is sufficient. On using the oil for lice, $I$ have seen a cow in seven days' time shed her coat, and in 14
days' time a new beautiful coat of hair in its place; took dass' time a new beautiful coat of hair in its place; took on fat so very fast that in 30 days' time she was ready 30 days from the time she had been served with the dose of oil on her back. She had the prettiest coat of hair I ever saw on an animal's back. We keep our
dogs well greased with tanner's oil, to kill fleas, and logs well greased with
zeep off flies in summer.
(34) A. E. K. asks: What is the salary of a first class engraver, capable of doing work similar and equal to banknote work, which is got up at present in the States and Canada? A. The compensation re ceived by first class banknote engravers varies a great
deal, according to their abilities. Youmust apply to an deal, according to their abilities. Youmust apply to an
engraving company, with specimens of your work, if ou wish to obtain definite information.
(35) F. C. writes for directions for making small maguetic engine, either upright or horizontalp
You will find a fully illustrated descriptiononp. 301 A. You will find a fully illustrated descriptiononp. 301,
Supplement No. 19.
(36) F. D. H. asks (1) if there is such an ar ticle as gunpowaer that makes no noisewhen exploded in an ordinary gun? A. No. 2. In the forcible diswaves be produced in a greater or lesi dot the sound er what the explosive employed? A. Yes.
(37) S. S. B. asks: How can I make and apply ink as used on ribbons of dating stamps, etc.,
either purple or some other color? A. The inks are either purple or some other color? A. The inks are
made by dissolving the soluble aniline or other coal tar dyes in hot glycerin diluted with about ${ }_{3}^{2}$ its weight of water. For red, "rubine"' extra or aurin with a few drops of ammonia; for blue, water blue BR , 5 B , or 2 B ; for green, methyl green; for violet, methyl violet 5 B ,
Hoffmann's violet 3B, or gentiana-violet B; for black, igrosin.
(38): A. K. asks: How can I detect the presence of sulphate of soda in a solution of hyposul-
phite of soda? A. Heat the hyposulphite solution for some time with excess of dilute hydrochloric acid, free from chlorine, filter, add tothe warm filtrate slight excess of solution of barium chloride, and after standing
a short time fllter. The precipitate, if any, consists of a short time fllter. The precipitate, if any, consists of
barium sulphate; 100 parts by weight (washed with barium sulphate; 100 parts by weight (washed with
hot water and dried) equal about 78 parts sulphate of soda in hyposulphite solution,
(39) A. K. asks: What is the best temper ture of water for scalling purposes (hogs, ponltry, etc.)
A. From $180^{\circ}$ to $212^{\circ}$ Fah. is generally recommended. Describe the method of extracting beeswax with the sulphide (free from dissolved sulphar) to cover the body containing the wax; after a short time the was will have been completely dissolved. Strain the solntion into a suitable retort, provided with an ordinary condensing worm, and distill of the volatile sulphid by team heat or hot water bati. The residue of wa
(40) F. de C. asks: Has estigated or explained why planets describe ellipses and not circles around their central sun? A. Yes; New fon (Princip. i. 17, i. .75) demonstrated that, under the in duence of an attractive force mutually urging tw
spherical gravitating bodies toward each other the will each, when movingin each other's neighborbood deffected into an orbit concave toward the othe and deecribe, one about the other regarded as fixed, o both round their common center of gravity, curves hose forms are limited to those flaures known in ge metry by the general name of conic sections. He ha hown that, in any assigned case, it will depend upo irection, which of these curves shall be described hether an ellipse, a circle, a parabola, or a hyperbola but one or the other it must be; and any one of any de ee of eccentricity it may be, according to the circum-
(1) R.
(41) R. M. B. asks how "Pepper's ghost" produced? A. By the reflection on a sheet of clear ad so placed as to be out of sight of the spectators.
(42) D. M. S. asks: Is there any powe gained by taking a belt from the main shaft (on engine), on a countershaft) ; ;hen another belt from a 4 fee pulley on this countershaft to a 10 feet band wheelthis latter to be the motive power? Which is the better engine ( 3 feet pulley) to a 10 feet band wheel? A. The
(43) B.-lf your cylinder is 4 inches bore

254 inch stroke, and you use a two-bladed screw, 16 inches diameter and 24 inches pitch, and carry a big pressure, you can run a 21 feet boat at about 7 mile
(44) W. R. inquires: 1 . Why is the slide to which a locomotive engine reverse lever clutches o
fastens made with irregular notches, that is, why is the reverse lever not alwayst thrown clear overt? A. The ob ject of the intermediate notches is to allow the link to b placed in such a position that the steam can be worked
expansively. 2. Is there any other reversing device than the link motion considered perfect? A. There other arrangements for reversing, but there are no ser (45) G W K writes: I when well designed. arr which runs from 300 to 400 revolutions per min ute. I am troubled with corn coming out at the top of the eye of the stone. The eye is 7 inches in diameter feeding with a shoe; corn led well down into the stone
by a 4 inch tin tube. What is the matter? A. From your account we imagine that you feed too fast or al
(46) C. H. writes: If a bullet be shot up ward in the air from a riffe or other gun, will the bullet when it returns to the point from whence it was sho have as much force or
from the gun? A. No.
(47) E. \& S. write: What is a horse power? We understand the rules for calculating the horse power of engines, use the $33,000 \mathrm{lbs}$., etc., but do not under stand
33,000 represents the number of lbs. that could be raised 1 foot high in a minute by a good horse in the time of James Watt, according to his observation. It is more
(48) J. A. O. asks: Will two inter-friction pulleys run and do good work when of different size-
say one 3 feet and the other 9 feet? A. Plain friction say one 3 feet and the other 9 feet? A. Plain friction
(49) I. B. M. writes: What do you think of the practicability of supplying a $2 x 4$ inch cylinder with 70 lios. of stean, wh a boine constructed by coiing a 2 inch iron pipe spirally with an outside diam also onveloping titin tian inch sheet iron, outside of which will be a perpendicular pipe connecting the ends of the con and also the middle. In this perpendicular pipe propose placing my injector, as I presume the down
ward current to be naturally in this pipe. The fre is to be built in the center of the coil and in direct con-
tact with it. Of course the water will have to be right ane above the fre surface, and a steam dome surmounting
the whole will undoubtedly be necessary point about this boiler would probably be the casing which might renaire frequent renewal if the boiler were forced. With a steam dome arran ged for superheating your boiler will not differ materially from some that ar
(50) H. \& T. write: Referring to the answer in your number of January 12 , abont arching boil-
ers completely with brick, will not the soot accumulate over the top of the boiler and burn off, and thus injure thequality of the iron, especially if soft coal is burned do not believe it likely to happen. In the monnting of stationary boilers, whether upright or horizontal the principle of distributing the heat from the furnace so that the boiler is almost entirely surrounded by an at mosphereof heat, will, if judiciously carried out, give
good results, both as regards economy of fuel, produc. tionof dry steam, and durability of the boiler, as com pared with boilers mounted in such a manner that onl a portion of their surface is acted upon by heat. In course be $n$ course be made for convenience of inspection a ye
quired by law. and by a proper arrangement of dors
it will be easy to prevent accoumulations of soot or ashes.
(51) C. S. B. asks (1) whether a steam si phon pump will operate by the use of compressed air,
the same as steam, and draw air through the suction ipes in the place of water? A. Yes. 2. Would funne pipes in the place of water? A. Yes. 2. Would funn
shaped suction pipes be the best for air? A. Yes.
(52) T. R. C. writes: The driving wheel on n engine is belted to a pulley 6 feet diameter on haftts belted to the hrge and run them twice as fast, can I use a smelle large and
shaft? $A$. Yes.
(53) H. S. S. asks: If a cannon loaded with charge that will espel a ball at the rate of 60 miles per nd discharged in the opposite direction, will the gun eave the ball and the ball drop to the ground, or at what speed will the ball leave the gun, and how far will itgo from the spot where it is fred from? I claim the
powder simply stops the momentum of the ball and powder simply stops the momentum of the ball and
the gun runs away from it, and the ball will drop ome say that the ball will part with the gun at the rate of 120
Ampricas.
(54) C. B. asks: What is the best method f burning coal slack or screenings for fuel? A. Use grate ba
dranght.
(55) T. F. W. asks: 1. What kind of baromers are used to record automatically? A. Mercurial jeneraily. 2. How is the recording effected? A. Th.
eneral idea is to have a chart moved regularly b clockwork, on which a pen or pencil connected witt the mercurial column traces a line in accordance wit he variation in height.
What can be depended upon to stick labels onto around the tubes and lap sufficiently to stick to itself. mucilage of gum tragacanth answers very well.
(56) J. D. B. asks: Are there any books on cal Technolggy," Muspratt's "New Chemistry," John on's and Appleton's "New Cyclopedia," Patent Office Reports.
(57) J. E. B., in answer to A. H. S., sends he following on making printers' rollers, which he nown quantity good results: Take of best glue any old wateruntil the whole is fully swollen, then weig it and add as much heavy glycerin as the glue has ab orbed water; then dissolve in a water bath and evapo weighing. Iclean my roller with spirits of turpentine
(58) G. P. says: I would like to know which is the cheapest to burn in my boiler, pine wood A. The wood, at the price named, is a little the cheap est. One ton of anthracite is considered equal to 1.7 ord of pine wood.
(59) W. S. O. B. writes: 1. If the magnet sm of an electro-magnet is contained in the core, would
the core when it is first covered with paper, and then wrapped with insulated wire. As the electricity canno escape through ins ulated wire, I fail to see how it induction, which is not core. A. It is an effect calle induction, which is not thoroughly understood, but.i
nevertheless caused by the continuous passage of cur ents of electricity through a conductor in the neigh core 2 of, but insulated from, the iron core. 2 . Tak with uncovered copper wire-why will it not make a lectro-magnet? A. It will, but as the electric curren chooses the course of least resistarice, it will pass di rectly through the mass of copper wire, and the mag were used as a conductor. 3 . What is the reason tha the finer the wire used in a magnet the more resistance it has? A. It may be explained by supposing electri
(60) G. M. S. asks whether wrought iron rillings are of any value? A. They may be worked u
(61) L H. asks: What way of filing a cir alar saw will enable me to cut 2 -inch pine plank int 18 inch strips smoothly, so as to dispense with planing
afterward? A. A circular saw will not cut smoothly nough to dispense with planing if a smooth surface
(62) W. W. asks: How can I black wrough ron or steel rifle barrels? A. Colored varnish is ofte used. For a permanent color, apply a misture of chlo
ride of antimony and obive oill, polish, and coat with hellac varnish.
(63) J. W. W. writes: A discussion in re ard to the formation of ice havingtaken place, and va our opinion upon th subject. On the I , fter the ice forms, does it increase in thickness fro the bottom of the ice or from the top of the ice? A
(01) D. W.
(64) D. W. P. asks: Is there any test, be with lime water, for carbonic di-ozide when mixe
or air? A. Solution of barium hydrate when agitated in an atmosphere containirg anyconsid amo ame carbonic acid, becomes clonded by under similar circumstances becomes wine red. Midetermined by the increase in weight of absorptio ubes (soda-lime or potash bulbs) by aspiration of larg quantities of the dried gas
Minerals, etc.-Specimens have been re eived from the following correspondents, and xamined, with the results stated
w. G. W.-It is nodular pyrites (iron sulphide), n meteoric.-N. A. R.-Impure kaolin

HINTS TO CORRESPONDENTS
We renew our request thatcorrespondents, in referri,
o former answers or articles, will be kind enough
name the date of the paper and the page, or the number
of the question. Correspondents
Correspondents whose inquiries fall to appear should that, for good reasons, the Editor declines them. The ddress of the writer should always be given. Inquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half our paper to print them all; but we generally take pleas are in ans
is given.

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 ess nature especially can be expeditiously obta y advertising in the column of "Business and P onal," which is set apart for that purpose, subject he charge mentioned at its head.We have received this week the following inquiriesparticulars, etc., regarding which can probably be elici ed from the writers by the insertion of a small adver tisement in the
ply their wants:
Who deal in aluminum
nd at what price ouses?
jector makes a machine for fllling a boiler without a jector or force pump?

## official

INDEX OF INVENTIONS For which

## Letters Patent of the United states

## January 3, 1878

## ND EACH BEARING THAT DATE

[Those marked (r) are reissued patents.]
A complete copy of any patent in the annexed list ncluding both the specifications and drawings, will be furnished fromthis office for one dollar. In ordering ease state the number and date of the patent desire nd remit to Munn \& Co.. 37 Park Row, New York city Acid, manufacture of tartaric, F.
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Bale tie, S. H. Gilman......
Bed bottom, D. D. Osborne
Bee hive, G. W. Wageoner.....
Beez steak tenderer, H. R. Fulle
Beezs steak tenderer, H.
Bellows, C. W. Dunn, Sr
ellows nozzle, E
Biliard bridge, C. F. Pr
Boot and shoo insole. G. H. Levi...........
Bottle, salt and spice, G. B. Richardso
Bottle stopper, J. Klee (r)
Brick machine, W.H. J. Me
Bridleattachment, T. P. Clines
ucke, Hotchkis \& Clinton..........
urglar alarm, H. F. Crawfor
Can opener. C. M. Williams
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Car, brick carrring, J. K
Car coupling, w. Dunn
.
Car, refrigerator, R M Birdsal
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Car, sleeping, w. D. Mann
arbureters, G. L. Gray.......
Cart, barre), W. Plank.
Casting metal, H. R.
Centrifugal machine, W. H. Tolhurst.
Chandelier trimming, glass, J. H. Hobbs
Check rower and dropper, Black \& Babcoc
Cigarette, J. Gordon
Clasp, A. Christey
Clevis, W. Kinney
Cock, stop, G. C. Bailey (r) .......
Cork cutting machine, A. Fabre
Corset, E. K. Bullock
Corset steel, C. Jordan
Cultivator, I. A. Benedict......................
cultivator and seed drill, E. G. Matthew
Cultivator tongue, W. P. Brow
Dam, water, H C. Herron...
Desk, cabinet, J. A. Moore........
Dish, covered butter, s. W. Eabbitt
Distilling apparatus, J. Wallace.
Ditching machine, J. W. Humphrey
Ditching machine, $\mathrm{r} . \mathrm{F}$. Randolph.
Door check, J. W. Craig....
Door hanger, C. W. Pierce
Doretailing machine, C. Stengel
Draft equalizer, A. J. F. Ehric
Drawer pull, J. E. Merriman.
levator, Bruner \& Rich
Engine, rotary, G. C. Hal
Envelope, J. Clowes....
eather renovator, Griswold \& Gipso
Feed water heater, etc., A. De Beaumo
Fence material, barbed, L. F. Betts...
Fence material, barbed, L. F. Bett
Fertilizer distributer,
ine, bill, w. C. Buss
ire arm, breech loading. G. H. Fox
Fire arm, hammer for, E. A. F.
Fire back, G. w. J. Woltz. ....
Fire escape, C. \&. Burrows.....
Fire escape, J. M. Chandler
Fire escape, , E. Lumpert...
Fruit, drying and cooking
Fruit, drying and cooking, J. B.
Furnace feeder, M. H. Smith..
Furnace for Priten, J. Hughes

Furnace for lead, J. B. McCurd Furnace erate, Burritt \& Ohl....
Furnace, hot aitr, C. w. Durham Furnaces, Stillman \& Webster. Game counter, J. Whitelaw Gate hanger, w. s. Dangler Glassware manufacture, D. Challinor Grain dumping device, A. Smith. Grain separator, H. E. Geiss... Grain separator, A. W. \& C. T. Kendrick. Grinding machine, G. Cowing (r)
Hame, H. E. Cosgrave........ Hame fastener, W. Moftat
Hammocks, A. B. Holme Hammocks, A. B. Hol
Harrow, A. H. Ballagh
Hide fleshing mat Hide fleshing machine, Holcomb \& Cl
Hoisting machine, C. C. Jonnson Hoop machine, barrel, J. Greenw Hoop making machine, J. Greenwood Horse power, E. Golucke House, portable, J. Boy
Houses, construction of, R. P. \&. C. G. Lindsay
Joist shoe, J. R. Payson .....
Journal for shafts and axles, P. Sweeney Ladder, step, C. G. Udell. .
Lamp burner, Hinrichs \& Reistle
Lamp shader, H. C. Scott.
Lime kiln, portable, H. H. Bour
Lock and key, D. Border
Lock, door, J. B. Felter.......
Lubricator, w. Moses.
Microscope, J. J. Bausch......
Mill, grain, C. A. W. Jaquet
Mill, grain, C. A. W. Jaquett
Mill pick, w. B. Morris ...
Millstone-balancing, J. P. Moore
Music leaf turner, W. Liddell....
Music leaf turner, W.
Nut lock, J. Pinkham..
Nut lock, J. Pinkham...
Nut lock, W. H. Sutton.
Ore crusher, F. Gimson.
Organ stop action, H. R. Moore
Ornamenting wood, T. Whitburn
Overalls, J. H. Willets
Packing welted felt, I. Swope
Pavement, street, J. A. Seaman.
Peg float, J. W. Fifeld ... ..............
Pencils, adding register for, C. c. Fiel
Planter and drill, S. J. \& C. Weickel
Planter, corn, J. D. Smith.......
Plow attachment, J. McBride
Plow attachment, J. McBride ...........
Plow, reversible, C. Daniel...
Plow. reversible, B. F. Morris
Potato digger. S. Hartshorne
Pottery kill. $\&$ G. Marsh
Pottery kiln, I. \& G. Mars
Press, hay, F. B. Boalt....
Press, hay and cotton, A. A. Gehrt.
Printing, paper ruling, J. E. Taylor.
Propeller, screw, E. Town...
Propelling boats, T. Feathe
Pruning knife, E. Hixson...

Pump, J. A. Whitma
Pump, A. S. Wright
Pump and measuring faucet, s. M. Cawker........
Pump plunger, J. Knouse ....................
Pumping fuids, W. F. Class (r)....... . .....8,02,
Punch, portable hand, M. L. Gutmann..........
Rake, horse hay, T. C. Lord . ............
Rake, horse hay, S. H. Powers
Rakes, metal, E. Sims ..........................
Rowlock, J. A. Baines................

Saw mill carriage, McCollum \& Seely
Sawing machine gauge,
Scaffold, ladder, w. Kyle.....
Screw tap, collapsible, J. M. Johnson
Sewer trap, W. A. Pitt...........
Sewing machine, G. Hancock (r)
Shaft and arle bearing, Lange \& Eisenbraun.
Sheet metal elbow, A. Syverson (r).......... .
Sheet metal, drying and scouring, A. P. Hine
Shet metal, marking, B. Wood..
Show case, F. A. Howell...
Show stand, J. C. Eckardt.
Skutter, G. Hayes.........
Slate, covering buildings, E. N. Lesi
Soap, medicated. E. L. Moodie
Spooling machines, H. Doak.
springs, fastening for seat, Z. Cobb...
pring vehicle, L. J. Bazzo
Spring equalizer, vehicle, D. C. Markha
Stave-making machine, J. Greenwood..
Stave-making machine, J. Greenwood.
Stove and furnace lining, A. S. Hodges
Stove and furnace linink,
Stove ovens, E. Barrows.
Stoves and ranges, E. Stumm....
Strainer, gravy,
Sugar, refning raw, G. A. Jasper
Sulky, J. F. Pray ....................
Switch signal, D. Rousseau...
Tanning leather, G. Good win
Telephone, A. E. Dolbear...
Telephone, T. A. Watson.........
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hrashing machines, R. R.
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Tongue support, wagon, , M. Morgan..........
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Windmill, S. H. Smith......................... 199, Wire-twisting machine. C. Shortau (r).............. 8,0
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