## ENGINEERING INVENTIONS.

A valve gear has been patented by Mr. Jo sept Ralstin, of San Jacinto, Ind. SThis invention re-
lates to reversing gear for plain alide valve engines, lates to reversing gear for plain elide valve engines,
and covers anovel construction and arrangement of and co
parts.

## agricultural inventions.

A grain drill has been patented by Mr samuel H. Koble, of Hickman Mils, Mo. This inven tion corers certain novel features in the construction
and arrangement of parts to promote convenience in operating and controling grain drills, and to secura uniformity in the distribution of seed.
A check row planter has been patented by Mr. Charles R. Dollarhide, of Paris, Ill. By this in vention the seed dropping mechanism is operated by
an endless chain, which is made to travel on suitable wheels by means of projections on the chain, which are placed in contact with the ground, the device ha
A self-dropping corn planter has been pa ented by Mr. John A. Johnson, of London Mills, Il drive wheels bo deelon the drive wheels by a wheel on the azle, and pro
vided with cams operating upon a vibraing frame pivoted at one end of the carriage frame, and connect dat the other end by a wire or attached to the seed dropping slide, so the slide is operated by the revol tion of the azle, with other novel features.

## miscellaneous inventions.

An improvement in fences has been patented by Mr. Charles C. Hinkle, of Hazleton, Ind. This invention relates to portable board fences, the con
struction being such as to make a frictional joint beween the panels, with variouz other novel features.

A fitting for gas brackets has been patent ed by Mr, Henry P. Drew, of New York city. This of parts to prevent gas from escaping, strengthen the rackets, and prevent the swings from being turne
A steam boiler has been patented by $\mathrm{Mr}^{\text {r }}$ George $W$. Shealey, of Marshalltown, Iowa. The ob ject of this invention is to provide an economical foo device is one which has great working capacity asily operated, and is adapted to various kinds of fuel
A fire escape bas been patented by Mr. Edward Painter, of Easthampton, Mass. It is constructe wheels mounted on ehafts journaled at the top and bottom of the building, the chains being united by cross rods, and buck ets being hung on the chains.
A door signal has been patented by Mr . trivance to disclose a word signal and to sound a bel in connection with the unlatching wire extending from the front door to the interior or upper portion of the
A balanced stack roof has been patented by Mr. Frederick W. King, of Farmington, Iowa. It ha lolled posts and rafters covered witb boards and shingles, with ropes altached to the roof, passing over with balancing weights attached to their ends, so the oof can be readily raised and lowered.
A band elevator for packages bas been pa ented by Mr. Frank Schumann, of Memphis, Tenn pivoted clamping arm, making a device for use in depositing packages and small articles upon elevated shelving, or for taking them down, thus dispeusing
A log binder has been patented by $\mathrm{Mr}^{2}$ John Flynn, of Roscommon, Mich. The inventio consists in a lever with a grab and a locking latch piv-
oted to a frame connected with one end of the chain or ome fixed object, one link being placed in the grab, by meaus of the la ch
A spring holder for napkins has been patented by Mr John C. Tutt, of Kansas City, Mo. This narp pointed hook with a rigid cross bar, one at eac end of the spring, so the contraction of the spring raws the hooks together, and holds the napkin, hand
A trace carrier has been patented by Messrs John C. Glaser and Charles A. Cummings, of Monticello, Towa This invention consists in a metal lic lonp with sockets adapted to ft and slide upon a metallic bar or slide secured to the skirt of the saddle, he movement of the loop.
A padlock has been patented by Mr.Wil liam W. Richards, of Washington, Ga. The invention consists mainly in the peculiar form of locking bo the revolving tumbler barrel swiveling on the case, an the key having bits adapted to engage with and pul down

A fender for wagon bodies has been pa tented by Mr. Christian L. Haubeil, of Waverly, Ohio This invention relates to guards or chaflng irons for
wagons in which rollers are arranged to project on or from the body of the vehicle to prevent the wheels of the rollers and means for supporling them.
A process of marking cakes of soap bas eeen patented by Mr. James M. Craig, of Brooklyn, N. pon a rod, and when the soap is hard the rod and dies are withdrawn; the cakes are then placed in a mould overing the ends of the die apertures, and liquid soap the rod aperture.

A friction balanced spring roller has bee patented by Mr. James E. Russ, of Providence, R. I. ented invention of the same inventor making a rolle which is cheap, durable, and reliable, and in som window shades, a rubber washe semploged upon the spring head.
A gearing for windmills has been patented y Mr. Charles W . Roberts, of Oskaloosa, Kan. Ther is a combination of double gears and shafts for trans. aitting rotary motion from tbe whed shart of the min $f$ the driving divars shan, win then the mill shifts or turns in the wind.
A railroad switch has been patented by Mr Ahraham Agres, of New Yorkcity. This invention re rated by the weight of the horses drawing the cars, the wwitch tongue being siifted by the movement of a iability in action.
A wagon spring and gearing has been pa tented by Mr. Joseph Allan, of Carrolton, Miss. Thi invention covers a novel constrnction and arrangemen of main and auxiliary springs in wagons, making a gear ng that is aubstantial and comparatively inexpensive
combined with which is a fffth wheel that reller rrains on the king bolt.
A button attaching implement has been patented by Mr. Millon H. McNair, of Meadville, Pa implement where the fastenings pass through the eye of the buttons, and consiits in a a novel construction and arrangement of parts, and the implement may be
aperated or the mechanism organized for use with perated or the mechanism organized for use with A pail, tub, or barrel of novel construction forms the subject of a patent issued to Mr. James W .
Weston, of New York city. The invention consists in the combination, with head sections and key,for clos ed or headed receptacles, of a removable support o follower, to close the openings of the adjacent hea ole and plug.
A lead press has been patented by Mr. William A. Shaw, of Pittshurg, Pa. This inventio overs a novel construction resulting in a duplex ma-
hine in which one charge of metal cools to prope onsistency in position in its holder or cylinder, while nother is heing forced through the die of a differe cylinder, so that no time is lo
A carriage pole or shaft has been paten by Mr. James M. Dille, of Cooperstown, Pa. The in part of the thills or pole to so attach the horse that h will have free andunobstructed movement of bislimbs, and to relieve both the horse and the occupant of the carriage from
A boiler for beating buildings has been pa tented by Mr. William H. Byram, of New York cits above the other, the connections being filted togethe fficient and economic sectional boiler, maintainiug a positive circulation, a comparatively or wholy free from leakage.
A bicycle has been patented by Mr. Wil with the wheels and fork levers ters on the cranks, bars connecting the front ends of he levers with the fork, there being springs on the evers and foot rests on their rear end, to give greater worked.
A fire extinguisher has been patented by Mr. James McGwi, of Fulton, Mo. A revolvable vessel, and there is a haft for revolying the crlinder the shaft being also arranged to liberate acid and miz it with the contents of the vessel, making a simpla portable fire extinguisher, which can be quickly brought into action.
A combined lint room and press has bee patented by Mr. William B. Padgett, of Batesville, Ar nd provides an improved contrivance for trampin the coton in the press case, avoiding the former labor ous and unhealthy method of tramping by the fcet while
A harness has been patented by Mr. Cicero C. Ferrill, of Shubuta, Miss. This invention relates to and consistented improvement of the same invento lar to be used in connection with devices for attachin thills to a pair of hames directly, to dispense with al ther parts of a harness excepta collar and breeching A fine tached the thin.
A fire escape has been patented by Mr Joseph M. Hodson, of Amherstburg, Ontario, Canad which a wire is coiled, the wire being passed through apertured lugs or brake levers pivoted in the casing the wire also passing between transverse pins or rods in the casing, the friction preventing the apparatus rom descending too rapidly.
A workbox has been patented by Mr. Hugh S. Dickson, of La Harpe, Ill. This invention covers an improvement on a former patented inven tion
of the same inventor, consisting of a workbox decreas. ing in depth from the botiom to the top, and having over increasing in depth from the bottom to the to helves being held in the cover from which incline project
A device for unloading vessels has been patented by Mr. James H. Teubert, of Coal Valley, W be;built on the bank of a river, and the barges or vesse are to have hoppershaped receptacles for cargo from which discharge openings are arranged directly ove the tracks, with sliding gates

A milk cooler has been patented by M Francis S. Hartzell, of Bean Pa. The object of this ream in the shortest time, and for this purpose is pro vided an outer and inner metallic tank of special contruction, so that the water spaces furnish a very larg cooling surface, and the contents of the can are quickl and uniformly cooled.
A photographic camera has been patented Mr. Walter Clark, of New York city. The inve tion provides a camera partition in front of the adjust be reflector and compartment or chamber in whic he sensitive plate is exposed, thus dividing the ho ntotwo sechn, whay provision is made for in he box, and doing away with objectionable outside esposure of parts, with other novel features.
The manufacture of solidified compound inand E. Canda, of New York city. This inventio ontemples the grinding or pulverizing of two more metals or afloys, and then coating the particles with tin or Babbitt metal or other alloy melting at a low temperature, after which the mixture so made may bly heated.

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marked or labeled.
(1) G. H. asks: On what part of the boiler does scale mostly collect-on shell or flues? A. It depends npon construction and was of overating. An
examination of the particular boiler only will determine. (2) Mrs. T. P. J. asks if there is any way of removingrust from cut steel ornaments. A. There
(3) W. B. asks a recipe for making the iquid used in the brilliant gold paint manufactured in Baltimore, ora liqnid that would do. A. We do not
now what is nsed in the preparation of the paint you mention, but benzine and paraffine are sometimes em(4) F. A. J. asks what the fulcrum of a safety valve is. A. The fulcram is the center on which engine? A. An automatic engine is one governing its ed by the work it does, or having cut-off governors (5) A. S. B. asks what to put in hard water to keep lime from forming in his water pipes that feed
his bathroom. A. A little caustic soda put into the tank will tend to break up the lime scale in the hot water Abont an ounce to the cubic foot.
(6) J. H. says: We bave four sections of dry docks here in the Manatee River which are raised by hand pumps; why is it that the pumps work sn
much harder when we raise a large schoonerthan when we raise a light one? It looks as if we were pumping water from a reservoir, and the weight should have no
effect on the pumps. A. Your pumps work harder on effect on the pumps. A. Your pumps work harder on
account of the increased height of the column of water (7) S. H. B. asks for a good formula for making sticky fly paper. A. In a tin vessel melt to-
gether one pound of resin and add two fluid drachms of linseed oil. While the mixture is warm dip a spatula nto it, and apred that the the of for cap paper. Different samples of resin require varying proportions of oil to make it spread properly
(8) J. H. S. asks: Is there a mine in Pennrequiris, pipe strong enough to stand a presof pumping out water? A. No The pressure is sometimes nearly reached in the pipe of "oill lines,", so that
pipe and flttings have to be tested to 2,000 pounds. (9) D. T. W.-To run water mixed with ir through glass tubing, the water, colored or otherwise according to one's fancy, is allowed to drop
uickly into a little funnel at the top of the glass tube This carries air in with the drop, and may be managed represt ostring of colo
(10) C. H. K. asks if any of the readers of the Scientific American have lany knowledge or in-
Pormation of that ill-fated American iaventor, $\mathbf{J}$. W . Starr, who about forty years ago cxhibited, in conunction with a Mr. King, an clectric light of great raid Starr's contr vance
(11) E. S.-There i no cुoneral rule as to the width or richness in $20 t a l$ in cold bearing veins.
It is said that the great $F$ aresa votin is California was 6 feet wide at the outcrop and igcreased in width and value to a depth of over 1,300 feet. Sometimes the flssures are found to divide, and finally vanish in several directions.
(12) C. B. S. -The paint peels off the smoke stack because it is to thick. Ube plumbago, lampcrape off the old paint. If the brass of the boile head is always hot, you can clean it with washed
(13) W. P. asks: What is the best wood to make a banjo with, and what kind of wood is used by in a banjo has very little influence on its tone. Curle or pin maple is largely used. Any etrong wood cap ble of being steamed and bent may be used for the hoop, and the kind of wood emploged for the neck $i$ io erely a matter of taste.
(14) C. G. R.-We know of no reliable method of plating with nickel without a battery, or its
equivalent in the shape of a dynamo. You can tin rticles by cleaning them thoroughly, and dipping the in melted tin covered with was or tallow.
(15) T. R. asks how to make a solder that wit come off easily without being heated after bein
put on. A. We know of no solder that will anaswer
(16) W. D.-We know of no solder that can be used on tin without reein, acid, or some other
form of fux. Oil is sometimes used instead of resin
(17) G. B.-The lenses of a magic lantern will answer for a camera; it is not uncommon to use
camera tubesfor magic lanterns. Magic lantern tubes, as a general thing, are non-achromatic, and a tube of this class would make an inferior camera.
(18) H. C. B.-The phonograph cannot be applied in the manner suggested by you. It is neceeany effect. The phonograph is the only instrumen now known that will record ariculate sounds.
(19) P. McC. says: I have a triangular box wood scale that is dull in appearance and loses distinct ness by use. How can I varnish it so that it will re-
main bright and yet not soil my drawings? A. A thin main bright and yet not boil my drawinger A. A win
coat of French spirit varnibh would improve your scale.
(20) J. K. C. asks the focal distances of the different glasees in the eyepiece as shown in Fig. 10 ,
SUPPLEMENT, No. 399. A. Beginning at the eyte end, SUppLEunNT. No. 399. A. Beginning at the eye end,
the focal leugthe are reepectively 1 inch, 2 inchese, $1 \%$, ine focal leutthe are
(21) E. F. McR. asks the proper method to clean oily waste. A. Place the waste in a aolution o
water and sal toda, and then blow steam through the water and
mixture.
(22) W. B.-"Boiling coal tar" thickens it and makes it set quicker by evaporating part of ite
(23) J. M. asks how long it takes a train to come to a standstill when the Westingbouse brakes are
put on. and what causes them not too act osmetimes? nside of 500 feet on a level. The rain will not stop quickly it the brakes become locked on the wheels.
(24) R. W. asks if the condensing of steam In an ordinary locomotive boiler, after the fire is put
out at night will cause a sunficient vacuum to draw out at night, will canse a safficient vaccuum to draw
water from a tank, the water in which is but little below the level of the water in the boiler, or will it
caute a vacuum atall? A Yes; it will draw the boiler ane a vacum al anlf A Yes; it will draw the boile
nearly full if the valve on the feed is not closed, pro vided that the eaferty valve, gauge cocks, etc., are tight,
and also depending somewhat on the temperature and also depending somewhat on the emperature
of the atmosphere. More apt to do so in winter than in of the at.
summer.
(25) L. J. S. writes: We have an artesian well about 1,100 feet deep and 6 inches bore, tubed
down 380 feet with 3 inch pipe; the water does not down sưfeet with 3 inch pipe, the water does not
come up any higher than 25 feet from the earface, and
wee are pumping it out vell was built, and was bored down 525 feet; it the fowed out of tubing at surface; one year after this it was drilled deeper,down to the preeent depth $-1,100$ feet -and the water stoyped flowing and we had topump
ever since. Now I would like to fill this well up with some material or plugg it so that it will only be 525 feet deep, as it originally was, and think it wiill then flow
agan. What is the best method to pursue? A. The drilled well for the distance between 525 feet and the botom contains 112 cubic feet. As clean sharp sand $n$ the safest material to fll in with. we recommend it.
Start by slowly flling in 25 cubic feet and observe Start by slowly flling in 25 cubic feet, and observe whether the water riees, if not, another 25 cubic feet, the well, and it the sand has not gone the same way
that the loes water went, you foould find bottom at
(26) N. W. asks: 1. What saving in fric tion is effected by anti-friction rollers, say 1 inch
diameter, surrounding an axle of 2 inch diameter? diameter, surrounding an azle of 2 inch diameter? I
refer to rollers whose surfaces touch the axle and its refer to rollers whose surfaces touch the axle and its
box, not to rolers which turr on an axles of their own. ormer seem difficult because they grind other. A. Friction rollers should not grind against each other, but should have end bearing running in a ring, which keeps each roller in its proper place. This
form has the least friction. We have not the data for the amount. 2 Haswell's work on Engineering, page 354 , tataes that the moving friction of a locomotive is 15 pounds per ton and that of trains only 6 pounds per
ton. Is this true, and if so, why soo A. The difference of friction in locomotives and cars arises from the different weight upon journale
(27) J. C. ask8: 1. Is there any formula for determining the lifting power of a magnet? A. You do not say whether you mean electro or permanent mag-
nete. As the power of a magnet depend on so many circumstances, it would be diff cult to provide a formula for determining this accurately. 2. What sized wire
should be used for the primary coils of a Hughes inshould be used for the primary coils of a Hughes in-
duction balance? What for the secondary? A. Number 24 w.re answers yery well for both coils.
(28) R. S. N. asks: (1) Is there any sodium
 nethod of drofluosilicic acid with potaseium chlorate, giving ried to free chloric acid, and then saturating the chloric acid thus formed with sodium carbonate. 3. In my
Barker's Chemistry f find the formula for saltpeter be $\mathrm{KNO}_{3}$. In the encyclopedia itis marked $\mathrm{KO}, \mathrm{NO}_{5}$. Why 18 this difference in oxygen atoms? Which is cor
ect? A. KNO
 high be produced (and by what) to cause the combusburn in air or oxygen when on electric spark is paseed hrough the misture. 5. Ought unwashed nitroglycerine to explode under the hammer? A. If pure nitrogly-
cerine is placed upon an anvil and struck with a ham cerine is placed upon an anvil and struck with a ham-
mer, only the particle receiving the blow explodes, mer, only the particl receiving the blow explodees, ecat-
tering the remainder. 6. In attempting to make nitro-
 tated them, when a brownibh-red gas came out and left a brown liquid. What were these, and why did I not
succeed in getting the nitroglycerine: A. The gas was
the vapora of the decompoed nitric acid, and the coloraion of the liquid was due to the same cause. See Manutacture of Nitroglycerine on page 3874 of ScirenTrfic A Arrican Supplement, No. 243. Any large book
dealer will have on hand or obtain for you a work of so standard a character as Watte' Dictionary of Chemtry.
(29) W. M. G. asks the reason why salt dds to the freezing qualities of ice,and if there is anyhing known that will draw out as much coldness wilh-
out meting the ice
Also the ingrediente nsed in ico out metting the ice. Also the ingredients used in ice
manufacturing. A. Salt has an affinity for water, and
 melt,which then absorbb treat in the action of fiquefying
n the Scriviviric Amricicas for June 21 , 1884, we give in answer to query 4 , a number of freezing mistures.
By consulting this you will find several substances which act similar to salt in this respect. There are various machines for makiog ice, and they are described rent, such as Nos. 85, 32, 73, 171, ttc.
(30) H. D. H. writes: 1. We are making honograph according to instructions in Sopptement,
No. 133; would like to ask if there is any subsetance betertban mica and ferrotype tin of which to make the diaphragm A. No. 2. What improvements have No. 133,was published? A. No material improvements . Has any invention yet been made that will dupl cate the vibrations on the tin foil, so that you could tranefer a copy of the vibrations on to another piece of
tin foil, and make it repeat what had been said on the in foil, and make it repeat what had been said on the
first? A. We think not. Possibly they might be electyped
(31) D. C. S.-E very chimney, gable, tower, and salient point of your building should be protected
by a lightning rod. It is well to have a ground connec y a lightning rod. It is well to have a ground connec tallic parts of the roof and tower sh ould be connected with the rods. The lower ends of the rodd should ex-
tend to a sufficient depth in the earth to reach a atratum tend to a sufficient depth in the earth to reach a stratum
that is constantly wet. t thould be laid in a trench that is constantly wet. It should be laid in $a$ trench
extending away from the house from ten to ffrteen fee extending away from the house from ten to iffteen feet, vith coarreely granuluated coke. metas macraps. or bette Ave-sitteenthe of an inch in diameter may be of copper his diameter. All the joints should be soldered as well as screwed together. Insulators are worse than use-
lese. For information on fliding a latitude convult Stpphe ment, No. 316.
(32) E. F. S. asks: 1. What telephone has he most extensive use? A. The Belltelephone is used
lmost exclusively. 2 . What telephone would be most saitable for use in a villages A. Any of the elec-
tric telephones will answer your purpose. 3 . Is a nonelectric telephone good for distances of a mile or two Acoustic telephones will work well for a distance of pay in a village of 2500 or 3,000 inhabitants, and what is the usual plan of charging or receiving payment for its use? A. It would proaably pay. For full informa-
ion on the management of central offices, you should write to oome of the telephone companiee
(33) J. P. C. asks: What speed will a cana ball have if when fred the cannon is on a train moving
at the rate of 1.000 feet per second, and the ball is fred in the same diection with sufficient powder to give aliso a velocity of 1,000 feet per second? A. Apart rom the additional friction by the train moving apaint the air at a apead of 1,000 feet per second, which would
somewhat retard the velocity of the ball, the ball would have a velocity due to ite discharge from the gun added to the speed of the train, or 2, 2 ,00 feet per the train, less what would be due to the friction of the
(34) W. W. H. asks: What is the best process for ebonizing wood. A. Scientipio AMrbican UPriEnENT, No. 207, gives several methode for
lyeing wood black. A recent process conisits in pouring 4 quarts of boiling water over 1 ounce of powdered extract of lowwood, and when the soln-
tion is effected add 1 drachm of potassium chromate nd Bir the whole well. Continue the application until dry, sandpaper down the grain to get a smooth face; and as the work $t w$ be ekonized must be quite free from holes, oil and fill in any of them with powdered drop hlack mixed ina fller. Then give it a coat of quick drying varnish, and rub down with fnely Dulverized pumice etone and linseed oil until a a good surface is ac--
quired. $A$ good wholesome varnieh for ebonized work (35) R by disolving black wax in spirits of wine
(35) R M. C asks: How many gallons of water per minute will be discharged through a nozzle
of $4, \%$, and $1 /$ inch diameter, under a presaure of 60

Discharge for $1 /$ inch nozzle 3\% 3 gallons per minute; do. for $1 /$ nozzle, nearly 2 gallons per minute: do. for $3 / 4$
nozzle, $\%$ of a gallon per minue.e. 2 . Will the water brough? of sufficient size to pass the above quantity per minute it will not lessen the pressure.
(36) A. J. D. asks: What is the dark bluish crocus used by burnibhers for polishing? A. It ie
rouge. 2. What is the beet record for a a 100 mile go as you please? A. The best time for 100 miles is 18 hours 8 minutes and 15 seconds, in London. The best time in United States is,150 miles 850 yards
made 600 miles 220 yardd in 6 days.
(37) W. R. H. writes: 1. I wish to run sewing machine by power; would you advise weight or
ater power? A. We advise water power if it is avail water power? A. We advise water power, if it it available; but if you are obiged to pump up the water to se-
cure the power, it would be better for you to procure some form of small motor. 2. Could you give me directions for making a very small turbine wheel, say inch or so, which would run my machine 2 hours wit You can secure small turbine wheels from any of the makers who advertise in our columns. 3. Is the Backue water motor a plain breast fluter wheel? A. It is a
plain fan wheel. 4. Please give me directions for coloring gold the Etruscan color. A. Etruscan is made by eatiog the alloy from the surface of the gold by
(38) E. C. B. asks the number of cubic feet of water and the number of pounds of coal engines of $1,2,3,4,5,6,7,8,9,10$ horse power would need to run
at 60 pounds pressure. A. Engines and boilers, in their at 60 pounds presure. A. Engines and boilers, in their
modern variet of kind and economy, present so many and variable features of conetruction that no special an be given that will apply to any sit 1 cubic foot of water per horse power per hour are
about the extremes, using about 3 to 6 pounds coal per our per horse power.
(39) T. H. B. writes: Suppose the cylinder an ordinary gteam engine to be lengthened out to twice its present length, no matter what that may be,
and reduced to a corresponding extent in diameter, so that the cubic a corresponding estent in diameter, $\mathrm{B}_{\mathrm{o}}$ as before and hold the same amount of steam; will the ifting power on the end of the piston rod be the same in the ehorter and wider cyliuder? A. No; the lift ing power, or force upon the piston rod, is propor-
tioned to the area of the pieton. The larger diameter exerts the greater force. The length of the stroke is
(40) A. E. M. asks: 1 . What could $I$ use in bookcases, closete, and wardrobes to get rid of wood getting in continually? A. Use camphor gum in small boxes set upon the shelves or among the books of your case, for insects. 2. Could sulphuric acid, carbonate of potash, or some other abborbent of moisture be used
safely in bookcases to prevent mildew? A. Carbonate safely in bookcases to prevent mildew? A. Carbonate
of potash or quick lime in open glase vessels will abof potash or quick lime in open glase vesels will ab-
sorb moisture. Use no acid. 3 . There is an inea prevalent among the country people here that trees should
 sap has then descended. I, myselif, am inclined to he moon, and shoold many euperaitions concerning subject. A. The moon has no infuence upon the time of cutting timher. Always cut at the wane of the app or fall of the leaf. I wish to carry a lightning rod into
well close to the walls of the house: but 1 have a a well close to the walle of the house: but I have a
pump set over it which works in all kinds of weather and I fear it would be dangerous to handle it during a storm. Do you think there would be any risk to ane attenant? A. Carry the lightning rod several fee without touching any pant then down to the bottom safe to keep away from the pump during a violent thunder storm, and siil bafer to make a water connec do not know who makes the wagons you ask about
(41) C. M. asks: 1. Would a bullet or other misesile thrown perpendicularly into the air, fall to the point of starting with the same velocity and force as cally only if in a vacuum. 2. Can electricity be peed for the purpose of beting an $A$ ane ing boee ad to othcr domestic purposes? A. Heating rooms by electricity has not yet been practically realized, though it is
certainly possible. 3 . Would a steamboat made upon the catamaran, or double hull, plan require a greater or less
force to propel it at a given velocity flrough the water, carrying a given lood, than would be required to propela a single hull steamer with the eame load on
steamer of equal displacement with the flrst, if both boats are made of the best shape of their kind? The steam catamaran has not thus far been shown e to single bulled boats in the utilization of power.
(42) B. W. S. says: Many makers of mowng machines claim they get rid of side draught by connection on pole. Will you inform $m$ if this is good reasoning, or possibleq A. If by the arrangement de-
ignated the power is applied at the center of rexistance, ide draught will of courre be obviated.
(43) J. K. says: I have a lens 5 inches in diameter, 24 inches focus,for the camera obscura to enn one of your Stpriemisnts. I put the lens in a tin tube, one iliding within the other, so as to give it the
right focua; my box is 12xx12 inches and my mirror is 12514 inches. Please let me know where the defect in,
If it on account of my tube being too bright? A. Your Fit on account of my tube being too bright A. Your
tube should be blackened inside. See direction in recent number of Scientifio Aumpioan for blackening tubes. 2. Does it make anv difference if I put the 24 inchcc $\sin$ ine tin tube or in the hors Does my mir-
row cor want to be of the same size as the lens magnites
or can I have it smaller, that is, if my lens magnifes up 114 inches. must my mirror also be 14 inches, or can I have it smaller! A. If your tube is large enoukh, it will
length. Your mirror may be much smaller than the
projected image, but to projected image, but to get the best results you shnuld
have a condenser in the form of a double or plano-convex lens to concentrate the light on the picture. 3 . Could alao copy pictures with the "blue process of I copys pictures "in the camera obscura, that is, could box and reflecting the image on it? A. The blue pro-
(44) W. S F. asks how the water proof blacking, or more properly speaking "liquid glose," blacking, or more property speaking Miquia grose,
for ladiest and childrens shoes is made. Kindy give
composition and quantity of each. A. A fine liquid composition and quantity of each. A. A fine liquid blacking consists of ivory black and molasses, of each one pound. sweet oil and sulphuric acid, of each four
ounces. Rub together the flrst three untilthe oil i is ounces. Rub togetber the frst three untilthe oilis
perfectly killed, then gradually add the sulphuric acid, diluted with three times its weight of water. Mix well and let it stand for three hours, when it may be reduced to a proper condistency with water or sour beer. A
number of recent shoe polishee and varnishes are denumber of recent shoe polishes and varnishes are de-
scribed on page 150 of Scrintiric Americav, for March
io 1883 , 10, 1883 , to which we refer you
(45) R. P. Y. asks: Does the telegraph abbe eink the full depth of the ocean, which I believe
five miles, and if so, what sort of grappling ma binery is it that will work at that depth? A. There may be narrow chasms in the ocean botiom over which the cable is suspended, but generally the
cable reats on the ocean botom. We heve in the cable rests on the ocean bottom. We have in the
back numbers of our paper deecribed several forms beck grappling apparatue for raising ocean cables. The
of depth of the Atlantic reported by the cable eoundings between England and France and Newfoundland, was nowhere over 15,000 feet, the bed consisting of two
valleys separated by a broad ridge rnnning from the Azores to Iceland, and the depth on this ridge being eenerally ajout 9,000 feet. A depth of about five milee foundland, but all the cables run on the higher platean to the north of this.
(46) A. C. C. asks: How many cells would it take of a Grenet fluid battery, zince $5 \times 21 / 2 \times 1 / 6$
inch thicks, carbons same dimensions, to heat to incan. descence $23 / 2$ inchies or 3 inches No. 38 platinum wire, and how long will each zinc last, if in ised 5 hours every evening: A. six cells would probably do it. If the zincs are kept
two monthe.
(47) T. W. H. writes: The reservoir of our water works consiitt of a stand pipe 6 feet in diameter and 160 feet in height. In the winter we are botbered
more or less with ice forming around inside of the pipe. We havea large cylinder stove at the base; don't you think if we would run about a four inch gas pipe
up through the water on the inside, then keep a good fire at the bese and let all of the heat go up through, that it would keep the pipe free from ice? A. Better run a second inlet from the pump to near the top upon the ineide, and pump the watep to the top during very
cold weather. This will keep up a circulation, and cold weather. This will
tend to prevent freezing.
(48) G. C. P. asks: 1. Can 1 build a dam of cement and sand by making a box to hold the mortar antit ill hardens? A. Yes. 2. Can 1 ise email stones to
help to 18 inches diameter, dum to be 7 feet high, 7 feet thick at bottom and $21 / 2$ feeet thick at top,front tide perpendicular and pond side slanting? A. Use as much
large stone as possible. Make the flling with coarse large stone as posible. Make the flling with coarse
sharp pand and Portland cement. 3. What proportion of small stone can I use and have it tstrong? The dam ie to be built on ledge the whole length, and is on a small stream and is 50 feet long. A. Use as much small stone as will make bolid flling between the large etone. 4. Which will be the best totones to use round cobble etones or ledge stone got by blasting? A. Fragmenta are
better than cobble stones, and will reist water and ice cut. The top of the dam should be capped with a layer of the largest stone that you can get lid clined a little toward the pond, so that ice will no push them off. Back the dam by a filling of sand and gtone for several feet level with the top for flood pro-
tection. Make an ample sluice way of plank or with . Wake an ample slice way or plank or wrem while building the dam. Make the top perfectly level and as long as possible, for the possibilittes of a flood, and protect the ends thoroughly against leakage a dam of this kind am, bay 4 or 5 feet in a 50 foot dam.
(49) J. S. asks for a receipt for removing water bugs or red roaches. A. Borax is considered one
of the very best roach exterminators. It sliould be pulverized and sprinkled around the infested places. A solution of 102 . 1 pint or water until the strength is exhausted, and tben mised with molasees and spread on plates and placed in localities
infeested with these pests, is "sure death." Paris green is likewise used, but undesirable, as it is poisonlime and 16 part of some fatry matter is said to lime and is part of some fatty matter

INDEX OF INVENTIONS
For which Letters Patent of the United States were Granted
September 9, 1884,

## and rach hearing that date.

[see note at end of list about copies of these patents.]
Alarn. See Fire alarm.



