## ENGINEERING INVENTIONS.

A coal washing machine has been patented by Mr. Samuel Nevins, of summit Hill, Pa. It comprises an automatic shaking screen, water circulaticg in a water tank for separating slate, fine dust, etc from coal, and for washing the coal.

A well drilling machine bas been patented by Mr. Lycurgus Nelson, of Florence. Tenn. It confor conventence of transportation, with a rock drill in combination with a driving shaft, wa king beam, and sheave, with several special fealures to promote economy and effleiency.

## MECHANICAL INVENTIONS.

A pulley bas been patented by Mr. John D. H. Cleavland, of Smithfield, Minn. It has dovetail tate the securing of leather or olher material on or tate the securing of leather or other material on or
around the pulley by nailing it to the keys, thu $s$ making a metal pulley covered on its periphery.

A motor bas been patented by Mr. Cesar Huet, of New Orleans, La. It cousists of a novel con
trivance for muliplying and transmitting the motion trivance for muliplying and transmitting the motion, an improvement in the contrivance of open coupling
for applying power to a fan and other devices, with an for applying power to a fan and other
improved regulator and brake device.

A sand belt altachment for spoke lathes bas ceen patented by Mr. Ephraim Case, of Owensborougb
Ky . The sand belts are contrived with the cutter head Ky. The sand belts are contrived with heads along the
cariage, for following the cutter heads cariages tor footh them automatically after the spokes and thus save the time a

## agricoltural inventions.

A stubble cutter has been patented by Mr. Josenb P. Gueno, of Terre Bonne Parish, La. In com bination with specially devised side bars, and knives
attached thereto, is a chisel edged tnoth and colter, so attached thereto, is a chisel edged thoth and colter. so
that as the implement is drawn forward the coltere cu that as the implement is drawn forward the coitere cat such as may be left standing.

## MISCELLANEOUS INVENTIONS

A draught vehicle has been patented by Mr. Thomas Hiil, of Jersey Cily, N. J. The mud shields are at ached to the hoxes containing the springs
by which the vehicle body is supported, and arranged to overhang aud partly inclose the inner end portion the arms or journals of the axle
A buggy spring bas been patented by Mr Cairos J. Dhilier, of Moust Kisco. N. Y. The invention consists in a splecial construction of spring adapted for
buckboard buggies, causing the vehicle to ride easily and prevent rumbling noises, and aloo preventing the buckboard from sagging in the middle.
A wick trimmer has been patented by Mr Robert Hoffman. of Cohoes, N. Y. In combinatio with a pair of shearsis a clamp for pressing the wic against one of the blades, and a lever for acling onthe the blade to permit passing the wick in between th edge of the blade and the clamp.
A calcimining and wall brush has been pa tented by Mr. Henry Bintz. of New York city. The aud promote convenience in renewing the bristles, the handle and its body uortion for holaing the brusb
bead heing struck up in halves from sheet metal, the bead heing siruck up in halv
brush head being removable.
A folding table has been patented by Mr. Charles M. Bolles, of Dallas, Texas. When folded the corner of a room, bui will make a square or parallelocorner of a room, but will make a square or parallelo-
gram or much larger size when unfolded and set up in the room, by the use of the leaves and specially devis ed brace.

A calendar attachment for pens and pencil has been patented by Mr. Scluyler C. Lord, of East
Surry, Me. This invenion consisis in a tube with a Surry, Me. This invention consisis in a tube with
rotatiug sleeve, the whole made for flung on the end of a pencil or a penholder for use as a calendar, the days on anouher, so the sleeve can be set for any month.
A $\log$ turner Las been patented by Mr. Royal E. Park, of Sherman, N. Y. It is for turning loge upon cheir carriages in saw mins, and the weigg log upon the carriage and force it to proper position
the device being also simple and strong and not liable the device being also

A vacuum pan lias been patented by Messrs. James D. Edwards aud Leon F. Haubtman, of Ne Oreans, La. This is primarily for ase in the suga
manufacture, and practically embraces a sysiem in cluding two pans ac ing together, a condenser, receiv ers. tanks, pumps, steam counections, all making cumplete practical plant. With many
constrnction and mode of operating.
A wagnend gate has heen patented by Messrs. George Thumas and Harrison H. Thomas, of Waterloo. N. Y. End wings or gates are secured to
the gate and have notches and stops, while rods are held on the sides of the box with a hook lug and handle at their opposite ends, so the end gate can be locked at their opposite ends, so the end gate can be locked
in position when raised, lowered, or held at an inclina ton.
A graining compound has been patented by Mesers. Hezekiah Bailey and William H. Balley, of
St.'I hnmas, Ontario, Canada. It consists of a mixture, comprounded in a special manner, of apple cider, egge sa tpeter, and color. which flows easily from a sponge
or brush, and may be worked with coarse or fine combs, the fugers, rags, etc., Las paint is worked in gratuing.

A sheet metal roofing plate has been patentd by Mr. Parrick H. Regan, of Nashvilje, Tenn. The joints are made to easi y lock together and be water-
proof, while not liable to be broken or pplic by pressure or tension, and alson providing for coutraction and expansion from chankes of temperature, the face of th A crane has been patented by Mr. John wild, of Chester, Pa. This invention covers a specia onstruction, combination, and arrangement of part o improve the effliciency of that class or cranes wher
the tioisting block has to travel aloug the crane beam for shifting the load, and has a n ovel clutch mechanism with puleys for moving the hoisting block backwar and forward.
A sash bolder has been patented by Mr. Obadiah G. Newton, of Trenton, Mo. It is a special and a pendent frictiou shoe, both secured on or to th shoe, making a very simple and efficient fastener,
which may be applied either to the right or left hand ide, and is thin enough to allow one sash to freely pas anolher.
A macerating machine bas beeu patented by Mr. Frank M. Avery, of Brooklyn, N. Y. It is a grinding or crushing machine, with a revolving drum and ibers and juices from vegetable substances, adapted to be easily and quickly adjusted for different materials, foreign substances enter the machine
A box for changing photographic plates Wurtemberg. Germany. The object of the invention artemberg. Germany. Ne of face foritiating the exchanging of dry plates within or outside of the studio, without necessitating the uas of complicater appliances, such as portable dark rooms, etc., and this nppliances, such as portable dark rooms, etc., and this
device enalles a photographer to easily carry a large number of plates with him.
The preparation of caseine and of articles made therefrom forms the subject of two patents issued
o Mr. Emery E. Childs, of Brooklyn, N. Y. The firs patent provides for the production of a cheap an superior quality of caseine from milk curd direct o common cheese, the products to be used for variou useful and ornamental aricles, while by the other pa tent the milk curd is taken after it has been separated
from the whey, but before the water bas \}een pressed from the whey, but before the water bas been pressed out. and working or kneading suct naturally saturated
curd in iis own water; the coloring ingredients may be atroduced here, the whole worked at a temperatur below boiling, and, as a tough, glutinons mated
into sbeets or moulds of any desired form.

## NEW BOOKS AND PUBLICATIONS.

## Poultry for Profit

This is a neatly printed little volume.by P. H. Jacobs, ditor of the Poultry Keeper, and Farm, Field,and Fire dide, at which offlce it is pablished in Chicago, IU. The author calms to have had a practical experience o thirty years in the pou try yard.
The Electrician's Pocket Book. Cassell
This is an English edition of Hospitalier's Formulaire ratique de l'Electricien, translated by a member of London. The work will be Eound useful Electricians in all branches of their art. It contains illiastrations of the ordinary appliances used in telegraphing, in house alarms, offlce signals, etc., with tables giving the con ductivity of the various metals, directions for charg ing the batteries, etc.
Ventilation and Heating. By John S.
Billings, Surgeou U. S. Army. The
Sanitary Engineer, New York. Price

## $\$ 3$.

This work is a revised and enlarged publication is book form of a eeries of papers formerly published in olved under the condtions of modern life, and the practical application. 'The source from which this book emanates is of such established high character that commendation would be superfluous.
n Important Question in Metrology By Charles A. L.
$\&$ Sons, New Yurk.
This book is a "challenge to the metric system," and an " earnest word with the English speaking peo ples on their ancient weights and measures," dating their origin back to the builders of the Pyramids and Imparted to the Hebrews, according to Bible accounts. Forestry of Norway, Northern Asia and the Ural Mountaing. By John
Crnumbie Brown, LL.D. Oliver \& Boyd, Edinburgh.
The tille above given covers three distinct vorumes y the same author, who is aleo the author of nin The buoks on forests and forestry, and arboriculture anist and lect rer on botany, and his books contain much valuable information on a subject that is of ver

Lee's Map of the Industries of Western Pennsylvania is a convenient offlce chart of the Pitts with their transportation lines and index to the mos important industries.

## Received.

Ewerme
New Systex of Lafing Out Rariway Turnouts,
By Jacob M. Clatk. D. Van Nobirand, New York New Method or Reoording thr Motions of the
Sort Palate. By Harriso Allen, M.D. P. Blak-
iston, Son CEC., Philadelphis,

## Special.

## gPITTING, AND THE MEN WHO SPIT.

 things about it, which $\mathbf{g}_{\text {g }}$ ve conslderable offense becaue they were justly merited. Since then the habit has increased a thousandfold.
Is it mere habit, or is there a valid cause for it ? It is a best a very unpleasant and untidy habit. With some jectionable, namely, the chewing of tobacco, which de moralizes the salivary apparatus as budly as it defle pavements and carpets. With that habit, however, we
having nothing to do fust now, for we are about to refer having nothing to do fust now. for we are about to rete o a far more deeply-seated cuuse of the evil practice.
T'he fact is that a very large proportion of the a can people have catarrh. Cutarrh is a disease of many forms. Its seat is chieffy in processes above and in the
tmmediate rear of the nose. 'Ine delicate passages are immediate rear of the nose. 'The delicate passages are
lined with an exceedingly sensitive membrane, which is ined with an exceedingly sensitive membrane, which often either lightly or severely inflamed. When in
flamed it secretes a pecaliar liquid or semi-liquid deposit, whicb must be got rid of in some way. It mus either be absorbed, swallowed, or spit out. The causes which produce it prevent its absorption. To swallow it is to affict the stomach with that which is not only indi gestible, but also poisonous. To spit it out seems the
only way to ret rid of tus. And so along the street and in public convesances and in halls, churches, tbeaters, stores, and even elecant private apartments we hear and
see the constant hawk, hawk, hawk, spit, spit, spit, of see the constant hawk. hawk, hawk, spit, spit, spit, of
thousands of people who would like to be free from the thousands of people who would like to be free from th

## catarrh.

Our editor had occasion recently to hold conversation with a gentlemun who was formerly in bondage to this
abit by reason of grievous catarrh. but who has of lat years been thoroughly emanolpated from it. He is a gentleman of culture and education: Mrom It. Chas. E. Cady Street and of Cady's Business Colleze, In witeenth position and the tiffuence he holds over young men, his experience is worth quoting.
Mr. Cady's catarrh was of long standing; probably in-
herited. He remarked to our correspondent that in his herited. He remarked to our correspondent that in his such, for instance, as that he should bathe freely in very cold water all winter, and that be should sleep with
more cold air in his room than most people consider more cold air in his room than most people consider
good for them. As he lived in Ogdensburg, N. X., he good for them. As he lived in Ogdensburg, N. Y... h old air and cild water in wintry weather
"
" By the time I was twenty years old,"
I had catarrh, deep seated and firmly fixed. Cady, on so slowly that I hardly knew it was catarrh. I had to use my handkerchief constantly. I was continualily
hawking and spitting. The habit grew upon me. It be hawking and spitting. The habit grew upon me. It be-
camea a great nuisance to myself, as I घnow it was to other people. There was a constant dripping into my
throat. I always had a weak stomach, and this made it weaker. I was not prostrated, nor was I such a dyspeptic that I could not eat my food; but I was in slavery t
this horrible catarrh. and Isaw no wavof escape from it. "After tryink sundry catarrh remedies without ad vantage, I concluded to make an experiment with Compound Oxygen, for which purpose I consulted Dr. Tur-
ner, at the New York offce of Drs. Starkey and Palen. ner, at the New York office of Drs. Starkey and Palen
procured a Home Treatment: In about four weeks great mproverment was visible. I contlnued the treatment for
nearly six months at intervals; my catarrh, which had been unusually obstinate, was now at an ena. The ung head which had accompanied them. The necessity for hawk ng and spitting ceased, and I wasf ree from that unplea tion better, and so continue to the present time. "Tn/s was about three vears ago. Since then I have had
0 return nfthe catarrh, and 1 have not needed any mor ompound oxyven. 1 know my cure must be reasonabl permanent, for I have taken several slight colds, which
have passed away without leaving any evil effects. During my catarrhal days such colds would have aggravated noyance.
"With my catarrh kone and my general health greatly improved, you may quote me as freely as you please a
a frm believer in the virtues of Compound Oxygen. "I wish for the sake of the thousands who are kep y their catarrh constantly hawking and spitting, tha all victims of this unpleasant disease could know of why it should not do for them what it has so thoroughl
A "Treatise on Compound Oxyoen." containing a histor of the discovery and mode of action of this remarkable
curative agent, and a large record of surprising cures curative agent, and a large record of surprising cures in
Consumption, Catarrh, Neuralgia, Bronchitis, Asthma etc., and a wide range of diseases, will be sent free. Ad dress Drs. ST
Philadelphia.

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ines burn ines burning kerosene. Shipman Engine Co., Boston see pace 317.


## HINTS TO CORRESPONDENTS.

 Beforermation, and not or prybilicaion.

(1) A. G. H. desires to know the proces ased for deodorizing tallow in the manufacture of imi used by those who manufacture artificial butier. Ad mission to the factories is almost impossible, and the details of manipulation are kept very secret. A good rticle of tallow is generally used, and it is presumed hat sleam is injected ints the fat in such a way as to remuve the odor and color. See article on this subject on page 6339 of Scientifio American Supplement
No. 387. On a small scale, rubstances rich in oxygen o. 387. On a small scale, Rubstances rich in oxyge
can be used to purify the ta low. thus, by melting the Can be used to purify the ta low. thus, by melting the
fad and to it a small quantity of potassium bicbromate dissolved in water; and subsequently a listle bydrochloric acid. The mixture is theu stirred, and washed with warm water until thorougbly cleaused, when the tallow will be found to be completely deodor ized and bleached. Potassium permanganate is likewise used with good results.
(2) S. R. S. asks in what sear Kolbe dis overed the process of making salicylic acid from car and what amount of the salicy ic acid coold be ob tained? A. That salicylic acid may be obtained from phenol was demonstrated by Kolbe and Lautermann in 1880. In 1874, Kolbe modifled and simplifted his arig1 nal process, subsequent to which it became prominen as a disinfectant. Prior to 1874 it had no commercia
va ue, and of course could not be obtained ln quanitry
(3) A. C. $\dot{\text { G. asks }}$ for a rubber stamp indelible ink for marking clothing, it being necessary that
glycerin be used in its mannfacture to keep the pads glycerin be used in its mannfacture to keep the pads
from drying up quick, and the ink from clogging up the from drying up quick, and the ink from clogging ap the
letters. A. The following is an indelible stamping ink and probably will be suitable for your wants: :osine
part, aniline black 4 parts, aniline blue 2 parts, cuprie part, aniline black 4 parts, aniline blue 2 parts, cupric
chloride 1 part, ammonium chloride 3 parts, sodium chloride 2 parts, glycerine. lampblack, water, and oil in sufflcient quantity to bring the ink to a proper consistency for the use to which it is intended. The ingredi ring, when the composition is ready for use. To pre-
vent moulding a small proportion of salicylic acid may vent mould
be added.
(4) H. D. S. asks a receipt for making some kind of cement that will stick greasy leather. The trobule is the in comes out of the leather and mixises
with the raber cement. A. Try the following: Soak with the rabber cement. A. Try the following: Soak junt enough water to cover them. Bring gradually to
a boiling heat, and add pure tannin until the whole bea boiling heat, and add pure tannin until the whole be
comes ropy, or appears like the white of egge. Buff comes ropy, or appears like the white of egge. Buff
off the surfacees to be joined, apply tbe cement warm and clamp frmly.
(5) F. H. asks for the process of making whiting and plaster of Paris. A. Whiting is simply
chalk, ground, elutriated, balled, and dried. Grinding mills break up the chalk and mix it with water, which is constautly flowing in. On leaving the mills, themix-
ture pasees along a series of wooden troughs, where the sand, which has a greater specific gravity than the chaik, it deposite, the challs passing on int on the setis partially dried on a floor under which hot fines rum racks on cars which ran on tramways into an immense oven. The heat from tbe flues is greatly increased by from the drying whiting; 12 hours on the heated fioo and 12 in the oven thoroughly dries the whiting, and it is ready for packing. Plaster of Paris is gypsum (sul-
phate of lime) carefully burut, so that it loses its water phate of lime) care
of crysallization.
(6) J. P. O'B. writes: I intend to build line of telephone like that described in Scientipri
Ambrioan Suprlewent, No. 142 and would like to have yon give me a little more information upon it. Would a person be liable to prosecution if he built
such a ine, and is it an infringement upon the Bell or such 2 line, and is it an infringement upon the Bell or
other patents? A. Tbe Bell TelephoneCompany claim other patents A. Tbe Bell Telephone Company claim
to own patents covering all articulating telephones. to own patents covering all articulating teepp
2. How far will such a linework satisfactorily? Such a line as you refer to will work over a line three
or four miles long. ${ }^{\text {. Do you have to use magnet bells }}$ for a iignal? A. You may use mignet bells or a bottery call. 4. Would smailer wire than No. 14 do just ased for this parpose. A smaller wire offers a greater
resistance and does not anser the resistance, and does not answer the purpose as well. and how large preces?. A. You can ground yourltue
on water pipes or on iron drain pipes, or by connecting your wires with copper plates, having about ten square feet area, and located in earth that is constantly
moist.
(7) G. G. asks (1) where be can get a work descring iow. A. Precott's Telephone, Electric Light, and Other Novelties contains a large number of illus
trations of magnets of different forms. You will also trations of magnets of different forms. You will also
find in Surplexernt, No. 182, a deecription of a large variety of forms of electro-magnets. 2. The best kind
of battery to work $i$ with of battery to work it with? A. The best battery for se-
curing the graatest amount of power in a large electrocuring the gratest amount of power in a arge electio-
magnet for a short time, is the plunging bichromate batere. 3. What mageet and to lifting ten pounds through wa exact a force equal
five inchee? A. To lift ten pounds a space of five
inchea you will need an axial magnet. A magnet inches you will need an axial magnet. A magnet
formed of abont 20 turns of No. cotton covered
wire used in connection with 10 cells of the battery described, having plates about 4 by 8 inches, will probably answer your purpose.
(8) S. P. S. writes: 1. Can you advise me of comparatively unaffected by pergpiration, ond that can be bought already made up. A. Those who make
flutes uge simply a mixture of beeswax and lingeed oil. This suitably applied and there lies the secret) will produce the most satisfactory kind of a finish. 2. Also
can you adviee a lasting preparation for silver-washmg can you advise a lasting preparation for silver-washmg
the keys of a flute? A. Nothing will be as lasting as silver or nickel plating. 8. Recently I have noticed the preparatory to rising, throb slightly. Does this denote presence of air? A. Wedo not think that the action
(9) B. M.-Plumbago is largely used as a lubricant, both in its dry pure state and pulverized
and mixed with tallows and oils. It is used dry on wood for the slides in organs and other movements requiring freedom from; oil. It is largely in use com-
bined with tallow and oil as axle grease. Also compounded with cotton as piston packing for engines andpumpsand for valves. It is a compound in several patent journal boxes. With tallow or lard it is excel-
lent for all bicycle bearinga, as not apt to spread, but not so easily applied as oil.
(10) H. H. writes: I bave an electric pen, also a parlor phonograph. I have broken one of my
porons caps; is there any way to mend it, and how? porons caps; is there any way to mend it, and how?
A If your porous cup is only cracked,yon maystop the leak by allowing it to become perfectly dry and flling the parts are separated, you may repair it by ueing a cement composed of equal parts of Peet'sguita percba and shellac melted together. 2. Where can I procure kinds, but they are not satisfactory. A. Any of our stationers can furnish the paper you
(11) L. P. asks how the rbubarb is prepared
that is sold in England as preserved ginger? A. The
article is not on the American market. Marion Har-
land, who is an excellent antbority, gives the following and, who is an excellent antbority, gives the following
receipt for preserviug ginger. She says: "- Pare the roots of green ginger, and lay in cold water fifteen minutes. Boil in three waters, changing the hot fo
cold every tume, until very tender; drain, and lay in ice water. For the sirup allow a pound and a quarter o sugar for every pound of ginger, and a cupful of water for each pound of sugar. Boil and skim until the scum dry and drop it in. Let it stand twenty-four hours Drain off and reheat the sirup. This time pat the ginger in when blood warm. Do not look at it again for
two days. Then reboil the sirup,and pour over the gintwo days. Then reboil the sirup,and pour over the gin
ger scalding hot. In a week drain off once, boil,and add ger scalding hot. In a week drain of once, boil,and add
again while hot to the ginger; cover closely. It will be fit for use in a fortnight. The rhubarb lozenges àr made with four pounds of sugar and ten ounces best
Turkey rhabarb in powder with a little gum solutior, ay 1 ounce dissolved gum arabic to 12 ounces of sugar (12) G. D. C. writes: I bave heen trying to ast lead figares (or type in one piece) from a plaster o
Paris mould, but have failed three times. The mould Paris mould, but have failed three times. The mould
came off good and clean, and after warming it I poured in lead, then took off after cooling, but the figures were all run together like so many bubbles. What wa
wrong? A. You cannot cast sharp lead figures or type wrong? A. You cannot cast sharp lead figures or type
in a plaster moald; you should asetype metal. A com mon way of making stereotypes is to form the mould as you bave done, then dry it perfectly, then dip it, face
upward, iu melted type metal, allowing it to remain below the metted type metal, allowing it to remain escaped, when the mould maybe raised outofthe melted
(13) T. B. B. writes: 1. I bave a china tea set decorated with gold bands. Is there any method by which I can remove those gilt bands without injury do so satisfactorily unless the gilt work is removed A. Try removing the gold leaf by means of tripoli or rotten stone: 2. How is this gilt decoration put on
table ware? A. It is deposited from a gold solution.
(14) W. T. B. writes: 1. I have had the tops or carbon heads of several Leclanche batteries become oft and ran out; what causesthis and what will remedy it? A. The carbon in the Leclanche battery is ce-
mented in the cell with pitch. 2. What glue can I use mented in the cell with pitch. 2. What glue can I use
to patch a boat with below the water line; patches of canvas: A. Apply the canvas patches to your boat with
thick white lead paint, allowing it to become dry before placing the boat in tbe water.
(15) C. B. D. writes: I bave constructed a dynamo five-fourths the size of your drawings in your UUPLEMENT, No. 161, with the exception that I have made two field magnets instead of one, have wound
field magnets with five layers No. 14, and armature field magnets with five layers No. 14, and armature
with 6 layers No. 16 wire. I run it at 1,600 revolutions per minute. I can get plenty of sparks at the commusert a Maxim 16 candle incandescent lamp in circuit al sparks cease. The lamp is perfect, as I have had it tis my trouble: A. The current produced by your dy-namo-electric machine is a quantity current, and inca-
pable of overcoming the resistance of the 16 candle pable of overcoming the resistance of the 16 candle 100 obms or more, whereas your dynamo would be incapable of wor
25 or 30 ohms.
(16) C. V. S. asks if a box $11 / 2$ feet square and 3 inches high can be heated to $104^{\circ}$ Fah. by means of electricity. Can it be done by means of coils? And it be very expensive? A. You can beat a box of the size given by means of electricity, but it would be a very expensive method of generating heat. The coin should be made of platinum, and you would require ment.
(17) O. G. H. writes: I bave a boat $25 \mathrm{x} 5 \times 4$ feet, drawing 18 inches of water. Will you kindly-inder, also what size screw, pitch and number of blades of same, mustI use in this boat to get an average speed of 12 miles an hour? Also please inform me of the di-
mensions of the boiler. A. Engine 4 inches or $41 / 2$ inches diameter and 6 inches stroke. Vertical tabalar boiler 34 inches diameter and 50 or 52 inches high,with not less than 120 feet of fire surface. Propeller 30
inches diameter and 42 to 44 inches pitch, 3 blades. It will be vers difflcult to get a speed of 12 miles per hour miles with of these dimensions,
(18) J. D. McR. writes: I bave a boat 18 feet keel and $41 / 2$ feet beam, which draws 3 inches of
water at bow and 18 inches at stern when loaded I water at bow qnd 18 inches at stern when loaded. I
am nuilding for it an engine $21 / 621 / 5$. Tbe wheel is two bladed, about 17x26; what size boiler would you recommend, and what is the greatest speed that car be had
from the boat with the $21 / 2 \times 21 / 2$ engine and a boiler of sufflient size, also with any other size engine which you think best suited for this boat? Do you think this boat can be made to run 10 miles perhour? Would you put on a larger wheel with leas pitch? Please adspeed out of the boat. A. You should have a vertical tubular boiler 24 inches diameter and 42 inches to 46 inches high. The pitch of your propeller sbould be such as to let the engine ron at a high speed, say 360 to 400 get a speed of 7 or $73 / 4$ miles. If you increase tbe engine and propeller in proportion, you would probably get (19) $81 / 2$ miles per hour
(19) C. B. L. asks how be can learn to be stady electrical engineering at some of our technical schools, the Stevens Institute of Technology at Hoboken, N. J., Corwn University at Ithaca, N. Y., the Rensselaer Polytechnic. School at Troy, N. Y., or
the Worcester Polytechnic School at Worceater,
pursue the study alone. If you desire to make it a proession, we advise yon to first become an adept in me trical engineering, and then apprentice yourself to some manufacturing electrician or electrical engineer. 2 . In an electrician? A. An electrical engineer is supposed to combine the qualities of a mechanical engineer and he theoretical part of the business.
(20) F. E. W. writes: 1. Please inform me tendent, whether Robert Fulton's steamboat was the first steamboat in actualuse. Did not John Fitch of Pennsylvania have a steamboat that worked on the Delaware River in 17809 A. M. Perrier navigated a
small steamboat on the Seing in France in 1775 . Jouf small steamboat on the Seing in France in 1775 . Jouf-
froy built and ran a small steamboat on the Soane in froy built and ran a small steamboat on the Soane in
France in 1781. James Rumsey exhibited an experimental steamboat 80 feet long, on the Potomac in 1782.
In 1788 Jobn Fitch launched at Philadelphia his steam In 1788 Jobn Fitch launched at Philadelphia his steam phere she unfortunately buret her boiler, from whence she floated back to the city, and being repaired made several trips. About this date Symington, Oliver Evans,
and others built experimental steamboats. Iu 1793
Fitch exhibited his propeller, a boat about 15 feet long, on the "Collect" pond in New York Robert Fulton in France, in 1803, and soon oat that ran on the Seine or the Clermont, of Boulton \& Watt, in England. In 1804 JohnStevens built a small steam propeller that
made excursions on the waters around New York; but no practical results were reached until Robert Fulton started the Clermont in August, 1807, running as a re-
gular paesenger boat to Albany. Soon after, in 1807, gular paesenger boat to Albany. Soon after, in 1807,
John Stevens finished the Phæenix, but was prevented John Stevens finished the Phoonix, but was prevented
from running upon the Hudson by a legislative grant to Fulton. The Plicnix was run a short time upon the to Philadelphia by sea, being the first steamer sailing upon the ocean. Thus, while Fitch and Fulton were not the first to build or run a steamboat by name, the practical triumph of steam nam
Robert Fulton and John Stevens.
(21) J. H. writes: I am a student of Lehigb engineering. Having a well equipped library at I wish you would let me know what books pertaining to that subject I shall read, and in what order I shall read them. A. Obtaiu the latest edition of Dana's
Mineralogy, as a descriptive text-book. Begin at once to gatherspecimens, and learn to recognize them by their descriptions in the book. A visit to cabinets
of named minerals will greatly aid you. It would also of named minerals will greatly aid you. It would also
be very profitable to visit the Museum of Natural Hisbe very prontable to visit the Museum of Natural
tory in geology will largely increase your interest
methods and the localization of minerals.
(22) F. P. asks: Is it necessary that poultry running at large upon the farm shonld have oyster
sbells or bones, or both? Why are they fed to poultry? should they be burned or fed raw? A. Anything that will furnigh phospboris and lime to the poultry will answer. If you provide them with oyster shelis, thes to form lim
(23) S. McI. asks: Which is the greatest power, and what are the proportions of water or steam,
the pressure on each volume beingthe same, in a water wheel and steam engine? A. Steam will yield the greatest power, on account of its expansive force, it
slight inertia, and the rapidits passed through the engine.
(24) W. asks what the general mode of testing glue is; how to find out by testing in cups how mine their relaive value. A. We do not know that the mine their relaiive value. A. We do not know that the
value of glue can be best tested by the quantity of water it will absorb, although the best glues will absorb the most water, and will also swell up in cold water with out dissolving or becoming slimy. A good test is to try the prepared glue by gluing pieces or blocks of
maple together; after drying, break the blocks apart The best glue will take splinters from the solid wood. Another way, when buying glue, is to decide by the
smell, color, and breaking with the band. Good glue smell, color, and breaking with the band. Good clue
will spring and splinter, while poor glue will break will spring and splinter, while poor glue will break
square like glass. Avoid glue that has a barned or fetid square
smell.
(25) C. P. K. asks how to make campho


Melt to of roseme and stir in the oil and ..... drachm.
ents while cooling.
(26) T. B. E. writes: I am suffering greatly with a frosthitten foot. Can you give me a remedy? a permanent cure. Many are advertised, but it is folly to spend money for them. Present relief can be ob
tained by the use of suitable liniments. One made of: Tincture of opium (laudanum).
Tincture of a
Camphor ..
Camphor
ons mamony prompt ease, and after a few applica tions makes a temporary cure. Of course the foot
shonld be guarded as perfectly as possible from ex-
(27) J. D. McC. asks bow and of what ingredients tailor's chalk is made, such as used in
marking cloth when catting out garments. A. The substance used is a variety of talc or steatite (sometimes called soapstone) known as talcose slate.
It is a mineral, and is a hydrated silicate of magnesia.
(28) V. B. M.-No cement will make your
boiler tight that leaks around the base of the dome.
The leaks are no doubt caused by a faulty construc-
tion. The shell is possibly cut out too large at the
dome junction, which causes a movement of the seam ome junction, which causes a movement of the seam
by the great pressure. It should be examined by a competent boiler maker and stayed crosswise, then
(29) J. M. H. asks how to cure a tea kettle rom rusting. A. Get the best quality of tin, or make
(30) W. K. M. - Cast iron cannot be practi cably hardened. It is not reliable. Malleable iron can
(31) J. A. H. asks bow to proportion pound soader for wipingjoints in lead pipe. A. Tin (32) T. \& M.-White japanning upon cast on is done in the same manner as for colors. The art u any mechanical manner. Tbe first coat is laido 1 wit brush quite thin (with turpentine), then baked in a ven at $250^{\circ}$ until dry. Then a second coat thicke than the first, or as thick as it can be epread, if you wish to finigh with two coals; bake as before. If the surface is not as smooth as desirable, the first coat can second and third coat apphed. The white japan var(33) A. S. R. asks what are automatic mo entum breakers as before mentioned in the Soientifi American. A. Any stone breaker with a heavy fly wheel that by its momentum carries the breaking jaws over
the hardest part of ltheir work, recovering its power uring the back motion of the jaws
(34) O. O. asks the greatest distance a can no ball or shell has ever been thrown, and when and where. A lso what gun? A. About 7 miles, by a gun
called the "Swamp Angel,"shelling the city of Charleson during the war of the Rebellion.
(35) N. H. writes: I bave a small engine 2 2月ax $^{6}$ 6, for which I wish to make a boiler according to directions in the Soirentific Amehioan Supplement, No. 182. Would one made of 10 flasks in the fire and 2 for dry steam furnish enongh steam for it, and what powerwould it be? If not, how many would I need
A. With 10 flasks for heating surface and 2 for steam A. With 10 flasks for heating surface and 2 for steam chamber, you mi
(36) N. H. asks: Does the center of a shaft turn? A. A theoretical axis or center is supposed not
to turn; but all parts of a solid body moving around or upon an interior axis or center turn. The trouble mes from confounding an imaginary line or axis with (A7)
(37) E. J. asks for a material or composi tion which in a soft state is plastic. and can be hand worked like clay into ornamental igares, which when dried becomes hard and strong, withont firing. Some-
thing not too expensive would be preferable. A. Take the flinest plaster of Paris,aod sprinkle it into the. water, stirring it till the mixture becomes of the consistence of thick cream. Perhaps, however, Portland cement would do, as plaster of Paris hardens so quickly, and you can keep the cement in working condition several
(38) C. F. L. asks: How many feet of one inch pipe would it take to condense the steam from a coils of pipe put in a common barrel and kept covered
with cold water be a good conderser for such an engine? A. A coil of 1 inch pipe of 100 feet in a barrel or trough at medium pressure ( 40 pounds). If high pressure, 60 to 80 pounds, 150 feet of pipe. If you can make it in two sections, so as to giv
haust, it will do better service
(39) G. D. - Ink stains can be removed by arious reagents, such as a cold aqueous solution or an acetic acid solution of calcium hypochlorite, bleaching is sometımesused. The following is from our back files Take of muriate of tin, 2 parts; water, 4 parts. To be applied with a soft brusb, after which the paper must (40)
(40) E. B. R. criticises our answer to S. L. Wtat, bun, vol. li., No. 15, on bow to make a cheap rheo any dealer in wire will " measure off an ohm," and that all wire of the same nominal size is of the same resistance for a given length. We do not think that any
dealer would "measure off an ohm" ex ept by the foot rule, and this would be a very rough measurement in deed. But if the dealer were to supply a length of wire by coiling or by coiling or stretching, and no accurate results could
be arrived at. Allowing that an obm of a certain kind of wire were procarable an accurate resistance boz could be made by comparing the resistance of other lengths of wire with that of the standard; but foot rule messurements in electricity will hardly answer. Our friend has made another mistake in the matier of winding. The spools of a resistance box should be wound in parallel layers, so that the currentmay pass through magnetic and inductive effects which in a coil " wound exactly like a sounder mannet" would be the source of much trouble. When only a very rough approximate to a given resistance is required, a box made on our corcorrect. A standard resistance must be had for com-
(41) H. R. C. writes: I Ghave a letter from Abraham Lincoln on which I had the misfortune to withoutdeatroying the glaze, to take it off, as the letter is in splendid condition? A. Ink stains should first be treated witha solution of tin protochloride to deozidize the iron, and then it can be removed with dilute oxalic
acid. An acetic acid solution of calcium hypochlorite is likewise an excellent substance with which to re. move the ink. First try it on a piece of paper before (42) T. G. C. asks your letter.
(42) T. G. C. asks for a preparation for pol-

Rub the surface gently frst with a clean pad of fine cotton wool, and afterward with a similar pad covered over with cotton velvet which has been charged with
fine rouge. The surface will under this treatment acquire a polish of great brilliancy, quite free from any
(43) S. W. F.-The best that can be don ith ruety planished iron (we suppose that you mean Russia iron) is to carefully scrape the rusty spots and
polish the sheet with plumbago wet with a little sour polish the sheet with plumbago wet with a little sour
beer or vinegar in the same manner as you would polh a stove. Any treat
(44) F. E. P. asks: What would be the proable result of the explosion of a cartridge sunk in deplh and size ai the top of the excavation? A. Dyna mite acts in clay much in the same manner as in rock that is uniformly compact ornot stritifled. It blows an a por shaped hole when well tamped. It is noteco nomical in shallowholes. as it is apt to blow out a blasting. We have but little experience with clay blasting, but have heard that deep boles 5 or 6 feet are the most econ
(45) Z. B. F.-Laps are not always thicke than other parts of belting, but they are stiffer, and to gether with the copper rivets cause quick running belts
over' small pulleys to produce uneven motion where the unning parts are light, as spindles in cotton and running parts are light, as spindles in cotton and
ilk machinery; but in wood and iron working machinery the difference is scarcely noticed.
(46) A.C. D. writes: We often see small tatues, etc., in store windows thatare bronzed, and the sh red, etc. Can you tell mehow this is done? Is it possible to lacquer over this work withoutspoiling it with the lacquer brush? A. In order to accomplis our desires, it will be necessary to purchase the so called gold paint. It is best to buy it rather than at tempt to make it. As generally sold in the market, the preparation consists of a solid metallic ppwder, which an be procured of some sixteen different tints of colors. It is mixed, according to the directions sold ith the package, with the liquid preparation, and ap an drying be finished by further application of a coat
furniture varnish
(47) N. G. asks where the amianthus or asbestos is found in the United States. A. Asbestos is an and Fulton Counties, Ga., in Northern Georgia, West ern N. C. and S. C., Staten Island, Long Island, variou ocalities in New York State, Maryland, Norkiern New Jersey. Pennsylvania. and Virginia. It is also found in Colorado and in Cahfornia. There are several hun red localities from which it can be obtained.
(48) G. W. C., of Selma, Ala., writes, re ferring to former inquiry of B.J B., that it is as safe There to cemeit cisierns right on the clay as any
foundation which could be made, saying: "Our fire department here is supplied by cisterns entirtly. the majority of them being cemented directly on to the clay sides, and in one case where there was no clay, nothin but sand, directly on to this. We have one cemented deep, which has been in use for 6 yeare, and has no cost one cent for repairs except a new cover. which is of wood- il is good for as many more years. The sides of these cisterns are dug sloping, which always causes an outward pressure. These cisterns are not theoretical on paper, bnt are in practical nse daily with us."
It is perfectly eafe to cut cisterns in the indurated c of the Tertiary in Alabama, even without cementing These clays are nearly as hard as rock. We have seen cisterns from 30 to 40 feet deep. and as many in diame wateris their only choice.

INDEX OF INVENTIONS
For which Letters Patent of the United States were Granted
November 4, 1884,
AND EACF BEARING TRAT DATE.

## Advertising E. Akins.


07.516
307.074
307,550
307,680

Bosom board. Levi \& Ellenbo Bottle, G. W. Clark........
Bottle estoper. A. F. Borden.
Bottle stopper C. Jox. See Folding box. Hat box. Lunch box
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Brush, 0. Fish..
Brush, calcimining and wall, ,..........
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('ar coupling, Keen \& Meeh
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ar coupling. D. P Prescot
Car coupling. J. D. Vance.
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Hay carrier, P. A. Myers.
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Heating apparatus. s Smith.....................
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holder. Spool holder.


| Ca |  |
| :---: | :---: |
| Carpet, J. L. Folsom |  |
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|  |  |

## TRADE MARKS.


Castor oil, Allen \& Hanburys.................................... 11.512
Cod liver oil. Alien \& Hanburys........................................11,59 Face cream. 1. Hubert...
buck, sheep, calf, dog, and other leather, B. D.11,60
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at and bonnet linings. s . Friedman \& Co ........Hat and bonnet linings. S. Friedman \& Co .........Sons $\cdot$. ....................... ................
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11,608
1,
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11,62
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enovating powder for horses and cattle, B. J.
${ }_{307,694}$
s07.473
..307,598,
쁭․․․․․․․
rupe, Schmidt \& Barn${ }^{11,611}$
J. W. Goodwyn.
hread, linen, Marsh$\cdot 11.609$
$.11,614$
hread, shoc, Marshail \& Co........................11,615 to 1A printed copy of the specitcation and drawing of
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lisued since 1866. Will be furnished from this ntlle for 25lssued since 1886. will be furnished from this notiliee for 25cents. In ordering please state the number and dote
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