## 3usitess and extonal

## The Charyefor Insertion under this head is One Dollar

 a linefor each insertion; about eight words to a line Advertisements must be received at publication officThe splendid Patent Hot Air Bath illus
Combination Roll and Rubber Co., 27 Barclay St., It drives diseasc away, is what every one says of Va, It drives diseasc away
Ladies can save the annoyance and expense of visitin chiropodist by using German Corn Remover. 25 cents Sewing Machines and Gun Machinery
The Pratt $\&$ Whitney Coo, Hartford, Conn.
Wanted. - A responsible business man would b pleased to represent a manufacturing company in Saft
Lake City. Centrally located for Utah, Idabo. and Montana. Address J. P., Box 755, Salt Lake City, Utah. Houghton's Boiler Compound contains nothing that
can injure the iron, but it will remove scale and prevent tsformation. Houghton \& Co., 15 Hudson St., N. Y. To Business Mrn. - An intelligent young man, of some
business experience. would like a situation. Anything business experience. would like a situation. Anything
honorable. Unquestionable reference. Box 98 j , Provi-

Wanted -An old established machinery firm on Cort land street would be pleased to represent, in New York gines, Boilers, etc. Ans Engine. Box 773, New York Why risk boiler explosion from mud? It can be avoid-
ed, at nominal cost, by Hotehkiss' Mechanical Boiler ed, at nominal cost, by Hotchkiss' Mechanical Boile
Cleaner, 84 John t., N. Y. Engineers make ten per cent
selling other parties than elling other parties than employers. Send for circular be very rich. Short distance from St. Louis, Mo. Un-
divided half interest for sale to some one who will de be very rich. Sbort distance from St. Louis, Mo. Un-
divided half interest for sale to some one who will de
velop it. $A$ fortune quickly made. Full particulars fur nished only to those who have a few thousand dollar
cash. Address W. W. Davenport, Oregon, Holt Co., Mo Genuine GermanCorn Remover; not asalve, ointment, or plaster. It eradicates the corn by four appllcations. Use the Vacuun Oils. The best car, lubricating, en gine, and cylinder oils made. Adaress
No. 3 Rochester Saving Bank, Rochester, N. Y.
wiley \& Russell M'f'g Co. See adv., p. 333.
Wiley \& Russell M'f'g Co. See adv., p. 333 Tarred Roofin
Portable Railway Track and Cars. Contractors, Plant ers, Miders. send for circulars. Francis W. Corey \& Co Punching Presses \& Shears for Metal-workers, Power
Drill Presses. Drill Presses. $\$ 25$ upward. Power \& Fvot Lathes. Low Books on Practical Science. Catalogues free. Pocke
Book of Alphabets, 20 cts. Workshop Receipts; a reli able hand book for manufacturkers. $\$ 2$, mail free. E. \&
F. N. Spon, 446 Broome St., N. Y.
Essay on Inventions.-What qualities will make them proftable, and how to incorporate these qualities in inparaiso, Ind.

- Rivol" Skinner Portable Engines. Erie, Pa "Rival" Steam Pumps for Hot or Cold Water; $\$ 32$ The Eureka Mower cuts a six foot swath easier than a side cut mower cuts four feet, and leaves the cut grass standing light and loose, curing in half the time. Send The Newcll Universal Mill Co., Office 34 Cortlandt St., Grinder for crushing ores and grinding phosp hates, bone, plaster, dyewoods, and all gummy and sticky substances. Circulars and prices for warded upon request. Pure Oak Leather Belting. C. W. Arny \& Son, MaPresses \& Dies. Ferracute Mach. Co., Brialgeton, N.J. Wood-Working Machinery of Improved Design and orkmihp. Cordesman, Egan \& Co., Cincinnati, O . Experis in Patent Causes and Mechanical Couns
Park Benjanin \& Bro., 50 Astor flouse. New York. Split Pulleys at low prices, and of same strength anil
apenrince as Whole Pulleys. Yocom \& Son's Shafting appenrince as Whole Pulleys. Yoc
Malleable and Gray Iron Castings, all descriptions, by National Steel Tube Cleaner for boiler tubes. Ad justCorrugated Wrought Iron for Tires on Traction' En-
gines, etc. Sole mfrs., H. Lloyd, Son $\&$ Co., Pittsb'g. Pa Best Oak Tanned Leather Belting. Wm. F. Fore-
paugh, Jr., \& Bros., 531 Jefferson St., Philadelphia, Pa. Stave, Barrel, Keg, and Hogshead Machinery a spe cialty by
Wright's Patent Steam Engine, with automatic cut ofr. The best engine made. For prices, a
Wright, Manufacturer, Newburgh, N. $\mathbf{Y}$.
Nickel Plating. - Sole manufacturers cast nickel anodes, pure nickel salts. Importers Vienna lime, crocus,
etc. Condit. Hanson \& Van Winkle, Newark, N. J., and ${ }^{2} 2$ and 94 Liberty St., New York.
Presses, Dies, Tools for working Sheet Metals, etc.
Fruit and other Can T'ools. E. W. Bliss, Brooklyn. N. Y Cope \& Maxwell M'f'g Co.'s Pump adv., page 332. The I. B. Davis Patent Feed Pump. See adv., p 332. Moulding Machines for Foundry Use. 33 per cent
saved in labor. See adv. of Reynolds \& Co., page 334. Machine Knives for Wood-working Machinery, Book
Binders, and Paper Mills. Also manufacturers of Solo Bind ers, and Paper Mills. Also manufacturers of SoloSkinner's Chuck. Universal, and Eccentric. See p. 333. Blake "Lion and Eagle" Imp'd Crusher. See p. 350. Gardiner's Pat. Belt Clamp. See illus. adv., p. 349. For best Duplex Injector, see Jenks' adv., p. 349. C. B. Rogers \& Co., Norwich, Conn., Wood
Machinery of every kind. See adv., page 39. Eclipse Fan Blower and Exhauster. See adv., p. 348. The Sweetlan Chuck. See Mlus. ad., p. 349.

For Sale.- $13 \times 30$ and $16 \times 48$ inch Horizontal En
gimes, complete andingoodorder. Prices, 8700 and 8950
 70 feet $31 / 2$ inch Shafting with in perfect order, $\$ 1,200$ Couplings. 5 cts. Belcher $\&$ Bagnall, 40 Cortland St. Peck's Patent Drop Press. See adv., page 366 Fire Brick, Tile, and Clay Retorts, all shapes. Borgne Silica Paints (not mixed); all shades, 40 Bleed

Turbine Wheels; Mill Mach'y. O.J.Bollinger, York, Pa For best Portable Forges and Blacksmiths' Han
Blowers, address Buffalo Forge Co., Buffalo, N. Y.
The Brown Automatic Cut-off Engine; unexcelled fo workmanship, economy, and durability. Write for in The None-such Turbine. See adv., p. 350.
Brass \& Copper in sheets, wire \& blanks. See ad. p. 365 The Chester Steel Castings Co., office 407 Library St . 000 Gear Wheels, now in use, the superiority of the astings over all others. Clreular and price list free. Wren's Patent Grate Bar. See adv. page 365.
Diamond Engineer, J. Dickınson, 64 Nassau St., N.Y. The Improved Hydraulic Jacks, Punches, and Tnbe Eagle Anvils, Geiser's Patent Grain Thrasher, Peerless, Portable page 364. Long \& Allstatter Co.'s Power Punch. See adv., p. 365 or Mill Macb'y \& Mill Furnishugg, see illus. adv. p. 364 For Mining Mach'y, see ad of Noble \& Hall, p. 366. ew Economizer Portable Engine. See illus. adv. p. 365 Rue's New "Little Giint" Injector is much praise
or its capacity, reliability, and long use without repairs ue Manufacturing Co., Philadelphta, Pa
Saw Mill Machinery. Stearns Mfg. Co. See p. 364.
Saunders' Pipe Cutting Threading Mach. See For Shafts, Pulleys, or Hangers, call and see stoc tept at 79 Liberty st.. N. Y. Wm. Sellers \&Co. Wm. Sellers \& Co., Phila., have introduced a new For Sequeira Water Meter
Toope's Pat. Felt and Asbestos Non-conducting Re movable Covering for Hotor Cold Surfaces; 'Joope's Pat.
Grate Bar. C.Toope \& Co., M'f'g $A$ gt., $3 \overline{3} \mathrm{E}$. 78th St, N. Y. Use Vacuum Oil Co.'s Cylinder Oil, Rochester, N. Y Don't buy a Steam Pump until you
ley Machine Co., Easthampton, Mass.

## For Machinists’ Tools, see Whitcomb's adv., p. 364.

##  <br> HIN'IS 'TO CORRESPONDENTS.

No attention will be paid 10 communications unless

## Names and addresses of correspondents will not be

We renew our requesthat correspondents, in referring former answers or articles, will be kind enough name the date of the paper and the page, or the number
of the question. Corresponden
a reasonable time should repeat them. If not then pub lished, they may conclude that, for good reasons, the Editor declines them.
Persons desiring special information which is purely of a personal characier, and not of general interest,
shoukl remit from $\$ 1$ to $\$ 5$, according to the subject, as we remit from $\$ 1 . \$ 0$, according to the subject, obtainsuch information without remineration
Any numbers of the Scientific American Supplement referred to in these co
office. Price 10 cents each.
(1) A. A. R. asks if either gun or powder is injured by leaving the gun loaded, the gun being
the ordiuary iron barrel. A. If the gun is not perfectly clean (freed from the remains of burnt powder) and well oiled it is not well to leave the charge in any length of time. 2. I want a simple test for cistern water to tell whether or not there is sewer poison in it.
A. Dissolve in a pint of distilled water half an ounce of pure tannic acid and filter the solution through filte distilled water a quarter of an ounce of pure permanganate of potash,and filter into a clean bottle as before Draw off two separate pints of the well water in clean the tanuin solution, put a new stopper in the bottle, and set it aside for forty-eight hours. To the other sample add few drops of the permanganate solution (just enoug out at once or on standing haif an hour. Add to an other sample of the cistern water a few drops of a filtered solution of a quarter of an ounce of pure nitrate of silver in a gill of distilled water, and note whether
a white precipitate or an opalescent cloudiness forms immediately or on standing half ani hour in the dark. If an appreciable quantity of sewage is present in the water the tannin will occasion a flocculent or curdy pre-
cipitate, at first a mere cloud, which finally settles to the bottom as a distinct precipitate. In the permanganate test the color imparted will soon fade ont if it does not do so at once. The white precipitate or clond forming on the addition of silver nitrate also indicates the presence of contaminating substances, especially if the
other tests are positive. If the tannin and permanganate reactions indicated are marked the water is unfit or potable purposes
(2) F. B. asks: How can I keep a tent made of thin cotton cloth from mildewing without coloring the cloth? A. Saturate the cloth first with a
solution of soap and then with a strong aqueous solution of lead acetate or alum. Let it partially dry, then rinse
(3) A. V. R. asks: Can you tell me o glue to use for cigarettes? I have used flour paste, but
tis not quick enough. The glue must not discoior the aper, and when dry must not show. Could you infor me what is used by the manufacturers of cigarettes A. Thick starch paste free from lumps and containing a trace of clove oil to keep it aweet answers admirably.
(4) H. C. F. asks for a receipt for pack ing eggs in summer to keep for winter. A. Dip the eggs in a solution of 2 oz. gum arabic in a pint of cold water, (5) C. H. H. asks how to make potash water glass? A. Potash waterglass is prepared by intimately mixing two parts, by weight, of pure white
ilicious sand or clear quartz, and six parts of anky silicious sand or clear quartz, and six parts of anhy
drous carbonate of potash, all ground to a very fine powder, andmelting the misture in a large clay cruc He at a bright red heat. Carbonic aciid gas is is iven on state of calm fusion it is poured out on an iron plate to cool. This glass dissolves readily in boiling water, an on cooling the solution a sirupy liquid is obtainea.
(6) C. J. H. asks (1) how aniline is pre pared and shaped which is used with the indelible writ ing pencils. A. A mixture of chalk and kaolin is mailine violet ( (or other soluble aniline dye) containing little gum dextrine, pressed into shape and slowly dried and sleeve buttons, that will keep its luster and no make the fingers and cuffs black
practical way. 3. How celluloid is prepare and put o linen such as is used for waterproof collars and cuffs? A. Celluloid is composed of nitrocellulose or solnble
cotton combined with camphor by means of strong pressure and heat, under which conditions it is quit lastic.
(7) A. K. asks: 1. Does water ever get too cold to freeze? If so, under what circumstances does
it pass the freezing point without congealing ? A. At nder al circumstances. 2 I the sugar that is in the maple sap taken from the ground, or is it manufactured from the material taken from the ground by the organs of the tree ? A. A purtionof the substances of which
maple sugar is composed is derived from the soil, and a maple sugar is composed is derived from the soll, and a larger port on from the air. The sap is formed by
chemical reactions within the tree. 3. Will evaporachemical reactions within the tree. . boiling? A. No; the contrary.
(8) J. D. S. asks how to make brick burn a not prove satisfactory. I have an amount of fire clay among the clay, which, when moulded, burnsa very ligh color. A. Spray the clay while mixing with a smal
quantity of a solution of 1 lb . common green coppera in 4 gallons of water. Or use as a cheap substitute fo his, ordinary acetate of iron liquor
(9) J. S. H. writes: I have a large marblc slab, with two large hair oil stains on same. What can
I use to take out the oil or to make it all oil? Have tried several oils but with no cffect? It has been on for six years, and has soaked through. What is a cheap way
to fix it ? A. Make dry slaked lime into a paste with to fix it ? A. Make dry slaked lime in whed in half a pint of one ounce of washis soto the spots and let it remain o over night.
if necessary.
(10) C. W. K. asks bow to remove common black ink from parchment. A. Moisten the spots firs with a strong solution of oxalic. acid, then with a clear (bleaching). Absorb excess of the liquids from the paper as quickly as possible, with a clean piece of blot ting paper. Repeat the treatment if necessary, and
(11) C. L. asks: Can you tell me how to dissolve rubber so as to make rubber stamps? A. The
rubber is not dissolved. See "How to Make Rubber Stamps," Sctplement, No. 83.
(12) H. E. writes: I have some receipts for making colored fires; among them are some articles termed meal powder and Che first is gunpowder reduced paste with an equal weight of finely chlorate and enough hot water, then thoroughly dried (13) W. W. asks about what steam press10 to mercury flask will stand. Will it be safe to put
10 . pressure in them? A. It will be safe at three times 40 or 50 lb .
(14) "Subscriber" asks: What would be the cheapest and best style to make a boiler for an engine $11 / 2$ inch cylinder, 3 inch stroke: whether aprigh
or horizontal, and of what material? Also, would oil lamp or lamps give out sufficient heat, and what part of a horse wonld the above be ? A. A vertical tubular
boiler of iron. Petroleum or kerosene lamps might be arranged to heat it. Engine would be balf horse power velocity at which it is run; 2 inches by 4 inchescylin-
(15) C. E. T. asks: Is there any difference between the power required to punch a hole in iron one
inch in diameter and one inch thick, and the power re quired to punch a hole two inches in dlameter and onehalf inch thick ? A. According to the result of experiments, the power reqnired for punching iron plates is
directly as thearea of the boundary of the hole, or as the circumference multiplied by the of the hess.
(16) J. D. S. writes: My engineer and I are in dispute on the following points,aua appeal to you for an opinion. We wish to draw water from a stream to the sugar house, four hundred yards distant. Have Blake pump, and will use a three-inch iron pipe for the feet perpendicular. From the level of the water to the top of bank, near the stream, is 22 feet. Now, will it be betterto lay the pipe with a gradual fall throughout, from the pump to the water, or to make a perpendicu-
ar lift at the stream which will carry it over the
bank, and then fall gradually back toward the pump, which is two feet lower than the top of the bank nea he stream? My engineer says it should be put with the all from pump to water, and use thin check valves in the leugth of the pipe. I hold the contrary opinion, an specially that more than one check valve is worse tha olift. He insists that ade lift. He insise the can, by laying a pipe as water forty fee it perpendicularly with plpe is tlght. it makes little difference which plan is dopted. Your engineer is "all wrong" in saying tha he can lift the water 40 feet by using a number of check difficulty.
(17) J. R. D. asks: 1. What is the best abricant for two wood surfaces ? A. Pure refined talformula for finding the theoretical horse power of iven head of water? A. One horse power is 33.00 lifted 1 foot high per minute. For water power mul minute by the an water falling over the dam per result is the theoretical horse power. When applied to water wheels the net power is from 60 to 80 per cen (18) G E asks. How can I make the alled liquid slating for blackboards? A. Shellac, 1 lb orax, 41 b.; water, $41 / 2$ gallons Heat the water to boil ing, add the borax, and when this is dissolved gradually
add the borax, and continue the boiling until the later s dissolved; then introduce lampblark, 2 oz.; silicate 8 ho water, $1,1 / 2 \mathrm{lb}$ it to the proper consistence for use
(19) S. C. D. asks if brase pipe for conduct ng water for domestic use would be safe; would water
so conducted and at times standing in brass conducting pipes, be perfectly free from any poisonous or injuri s properties, and positivelysafe to use? A. Brass Water that has remained in such pipes for any length of ime is not fit to drink or for cooking. Use iron o
(20) M. R. P. writes: I am painting with colors on gold and silver leaf. To preserve the bright ness of the painting some kind of varnish is necessary.
What kind can use so as not to damage the gold or What kind can I use so as not to damage the gold o
silver leaf \& A. Photographer's clear plain collodion
(21) W. FI. B. asks: Is there anything that will neutralize the oxide of iron in glass sand, which in small blisters? A. The introduction and fulitle sand manganees will improve though it will not eradicale e color. Fine glass cannot be made from such
(22) G. M. P. asks: What is the proportion coal to the amount of glass melted in the manufac elting glass table ware? A. In the old metho of pound of glass; in Germany, where coal is expensive the glass manufacturers claim to be able to melt a pound of glass with a pound of coal. There are glass melting furnaces running successfully in Pittsburg, with one pound of coal.
(23) E W. M. asks: What is the nutritive value of fish as food as compared with other articles of
flesh diet ? A. According to ProfessorAtwater: Taking medium beef at 100 , we should have, as the nutritive lue of like weights of fish free 124; ch0; fresh milk, 23 8; skimme mik, 15 , flounders, 65; halibut, 88; lake trout, 91; eels, 95; sbad, 99;
fish, 346.
(24) R. H. asks: Are there any coal mines successfuily worked under the sea ${ }^{\text {a }}$ A. A number of
English coal mines are being worked under the ocean. In Northumberland the net available quantity of coal Durbam sea is estimat ne a Durbam coast under the sea, miles, $734,500,000$ tone. The latter mine is in a vein of an aggregate thickness of thirty feet, distributed in six
(25) T. A. W. asks how much lap there is on the steam and exhaust valves of the Corliss engine, also, if there is any way of setting the valves
except to take off the cylinder heads. A. The lap is different in the different sizes of engines and engines running at different velocities. You can set the valves by baving the position of the openings and the section side.
(26) W. L. asks why the screw propeller cation. ccupies less room than for paddewheels 2 Its and pelling power is not so much affected by the varying draugnt of water. 3. Its propellling effect is not reduced in a sea way and by the rolling of the ship, as is the case
with paddle wheels. 4. It is much less liable to damage with paddle wheels. 4. It is much less liable to damage
(27) J. B. asks if an engine of the following dmensions is well proportioned: cylinder $7 \times 20$, with a two-flue boiler. What is the horse power of such proportions are very good, unless you wish to run at a high velocity, then a shorter stroke will be better. The tions per minute. Boiler 38 nches diameter by feet long, 2 flues 12 inches diameter. Of the speed of the engine is less than 120, a smaller boiler will answer. (28) W.E. F. L. asks: What is the cheapst way to magnetize small steel bars to saturation ? find bars are from 2 to 3 oz. in weight. A. You will
find information on this subject on page 379 (36), Scientific American, for December 11, 1880, vol. xlui.
(29) W. B. R. asks how to soften hard cast good force pump will pump hot water if the supply of iron so that it can be filed and fitted easily. The castings we want to use are so thin that heating breaks
them. A. The metal may be superficially softened by hematite iron ore in an iron box, heating the whole to redness and keeping up the heat for twenty-four hours or more. The co
cool down slowly
(30) T. M. inquires as to the action of glue on porcelain, when allowed to dry in a porcelain evapor ating dish. The glue causes the glazing to crack and flake off. I placed some glue in a glass vessel, and
found that when it solidififed and contracted it caused the glass toflake. If this is a common case I have failed to notice it before. Is it due to mechanical action
alone? A. The fiaking of porcelain and glass surfaces by glue in drying has been frequently noted. The ouly el clean. It is due to mechanical action.-Your min erals were reported under appropriate headings in a recent issue.
(31) C. H. asks for a good work on amalgamating and milling. We are running over silver
plated copper plates, using cyanide of potassium to clean with, but caunot get the plates in good order, the quicksilver running off. Whatshould we use to prevent this? A. Consult, Percy's "Metallurgy of Gold and Silver." Address the book dealers who adverise in this paper.
Wash the plates with a strong hot aqueous solution of caustic potash. Rinse off thoroughly with water, then try the mercury, with a little dilute nitric acid if necessary, at first.
(32) J. H. asks: 1. Is it lawful for any one owner of the patent, providing the person makes it for his own use sotely, and not to sell ? A. Any one may
make a patented article for experimental purposes, but notfor actual use. See "Rights of Investigators," page
128, vol. xxxix. 2. What would be proper size, bore of cylinder, and stroke for engine of steam launch, 33 feet 7 to 8 inch cylinder by 8 inch stroke. 3. The amount pipe necessary to make a coil boiler for such an engine? A. There should be pipe enough in coil boiler to give
not less than 300 feet surface. (33) W. F. K. writes: I bave a small stream of spring water about 20 inches square, or rather 20
square inches as it runs, that is 10 inches wide and inches deep, could raise the head to 20 feet high. Would like to know the best water wheel to get, and what
would be the greatest amount of power that could be got out of the water under a 20 foot head? A. We canthe quantity of water per unit of time. A turbine is the best wheel for you. Address dealers who advertise in our columns.
(34) M. F. J. asks: 1. Can a reliable watch taking shocks from a small induction coil? A. No 2. Can an induction coil be compared to a dynamic
machine for lights? A. No, it would be impossible to machine for lights? A. No, it would be impossible to
substitute onefor the other. An induction coil isnot adapted to electric light purposes,
(35) W. C. B. writes: 1 bave tried to put up an acoustic telephone, from office to dwelling, dis-
tanceabout 200 feet, and cannot get it working satisfactory. There seems to be too much vibration or buzzing noise in the diaphragm, as though the words
spoken could not get out fast enough. Will you please state through correspondence column, Scientific
Ambrican, where the fault lies? My boxes are $6 \times 6 \times 6$ inches, with drumhead diaphragm 6 inches square,forming a slight cone, with a cover over the front and
around hole of $4 \not / 2$ inches in that cover, forming a small chamber in front of diaphragm of about half an inch. Back of diaphragm I have packed cotton to partly take
away that vibration. I use common iron wire insulated with string (wire is about one-thirty-second of an inch thick), forming four right angles. Wire is moderately and strings to form the angles. There seems to be no difficulty as to quantity of noise: we can lear that very
plainly 20 feet away from box; only as to distinctness, plainly 20 feet away from box; only as to distinctness,
we have experimented every way, and cannot strike the we have experimented every way, and cannot strike the
right thing. A. Your diaphragm is too large. Make it from 2 to $2,1 / 2$ inches in diameter, of thin sheet iron (ferrotype plate) or tin, and turn your corners with an angle less acute than a right angle; that is, use
three suspenders at the corners insteal of one.
(36) Dr. N. J. S. writes: When sheets, handkerchiefs, and other linen or cotton fabrics are sudd or boiled in lye. the staindisappears. When the
articles are ironed, however, the heat causes the stain, Which lonks like a grease spot, to reappear. Neat
patients complain that their bed linen and clothing is
thereby rendered unfit for use. What is the remedy A. The best way is to put the stained pieces to soak fur ten orfifteen minutes in a quantity of deodorized benzine (a common commercial article) sufficient to
completely cover them. Wring out aud hang up the pieces for about ten minutes, when they will have dried sufficiently to put in the soap suds.
(37) J. A. D. writes: I have a Niagara pump. 4 inches suction and 2 inches dscharge, and I canright. Can it be made to pump hot water $\%$ The valves and rings are all metal. The heater is an old boiler (with
the flues taken out and the ends closed up), 24 feet long, the flues taken out and the ends closed up), 24 feet long,
40 inches diameter, and the exhaust goes through it. Cold water1s pumped into the heater with a Blake pump The heater sits 4 feet above the pump, and it is to supply seven boilers 25 feet long, 40 inches dameter, with
two flues carrying 90 lb . of steam. As soon as the water gets hot in the heater, after running half an hour it pounds bad and blows out the packing from the wate cylinder. I took off the air chamber, and it worked a
fittle better, but n ot much. A. The hot water produces a vapor in the pump which prevents the valves from pump; it would work better if the tank were 10 or 12
feet or more above the pump instead of 4 feet; any
good force pump will pump hot water if the supply of
water is a goo height above the pump. Write the (38) H. O. asks how to charge borseshoe and bar magnets. A. The quickest and best way to
magnetize steel bars is to place them centrally in magnetize steel bars is to place them centrally in
a suitable coil, and then connect the helix with the wires from a dynamo-electric machine or powerful bat-
teryfor a few seconds, remembering to break the curteryfor a few seconds, remembering to break the cur-
rent before renoving the magnet from the coil. If the source of the current is a dynamo machine, the coil should be about $2 . \frac{1}{6}$ inches long, and should consist of
tenor twelve layers of No. 12 magnet wire. If tenor twelve layers of No. 12 magnet wire. If a battery is used, a coil $11 / 2$ inches long, composed of fourteen or
sixteen layers of No. 16 magnet wire,will be the best. The sixteen layers of No. 16 magnet wire,will be the best. The
internal diameter of the coil should be only large enough to admit the bars easily. A battery of six Grenet elements, each having an effectivezinc surface of 30 square inches connected in series, will do the work very well on small magnets; such, for instance, as are used in made at one time the bars may be magnets are to be made at one time the bars may be passed in a continu-
ous line through the coil, always keeping three bars in contact end to end, adding one above the coil before taking one off below. In this manner sixty bar magnets have been strongly charged in ten minutes. Horseshoe magnets cannot be charged so readily. There are two
or three ways of charging them. One way is to place or three ways of charging them. One way is to place
them in contact with the poles of a very strong electromem in contact with the poles of a very strong electro-
magnet, removing them after breaking the current; magnet, removing them after breaking the current; coil adapted to the currentto be used; and still a nother method is to employ a single coil, inserting one pole of the magnet into the coil in one direction, thus breaking the current, and inserting the other pole into the coil from the opposite direction. It is well to remember that the magnet will be very much impaired if the current
is not broken before removing it from the coil. is not broken before removing it from the coil. The
secret of success in charging magnets is to have a strong current It is impossible to make magnets satisfactorily of steel best all-important this purpose, machinery steel, hardened and not tempered, answers admirably. For
horseshoe magnets German spring steel is the best. horseshoe magnets German spring steel is the best. Tool steel answers well if hardened and drawn to a straw
color. The steel receives its maximum charge almost color. The steel receives its maximum charge almost
instantly. It is useless to allow it to remain under the infiuence of the magnetizing current more than a few seconds.
(39) E. R. T. asks how to make pure oxy gen gas. A. Mix pure crystallized potassium chlorate
with about one-quarter its weight of pure black oxide with about one-quarter its weight of pure black oxide with large delivery tube, until the gas begins to come over. Conduct the gas through a large empty bottle (to avoid accident by back pressure), then through a strong
solution of iron sulphate (copperas), and then through solution of iron sulphate (copperas), and then through
an iron tube several feet in length, filled loosely with fresh quicklime in granular lumps (free from dust) swers well enough if the air from the lungs is expelled through the nostrils, or so as not to contaminate the contents of the bag. The heat should be continued
under the retort with caution to avoid too rapid a disengagement of the oxygen until no more gas comes
(40) O. E. C. asks for a receipt for white wash for out-of-door work. A. For brickwork exposed to damp take one-half peck wellburned quicklime, fresh
from the kiln, slake with hot water, enough to reduce it from the kiln, slake with hot water, enough to reduce it clean white salt whitch has been dissolved in a small quantity of boiling water, and a thin smooth paste, also hot, made from 1 pound fine rice fiour; also one-quarter pound best white glue, made in the water bath. Mix
together, stir well, and one-quarter pound best Spanish together, stir well, and one-quarter pound best Spanish
whiting in 5 quarts boiling water, stir, cover over to rewhiting in 5 quarts boiling water, stir, cover over to re-
tain heat and exclude dust, aud let it stand a week. Heat to boiling, stir, and apply hot. The above proporto refine cider for family use? A. See pp. 394 (7) and (15), vol. 39, and
tific American.

Minerals, etc.-Specimens have been received from the following correspondents, and examived. with the results stated:
F. C. R.-Iron pyrites-sulphide of iron--contains containing much sulphur--E. S. H.-1. Encrinites or containing much sulphur--E. S. H.-1. Encrinites or
stone lilies. 2 . Niagara limestone.
3. Fibrous talc.
-R. McA.-A variety of fine silicious clay.
COMMUNICATIONS RECEIVED.

## On the Mound Builders. By w. O.C.

## INDEX OF INVENTIONS

## Letters Patent of the United States were

 Granted in the Week EndingMay 10. 1881.
AND EACH BEARING THAT DATE
[Those marbed (r) are reissued patents.]

A printed copy of thespeciff cationand drawing of an
patent in the annexed list. also of any patent issued patent in the annesed list. also of any patent issued
since 1866. will be furnished from this office for onedol lar. In ordering please state the number and date of the
patent desired and remit to Munn $\&$ Co., 37 Park Row New York city. We also furnish copies of patents
granted prior to 1866 ; but at inceased cost granted prior to 1866 ; but at ncreased cost. as the speci
fications not being printed, must be copied by band. Advertising inkstand, A. I. E. Knight............ 241,380
Air brake apparatus, F. W. Eames ........21,323, 241,325 Advertising inkstand, A. I. E. Knight........ $1 . . .241,38$
Air brake apparatus, F. W. Eames ........211,323, $241,31,35$
Animal trap, J. Quigley....... Animal trap, J. Quigley......... .......................241,155
Annunciator index, electric, W. R. Cole. ...... 241,305 Atomizer, A. F. Elliot....
Axle, carrtage. H. Klllam Axle. wagon, J H. \& E. M. Kelier
Bag machine Bag machine, D. Appel.......
Baling press, P. K. Dederick
Band wheel, J. W. McKee..

Barb making machine. M. W. Watkins...
Barrel trussing machine, E. \& B. Holmes
 Bed bott om, spring woven wire, Dunks \& Ryan
Bed, folding, E. S. Grifith Belt, grain conveyer, L. R. Fix. Belt, sand, J. Obart.
Belting, A. E. Foth. Blasting powder, T. P. Sleeper............................
Bleachingand dyeing cotton, process of and apparatus for, F. Wilkinson. .....................
Bilge water, apparatus for discharging, J. J. De Kinder................. ...... ..... Boiler furnace, steam, H. McElroy
Boiler furnace. steam,
, D. Ory Bookcase, revolving, J. Danner.........
Bootand shoeguard, D. A. McDonald Boot and shoe soles, machine for moulding, J. B. Johnson ........................
Boot and shoe tip, J. W. Rogers
Booner. J. W. Dowler....... Bottle cooler, w. Keech.
Bottle stopper. B Bottle stopper. R. F. Osgood.
Bottles, crate or basket for Bottles, crate or basket for carrying, J. Close. Boxes and cases. provisi
Bridle bit. R. W. Jones...
Buckle tug J.

## Buckle, tug. J. S. Nelson... Burialcaskets, outer

 Burialcaskets, outer case for, , .............Cable ways, switch for endless, H. Casebolt. Can, nozzle, J. W. Farrell.. Can sealing apparatus, J. A. Woodbury.... Cap and process of manufacture, D. W. North Car and feeding device, stock, J. A. Hay
Car brake, automatic, D. S. Randolph.... Car brake, automatic, D. S. R.
Car brake reel attachment. I. H. Randall..
Car coupling, W. J. Stet hem....... Car coupling, W. W. Stet hem
Car, stock, H. Illowaytt al. .

## Car, stock, I. Kitsee et al. Car, stock, M. F. Seeley ..


 Carriages, paras
Cart, self-loading, J..... . ...........
Chain, ornamental. H. A. Church.
Chandelier for burning oil, A. P. Steinmeyer. Churns, etc., cover fastening for, Davis \& Mister. Cigarns, etc., cover fastening for, Davis d , Mister.
A. C. Schutz.................................... Clgarette machine, pocket, H. W. Thurston... Coffee, etc., machine for cleaning, scouring, and polishing, J. Burns. . ................................................... Collyrium. M. s. Judah .241,294, 211,295

Comb, J. Hart....... .
Comforter, H A. Stearn
$\ldots \ldots . . . . . . . . .241,292$
241,126
Comporter, H. A. Stearns.............................

## Brinkerhoff.

## Cenveyer, H. A. Barnar

Cork cutter, R. S. Noyes.
Corn husker, field, C. A. Penningto.....
Cornice, window, J. M. Mont
Cornice, window, J. M. M.
Corset, W. J. Brewster..
Corset, J. A Ordway
Corset, $\mathrm{C} . \mathrm{J}$. Brewster...
Corset, J. A. Ordway....
Coton picker A.
Cotton picker, A. R. Nixon.....
Crozing machine, R. B. Mitchel
Crozing machine, R. B. Mitchell
Cuff or wristlet, I. B. Kleinert...
Cuff or wristlet, I. B. K. Keinert.
Cultivator, sulky, N. Dulaney
Cutter body, C. R. Wilson ..
Cutter frame, w. Bruening.
Cylinders, machine for straightening and holdin
sheet metal, D...........
Desk and bedstead combine
Door check, J. H. Coffman
Door check, J. H. Coffman..
Drums, hook attachment
Drums, hook attachment to....... J. c....... .
Ear jeweis, fastening for, G. W. Washburn
Ear jeweis, fastening for, G. W. Washburn....
Edible composition, L. M. Haskdns.
Ejector, air. F. W. Eames.... .....
Electric circuit, W. w. Jacques...
Electric machine, dynamo, w. Elmore.................
Electric machines, armature for dynamo, Sawyer
\& Knowles..
Electric wires

W. C. Allison.................
End gate, wagon, A. C. Badgley
End gate, wagon,

End gate, wagon, A. . Bary....
End gate, wagon, W. Emen
Evaporating pan, J. E. Weave
Evaporating saline and other liquids, process of
and apparatus for, J. E. Weaver.
Faucet, TV. F. Conklin.
Faucet, filtering, W.
Faucet, filtering, W. M.
Feed rack, F. A. North
Felles, machine for
Fellies, machine for troughing metal plates for
Fences, manachine for twisting barbed wire
T. V. Allis...................... ............

Fertilizers fr
dermann.
Fifth wheel

Flle, billee, vehicle, J. B. Tainter
Flle, bill, J. E. Gorman
File, bill, C. W. Lord ..
Filter, J. Grant...........
Filtering tank, A. Gel
Finger ring, D. Untermeyer..............
Firearm, breech-loading. J. W. Wilson.


Flower pots, wire window rack for. H. R. . Van Epps.
Fluted trimmings, machine for making, Kersten

## $\underset{\text { Fruit drier, G.C. }}{\boldsymbol{\&} \text { Shaup }}$

Fruit drier, G. C. De Lam
Fruit drier, G. S. Grier.,
Fruit in boxes,
Fruit in boxes, machine for packing evaporated
N. S. Gilbert
Furnace door attachment. A.J. Simmons...
Furnace door attachment. A.J. simmons.....
Gas apparatus, Granger \& Collins, Jr.
Gas, apparatus for obtaining an illum
as, apparatus for obtaining an, illuminating and
heating. E. B. Neynolds.........................

Gases and vapors, apparatus for combustion of
J. P. Gill. . ................
Globe. time. L.
Glucose, mavet (r)...

241,256
211.139

Governor for cot tongins and cotton gin feeders,
L. D. Forbes L. D. Forbes ..................................
Grain, etc. apparatus for pulverizing and granu-
lating, A. Mechwart . 241,470
.
241.397
 Grain conveyer, L. R. Fix..
Grate, fre, T. R. Houston Gun, machine, D. C. Farring Hame fastener, J. Gilsun...
Hame fastener, J. Hame fastener, J. Lépine..
Hameloop, A. Arter Hammer, bush. J. B. Sullivan. Harrow, spring tooth, A. J. Nellis................................241.485 241.12 Harvester, J. P. Adriance......................................................61,299
Harvester, C. J. Lilloe ................29
Harvester guard finger. E. S. Snyder................ 241,436
Hat bodies, etc., machinery for feiting, J. T. War-
ing...................................... 241,46
Hat felting process and apparatus. G. Yule.......................21,266
Hat sizing machine, G. Yule....................... 241,268
Hay and cotton press, W. W. F.Liddell.......... 41,884
Heat and power in cities, system for distributing,
Heat and power in cities, system for distributing,
J. Newton.............................. 241,40
Heel shave blades, making, O. E. Dunham ....... 241,32,
Ifide and pelt working machine, E. D. Warren.... 241,171
Hides, machine for boarding and breaking raw,
Hides, machine for boarding and breaking raw,
W. Coupe.............................................3148
Hinge, Baush \& Fleming................... 241,280

Hoof parer, H. L. Watts.........
Horse detacher. H. L. Watts...
Horse toe weight, p . Broadbooks
Horse toe weight, $j$. H. Fenton..
Horse toe weight, J. H. Fenton..................... $2411,1,131$
Horseshóe, E. . Folger ..................
241.34
Horseshoe nails, machine for forging, L............ 24 . 241.341
Hub band, detachable interior, W. I. Atwood
Hub band, detachable interior, W. I. Atwood.. .. 2411177
Hydrant, R. Peet............................154
Hydrant, R. Peet...................
Hydrocarbon burner, J. S. Hull..
Hydrocarbon burner, J. Donald.
Hyarocarbon burner, J. Donald.
Iridium, fusing and moulding, J. Houland............. 24112121
Kettle, steam, F. K. Clarkson.
Kettle,steam, F. K. Clarkson...................... 241
Knit fabrics while being cut and sewed, device
Knit fabrics while being cut and sewed, device
for securing, s. Arnold.............................1116
Knitting machine, H. c. Shaw................ 241,162
Lamp, J. M. Carnahan
Lamp. W. M. Jackson.
Lamp. W. B. Rnbins...
......... 241,291140
$\ldots \ldots .{ }^{2411,42}$
$241,417,24141$
Lamp. W. B. Knbins........ ......................... 241,422
Lamp burner, E. . Requa ........... 241,417, , 2411418
Lamp bracket, suspension, B. Porter........... 241,116
Lamp, electric. c. A. Hussey .... ...................... 241.366
Lamp, electric, Sawyer \& Street ............... 241,430
Lamp, electric, Sawyer \& Street .......................................411,127
Lantern, A. M. Duburn ..........
Lantern, A. . . Duburn ................................ 241,148
Lantern lighting device, G. L. Sackett........
Lantern, signal, J. H. \& J. M. Williamson ....... 241,263
Last. F. H. Holden ........................
Latch, locking, P. Lacroix................
Lead and crayon holder, J. Hoffman.

Leather scalloping machine. 1. P. Hall | ... 21,225 |
| :--- |
| ... 241,362 | Leather scalloping machine, 1. P. Hall.............. 241,1135

Leather skiving machines, cutting disk for, C.

Loom pickers to their staves, attaching, P. T.

Measuring machine, cloth. A. \& S. S. Ross........ 24142
Medical coupound, A. Lange.......................... ${ }^{241,144}$
Metallic objects from rust, etc., protecting,'ग.J.
Metalic objects from rust, etc., protecting, T. J. ${ }^{\text {Mayall } . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .241,230 ~}$
Middlings purifler,L. Gathmann..........................................1123
Middlingspurifer, W. Tucker................
Milk. centrifugal machine for creaming, D. M.
Veston..............................................1212
241,290
Millstone driver and rynd. H. W. Vit
Millstone sharpener, P.Graham.
Mitten, knit, C. E. Wakeman...
Mop wringer, W. Taylor
Mordant, s . Mellor..
Motion, device for converting, J........ .......... 241,149
Music boxes, spring motor for, R. Karrer.......... 2411,177
Music boxes, spring motor for, R. Karrer..........
Music rack, C. Parent... .......
Nutlock a and bolt, A. McKenney.
Oatmeal machine, L. G. Thorp...............
Ore concentrating machine, A. M. Rouse
Ore roasting furnace, N. M. Langdon....
Packing, piston, iv. Temple
Packing, piston, iv. Temple ..... .................... 241.247
Packing, valve stem, C. C. Jerome (r).........
9,i0
Padlock, G. M. Barth. .
Pantograph, W. V. Osthout. ...... .............. 241,23
Paper bag machines, former for, D. Appel.. ..... 211113
Paper box. B. Osborn,.......................... 2414140
Paper mills. trimmer and slitter for, J. M. shew.. 241.431
Paper pulp from wood, machine for manufactur-
ing, E. M. Ball.
for making, A. Dean........ ........................ 241,311
Pen, fountain, F. Holland .............. 241,215
Clifford...................................... 241,302
Photographic camera lens. A. Steinheil....241,37, 241,438
Photographic camera lens. A. Steinheil....241,437, 241,438
Planoforte frame, upright, A. H. Hastings...... 241,212
Piano legs. machine for shaping, W. Dietrich..... 241,316
Pigeon starter, J.J. King ......... ................
Pipe coupling, F. W. Eames.,
Pipe coupling, S. T. Williams.
Pipe cutter. Jacoobs \& Jame
Pitcher, ice. J. H. Brown...
Pitcher or mol asses jug. cream, J. M. Bauman ...............141,291
241,18
Planing machine. metal. E. A. Thwing.. .......... 241,448
Planter, corn. A. . Evans.................. 211,29
Planter, corn. A. C. Evans..
Planter, corn, B. P. Snyder...
Planter, cotton. J.
Planter, cotton. J. G. Walton ........................... 24,
Planters, check line guide for corn, G. D. Hawort.
Post office drawer, steinmetz \& Chambers. ...... 241,439
Printing machine, s. D. Tucker. ....................... 21
Printing press, C. B. Cottrell (r).... .......9,700,
Printing press, C. B. Cottrell (r).....................700,
Printing press, oscillating, F. H. Richards...... Printing press, oscillatirg, F. H. Richards.......... 241,421
Processing apparatus, F. C. Nicodemus......... 241.46
Prosle gaupe, D. Ruge.. Profie gauge, D. Ruge.. ............. ............ 241,241
Propeller blade, perforated, H. D. Deane......... 241,121
Pump, force. F. W. Eames.................. 21133 Pump, force. F. W. Eames......................................2411,355
Pump, force, C. Verniaud........45
Pumps, gearing for operating a series of, F.
Crocker ............................. 241,19 Rag picking macbine, T. Kershaw....................
Railway frog. F. C. Weir................. Railway signal apparatus, electric, W. B. Sykes. Railway switch, F. C. Weir.................
Railway switch. automatic. R. P. Garsed...
Railway tie, W. C. Lutz................. Reaper and mower. combined, G. O. Proper Refrigerator, J. Morgan .....................
Refuse conveyer, pneumatic, P . Thorpe... Refuse conveyer, pneumatic, P. Tho
Rendering lard, etc., O. F. Boomer..

