(29) W. B. R. asks how to soften hard cast iron so that it can be filed and fitted easily. The cast-
ings we want to use are so thin that heating breaks ings we want to use are so thin that heating breaks
them. A. The metal may be superficially softened by packing the pieces in an iron box, heating the whole to redness and keeping up the heat for twenty-four hours
or more. The contents of the box must be allowed to or more. The co
(30) T. M. inquires as to the action of glue on porcelain, when allowed to dry in a porcelain evaporlake off. The glue causes the glazing to crack an flake off. I placed some glue in a glass vessel, and
found that when it solidififed and contracted it caused the glass to flake. If this is a common case I have failed
to notice it before. Is it due to mechanical action to notice it before. Is it due to mechanical action
alone? A. The fiaking of porcelain and glass surfaces alone? A. The fiaking of porcelain and glass surfaces
by glue in drying has been frequently noted. The ouly to mechanica 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 pamated copper plates, using cyanide of potassium to clean
plat with, but cannot get the plates in good order, the quick-
silver running off. What should we use to prevent this? silver running off. What should we use to prevent this?
A. Consult, Percy's "Metallurgy of Gold and Silver." A. Consult, Percy's "Metallurgy of Gold and Silver."
Address the book dealers who adverise in this paper. Address the book dealers who advertise in this paper.
Wash the plates with a strong hot aqueous solution of caustic potash. Rinse off thoroughly with water, then try the mercury,
cessary, at first.
(32) J. H. asks: 1. Is it la wful for any one owner of the patant, 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
$\begin{array}{ll}\text { 128, vol. } x \times x i x . & \text { 2. What would be proper size, bore of }\end{array}$ cylinder, and stroke for engine of steam launch, 33 fee
keel, 8 feet beam, to make seven miles an hour? 7 to 8 inch cylinder by 8 inch stroke. 3. The amount of pipe necessary to make a coil boiler for such an engine? A. There should be pipe eno
not less than 300 feet surface.
(33) W. F. K. writes: I have a small stream of spring water about 20 inches square, or rather 20
square inches as it runs, that is 10 inches wide and 2 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 can-
not tell anything about the power, as you do not give the quantity of water per unit of time. A turbine is the 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 be affected or made to go faster, on account of its owner
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 theother. An induction coil is not adapted to electric light purpose
(35) W. C. B. writes: 1 have tried to put
ap an acoustic telephone, from office to dwelling, dis. $u p$ an acoustic telephone, from office to dwelling, dis-
tance about 200 feet, and cannot get it working satistance about 200 feet, and cannot get it working satis-
factory. 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 state through correspondence column, SCIENTIFIC
AMERICAN, where the fault lies? My boxes are 6x6x6 Anches, with drumhead diaphragm 6 inches square,form-
ing a slight cone, with a cover over the front and ing 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 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 taut and does not touch anywhere but the diaphragm
and strings to form the angles. There seems to be no difficulty as to quantity of noise: we can hear that very 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 (ferrotype plate) or tin, and turn your corners with an (ferrotype plate) or tha, and turn your corners with an
angle less acute than a right angle; that is, use two or three suspenders at the corners instead of one.
(36) Dr. N. J. S. writes: When sheets, handkerchiefs, and other linen or cotton fabrics are
soiled with vaseline, and afterwards washed in soap 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 A. The best way is to put the stained pieces to soak for ten or fifteen 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 potp. 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
40 inches diameter, and the exhaust goes through it Cold water is 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 two flues carrying 90 lb . of steam. As soon as the water
gets hot in the heater, after running half an hour it gets hot in the heater, after running half an hour
pounds bad and blows out the packing from the water cylinder. I took off the air chamber, and it worked a
fittle better, butn ot much. A. The hot water produce 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 good height above
manufacturers of your pump.
(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 batteryfor a few seconds, remembering to break the cur-
rent before renoving the magnet from the coil. If the rent before renioving the magnet from the coil. If the
source of the current is a dynamo machine, the coil should be about $2 \not 2 /$ inches long, and should consist of tenor twelve layers of No. 12 magnet wire. If a battery
is used, a coil $11 / 2$ inches long, composed of fourteen or 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 telephones. Where a number of magnets are to be made at one time the bars may be passed in a continu-
ous line through the coil, always kceping 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 them in contact with the poles of a very strong electro-
magnet, removing them after breaking the current; magnet, removing them after breaking the current;
another methoo is to place each limb of the magnet in a 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. The is not broken before removing it from the coil. The
secret of success in charging magnets is to have a strong secret of success in charging magnets is to have a strong
current is impossible to make magnets satisfactorily without this all-important requisite. As to the quality of steel best adapted to this purpose, machinery steel hardened and not tempered, answers admirably. For
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
instantly. It is useless to allow it to remain under the infuence of the magnetizing current more than a few
(39) E. R. T. asks how to make pure oxygen gas. A. Mix pure crystallized potassium chlorate of manganese and heat the misture in a black oxide with large delivery tube, until the gas begins to come over. Conduct the gas through a large empty bottle (to solution of iron sulphate pressure), then throug 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 red uce it to a paste,and pass it through a fine sieve; add a gallon of
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 whiting in 5 quarts boiling water, stir, cover over to re-
tain heat and exclude dust, aud let it stand a week. tain heat and exclude dust, and let it stand a week.
Heat to boiling, stir, and apply hot. The above proporHeat to boiling, stir, and apply hot. The above propor-
tions will cover 40 square yards. 2. Also the best way to refine cider for family use? A. See pp. 394 (7) and tific American.
Minerals, etc.-Specimens have been recei ved from the following correspondents, and examined. with the results stated:
F. C. R.-Iron pyrites-sulphide of iron--contains containing much sulphur.-E. S. H.-1. Encrinites 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.
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