## 

HINTS TO CORRESPONDENTS

(7232) H. G. V. writes: 1. I tried to make some batteries. I cut lead plates about $6 \times 7$ and rough
ened them with a coarse rasp, put red lead pasie on each side, with strips of asbestic cloth next to each plate and a pecce of card board betrreen. Have six to elght plates
to each cell outside of the bunch. I put thin all and hold them together; each bunch is put in a bard ruber jar. I charged them once and got good results; current both times, wbich is 125 volts. and about 4 or amperes. Do not think they are short circuited. Pu
them in series with alternate fields. What them in series with alternate fields. what is the
trouble 9 A. For charging storage cells use a continuous current; place them in series. Allow $21 / 2$ volts for each cell. The remaining voltage of your current must
be disposed of by resistance coils or lamps, arc light preferred, since they carry more current than incandes cent lamps. Thus, if you have 10 cells, $10 \times 2^{\circ} 5$ volts $=25$ volts. If the current is of 125 volts, there remains 100
volts, which two arc lamps in series will use up. can cheaply make a coil of No. 10 bare iron wire for the that you can oo the charging at night, if you have any use ternator field If she $21 / 2$ volts per cell, which yo can easily measure; but with only 4 or 5 amperes, it will require 213 to 2 times as long to charge them as with 10
amperes. The probability is that the cells do not olts each when in series with the alternator field. since with the very low resistance of the cells. 2 . Should they
be charged in series or separately? If in series, would I get the same voltageper cell as when charged separately?
A. Storage cells are always charged in series. Put as many in one series as will use up the voltage of the cirthe circuit by $2 \cdot 5$; the quotient is che number of cells As many such series may be put in multiple as the cur to keep from spilling the fluid and keep the salts from creeping? A. There is no remedy for spilling. except to by coating the upperedge of the cell with prom creeping the edge of the cell into the melted paraffine. 4 If the edge of the cell into the melted paraffine. 4 If
the field of a motor gets hot on a warm day, would it ay to put an air blast on? A. If the heating is so great as to endanger the insulation, something should be done.
It indicates too strong a current in the field. An air blast might cool it; additional external resistance in series
(7233) A. B. J. asks : 1. Where can I obtain any information regarding size and description also what kind of carbon is used in the same made, and Scientific American, vol. 72, No the same? A. Sce on such $a$ used in arc lights, finely powdered, answer ame purpose ? A. Yes; but not quite as well as the
polshed granules. 3. What is meant by kilowatts or watt hours? A. A kilowatt is 1,000 watts. A watt hour is one watt of electric power flowing for one hour through a wire. 4. What is a Wheatstone bridge? A. A Wheat-
stone bridge is an instrument for measuring electrical resistance. We should advise you to study carefully Physics,'" chap. 6, is excellent.
(7234) T. B. B. writes : I have a small engine, the cylinder of which is $2 \times 4$ inches. Would yo
kindly tell me how large a boiler I will have to make to ork it economically? A. Your engine at 60 pound should pressure, ard with 150 revolutions per minut to one-half horse power, and will require
shoul will find a description and scale drawings for safe boile of the size you require in Scientific American Sup-
(7235) E. D. A. asks: Will you give the formula for a lasting luminous paint? A. We can
send you five papers on the subject of luminous paint on receipt of fifty cents, which will give you all the neces-
sary information.
$(7236)$ W 8 lighit dynamo described in Scientific American SupPLEMENT No. 60, to convert the same into a 550 vol
motor for direct current? A. You should not attempt t convert the dyamo of Supplement No. 600 into a mo or it; the number of turns for the armature coiis would lave to be too great, and the commutator could not in each coll of No. The armature would require 40 turn bly be used with a regulator of about 400 ohms
(7237) G. E. R. writes: Will you kindly solution to be used as a flux for brazing? What kind solution to be used as a flux for brazing? What kind of after brazing? I have been using borax as a flux, but
ind some difficulty in getting the spelter to flow into the joints, as the borax seems to fill and keep out the spelter.

I also tind the melted borax is very hard to remove after
brazing; of course dipping the hot parts into water would remove the surplus flux after brazing, but tempers the steel, which I want to guard against.
Borax is the only suitable finx for braziug. It should be ground with water to a creamy consistence on a small slab of stone made slightl| hollow on the surface to hol
the misture. Hard slate or a fine hard sandstone is mos suitable. Use a small brush and smear the surfaces tha are to be brazed, with enough outside to hold the spelte side of the joint will often flow through better than th side of the Jint Wse hydrocbloric acia and water equal
loose spelter. Une
paristo clear the joint of borax Have it hot and dip the work when cooled just below the red ; then the steel wil not harden. If the borax is not all removed, it may b
thoroughly cleaned off by boiling the joint a few minute in the acid water. See "A New Book on Bicycle Repairing," by Burr, $\mathbb{\$} 1$ by mail, which fully describes the est methods of brazing.
(7238) J. T. B. asks (1) whether would not be better to wind the induction coil (SUPPLi
mENT, No. $\mathbf{1 6 0}$ ) all the way across with silk covered wire AENT, No. the wire wouldcost more than it would be worth Would not adhesive tape be better for insulating pur more value than a porous cloth would be; the spark wou pass through it easily. 3. Would it be any thinner ? A
That would depend on the quantity you used, but it ot a suitable material for the purpose. The insulatio
f the primary coil must be impervious to air of the primary coil must be impervious to air. 4.
there any battery of higher voltage than the bichromat cell? A. No practical battery. The bichromate battery our paper describing some experiments with alternatin electricity, for which I could use the alternator described in an issue of three or four weeks ago? A. See Supple-
MENT, Nos. $762,763,792,847$ and 855 . 6. Can you give Ae a formula for a liqui
(7239) W. G. M. says: I write you fo little information. I am repairing a water mill with turbine wheel, and want your advice on the following
points: First we have 7 foot head or 7 feet over the whee nd the forebay or water house is 10 feet by 12 square.
Now what $I$ want to know is, shall $I$ have any more powe if I make the water house larger, or do I gain any powe
by any water outside of the wheel or any waternot directly ing the whater bay of your wheel. The head or height of the surface above the wheel and the quantity of wate is the measure of your water power. If your race i early full head, the race should be made larger, and no
(7240) S. L. asks: Which contains the reater number heat units-one ton of coal or one ba heating capacity of about $28,000,000$ heat units. A bat rel of petroleum ( 42 gallons, or about 275 pounds) has heating capacity of about $3,500,000$ heat units, or $1 / 6$ a
(7241) T. O. S. asks for the formula of
W. W. C. Hoover's pyro and potash developer:




To develop a $5 \times 8$ plate take water, 4 ounces; No
drachms; No. 2,2 drachms. If more intensity is uired, add more of Nos. 1 and 2 . More of No. 1 will
train and of No. 2 will accelerate.
TO INVENTORS.

An experience of nearly ffty years, and the prepara-
tion of more that one hundred tousand appications
or patent



INDEX OF INVENTIONS For which Letters Patent of the United States were Granted

NOVEMBER 9, 1897,
AND EACH BEARING THAT DATE.



THE TORPEDO BOAT TURBINIA.This article describes the construction of the Turbinia,
Wbich made such apbenomenalseed. Detailed draw-
ings howin arrangement of machinery ScIENTIIT
AMERICAN SUPLEMENT 1 2 .


GATES ROCK \& ORE BREAKER, Steam Ore Stamp, Mining Machinery, , in
moves Huy UJay You Like


 serviceable, and satisfactory in every way.
Waltham Watch Tool Co.,Springfield,Mass ARMSTRONG'S No. 0 THREADING MACHINE
 Can be atacted to bench or post
Desioned for for trieading the
smaller size of pipe, iron or or
brass, also bolt
 T DOES IT ALL!
YOUR FOOT DOES IT ALL : Rivett Bicycle Foot Power Which is invaluable to those who do
not bave steani or other power at
command. Poished cater iron table.
with true smo oth curface Heavy
wheel with regu lar motion and great er. Weight of all,
FANEULI WACHC
Boston, Mass.,


## Eyelet Machines.




