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## NEW BOORS AND PUBLICATIONS.

 The Worksiop. Von J. Engelhorn, Editor and Publisher. Stuttgart, Germany. An edition of this meritoriousillustrated art monthlyis now being published in English, and furnished to the is now being published in English, and furnisbed to the
American public by Messrs. Willmer \& Rogers of this city. For furniture manufacturers, decorators of dwellings, and public buildings, fabricators of gas fixtures, flreplace utensils, ornamental hardware, euch as door
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( 50 cents single number), and nay be had at the Willmer
$\&$ Rogers News Company, Beekran st., New York.' \& Rogers News Company, Beekman st., New York.! Tile Art Interciinnge.
A fortnightly journal devoted to art and household decorations. The mania existing among the more refined ing on china, ornamenting panels for furniture, em-
broidering curtains, and a variety of other work coming under the head of decorative art, has created a demand Or a newspaper to be devoted to these various subjects. Under the auspices of a dozen well known ladies in this
city, and under the editorial management of an energetic and talented young graduate of Princeton College, the pullication of The Art Interchange has been commenced, with very encouraging prospects of a successful
esistence. It is handsomely printed on a superior quality of paper. at the moderate price of $\$ 125$ a y year and will be found extremely interesting to those inter ested in woman's art work in all its branches. Persons
desiring to subscribe or to know more of the publication, should address The Art Intercharge, No. is Eas etreet. New Yor

## 

(1) J. H. asks how to prepare battery salt or Grenet batteries. A. It mas be prepared by triturat together in a dry atmosphere-
Potassium dichromate. about.
sulphuric acid, sp. gr. 188, abo
The dichromate should be perfectly 1 may, with adventage. kept from the air in glass. to preserve it in the dry state, strong that it very quickly destroys organic matters by contact at ordinary temperatures.
(2) E. R. writes: Suppose two locomotives in which the only difference is size of drivers (one having
5 foot, he other 6 foot wheels), using the same amount
of fuel and consequently of steam. Which will pull the
greater load a $t 30$ miles an hour, friction, etc, not greater load at 30 miles an hour, friction, etc., not being
consideredp $A$. We reply that, the steam being the
power, and the quantity of steam being equal in both cases, there can be no difference in the loads at 30 miles an hour. We do not, however, desire to be understood as saying that there is no difference in engines with 5 and 6 foot driving wheels. On the contrary, we believe locomots, when unrestricted as to fuel and not confined to wheels, when unrestrict a the largest load over an un dulating track in a given time between terminal stations. Such an engine will have the advantage on grades over an engine with larger driving wheels; and the more frequent exhaust produced by the more rapid revolution
of the 5 foot wheels wlll produce more steam, and conse of the 5 foot wheels will produce more steam, and conse-
(3) L. H. R., F.S., and others.-The dimen rions of the great electro-magnet at the Stevens Institute at Hoboken, N. J., are as follows: Total weight. 1,600 bs.; coil wound on 8 spools, each $91 / 2$ ins. high by $111 / 2$ nchescsternal diameter, 40 ins. of copper wire, one are split and the slits filled with vulcanite; the iron cores are hollow, 6 inches in diameter, 3 feet 3 inches long. It has a lifting power of several tons; some have estimated it at 30 tone.
(4) W. C. R. asks: 1. What pressure should be driven by an air blast having a pressure of about 4 inches of water. 2. Is it made by ordinary circular fan? A. Yes. 3. Is the sand let into the air passage from a
hopper of its own gravity A. The sand is introduced hopper of its own gravitys A. The sand is introduced
coops.
5) J. F. B. writes: 1. There appears in your Scientific American Supplement, No. 157, an article on inks, in which appears A Brimiant Red Ink." getting it very bright. Would you please inform me the reason, and give a recipe for making vermilion ink or
red ink (not carmine)? A. Use more or better Brazil wood, and concentrate your solution. Aqueous solutions (strong) of aniline red or scarlet make very bril-
liant, but, unfortunately, not very permanent red inks. liant, but, unfortunately, not very permanent red inks. this with quite col days, and decant the clear liquid.
2. How to correct sour sirup. A. Heat the sirup to the boiling point, strain through a piece of linen, and hrough fresh boneblack.
(6) Subscriber asks: Where will I find Edion's tasimeter describeds A. In Scientific Amprican (7) p .
(7) N. T. R. asks why it is that malleable castings, heavy ones especially, are nearly alwaysfull of
flaws and blow holes. A. We do not think this state. flaws and blow holes. A. We do not think this state-
ment is generally true. When such flaws occur. as a rule, it is on account of some deffciency on the
the mould, the moulder, or the material used.
(8) F. B. H. asks: What amount of Lehigh or other hard coal is necessary per day to heat 1,000
cubic feet in flrst-class stone building with any of the best hot air heaters? I want the average, or as near as
you can give it, weather such as we have had since Deyou can give it, weather such as we have had since De-
cember 1, 1878. A. If the building has only to be heated in the day time, we think it might not require more than 100 pounds of coal in 24 hours. We should be glad
to receive data on this subject from those of our readers who have kept records.
(9) J. F. B. suggests the following experiment to show that the action of a telephone diaphragm

ordinary telephone, to the center of whose diaphragm 10 or 20 feet long), by frrst stringing through a may be parchment about one half inch in diameter, knotting, and then gumming on to the middle of disk, it is secured: the other end is connected with a small parch-
ment drum. D. 2 inches in diameter; the string is kept ment drum. D, 2 inches in diameter; the string is kept
taut. A sound now produced in the sending telephone taut. A sound now produced in the sending telephone
will be distinctly heard in the drum connected with the will be distinctly heard in the drum connected with the
receiving telephone, and conversation can be kept up at the drum, D, not as clear. of course, as at the receiving telephone, but the results are suffclently conclusive, for
no sound could be transmitted alongthe stretched string unless the telephone plate had vibrated. This. I might venture to say, goes to prove that the sound at the re-
ceiving telephone is due to the attraction of the diaceiving telephone is due to the attraction of the dia-
phragm by the magnet, in virtue of its variation of mag-
(10) E. B. sends the following directions for (10) E. B. sends the following directions for
drilling glase: Take a common drill, run a little fast; do not press cn, the weight of the drill press is enough. Drill from both sides, seeping the glass and dril wet
with turpentine. Be very careful when the two holcs meet not to let the drill catch. After a hole is made
large enough for a small round file, flle to the desired size, keeping the file and glass wet with turpentine.
(11) J. H. P. asks: 1. If I drop the end of a telephone wire into a well of water, or into a tub of
water through which a stream is constantly running, water through which a stream is constantly runni
will it constitute a sufflcient ground connection? Yes. 2. Will fine brass or copper wire the sizeof a com mon pin answer for the line wire ? A. Yes. 3. Does it
require to be insulated, the distance being 400 feets A require to be insulated, the distance being 400 ieety A .
It should be supported on insulators. 4. Will such a wire connecting two houses be a source of danger during thunderstorms? A. It would be prudent to employ lightning arresters. 5. Are the phonograph and
the carbon telephone now in the market? A. Yes. 6. Why does condensation take place in a stove pipe 9 . It is usually owing to a great length of
pipe between the stove and chimney. which condenses pipe between the stove and chimney. which condenses
the vapors resulting from combustion before they can
(12) G. S.-To prepare geod cider, choose ripe, sound apples, sweat them in small heaps for a few hours, and wipe dry. Then grind them, place the pomhair cloth, in a suitable screw press, and apply the pressure As the juice runs from the press strain it through a hair cloth sieve into a large open cask cap-
able of holding all the juice to be expressed in one day. In a day, or sometimes less, the pomace will rise to the op and grow very thick. When little white bubbles break through it draw off the liquid through a spigot placed about 3 inches abovethe bottom, leaving the lees
behiud. The cider must be drawn off into very clean casks, and repeatedly racked off until the first fermentation is over, which is known by no more of the
white bubles, before mentioned, forming. Then add white bu bbles, before mentioned, forming. Then add
a gobletful of sweet oil to each cask, fll it up with cider a gobletful of sweet oil to each cask, ill it up with cider
in every respect like that contained in it, and bung up tight. Sugar orglucose is somettmes added at this stage -8 to 15 pounds to the barrel, according to the charac-
ter of the apples used-sweet or sour. When the cider has attained the proper taste, add one quarter to one half pound of isinglass dissolved in some of the cider, and then about one quarter pound (not more) of freshly prepared sulphite of lime (common preserving powder), and draw off, after shaking and allowing to settle, into very clean barrels, or bottle. The sulphite (which must
not be mistaken for sulphide) preserves the cider perfectly.
(13) R. N. asks if ferrocyanide of potasstum is made in this country, and what is the process
of manufacture. A. Yes. It is usually prepared by of manufacture. A. Yes. It is usually prepared by
heating to redness potassium carbonate with dried and heating to redness polassium carbonate with dried and
partially carbonized horn, or other similar nitrogenous substance, and iron flings, digesting the black mass with hot water, from which the salt is afterward crystalized be: 100 of potaseium carbonate, 400 of nitrogenous coal, and 10 of iron flings. The furnaces used are somewhat
similar to those illustrated on p. 33, Wagner's "('hemical Technology."
(14) J. B. W. writes: I wish to ask if it is a fact generally known that the sun when in partial the sun not eclipsed; in other words, when the sun looks like a new moon all shadows are new-moonlike in shape? A. Under favorable conditions the light from the sun, shining through a small opening in an opaque
body, will form an image of the sun on the surfaceupon which it strikes. When the sunlight falls through the foliage of a tree, multiplied images of the sun will aptake the form of the visible portion of the sun.
(15) C. W. G. writes: I have an old cistern (cemented) about 6 feet deep by 6 feet in diameter (round) If I pack it with ice will the ice keep, or would ground, and in a shady place. The cement is whole and good. A. We think this arrangement would not prove very economical. You will fnd much useful informa-
tion respecting the preservation of ice in Nos. 38, 55, 99, and 116 Scientipic American Supplement.
(16) H. A. M. asks: What shall I use to black brass, and so that it will not peel when bent? $A$.
Dip the articles bright in nitric acid. rinse in clean water Dip the articles bright in nitric acid. rinse in clean water. Hydrochloric acid, 12 lbs.: ferrous sulphate (copperas), 1 lb ; arsenious acid (white arsenic), 1 lb . When taken out, rinse in cold water, dry in sawdust, and pollsh with
blacklead or lacquer as desired. (17) H. C. W. asks: 1. How shall I melt the paraffine to be used as a coating on the plaster of Paris cylinder for the phonograph described in Supmis-
MENT No. 1339 A. Make the plaster quite warm. and rub on the paraffleas long as it will melt and soak in. 2 In wish to know whether it will make any difference in the power of common horseshoe magnets toriveta number of them together? A. A compound magnet is
stronger than a single one of the same size, but its stronger than a single one of the same size, but its
strength is not equal to the combined power of the several magnets of which it is composed when they are separated.
(18) A. M. P. asks: In transmitting messages by the telephone long distances, say 100 miles or more, is a battery with electricity used to iransmit the
message? A. A battery is used with Edien's telemessage A. A battery is
phone. Bell's requires none.
(19) A. B. asks: 1. What is the difference between the actual falling velocity of water and its theo-
retical falling velocity? A. Little, if any. 2. If a broad retical falling velocity? A. Little, if any. 2. If a broad
belt pase over two pulleys 12 feet apart, one above the other, and upon this belt at short intervals are fastened buckets similar to flour elevators, and 10 feet from the bottom of the lower pulley a jet of water fills these buck ets as they pass, so that the combined weight of the buckets from where they are filled to the hottom of the
lower pulley, where they are emptied, is 1,000 pounds, lower pulley, where they are emptied, is 1,000 pounds,
and this weight thus acting causes the upper pulley and this weight thus acting causes the upprep pulley
which is 50 inches in diameter, to make 70 revolutions per minute when meeting with no resistance, what is the horse power of this pulleys Now, if the pulley is
made to drive machinery. so that lts speedis reducedone half, the weight remainmg the its speedis reducedone the same, or only one half of what it was in the frat case? A. The horee power is the weight in pounds mul
tiplied by the distance in feet it moves per minute divided by 33,000 . So that, when the speed is minute d to one half, the horse power is diminished in the same
(20) T. B. L. asks: Will the temperature of inside of a mase of ice fall much, if any, below the freezing point, notwithstandir.g the surrounding atmo-
sphere may be at zero, or below zero? A. Yes. The temperature of the ice under the conditions assumed would vary with the temperature of the surrounding ai on common with other solids of a similar nature, unde milar conditions.
(21) M. J. H. writes: 1. I have tried the re ceipt given in one of your late issues for making gelatine
moulds for plaster castings. The mould is a success, moulds for plaster castings. The mould is a success,
but. the face of the cast is cestroyed by the glue. Can you tell me how to overcome this diffculty? A. Coa
the mould uniformly with a fim of oil. 2. Could you
ive a receipt for painting plaster casts, so as to render
hem impervious to the action of the weather? A. They them impervious to the action of the weather? A. They
are warmed and saturated with melted stearine or parapfine wax. The former is preferable. Soluble glass is
also used.
Minerals, etc.-Specimens have been received from the following correspondents, and examined, with the results stated:
F. W.D., Jr. - No. 1. Bornite-composed of sulphur 25, copper 63, and iron 12 per cent. No. 2. Epidotewater 3 per cent.-M. T. F.-It is not tin ore. The quartz contains augite and epidote.-S. H. M. -The ore contains a large amount of manganese oxide. Its value
can only be ascertained by assay. It is worth assaycan only be ascertained by assay. It is worth assay-
ing.-J. K. M.-No. 1. Marcasite-iron 46 , sulphur 54 per cent. Not an iron ore. No. 2. A ferruginous clay stone. No. 4. This ocher, if properly ground and calcined, may have some market value. No. 5. An impure limonite iron ore.-F. and M.-It contains gold, of the variety known in works on mineralogy as "fool's gold " or iron pyrites-composed of irou and sulphur. E.B.S.-It is not sulphur as suggested, but iron sulphate, arising from the decomposition of $p$ rites. It is scluble in water, from which it cryetal lizes upon craporating the
solution slowly. It is used extensively in the arts,J. C. U.--The crystals are quartz ; when small and perect they are sometimes employed as cheap Imitation diamonds.-J. A. W.-It is zinc blende, of good quality, containing small amounts of cadmilum- -Z.Y. X.-The mall button consists chieffy of metallic iron.-W. J. B. -It is quartz.-L. H.-The quartz contains a notable
amount of silver, copper, and traces of gold. An assay would be requisite to determine the precise value of the re.-Poughkeepsie-No. 1. Gray limestone. No. 2. An ery, tiles, etc.-J. B.-It consists chiefly of iron sesquioxide, organic matters and clay, of little value.-J. B.It contains no silver. The crystals are iron sulphide-
pyrites.
Any numbers of the Scientipic American Supple. MENT referred to in these columns may be had at this
offce. Price 10 cents each.

## COMMUNICATIONS RECEIVED.

The Editor of the Scientific American acknowledges with much pleasure the receipt of original papers and On Wa
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Manufacture of Watches. By D. B. R
Aerial Navigation. By $<, ~ M$ On the ('aptive Balloon. By A. C. M
On Writing Mıdiums. By M. L. B.

## cofficial.

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Axle 刃ox lid, car, 0 . J. Miller

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Bosom board, F. Deming.
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Feed water heater, T. Murphy
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Fence, J. II. Bailey....
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Plow, J. I. Eavenson ................
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Rotary englue,, . Bazin..
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Tool, bench, J. H. Lewlis .....
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