(15) E. McL. asks: 1 . Is there anything cheaper than alcohol which is suitable for chemical manipulations-for burning in lamp? A. Methylic quite as useful.
(15) A. F. asks: Will you please inform me through your paper what preparation is used by
map makers to cover the brass plate before immersing same in battery in order to produce lines in relief? A. The varnish used is a solution of purifled asphaltum
(17) E. K. asks: 1. What could I mix wit pelter for castings so as to make it less brittle? A Use abour five per cent of tin and two per cent of cop er as alloy. 2. Referring to description of telescope, object glass? A. The form of the ordinary convex ens is such as to cause a slight decomposition of the
rays passing through it, making the outlines of objects when viewed throngh it more or less indistinct or col ored. These lenses, when corrected for color by the superposition of properly ground con
glasses, are called achromatic or color free
(18) O. L. C. asks: 1. What proportion in bulk should the quantity of black oxide of manganes bear to the fnely pounded carbon, as used in manga
fese batteries, to procure the best results? A. About one of carbon to one and three-fifths of manganese xide. 2. How long should a good manganese batter last, allowing the sal-ammoniac solution is renewed as its strength weakens, if the bell the battery rings ach time-the battery to consist of two cells of the battery? A. At least four months, if the connections ar erfect.
(19) F. S. W. asks: 1. Could you give me a good receipt for stove polish, either liquid or solid A. The best stove polish we know of is pure graphite ing and sifting. 2. Also a receipt for a starch gloss, have seen a gloss, and think it is made of borax an tarch. Will that $g$ other correspondents, this page. 3. Do you know an oodremedy for bedbugs? A. Genuine Persian (Dal matian) insect powder is effective when properly use Kerosene oil is also quite serviceable.
(20) C. L. W. asks: Please give me direc tions for making a paste for fastening photographic prints to cards, one that will not stain the print.
Use a clear, well boiled, rather stiff starch paste which has been added a few drops of clove oil. 2. Ca he gelatine film be removed from a dry plate negativ (after having used it to print with) and the glass re bichromate
(21) E. T. G. writes: I have dissolved some quicksilver in strong commercial nitric acid, and on standing a day..a quantity of crystals appear in the bot-
tom of the flask. According to U. S. P., nitrate of mer ury doesnot crystaliize. Now what have I in the flask t is not soluble in water, but in strong $\mathrm{HNO}_{3}$. Please reply in the columns of your paper. A. The crystals are doubtless mercuric and mercurous nitrate and nitrate
with probably traces of mercuric chloride. The nitrate with probably traces of mercuric chloride. The nitrat
(22) J. H. Z. asks: Can you tell me how to starch collars, cuffs, etc.., so that they will be stiff and
glossy, as those you buy at furnishing stores? A. Ad to one quart of the well boiled (corn) starch three ounces of loaf sugar. Use a polishing iron.
(23) C. H. W. writes: In using knitting machines I find some yarn breaks, which, if well oiled works all right; but he oil soils the paper bozes and ell me of any other method of softening the yarn that will not soil the paper? I have tried soap, but do no succeed with it. A. Have you tried glycerine?
(24) M. I. writes: In order to oxidize the ion of $\mathrm{NH}_{4} \mathrm{Cl}$ (salammoniac) in water. We use a solu action talkes place, and where does the oxygen com from? A. Chlorides in aqueous liquids oxidize b virtue of the inclination of their positive element t form hydrates or double salts. In these cases the oxy gen is obtained from the water. 2. Cau Georgia iro
(25) D. P. S. asks: 1. Could you tell me of a goodgrease for greasing cartridges? Have been using
beef tallow, but it melts too easy. A. Try pure stearic beef tallow, but it melts too easy. A. Try pure stearic
acid or stearine. 2 . Why does an ice boat sail faste than the wind that propels it? A. See pp. 38es, 340, and 381, Scientific American, vol. slii., and pp. 3402-3, No inent.
(26) E. D. S. asks: Will you please inform e, through the Scientific American (1), how I can tain a glass lamp chimney green? I have a great ded Jry painting the glass with a solution of waterglas (sirupy) stained with chrome green. Let it dry thor oughly before using on the lamp.
globe do any good? A. Probably.
(27) A. G., Jr., asks: Can you inform me of the composition of the hektograph or gelatin pad? A.
Use one ounce best gelatin (softened by soaking ove night in a little water) dissolved, by aid of heat over water bath in about six ounces of purest glycerine. sing It should be heated for an hour or more in the water bath before pouring.
(28) A. H. C. asks: Can you inform me of that is, to make it hard enough for a mould for metal? . Use ten per cent of alum in the water used for mix ing the plaster. Let the cast set slowly, and when properly set dry it in an oven.
(29) Beferring to our answer to D. McF.
with glue is very good, but I have found that it is easier nd better in many cases to mix the colors with shellac varnish (shellac and alcohol) and not
all. It makes a clean and better job.
(30) N. E. F. asks: Will distilled water in boiler foam? If the distilled water is not exposed to the atmosphere at all will it foam sooner than rain long enough in contact with the air to become properly narily this will thump and foam on frrs heating.
(31) W: C. M. asks: Is there any rule laid down for working gears on all kinds of lathe, thatis, for cutting (threads?) There is generally an index on all referring to the index. Is there any book on lath work? A. In a three train gear, where $A$ is the frs driver running at the same speed as the spindle, $\mathbf{B}$ the he formula is $\frac{C}{A}$ (number of teeth $) \times$ pitcin of screw $=$ number of threads to the inch-or reverse if convenient. nd multiply the number of teeth in the screw gear by number of teeth in the driving gear, which will give the number of threads required to the inch. In a four train ear, where A is the first driver running at the same peed as the spindle, $B$ the first receiver, $C$ the second river ( $B$ and $C$ being on the movable stud), $D$ the formula is $\mathbf{A} \times \mathbf{D}\} \times$ by the pitch of the screw $=$ the num. ber of threads the lathe will cut to the inch. If (as in some lathes) the first driver runs at one half the speed of the spindle, the last product in both the above trains
must be multiplied by 2. The books on lathe work are must be multiplied by 2. The books on lathe work are "Denerally defficient in this essential part. Consult Joynson; also
Martin, London.
(32) E. F. B. writes: It is said that putting lass jars into cold water will prevent them from cracking when any hot fluid is poured into them, as in can when heated, and if heated unequally is.liable to break In a jar of this description it is better to have the out side of the jar quite dry and warm or hot.
(33) A. L. H. asks: What are the rules for proportioning the lenses of a terrestrial eyepiece for a telescope, having given the power required, diamete and focus of the object glass? In the eyepiece de scribed in No. 1 of the Scientific American Supple mage of a , , ore invert the image, $a$ b? I wish to increase a little the power of such an eyepiece. Is it necessary to chang all four of the lenses, or only the one nearest
the eye? A . The best proportions for focal length of the lenses are 3, 4, 4, 3. The power is abon he same as if the outer lenses were used alone, separa tedyhalf their focal distance. Plano-convexlenses are generaly yused, although variations from these forms from different formulas for correcting both aberrations The power can be varied slightly by changing the distance of $r^{\prime}$ and $s$ in Fig. 3, No. 1, SUPPlement. The
mage, $a^{\prime} b^{\prime}$, Fig. 3, as above, may be varied also by va ying the distance of 3 and $t$, but ought not tointerfere with the general adjustment for achromatism. The (34) R. W. asks: Is there a chemical process for distinguishing between the different vegetable
fbers? A. Yes; dyes are occasionally advantageously bers? A. Yes; dyes are occasionally advantageous
employed for this purpose. See articles on "Fibers," ner’'s "Chemical Technology.
(35) F. A. L. asks: Can you tell me how to remove rust from tools, such as saws. chisels, etc.?
A. If very rusty scour first with emery moistened with sulphuric acid diluted with six volumes of water, rinse dry, and fnish with oil and emery flour.
(36) A. L. W. asks: Can you tell me if oremove thecolor (brown) so that it can can soak secolore red. or so that it will remain light? A. You can try a
strong solution of sulphurous acid in water.
(3\%) T. H. S. asks if as strong a weld in fron can be made by hydraulic pressure as by ham pressure as perfectly as by hammering, provided you make the time of contact as short as it is with the hammer. It is the quick stroke that keeps up the heat on he surface and makes what is called a smooth weld. The slow hydraulic pressure would, no doubt, make the
(38) E. H. writes: Having a well protected covered one-inch steam pipe connected at boiler dome
(boiler supplying 70 horse power engine, pressure 65 pounds 1 , the pipe is carried about 400 feet; steam is not oo rapidly at terminus. Would you advise for the or ten rings) incased in an oven or heater to supergeat the steam lefore utilizing; or do you think it will in any way interfere or endanger working of boiler? A.
Steam passing through such a heater wonld not in any way endanger or interfere with the operation of the
(39) H. A. B. asks: What is the fastest ry, and also in England? A. From Jersey City to Philadelphia, 90 miles, in 1 hour 50 minutes, and about 54 miles per hour on English fast espress. 2. What is he diameter of the driving wheels used upon the pasto $6 \% /$ feet, and in England 615 feet to 8 feet. It is claimed that on the West Jersey road 70 miles per hour has been accomplished.
(40) W. G. S. writes: My engine is an upight, and has two cylinders 636 inches each diameter.
The steam supply pipe is only $11 /$ inches diameter. am working with only one cylinder. When both are con-
nected they fill with water from the boiler. Is the
steam pipe tou small? Would that cause the cylindersto
take water? A. The steam take water? A. The steam pipe would not cause the
engine to take water. Probably the steam chamber engine to take water. Probably the steam chamber or
capacity of your boiler is too small when usirg bot
engines.
(41) H. H. asks: What has been the fastest don made on railroads in Europe, and where? A. Lon an and South Eastern, 64 miles per hour.
(42) J. A. writes: In compressing a cubic ootof air at $63^{\circ}$ into the space of half a cubic.foot, will not its temperature be raised to $120^{\circ}$ and its pressure to
15 pounds per square inch, provided there be no loss by radiation or otherwise? In short, what is the law ncrease of temperature of air by compression. and in contrary its decrease by is cheap, though ynsteady, but might it not be utilized by raising heavy weights, and from the slowdescent of which, by proper gearing, small but constant power derived; or might not stout coiled springs be used in chinery or any known records of attempts in that line A. Air compressed at $60^{\circ}$, two vols. into one tate theoretical temperature of $192^{\circ}$ and a pressure of 2 pounds per square inch; falling upon cooling to its nor mal temperature to 15 pounds pressure where provision ipe, the polng the air in the pump and discharg volumes to $1=60$ pounds 4 voiumes to $1=30$ pounds, volumes to $1=60$ pounds, and so on. The contrary rom some normal temperature (say $60^{\circ}$ ), with variations in practice resulting from the absorption of heat by the rounding material at the instant of expansion.
The decrease of heat from $60^{\circ}$ when
r as above, to dis charge a constant stream of air from tank at a temperature of $60^{\circ}$, and under a pressure o discharge to $40^{\circ}$ below zero, outward influences mod ying this result somewhat in practice. A constant mall power may be utilized from the irregular action of a windmill, by pumping water into a reservoir, or compressing air into cylinders for the purpose of driv ng a water or air engine; orby the windingup of heav
weights and distributing the power through a train o earing or pulleys, or by converting the power intoele ricity and storing it in stcrage batteries.
(43) W. L. G. asks: Referring to the article n tinning, in Supplement, No. 310, is protochloride o in and muriate of tin crystal or solution, the sume
rticle? A. Protochloide f tin or tin salt (stanno chloride)refer to the same salt. It is also occasionally alled tin crystal. Tinliquor is stannicchloride, or a mix are of the stannous and stannic chlorides (lower and need before dipping? A. Brass may be most cea before dipping? A. Brass may be most readil. hot potash dip, and after rinsing in plenty of cold water dipping it momentarily in a cold mixture of equa parts of sulphuric and nitric acids and quickly rinsing again.
(44) E. E. O. asks: What circumferentia peed will it take to burst a disk of uniform thickness ing the speed correct? $32_{\bar{n}}^{\sqrt{v}} \frac{\sqrt{L}}{18^{\frac{1}{1}}}$ in which $L$ equals the length in feet of a bar of uniform size, which will support itself by its tensile strength? A. For cast iron minute. The formula that you give is a safe one, as it Minerals, etc.-Specimens have been rit eived from the following correspondents, and xamined, with the results stated
C. B. C.-It is a fragment of fluorspar.

## [OFFICIAL.]

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