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Steel Casting Company, Pittsburg, Pa.
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rion ornamentat grasses and mosses and their uses, di-
rections for collecting and preserving butterfies and other insects, the art of making wax flowers and fruits,
and kindred subjects. Mr. Kresken has worked up his and kindred subjects. Mr. Kresken has worked up his
subject with no little patience and enthusiasm, and gives subject with no ittle patience and enthusiasm, anc gives
his readers the benefit of many years of experience in this department of honsehold decoration. His exhibitions of preserved flowers at the Cincinnati Exhibition
and elsewhere have been much admirea, and have won nim many medals. The book is prettily printed and bound.
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the party in Paris, on the Mediterranean, in the chief Italian cities, at Malta, Cairo, and up the Nile. The promise of the early numbers is well sustained both in
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Hygiene and Pbbluc Healiti Edited by
Albert H. Buck, M.D. 2 vols. 8vo, pp.
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791 and 675 . New York: William Wood \& Co.
The most important cyclopedia of individual and pub-
lic sanitation ever published. The several papers, each lic sanitation ever published. The several papers, each
a treatise in itself, have been written by A merican phya treatise in itself, have been written by A merican phy-
sicians and scientific investigators of established repusicians and scientific investigators of established repu
tation, with special reference to the climates, conditions of soil, habitations, modes of life and laws of the United States. The introductory chapter, by Dr. John S. Billings, U. S. A., sets forth in some seventy pages the
scope and importance of the subject, the causes of disease, and the jurisprudence of hygiene. Then fol low: Infant Hygiene, by Dr. A. Jacobi; Food and
Drink, by Dr. James Tyson; Drinking Waterand PubDrink, by Dr. James Tyson; Drinking Water and Pub-
lic Water Supplies,' by Professor William Ripley lic Water Supplies, by Professor William Ripley
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Dr. Allan McLane Hamilton and Dr. Bache McE. Emmett; The Hygiene of Syphilis, by Dr. F. R. Sturgis; Disinfectants, by Elwyn Waller, Ph.D.; Village Sanitary Associations, by Dr. R. S. Tracy; School Hygiene, by Dr. D. F. Lincoln. The writers will be recognized as
among the best known physicians, medical and surgiamong the best known physicians, medical and surgi-
cal professors, sanitary inspectors, and health officers of the country. For the medical profession and for public health officers and inspectors the work must prove of the highest value. If it could have a proper popular circulation, the benefit would be inestimable. It is too much to hope, however, that the public will take any-
thing like a sufficient interest in matters of such vital importance as to secure to the work anything like the general reading it should have. It siould have a place
certainly in every public library.

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HINTS TO CORRESPONDENTS
No attention will be paid to communications unless
accompanied with the full name and address of the writer.
Names and addresses of correspondents will not be Fiven to inquirers.
We renew our request that correspondents, in referrin to former answers or articles, will be kind enough to name the date of
of the question.
reasonable time should iquiries
Persons desiring special information which is purely of a personal character, and not of general interest,
hould remit from $\$ 1$ to $\$ 5$, according to the subject, should remit from $\$ 1$ to $\$ 5$, according to the subject,
we cannot be expected to spend time and labor to obtain such information without remuneration.
Any numbers of the Scientific American Supple A ENT referred to in these columns may be had at this
office. Price 10 cents each.
(1) F. B. G. writes: 1. I send per mail a sample of rock for examination. It is unlike any of the otherrocks and ledges about here; we use it for cutting
glass. It makes a good polishing powder. A. It is quartz rock. 2. Is there anything used in refining keromedicine? A. Usually, no. We cannot recommend
(2) " Engineer" asks: What is the Great Eastern steamship doingat present? Have yougiven any
news about this ship in any previous number of your
paper, as I believe it was reported lately in the Londo
Times she was being newly fitted up for some new Trmes she was being newly fitted up for some new
trade? A. We last heard that she was being fitted up trade? A. We last heara that she was being inted
for the catte trade between Texas and Great Britain.
(3) T. H. J. asks by what process the two lenses (forming an achromatic lens) can be separated hardened by age. A. Heat them in hot water.
(4) R. B. N. asks: What is torsion strength ten, forty, and fifty feet long, driving pulley being at en of shaft; and what breaking strain at ten feet? A. It de pends upon the speed of the shaft. You must have the bearings close enough together to prevent a
spring of the shaft from the strain of the belts.
(5) W. C. asks: 1. How many ounces of puregold are obtained from one ton of high class California quartz? A. There is a wide difference in the yields of different mines-from 30 cents per yard (hy-
draulic gravel) to $\$ 1,000$ per ton (quartz lode); from $\$ 6$ to $\$ 70$ would perhaps comprehend the average variation of those quartz mines at present proftably worked. 2.
How much is one ounce of gold worth? A. Pure gold is worth $\$ 20.67$ per ounce.
(6) J. C. C. writes: 1. I have a boat 18 feet long by 4 feet broad; she also has very fine lines enough for the boat? A. No. 2. Would you advise me to use one of Herreshoff's coil boilers, or a common use, and what speed would she make? A. 15 or 16 inches diameter. Probably about 4 miles per hour, if yọu have
plenty of boiler.
(7) E. B. asks: How do the makers of carved toy work in Switzerland and Germany learn their skill, acquire their ability in imitating forms of
men and animals $f$-for, I take it, this ability of theirs is not learned in any school. A. The skill of the Swiss and German wood carvers has been developed very largely by the instruction in this art furnished by
special schools, established for the purpose in all the wood carving districts.
(8) W. T. A. writes: When a steam engine working does the steam exert the same force on th cylinder head as on the piston? A. Yes.
(9) E. C. M. suggests the following method of binding the numbers of the Scientifio American into compact volumes: Procure two small planks,
slightly longer than the paper and, say, $11 / 2$ inch wide and 3 finch thick; pine will do. Having nicely arranged tie a strong double cord loosely around them. This
cord is then drawn taut by inserting two nprights, say \% inches high, and is still further tightened by twisting by means of the short stick, A, as in the old fashioned
buck saw. In this way the papers are firmly com-
prevent the passenger cars from telescoping and save
the lives of manypassengers. Was this mode of prodives of many passengers. Was this mode of pro-
eeding correct? A. It is stated as the result of ex perience, by old railroad engineers, that in all cases of apprehended collision, if the speed of the train cannot be effectually checked, and a collision be unavoidable, he safest course is to get all the speed possible, as the
(14) J. A. S. asks: 1. What would be the est and cheapest piping for conveying strong salt water, Wood 5 or 6 inch stream, for a distance of 5 or 6 miles? A. Wood tubing, also enameled iron conduits, are in praccal use for such purposes, and have, we believe, proved he different systems of water works, if so, where can it be had, and what would be the cost? A. There are number of good works on this subject. Address the ook dealers who ad vertise in these columns for catalogues.
(15) D. S. asks for a method of removing aildew from sailcloth. A. Hypochlorite of alumina is vater, rub well into the cloth, moisten again with dilute sulphuric acid ( 1 to 20 ), and, after half an hour, rinse horoughly in soft water and then in water containing bout an ounce to the gallon of sulphite or hyposulphite applying the hypochlorite.
(16) J. H. N. asks: What preparation is used in dyeing duck deadgrass color? A. Boil the goods jin bath of 2 lb . ferrocyanide (yellow prussiate) of of $1 / 2 \mathrm{lb}$. sulphate of copper in 10 gallons water. Use ronger copper for a stronger color
(17) A. H. M. asks: 1. What are the proortions of the popular shoe dressing for ladies and xtract logwood, bichromate of potash and amporax, but I cannot get the proportions to make it. A. See p. 171 (22), current volume of Scientific American. 2 . want to make oneof those phosphorescent or illuminated aces for clocks. What shall I use and how shall I use it, and is it permanent? A. The substance employed
for this purpose is a sulphide of calcium mixed with a resinous varnish. 3. I dissolved some India rubber in trpentine and benzine and applied it to cheap muslin and calico; but will noth so as to make the cloth to be elastic and flexible? What I applied was as thick as honey. A. Moisten the cloth thoroughly, efore applying the varnish, with benzol. When the coating has partially dried pass the cloth between
(18) D. M. C. asks how to make a good nodeling wax, such as mould makers use. A. Melt 20 with it 1 ounce flake white. 2 . I have been making a brass mould for casting white metal rings; the castings are about 2 inches in diameter, and they do not fill the
mould. A. Provide plenty of small air vents, smoke your mould occasionally,
and pour your metal into the mould and pour your metal into the mould
through a deep gate or channel. If you through a deep gate or channel. If you
do not succeed well with the metallic mould, try plaster of Paris, following mould, try plaster of Paris, following
directions given in SUPPLEment, No. (19) W. C. writes: In your issue of July 12, Mr. Cobb speaks of the
good results he obtains from the use of refined petroleum in his boilers. Will you please inform me in your Answers to Correspondents, what he means by refined petroleum, or to what grade of
oils in our markets this would apply? oils in our markets this would apply?
The water we are compelled to use here is about the worst in the world, being is about the worst in the world, being
mostly from wells sunk in the sand. It
pressed. Then with a $1-12$ inch twist drill (nsing, preferably, a spiral drill tool) pierce from 13 to 14 hole along the edge of the volume, taking care that th Finally pass a strong waxed cord through the holes making a slip knot at B, and continuing in a sort of making a slip knot at B, and continuing in a sort of
lock stitch way as indicated by the diagram, always drawing the cord as tight as possible. The head of a
stout pin will do to pass the cords at the points, c . Fasten the end of the cord, and all that then remain
(10) J. H. W. asks: Which has the most power, a cylinderwith 20 inch bore and 20 inch stroke, or two cylinders 10 inch bore and 20 inch stroke, using
the same steam pressure in both cases? A. If they the same steam pressure in both cases? A. If they
make the same number of revolutions, the 20 inch cylinder has double the power of two 10 inch.
(11) C. H. asks for a receipt for keeping the bright surface on polished strel instruments, such as pocket knives, razors,drawing and surgical instruments; and how to remove the tarnish. A. In finishing a film of oil remains adhering to the steel, which, under ordinary circumstances, preserves the luster. Clean them fre-
quently, and especially after handling, with well dried hamois leather.
(12) W. M. asks how to remove wool from the skin, without clipping. I have a large quantity and find it very tedions to clip, and I think there is a pro-
cess to remove it without soiling the wool. A. Short cess to remove it without soiling the wool. A. Shor,
wool is removed from skins by a process called "liming," in which the skins are soaked in milk of lime until the tissues are sufficiently softened to admit of removing the wool readily by hand pulling. D
(13) F. C. writes: On Thursday last we had Railroad, in which five lives were lost on the passenger Railroad, in which five lives were lost on the passenger
train, the other colliding train being freight. Now, accounts state that the engineer of the passenger train, seeing that it was impossible to avoid a collision,opened
the throttle valve of his engine to give all the impetus possible to his train, with the object of trying to knock
mostly from wells sunk in the sand. It
seems to be charged with dissolved
shells, etc., in addition to the usual salts of sea water, and forms a most obstinate scale very rapidly. I have tried a number of compounds, which were all highly recommended, but none of them were successful, even to he extent of modif ying the evil. A. Petroleum which partial distillation in order to remove the lighter or more volatile hydrocarbons-such as petroleum ether, gasoline, etc., is usually denominated refined petroleum. Onder the circumstances a feed water hcater properly arranged would probably remove much of the incrustation forming matters.
(20) F. L. asks(1)for a receipt to color iron castings black or brown. A. Mix chloride of antimony with warm olive oil to form a cream, add a few drops of nitric acid, and apply to the warm clean iron. Or apply
the following preparation. Sulphate of copper, 2 oz .; the following preparation. Sulphate of copper, 2 oz ;
chloride of iron tincture, 1 oz ; nitric acid and spirits of chloride of iron tincture, 1 oz .; nitric acid and spirits of
nitre, each $1 / 2 \mathrm{oz} . ;$ spirits of wine, $1 \mathrm{oz} . ;$ water, 40 oz . A strong warm aqueous solution of pyrogallic acid strong warm aqueous solution of pyrogalic acid
tains iron black. 2 To bronze castings. To make castings with green and bronze stripes. I would like a cheap made up preparation of chemicals, and at oz ; benzoin. $1 / 2 \mathrm{oz}$; methylic spirit, 1 pint; dissolve nd strain through a fine cloth. To this add a sufficient quantity of bronze green, finely ground. Lampblack, ced or yellow ocher may be added to temper the shade.
Thin with methylic spirit, and apply with a brush. his work is usually given a thin coating of the clear arnish and touched up with gold powder. 3. A receipt he work. A Clean the castings by pickling in dilute sulphuric acid ( 1 to 20 of water) and scouring with sand if necessary. Then boil them in a concentrated aqueous clution ofstannate of soda, with a quantity of granuated tin. 4. How to copper iron castings. A. Clean the iron as above and tumble it for a few minutes in swdust moistened with a solution of one lb. sulphate copper in oitro vitriol
(21) F. H. S. asks: 1. What is the best Porm of a simple battery, and how many cells would be
required for nickel and silver plating A. You can use
several cells of an ordinary smee battery, with carbon
negative plate. The zinc surface exposed in the battery should about equal the surface of the work in the plat
ing bath. A tension of two such cells will be found ing bath. A tension of two such cells will be found
sufficieat for ordinary work. 2. How are the solutions for gold and silver plating made, and what are the pro-
portions for 1 gallon of each of the solutions? A. The portions for 1 gallon of each of the solutions? A. The
whitening bath consists of a solution of 1 lb . potassium whitening bath consists of a solution of 1 lb . potassium
cyanide and $\frac{1}{4}$ oz. of silver cyanide or chloride to the cyanide and $\frac{2}{4} \mathrm{oz}$. of silver cyanide or chloride to the
gallon. of water (soft); the plating bath of 1 lb . potassium gallor. of water (soft); the plating bath of 11b. potassion of
cyanide and 1 oz. silver cyanide or chloride per gallon water. For gold plating see p. 2540, No. 160, Scientific American Supplemenr. 3. How is the quantity silver solution to plate bright. and how used? A. Weigh the work before and after plating. This is seldom re-
sorted to, however, the time of exposure in the bath sorted to, however, the time of exposure in the bath
being a sufficientindex for practical purposes. Carbon being a sufficientindex for practical parposes. Carbon
disulphide is sometimes added to the bath with the in tent of securing a bright deposit, but as a rule, electro platers preferto dispense with anysuch ad and Usually by burnishing with tools of steel or bloodstone or by buffing with rouge and whiting.
(22) A. A. \& S. ask: How much more water is there in every cubic inch in a pipe at 50 lb .
pressure, than when there is no pressure? A. The difference is inappreciable. Water is practically incom ressible.
(23)) H. B. \& S. ask : If the inside of a house paint yet sticks, what will prevent the paint from stick paint yet sticks, what will prevent the paint from stick
ing? A. Try a small quantity of linseed oil with plenty of drier, and thinned down considerably with turpen-
tine. You shouid try the experiment on a small scale at first.
(24) C. T. asks: Which would support the greater weight,a pillar of solid iron, 4 inches in diameter
or one of same diameter of hollow iron, and about what would be the difference in strength? A. One of solid
iron. The difference would depend upon the thickness iron. The difference would depend upon the thickness (25) T. T. P. writes: Our village is watered by a spring about six hundred yardsaway, at an eleva-
tion of some 15 or 20 degrees. The water is conveyed to the town through an inch lead pipe, having only one outlet. I put a stop cock hydrant in the pipe, about one
hundred and fifty yards from its outlet. I proceeded as hundred and fifty yards from its outlet. I proceeded as dicularly, I made a short bend upward in the pipe just below, the bend being elevated about ten inches above passed on by thestop cock without flowing out. What is the difficulty, and how can I make it work? A. You put in the stop cock at right angles to the current in the
pipe; the current carries the water past the opening pipe; the current carries the water past the opening
without being diverted from its course. If you insert without being diverted from its course. If you insert
an enlargement in the main pipe, and divert the water to an enlargement in the main pipe, and divert the water to
the stop cock with an easy angle, you will probably suc-
(26) "Novice" writes: I wish to move a shaft which is now geared to another as follows: The distance between each shaft centers is $85 / /$ inches, and on
one shaft there is a 4 inch diameter gear, and on the $37 /$ in $13 \%$ inch gear. I wish to mover from the shat with the 4 inch gearand retain the present speed of both; what size gear shall I put on each shaft? A. Wheel, what size gear shall I put on each shaft? A.
1921 ineh diameter; pinion, 553 inch diameter.
(27) W. C. T. asks: 1. Can I place one end of a 2 inch iron pipe in the fire and force air through 100 feet with a fan and have it come out hot at the end
from the fire? A. Yes. 2. If the air is forced through very rapid will the speed cool it before it gets through? A. It will probably part with some of the heat, though if sent through the pipe at a high velocity, the loss will e very slight.
(28) P. M. writes: 1. In testing a steam boiler with cold water pressure, if the inspectors apply 120 lb . pressure, how much steam can the boiler carry
with safety? A. By inspectors' rules, 80 lb . 2 . Which with safety? A. By inspectors' rules, 80 lb . 2. Which
can you get the greatest pressure with, cold water or can you get the greatest pressure with, cold water or
steam? A. With cold water, having proper appliances. 3. Why is water used in preference to steam? A. If the boiler gives way under the test, the water is not so dan
gerous or destructive as steam. 4. In your article on the horse power of the steam engine, where do you get the 33,000 that you divide with? A. $33,000 \mathrm{lb}$. lifted
one foot high per minute, is the unit of horse power. It nepresents the
(29) J. G. B. writes: There is an engine in this place, $8 x 12$ cylinder, which makes 150 revolutions per minute, uses 70 lb . steam on gauge; sold by maker for 15 horse power. By rule in Scientific, it is 50 horse
power. What is the matter? One fifth off for friction, and it would be 40 horse power. A. Your engine was ine that cannot in use give out double its nomina gine that cannot in use give out double its nominal
power, and frequently it is 3 to 5 times the nominal power. 2. Will you work out your rule in all its details oo that it can be comprehended by all, with 2 sums, say one engine, $8 \times 12,150$ revolutions, 70 lb . steam, and one $10 \leq 20$, same revolutions and steam? A. You say 70 lb . steam: this is the pressure in the boiler, but what is it
in the cylinder? Boiler pressure does you no good, except you get it in the cylinder. Your 8 inch cylinder, by 12 inch stroke, with 70 lb . steam in cylinder, 150 revoluons is: Area of 8 inches $=50$ inches, and 150 revolu tions $=300$ feet per minute, then $\frac{50 \times 70 \times 300}{33,000}=13.8$ horse power; deduct 20 percent for friction and losses, $31 \cdot 8$ -
$3=25^{\circ} 5$ horse power. Then for 10 inch cylinder, inch stroke, 70 lb . steam, and 150 revolutions $=550$ feet per minute, $\frac{78 \cdot 5 \times 70 \times 500}{33000}=83$ horse power, less 20 per

## ent $=83-16 \cdot 6=66 \cdot 4$ horse powe

## (30) J. B. H. asks (1) how to Babbitt a

 brass box of au engine that is worn well down andthumping, A. Drill shallow holes in the box, tin the surface, and then cast in the Babbitt metal. 2. What will stop a boiler from foaming? A. We cannot inform you without knowing the .cause. Sometimes throwing
3. How to find out the pressure of steam in the cylinder. A. By using an indicator. 4. To find out how much
water the pump of an engine is throwing. A If the pump is throwing full, estimate its contents: otherwise deliver the water into a tank a certain number of strokes, and measure the water in the tank. 5. How to find out the horse pow
on this page.
(31) G. B. M. writes: I wish to transmit five horse power the distance of one mile. Can it be done
with a line of shafting; and if so what size iron? The use of shafting for your purpose would be very expensive and unsatisfactory; the torsional spring or elas-
ticty would be so great that the speed given off would be very irregular. Wire rope transmission would be eaper and far better.
(32) W. H. M. S writes: Please give me a rule to determine the horse power of an engine. Supdiameter, length of stroke 4 feet, cylinder 16 inches diameter, and a pressure in the boiler of 125 lb . to the square inch: what is the horse power? A. See reply to J. G. B., on this page.
(33) J. F. asks for the best paint or other cheap, available means of protecting a wrought iron post varnish thickened with anhydrous iron oxide or burn (34) F. S. W. asks: How can I make lard ard, yet run into an oll when a gentle heat is applied to it? I have tried wax, but it leaves small hard lumps when cold. A. Try paraffine wax.
Minerals, etc.-Specimens have been received from the following correspondents, and examined, with the results stated:
C. W. C.-Argentiferous copper glance. This ore
will probably prove well worth working.-F. K.-They will probably prove well worth working.-F. K.-They are crystals of chrome alum. The carbon had proba-
bly been employed in a bichromate of potash battery.A. H.-It is a hydrocarbon closely resembling hatchettite, probably of natural origin. A larger sample Neither of your samples contains silver. No. 1 is a shale, and No. 2 a ferruginous sandstone.-J. W. W.-1. A
variety of amphibole. 2. Quartz and argeutiferous galena, of some value.-W. R. T.-It is simpla lunator.

## COMMUNICATIONS RECEIVED.

## On Aids to Motive Power of Vessels. By E. R

 How to Forecast the Weather. By G.R. C. How to Forecast the Weather. ByOn the Ground Element. By E. Z.
[OFFICIAL.]

## INDEX OF INVENTIONS

## Cetter Patent or the United

 Granted in th dVeek EndingAugust 26, 1879,
AND EACH BEARING THAT DATE. [Those marked (r) are reissued patents.]

## Air tight preserving package, A. J. Finnegan

 Amalgamator, electric, J.Axle box, car, A. Onslow

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x xle box lid, S. S. Sencenbaugh
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Axle box. vehicle, $\mathbf{B}$.
Axle, wagon,
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Planter, seed and corn M . Martischang .
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|  | Vulcanizing chamber for use in the manufactureof articles of Indiarubber, W. E. Kelly.... ${ }^{\text {a }}$ (1) |
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|  | Lager beer, Bartholomay brewing Company........ 7.626Linen goods, curtain mustins, and linings (except |
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|  | Mainsprings for watehes, Cross $\downarrow$ B |
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|  | Medicated stock feed, L Shoenteld ................ 7.630 |
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|  | From August 12 to August 19, inclusive. <br> Aluminum, manufacture of, J. S. Howard et al., Philadelphia, Pa |
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|  | Filtering saccharine solutions, J.s. Howard et al., Philadelphia, Pa. |
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|  | Lamp burners and chimneys, Manhattan Burner Company, New York city. |
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|  | Lanterns and lamps, E. B. Requa et al., New York city. Metallic fastenings. machine for inserting, etc., G. W. McGill, New York city. <br> Paper, manufacture of. J. S. Torrey, New York city. <br> Rolling mill, S. P. M. Tasker, Philadelphia, Pa. |
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