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A. P. will find an answer to his query as to a ball dropped through the earth, a vacuum being maintained in the hole, on pp. 138, 250, vol. 31.-D
O. F. will find the description of a method of put ing a black enameled flisish on cast iron on ting a black enameled finish on cast iron on $p$.
0,98 , vol. $26 .-H$. L . M. will find directions for pol-
ishing handles, etc, in the lathe on p. 138, vol. 26.ishing handles, etc., in the lathe on p. 138, vol. 26. C. H. S. will find directions for preparing corn
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on p. 203, vol. 30.-J. M. will find directions fo on p. 203, vol. 30.-J. M. will find directions fo
naking friction matches on p. 75, vol. 29.-S. T. informed that there is no safe way of tampering with the natural change of color in the hair.-J P. C. will find that the proper speed for a circular
saw is given on p. 163, vol. 34.-C. B. R. will find directions for producing white enamel on iron on p. 362, vol. 32. This also answers H. W. P.-F. D the directions given on p. 56 , vol. $33 .-$ M. J. M. is informed that we cannot recommend a boiler scale preventive, as we do not know what is the injuri ous element in his water.-A. J. P. will tna a soll
ion of the wheel difficulty on p. 298, vol. 31.-D.C can clean his tarnished plated goods by the meth od described on p. 251, vol. 33.-W. A. will find di-
rections for making corn starch on p. 154, vol. 30 ections for making corn starch on p. 154, vol. 30

- H. B. L. will find full directions for soldering cast iron on p. 251, vol. 28.-H. B. C. will find full directionsfor bronzing castiron on p. 11, vol. 33 .
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fnd directions for making a silver-plating solution, for use with a battery, on p. 362, vol. 31.-I B. \& S. should apply to a toy manufacturer.-A.
J. G. should read our article on the horse power of engines, published on p. 33, vol. 33.-C. D. F. is in ormed that we are unable to calculate the hors power of bnlers fom the dimens and ure. No trustmorthy formula for such a calcula-
tion has ever been laid down.-J. McE. will find directions for building a refrigerating room on p . 251, vol. 31.-B. H. Jr. is wrong in trying to re move hair from his face.-J. V. B. will find direc tions for producing a green bronze on brass on $p$.
51, vol. 33.-J. V. B. will find directions for polish ing meerschaum on $\mathbf{p}$. 155, vol. 31.- H. M. H. wil ind directions for making rubber cement on p
119 , vol. 28 . The construction of an aquarium described on p. 80, vol 31.-F. J. will find dire tions for transferring engravings to wood on p.
138, vol. 30 .-W. K. P. must use olive oil and white phosphorus for his phosphorus and oil lamp.-A M. G. will find the requircd tables as to tempera ture and pressure of steam in Box's "Treatise on
Heat."-W. R. M., H. G., H. H., E. H, G. A. B., W o recommend books on industrial and scientif subjects should address the booksellers who ad-
vertise in our columns, all of whom are trustvertise in our columns, all
worthy firms, for catalogues.
(1) E. W. H. says: In a recent number of the Scientific American appears an article unde the head of "The New Phase of Electric Force." Itried the experiment, using a telegraph sounde I arranged the wires so that the armature vibra could obtain no sparks. I used three cups Bunsen battery. What is the matter? A. Try again.
(2) C. S. says: Please give me a formula copper. I a solution to clectroplate zinc with copper. I have tried the usual cyanide of copper down copper, whi peculiar result of frst throwing bright yellow, like brass. What is my trouble? A. Dissolve $1 / 4$ oz. sulphate of copper for every pint of water; add ammonia till all precipitate is
re-dissolved, forming a deep blue solution, then add solution of cyanide of potassium till this color quite disappears. Add ammonia and cyanide whencver required. When these are deflicient the anode becomes coated with a blue powder About
quired.
(3) E. B. asks : Can steel knives be silver plated without putt the some other metal adhere prop
A. No, not erly. (4) J. G. asks: 1. What size of wire is fine enough to wrap the electro-magnet of
a Morse sounder? A. No. 18 will be found a convenient size. 2. How many feet will it take? A. Use 20 or 25 feet. 3. Is it necessary to cover the silver plate of a Smee battery with platinum? A. Yes, to get the best effect. 4. How is the Léclanché battery arranged? A. Manganese and car-
bon in the porous cell, the latter closed with pitch, and a zinc rod in the outer cell. Use a solution of sal ammoniac for the excitant. I made a marine telescope for use in water, but
arrange a lamp inside it, and ho
of electric light might be used.
I made a phosphorus use
Irections, but it will not oil, and poured it in the bottle on a small piece o white phosphorus. What was the trouble? A Warm the bottle slightly by holding it in the hand or by placing it in a warm place, away from th ir by opening the bottle.
(5) S. G. says: If oxygen and nitrogen are phere that will sustain life? If so why canno hey be uied in sea diving? A. You propos merely to supply artificial air. There is no ad
vantage in this, as common air may be pumped to the bell from above, or already stored ther nder pressure.
(6) A. S. G. says: I have observed some oints in experimenting with a small inductio oil which seem peculiar, and I shall be glad if
you can assist me to an explanationof them. With you can assist meto an explanation of them. With parks will leap nearly $3 / 8$ inch when the battery in in its best condition. Of course, sparks pas freely between wires from the secondary poles, when brought within striking distance; a point hich troubles me is that sparks are freely given off from one secondary pole when no circuit is ade. A. Hi with all high inductive action,an paratus. 2. Another peculiar phenomenon is tha the primary current gives quite severe shocks. When the circuit-breaker (magnetic) is operating no connection between the secondary poles) upo ressing a moistened finger on the thumb screw hich governs the distance of the platinum poin rom the vibrator, and another on either of th imilar to that from a medical coil, when the bunde of wires is pushed about half in. A. The hock is occasioned by the extra current. This it produced by the induction of the battery current
uponitself, hightened, also, by the reaction of the nagnetism in the core.
(7) C. I. H. asks: What is the matter with m batcery? I have 4 cups (bichromate of potas and 1 get a stronger shock with 2 cups than with 4 use an induction coil; the wires are No. 36 an your primary coil were a little larger, we think you kely that bad connections cause most of you rouble
(8) D. G. asks:1. What is meant by a drop rrought is there any way of driving hot iron s are difficult to forge? A. Yes. Drop forging re forgings driven into a mold or form by a dro hammer. 2. What is cast cast steel? Has
reater strength than iron, or is it simply harder A. Cast cast steel is a casting made of cast steel It is much stronger than wrought iron, and is soft. 3. How does it compare with cast steel ? A
It is cast steel of fair quality. 3. Is malleable iro It is cast steel of fair quality. 3. Is malleableiron and nut, or will it pull in two too easily? A. I and nut, or will it pull in
is strong enough if sound.
(9) N. L. C. asks: Why does cider made from sound apples in a hand press, and carefully bottled in clean bottles, have, year after year,
bitter taste? A. If it is as you eay, we can give o reason.
(10) L. B. aays: I am framing a barn, and I want to raise it with a pair of pulley blocks with
114 inch Manilla rope and a gin pole. The bent will consist of one beam 36 feet long, $9 \times 9$ inches posts 20 feet long, $9 \times 9$ inches, 2 posts under the beam 16 feet long dividing the 36 feet into three
equal spaces, and three girths 5 feet 6 inches in equal spaces, and three girt bs 5 feet 8 inches in
each spacc. 1. Will a pair of pulley blocks that will carry that size of rope be strong enough? A. teady the pole, and how many are peceary The blocks are what they call four fall. A. Provide four guy ropes, placed at equal distance around the pole, and so placed that the strain when
the load is on will be borne by two at once; 11 inch ropes will do for these. 3. Could I raise
ind nch ropes will do for these. 3. Could I raise a
barn that way by using a span of horses to pull with? A. Yes; but if you are shorthanded you is now quite frequently practised. Set up a cor ner post and brace it both ways in its proper posi-
tion; then set up the next post and brace it, puttion; then set up the nest post and brace it, put
ting the girt in its place at the same time ; so pro eed with the third post and girt ; then put in you 36 feet beam and last girt, and set the remainin tended with less labor prond with less danger fro accidents, than that of raising by bents. The
heavy sticks may be raised by a pole and single pulley, if required.
(11) W. H. K. asks: Can a person's beard chin? A. Try the following: Make a strong solu tion of sulphuret of barium in warm water; and when required for use, mix it into a paste with powdered starch and apply immediately.
about 10 or 15 minutes, or sooner if much smar ing occurs, the paste should be removed by mean of warm water.
(12) S. D. asks: Please inform me what win cleanse brass shells, used in breech-loading
vuns. A. We suppose you refer to the blackish carbonaceous crust formed on the surface of the shells, often to a considerable thickness. Try ben zine or benzole, and inish with dilute nitric acid
applied with a piece of cloth. What will clarify or bleach There is no chick
ket. Send a sam beached.
(13) A. P. D. asks: Will hard water do
use in an aquarium? A. Yes
(14) H. S. asks: 1 . I have been trying for Where can I find the explanation of the meaning of color, and the conditions under which a given
a. The information aeked for is be partly found in a resume, published in the Quarterly Journal of Science" (Vol. XL., 1873 451), of an investigation by H. C. Sorby on this ubject. He found that the most important colring substances met with in plants in water, but soluble in bisulphide of carbon. He
so made a series of determinations of the mount of coloring substances by obtaining soluons of the same tint, but of different depth. The tatal number of the fundamental coloring sub2; for their names and properties see "Proceed 12; for their names and properties see "Proceed-
ings of the Royal Society," Vol. XXI, p. 442. 2. If I mix two different colors or paints I get a color different from the two. Now if I, by some means, extract one of the colors, would I not get the two
colors separately again: A. Yes. 3. Can I not xtract something from any color so as to change the original colors? A. Yes. 4. I have the im pression that black is no color and white is al
olors. Is this so? A. Black is the absence of olor, and white is the mixture of allthe spectrum olors. 5 . I have been trying to make a plant diest certain substances through the aid of a gal nic battery. Has this ever been tried? I know it to be possible. for I have obtained such results.
A. What are the resulta spoken of? (15) F. C. B. asks: How can I make an ink fill nomping buckskin and chamois leather, tha rial itis a somewhat dificult matter to get a per ectly clear and legible impression from any han tamp of ordinary description, no matter wha ind of ink is employed. If a ribbon stamp, how ver, be employed, and an ink of sufficient fluidity clearimpite that the print should not be handle is requisite that the print should not be handled ng, it is hardly necessary to add, will be much ac elerated by a moderate warmth.
(16) G. C. 日ays: I tried the following for parts ulphate of soda." I could not get the nitrate o ickel, but was told that sulphate of nickel wa es same thing, and I used I. It quicsly made thin coating of nickel, but I could not get it an hicker, as the the all over with crsatal 1 of an inch thick. The anode was granular nicke n a cotton bag. Can you tell me the reason o hat? A Thefollowing is recommended highly $21 / 8$ parts sulphate of nickel and 1 part sulphate o
ammonia, dissolved in enough water to kcep the mmonia, dissolved in enough water to kcep th dill diminish the tendency to of eaturation. This r three Bunsen cels to start with;a single Sme ell will answer for the main deposit.
(17) J. E. B. aoks: What are the solvent olid bitumen. The bitumens differ in the facilit with which they are attacked by solvents. Mos of them are in great part dissolved by ether, mix tures of ether and alcohol, tu
(18) C. F. L. says: Our town authorities ar alkigg of supplying the town with water by ump or water ram, from a stream 1,000 feet distan a a 800 feet higa, thence from a reservoir by pipe, 800 feet, to the streets, and up and down the
treets, 2,000 feet more or less. The town is from 80 to 100 feet below the hill. Will pipes from the eservoir under that head be sufficient to put out re, or would it be better to attach a large force water through pipes to different parts of th wn ? A.The town of Rabway, N. J., and severa very economical and effective system of wate upply. It consists of a stationary engine supplying a certain number of millions of gallons o well water per day, at a certain pressure agree upon, and which an times sumclent to forc he water to the upper stories of the houses in nown as the Holls sgstem and would probebly suit you better than any other. In case of fre the pressure is maintained at its maximum by mean of thecontrol obtained through the stationary en sine. Write to Holly Manufacturing Company
(19) M. O. R. says: I am about to build a ports 16 inch wide and 2 inches long, and the ex haust port 2 inches wide and 2 long. Will th ports be long enough for the engine? A. Mak our stean ports 56 wide and 3 inches long and th xhaust port $11 / 4$ wide by 3 inches long
(20) J. W. Jr. says: In one of your bac numbers you say that the scent of the hay flower
can be made of the bark of the marie. Please give made of the bark of the marie. Pleas
give me thedirections. A. The plant is one new so. The statement that it may be eay" is mad by a French perfumer

1. What preparation is put on the sensitive plate or an instantaneous photograph? A. No photo of exposure may be reduced to a verg smallfrac tion of a second. There must be a slide attached to the camera brief exposure. Use a neutral new 30 grains bath, a bromo-iodized collodion justold enough to wor aplain iron developer, acd a lens giving a strong bright image. Give a very brief development and ated A collodion containing 5 grains ammoniu iodide and 3 grains ammonium bromide to the ounce works well. 2. What substance is put on
the sensitive plate after it comes out of the came
ra to bring the picture out? A. A good develope
is composed of 2 ozs. protosulphate of iron, and is composed of 2 ozs. protosulph
(21) A. D. T. says: I have a porcelain slate which has become so smooth that a pencil will no make a good mark on it. What can I use to glve
it a good surface to mark on? A. If the slate is really porcelain, try a little dilute sulphuric acid, which allow to remain in contact with the surface water and flow over it a little strong potash lye Allow this latter to remain in contact with th porcelain for about half an hour, and then was
clean with water.
(22) J. D. M. \& Co. say : There is an article of vegetable origin used in Germany for cleanin kid gloves, and as a substitute for white of eggs in icing cakes. Can you tell us what it is? A. Whe
the water that has been used to wash starch from wheat flour or scraped potatoes is allowed to stand until it becomes clear, and is then boiled, it assumes a turbid appearance, and deposits a flaky white substance, which has the same character as men. When dried, it forms a brittle vegetable albumy mass, which dissolves in brittle, yellow, gum coagulated it will not dissolve in water, either hot or cold. The change coagulation does not alter its composition. The temperature at which it takes place varies. A strong solution of the albumen in water becomes completely insoluble at $145^{\circ}$ Fah., led warates in fiakes at $166^{\circ}$. The more it is al coagulation.
(23) H.O.R. says : I have a well 10 feet deep About 3 gallons of paraffin oil has leaked throug how to clean it, and destroy the oul? A. The or dinary means of destroying or absorbing the oil would notanswer in this case, and we know of no means of cleaning the wel، better than those usu ally employed. If you have at hand some absorbent clay or earth, it would assist you.
(24) P. S. says: 1. I have made a Daniell's battery, and am trying to make a Neef's hammer for producing shocks. Piease explain the easiest method for making it, and to make the conhandles. A. If you wish to produce shocks from a single coil in which there is an iron cote,arrange the coil horizontally on a wooden base, fix a short round piece of soft iron to a spring, and fasten the latter to the base in such a position that the iron piece is within the attractive influence of the which the spring rests when the battery is not in circuit, is also attached to the base back of the spring. Connect one pole of the battery to the upright carrying the adjustable screw, the other pole to one end of the con, and the opposite end of the coil to the spring. By properly regulating the adjusting screw, the iron piece will vibrate rap-
idly; and if the hands grasp conductors in comtivels, What form of battery is best adapted for producing shocks? A. Two or three Grove cells will answer. 3. Will silver answer the same purpose as platinum for the connections on the spring platinum point for breaking and making the circuit?
A. No.
(25) A. R. M. says: How can I make a ce-
ment for sealing glass bo thes that wifl not soften at a temperature of less than $250^{\circ}$ Fwha. ? The parts of good india rubber into small shreds; dissolve it by heat and agitation in 34 parts of cold
naphtha. Add to this 64 parts of shellac in fine powder, and heat thewhole, with constant stirring, until the shellac is dissolved. Then pour it required for use, heat to $250^{\circ}$ Fah and apply quickly
(26) B. \& F. say: 1. We are fitting up a ute. We think of putting in an engine of 10 or 13 inches bore by 24 inches stroke, running at 100 or 110 revolutions per minute, with an 8 feet fly band wheel, requiring about a 40 inch pulley on line shaft. Some of our friends say a shorer so, how
engine will be more economical. If so, engine will be more economical. If
much? And where is the economy? A. A short er stroke will be more economical if you run your engine proportionally faster, so as to have the same speed of piston perminute, the economy be-
ing because the temperature of the cylinder will be maintained more equally, and nearly equal to hat of the initial steam. 2. Would it be more independent fly wheel? A. Yes, if the bearing surface of the working parts will stand the neces sary increase of speed.
(27) A. B. asks: What is the property o haled or otherwise absorbed into the system, it remarkable noxiousness? A. The subtlety of the poison in the filuids of the bocar is brought about by the presence there of carbonic acid. The
amount of lead which may be received into the body, and the length of time which must be con oning can be developed, is uncertain. These fac tors depend upon the peculiarities of the patient the form under which the metal is introduced into the system, and the channel through which it makes its way. Sometimes a single dose (so to speak) will be sufflcient to produce severe sympmay elapse before a man who is constantly at work will beat all affected by it. The excretlon of lead after it has been received into the body is performed very slowly. In bad oases of lead pois-
oning, the metal can be detected in the urine a oning, the metal can be detected in the urine a
long time after the patient has been removed from the source of contamlnation. Parks mentions a
to the influence of lead on December 20,1852 , and lead was found in the urine on June 16, 1853, b
fore treatment had been commenced.
(28) C. Y. asks: In $\mathrm{Na}_{2} \mathrm{CO}_{3}+10 \mathrm{H}_{2} \mathrm{O}$, how can I cheaply and expeditiously get rid of sever equivalents of $\mathrm{H}_{2} \mathrm{O}$ so as to get a dry, white, a most anhydrous powder? ( wish to gain the same n dry air. A. Crystalized carbonat of tains $62 \% 4$ per cent of water. The crystals readily effioresce in the air, and melt in their own wate of crystallization. On decanting the liquid from the fused mass, it is found that one part of the sal has given up its water of crystalization to an ther. By efaporation ar this ate of sode are obtsined. These do not effloresc n air. The same result may be obtainct by heat ing the carbonate in a current of dry air for hort time.
(29) W. T. S. asks: How can I produce crystallized surface on tinned plate? A. Use acid, and 50 parts water. First clean the pla with a strong solution of potash in water. Whe oped, remove the acid and wash in clean water.
(30) J. G. says: I have a paint mordant which I cannot make work. This is the formula cate of soda. Heat until disolved, then add cate of soda. Heat until dissolved, then add
lbs. rosin, boil until dissolved. To this I wish to add rubber, but cannot dissolve the kind I hav with benzine. It is old billiard cushions. How can I do it, and will rubber replace linseed oil an make durable paint ${ }^{2}$ A. The rubber you men tion is not suitable for the purpose. Use a pure rubber, and dissolve in the benzine by heat and
agitation. This solution is not miscible with the solution of borax, water glase, etc, and will not replace linseed oil. 2. Would more water glass b of use? A. No. Shellac might replace part of the rosin.
(31) A. F.O.asks: 1. What is the proces for enameling on zinc in making faces for common white 1 . The zinc disks are simply painted with maintain the requisite intensity. 2 How are the the figures put on? A. The figures are worked o with stencil plates and afterwards finished with a
brush; and finally the whole is finished with a coating of good picture varnish.
(32) E. C. N. asks: Why does paint which children and even some adults? $A$. There is $n$, doubt that lead findsits way into the human body under certain conditions, and there produces a $\mathbf{v}$ riety of morbid changes, which may in some instances terminate in death; for the metal has of ten been found after death in the muscles, live troduced into the body in three ways: First, by the lungs. This takes place chiefly among house painters, when the lead is mixed with turpentine in large quantities. In the evaporation of the latter, a small amount of lead is carried off, and is breathed into the lungs. Lead dust may be taken sorption through the skin. The third mecthod sorption through the skin. The third method is
by the mouth. When the painter is careless his personal cleanliness, and neglects to change his clothing at meal time, a considerable quantity of paint may be taken into the body with his food and drink. This is especiaily true of his midday meal, which in many cases is eaten on the spot
(33) J. H. L
(33) J. H. L. asks : In the process of making malleable cast iron, is soft or hard cast iron em-
ployed? A. A mixture of two good sorts of No 2 pig iron and old scrap is used, the latter in the proportion of $\frac{1}{5}$.
(34) J. S. G. says: In reply to a correspongarithms, you give the following: Lel $a=$ anynum ber. Then loo. $\binom{a}{a-1}=0$ ehisran $\times \frac{1}{2^{2}-1}+$, etc. Why do you not tell us how you came by that
number 0.868589 ? our corressond $A$. In the answer referred which he could calculate the logarithm of a num ber. The demonstration of the formula would require considerable analysis, quite out of placein treated in a number of works, among which we may mention "Rudimentary Treatise on Logar ithms," Weale's series, introductory to Law's Tables," Hutton's "Mathematical Tables," Davies' Bourdon's " Algebra," and Todhunter's "Algebra.
(35) B. \& H. say : Please tell us whether there will be any difference in the drawing power
of two locomotives, of equal weights, etc., one of which has drivers of a larger diameter than the other. A. The smaller the driving wheel, the greater the leverage at which the power is working to the load, and hence the greater the tractive

Minrrals, bTc.-Specimens have been re eived from the following correspondenta, and axamined, with the resalta atated
E. M.-It is red ocher.-H. W.-No. 1 is red ox ide of iron or hematite. No. 2 is iron pyrites.-J. M. M. 's speoimen is under examination, but no one Noblesville, Ind., is iron pyrites.-Specimen marked "Eberhart" is'sulphide of antimony on surface by oxdde of manganese.
R. C. C. asks: What was the Egyptian mode of incubation ?-F. N. asks; How can I cal-
culate the quantity of air that and the velocity culate the quantity of air that and the velocity
with which it will pass through a given apert ice ita wiven it will p

COMMUNICATJONS RECEIVED
The Editor of the scientific American original papers and contributions upon the follow ligg subjecta:
On Storm and Flood Signals. By A. W On Cotton Factories in the South. By E. H On Timber Waste. By H. C. B
On Bank Vaults. By J. K.
On a Patent Pirate. By C. F. J., Jr.
On a Mathematical Problem. By A. B.
On Boiler Explosions. By A. C.
On Centennial Circulars. By T. A. R.
On Centennial Circulars. By T
On Mohair Goods. By O. C. K.
Also inquiries and answers from the following:

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HINTS TO CORRESPONDENTS. Correspondents whose inquiries fail to appea may conclude that, for good reasons, the Edito declines them. The address of the writer should always be given.
Enquiries relating to patents, or to the patenta bility of inventions, assignments, etc., will not b published here. All such questons, when initial as it would fll half of our paper to print them al but we generally take pleasure in answering briefli by mall, if the writer's address is given. Hundreds of inquiries analogous to the following are sent: "Whose steam boiler is the safest Who sells egg-hatching machinery? bookbinderg' cloth, dyed with permanent colorg Who makes machinery for cleaning moss for upholstery? Who sells the officinal preparations of boldo? Who sells penholders which teach the proper position for holding the pen?" All such personal inquiries are printed, as will be observe a the columa susiness an Personal, Whic is specially set apart for that purpose, subject Almost any desired information can in this wa be expeditiously obtained.
[OFFICIAL.]
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