## zusiness ame ersoul.

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valuable information. How to straighten saws etc. Sent free by mail to any part of the world. Send your Eagle Anvils, 9 cents per pound. Fully warranted. Repairs to Corliss Engines a specialty. L. B. Flan

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square shank drills. Pratt \& Whitney Co., Hartford, Ct . Electro-Bronzing on Iron. Philadelphia Smelting Electro-Bronzing on Iro
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Improved Steel Castings; stiff and durable; as soft ess than 65.000 lbs. to sq. in. Circulars free. Pittsburg teel Casting Company, Pittsburg, Pa.
Mineral Lands Prospected, Artesian Wells Bored, by
Pa. Diamond Drill Co. Box 423 , Potteville, Pa. See p. 349. Rue"s New "Little Giant" Injector is much praised or its capacity, reliability, and long use without repairs. C
Catechism of the Locomotive, 625 pages, 250 engrav ings. The most accurate, complete. and easily under
stood book on the Locomotive. Price 2 2.50. Send for a catalogue of rallroad books. The Railroad Gazette, 73 Broadway, New York
The only economical and practical Gas Engine in the market is the new "Otto" Silent, built by Schleiche
Schumm \& Co., Philadelphia, Pa. Send for circular SteamEngines, Automatic and Slide Valve; also Boilillustrated advertisement, page 285 .
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## NEW BOOKS AND PUBLICATIONS

Van Nostrand's Science
York: D. Van Nostrand.
Price 50 cents.
Numbers 45 and 46 of these reprints are respectively Thermodynamics, by Henry T. Eddy, C.E. Ph. D., the University of Cincinnati; and Ice Making Machines, translated from the French of M. Ledoux, mining engineer. The former aims to give a brief and logical exposiion of the fundamental and simplest applications of conditions of effective working of the threeclasses the ice-making machines
Kesume of Yellow Fever.
and (Quarantine
Home Sanitation.)
and Home
Abstract of report ly Dr. Clendinen, as chairman o Committee of Intelligence, District Society of Bergen he State Medical society. The author has brought to ether a good many facts in the history of yellow fever which he finds well described by Hippocrates, 2,240 years ago. He does not believe that the disease is always imported, and denies the efficacy of quarantine always i
to preve
orable.

A Catechism of the Marine Steam En GiNE. By Emory Edwards. Ilustrated.
Philadelphia: Henry Carey Baird \& Co.
Offered as a practical work for practical men, espe
and firemen, who wish to adopt marine engineering as
proflession. For such men it is likely to prove very se
viceable. They will at least find no trouble in unde viceable. They will at least find no trouble in under-
standing what the author has to say, his language being admirably simple, direct, and free from mathematial or scientific affectation.


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## given to inquirers.

W e renew our request thatcorrespondents, in referring name the date of the paper and the page, or the numbe of the question.
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a reasonable time should repeat them. If not then puba reasonable time should repeat them. If not then pub. lished, they may conc
Editor declines them.
Persons desiring special information which is purely of a personal character, and not of general interest should remit from $\$ 1$ to $\$ 5$, according to the subject, as we cannot be expected to spend time and labor obtain such information without remuneration.
Any numbers of the Scientific American SuppleMENT referred to in these col
ofter. Price 10 cente each.
(1) O. R. writes : Your recipe on shoe dressing is very good. I find that the different ingredi ents give a good black liquid. which makes the leather smooth, soft, and black, but without gloss. Can you
inform me how to obtain a gloss? A. Increase the per inform me how to obtain a gloss?
centage of shellac and ammonia.
(2) H. C. asks how much fall would b required in a ditch to carry the water three miles a hour, provided the ditch is straight. A. The flow
water in the ditch would depend upon the character he soil and smoothness of the surface 2 Could you refer me to some reliable work that treats on running water and ditching, etc.? A. "Fanning on Water Sup ply Engineering "is a good work.
(3) "Atlas" asks how to mount maps on cloth, and best kind of paste and fabrics for purpose.
A. Stretch smooih factory cloth upon a frame and coat it with glue size. Before this dries, apply a strong flou paste to the back of the map and lay it smoothly on the coth. Let it remain until perfectly dry. If the map is to be varnished, apply two or three coats of isinglass
size, and after it becomes thoroughly dry flow on a size, and after it becomes thoroughly dry flow on a
coat of varnish consistimg of balsam of fir diluted to the proper consistency with turpentine.
(4) J. P. asks: 1. Can a current of elec wicity be generated by an electro-dynamic machine nets to charge the machine with? A. Yes; see Supple indt, No 161. 2. What is the electromotive force of he Grenet battery when first connected? How long afte it is put in action will it mamtain its strength, and hat extent will the force of current decrease? A. 1.095 volt. The strength of the current diminishes quite
rapidly if the battery isallowed to remain in action any considerable length of time continuously. It is not adapted for a continued use, but where a strong current is required occasionally for a few minutes at a time
it answers a good purpose.
3. What form of battery it answers a good purpose. 3. What form of battery
best combines strength of current, constancy, and nomy? A. Bunsen's, or some of its modifications.
(5) E. M. C. asks: Is there an easy way other sizes of books, by those not practical printers, other sizes of books, by those not practical printers,
and what is it? A. Count the pages between printers' (6) O. M. S. asks: Is a lightning rod sup. ported upon large insulators and having no ground conknow of? A. No.
(7) J. S. B. writes: The yachts in use here, of which there are many, are built on a flat model. They are very broad beam, the beam in some cases being about without keels, but furnished with center boards. Now, am thinking of building a yacht, upon a deeper and na ower model, withkeel. How will the two compare for model in whole or part of iron,hea vyenough so that ordinarily no other ballast will be needed? My object in this is to bring the center of gravity as much below the water
line as possible, as it seems to me that by so doing we would be able to sail closer to the wind without going ver. Would my plan have that effect? A. The mere form of midship section does not determine the best
model. What you propose would probably be fastest in deepel. What you propose would probably be fastest est in light winds. The iron keel is good and should be
heavy; do not make your cross section too full below.
(8) F. M. D. asks what is the horse power fan engine of $61 / \mathrm{inch}$ cylinder, 14 inch stroke, 70 lb . pressure, 180 revolutions. I am running an engine of
that size, there has been quite a dispute about it. One mansaid it was a four horse, another said 20 . I think it about an 8 horse. A. If you are working 70 lb . pressure on the piston, whole stroke, the available power is about 24 horse power. By actual calculation it is 32
horse power, deducting 25 per cent for friction and other
(9) "Inventor" writes: I want to connect an engine or engines to a shaft running 390 or 400 revolutions per minute; howsmall ought the cylinders to be oo give me 8 or 9 horse power, and what size upright tubular boiler will furnish steam? Can 1 run the engines with success? How many engines are necessary? A. power you want. A vertical tubular boiler should have
speed succersftily, everything must be well aropor
tioned and nicely fitted oned and nicely fitte
(10) J. F. asks: What is the best method of easily and economically separating in large quantities
salt water, the calcium magnesia. etc., so that the salt will remain pnre? A. There are three methods employed for separating salt from calcium magnesia, etc.: $a$, by evaporation of the water by aid of the sun's heat; $o$, in winter by freezing; $c$, by artificial evaporation. The
first method is generally used on the coast lines of southern Europe. The arrangement of the salimes or salt gardens is as follows: On a level sea shore is constructed a large reservoir, which by a short canal communicates with the sea, care being taken to afford protection against the inroads of high tides. The depth of water in these reservoirs varies from 0.3 to 2 meters. The sea water
is kept in the reservoir until the suspended matter has been deposited, and is then conveyed by a wooden chanby underground pipes to ditches surroundingthe salines where the salt is separated from the water. The salt is collected, placed in heaps on the narrow strips of land which separate the ditches from each other, and sheltered. As these heaps are left for some time, the delisorbed in the soil, consequently the salt is comparatively pure. If the salt water is derived from salt wells or springs, the brine is immediately boiled down. This boiling generally requires several weeks, the scum being removed and the soda and calcium sulphates deposited removed with perforated ladles. As soon as a
crust of salt is formed on the surface of the liquid a crust of salt is formed on the surface of the liquid a
temperature of $50^{\circ} \mathrm{C}$. is maintained. At this stage the temperature of $50^{\circ} \mathrm{C}$. is maintained. At this stage the
salt is gradually deposited at the bottom of the pan in small crystals, and being removed, is put into conical small crystals, and being removed, is put into conical
willow baskets, which are hung on a wooden support over the pan to admit of the mother liqnor iwhich contains the greater part of the magnesium and calcium
chlorides) being returned to it. Finally, the salt is chlorides) beng returned
(11) G. S. T. writes: A reservoir is $\mathbf{6 0}$ rods distant, descent 40 feet. One pipe of $1 \%$ inch bore con
tracted to $3 / 4$ inch just at the lower nozzle, the other tracted to $11 / 4$ inch just at the lower nozzle, the other
pipe of $1 \% / 2$ inch bore for 20 rods, 1 inch bore for the next 20 , and the last 20 rods of $3 / 4$ bore. Which of the contracted just at the outlet the friction will be least
(12) T. M. J. asks: 1. Will the water, if conveyed tothe boiler in a 2 inch pipe, force itself into the boiler against a greater steam pressure than (say) in
a $\nless /$ inch pipe? A. No. 2. In "Peck's Natural Philo-为 inch pipe? A. No. 2. In " Peck's Natural Philoby filling the cask with water from the top of a tube 34 feet long. Will the heavier weight of water in a large pipe not add materially to pressure per square inch at the lower end of the pipe? A. No. 3. Could I overcome any resistance in the boiler by letting the water into the boiler through a funnel or a small hole on the principle of an
(13) J. R. H. asks: 1. Can exhausted steam be used to heat up a workshop? A. Yes. 2. In what way does it affect the working of an engine? A. Proper cent of power is lost between exhausting through a pipe 20 feet long, and one 120 feet long? A. Difference is not appreciable if pipe is large.
(14) G. E. T.-You will find directions for 159.
(15) W. H. B. asks, Does the microphone strictly magnify the sound or only transmit it? A. It
(16) C. K. M. asks: 1 . What is the best method of magnetizing a rat tail file $158 / 2 / 2$ ? A. Inclose the file in a helix made of about 50 feet of No. 16 insulated wire, and connect the helix with 4 or 6 cells of car-
bon battery. 2. Can I magnetize it with an ordinary Daniells battery, by wrapping it with insulated copper
(17) S. G McM. asks: 1. Will a etlephone that is constructed as described in Supplement, No.
142 , work when thecoil is made of No. 30 wire? If not, 142 , work when thecoil is made of No. 30 wire? If not,
will it with No. 32 A. No. 30 wire is too coarse. No. wil it with No. 32? A. No. 30 wire is too coarse. No.

(18) A. S. B. asks: How can I take grease out of marble? A. Mix sal-soda with two parts of quickwater, coatthemarble with this, and letit rith soft cold hours.
cessary.
(19) J. D. asks: How can I make an alloy of copper which will attach itself to glass, metal, or por-
celain? A. 20 to 30 parts finely blended copper (made
. by reduction of oxide of copper with hydrogen or precipitation from solution of its sulphate with $\mathbf{z i n c}$ ) are made into a paste with oil of vitriol. To this add 70 parts of mercury and triturate well; then wash out the
acid with boiling water and allow the compound to cool In ten or twelve hours it becomes sufficiently hard to receive a brilliantpolish and to scratch the surface of in or gold. When heated it becomes plastic, but does not contract on cooling.
(20) A. L. C. asks why a piece of paper cannot be blown off the end of a tube if it is simply placed over the tube at one end with nothing to fasten A. This phenomenon occurs only when the tube has
aflange or its equivalent around the discharge opening. The adherence of the paper to the end of the tube is due a vacuum formed on the surface of the card by the ateral discharge of air. This subject is fully treated in
an article on the ball puzzle in Supplement, No. 51 . (21) A. H. asks: Where on the globe will Ne new year 1880 be greeted or welcomed first? A. In
New Zealand most probably; possibly a little earlier at some English missionary station in Polynesia. Eastrn Siberia is ruled out of the reckoning by the Rusian calendar; and our Alaskan islands by their taking their time from San Francisco.

