## zusiness and extsonal.

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If you have a cold or cough, you can cure it by using Ian Beil's "Rye and Rocks."
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frey \& Son, Union City, Conn. The manufacture of small wares, notions, and metall.
ad vertisement on page 92 .
The Inventors' Institute, Cooper Union, New York Sales of patent rights negotiated and inventions exht-
bited and advertised for subscribers. Send for circular bited and advertised for subscribers. Send for circular. A large manufacturing concern desires to enter into
correspondence with reliable houses doing business in sinking artesian
Haven, Conn.
Presses, Dies, and Tools for working Sheet Metals, Presses, Dies, and Tools for work
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Hartshorn's Self-Acting Shade Rollers, 486 Broadway, New York. No cords or balances. Do not get out of
order. A qreat convenience. Sold everywhere by the trade. See that you get Bartshorn's rollers. Makers and
dealers in infringing rollers held strictly responsible. Street Sweeper, Smith's patent, for sale. Machinery Excinange, 2b1 N. 3d street, Philadelphia.
Second hand large size Wood Planer, R. Ball \& Co. make, for sale cheap, by Wm.M. Hawes, Fall River, Mass.
Wm. Sellers \& Co., Steam Hammers. See ad., p. 108. The Practical Papermaker; a complete guide to the manufacture of Paper, by James Dunbar. \$1.00. Mail
free. E. \& F. N. Spon, 446 Broome street, New York. Wanted-An experienced and thoronghly capable machinist, competent to design, build, and set up in work-
ing order light. special machines in a manufacturing business; also to superintend repairs in shop connected with the factory; must furnish best reference as to
character, habits, and ability. Address 1'. O. Box 539, Baltimore, Md.
Abbe Bolt Forgis Wood Working Mach'y ad. p. 92. Abbe Bolt Forging Machines and Palmer Power Ham-
mer a specialty. S. C. Forsaith \& Co., Manchester, N.H. mer a specialty. S. C. Forsaith \& Co., Manchester, N. H.
L. Martin \& Co., manufacturers of Lampblack and L Mortar-black, 226 Walnut St., Philadelpha, Large Slotter, $72^{\prime \prime} \times 18^{\prime \prime}$ stroke. Photo on appli
tion. Machinery Exchange, 261 N. 3 d St., Phila. Lion. Machnery Exime, 25 , Phila. List 25 .--Descriptive of over 2,000 new and second-
hand machines, now ready for distribution. Send stamp hand machines, now ready for distribution. Send stan
for same. S. C. Forsaith. \& Co., Manchester, N. H.
Books for Engineers and Mechanics. Catalogues free. Books for Engineers and Mechanics. Cat.
E. \& F. N. Spon, 446 Broome St., New York.
4 to 40 H P. Steam Engines. See adv. p. 93. Send to John D. Leveridge, 3 Cortlandt St., New York,
for illustrated catalogue, mailed free. of all kinds of Scroil Saws and Supplies, Electric Likhte
Steam Engines, Telephones, Novelties, etc. Pure Oak Lea Belting. C. W. Arny \& Son, M
turers. Philadelphia. Correspondence solicited. turers. Philadelphia. Correspondence solicited.
Eclipse Portable Engine. See illustrated adv., p. 93 Eclipse Portable Engine. See illustrated adv., p. 93.
Within the last ten years greater improvements have es than any other agriculthe Eureka Mower Co impersersally acknowledged that the best mower now in use, and every farmer should
write to the manufacturers for catalogue, with prices. Jenkins' Patent Valves and Packing "The Standard." akins Bros Proprietors, 11 Dey St Presses \& Dies. Ferracute Mach. Co., Bridgeton, N. J. Wood Working Machinery of Improved Design and
Workmanship. Cordesman, Egan \& Co., Cincinnati 0 . The " 1880 " Lace Cutter by mail for 50 cts.; discount Experts in Patent Causes and Mechanical Counsel Experts In Patent Causes and Mechanical Coun
Park Benjamin \& Bro, 50 Astor House, New York. For Mill Macb'y \& Mill Furnishing, see illus. adv. p. 108. Corrugated Wrought Iron for Tires on Traction EnMalleable and Gray Iron Castings, all descriptions, by Erie Malleable Iron Company, limited. Erie, P' For Machinists' Tools, see Whitcomb's adv., page 73. Power, Foot, ancl Hand Presses for Metal Workers. Recipes and Information on all Industria! Processes.
Park Benjamin's Expert Office, 50 Astor House, N. Y. For the best Stave, Barrel, Keg, and Hogshead Machinery, address H. A. Cross! ey, Cleveland, Ohio. National Steel Tube Cleaner for boiler tubes. Adjust-
able, durable. Chalmers-Spence Co., 40 John St., N. Y. Wren's Patent Grate Bar. See adv, page 109. Best Oak Tanned Leather Belting. Wm. F. Fore-
paugh,Jr., \& Bros., 531 Jefferson st.. Philadelpbia, Pa. Saunders' Pipe Cutting Threading Mach. See p. 109. Stsve, Barrel, Keg, and Hogshead Machinery a spe. cialty, by E. \& B. Holmes, Buffalo, N. Y Wright's Patent Steam Engine, with automatic cut
off. The bestengine made. For prices, address William right, Manufacturer, Newburgh. N. Y
Peck's Patent Drop Press. See adv., page 109. Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys Yocom \& Son's Shafting
Works. Drinker St., Philadelphia. Pa.
Blake "Lion and Eagle " Imp’d Crusher. See p. 109.

The Brown Automatic Cut-off Engine; unexcelled fo
workmanship, economy, and durability. Write for in forkmanship, economy, and durability. Write for in
formation. C. H. Brown \& Co., Fitchburg, Mass. National Institute of Steam and Mechanical Engineer gg, Bridgeport, Conn. Blast Furnace Construction an
Ianagement. The metallurgy of iron and steel. Prac tical Instruction InSteam Engineering, and
tion when competent. Send for pamphlet.
Nickel P:ating.-- ole manufacturers cast nickel an odes, pure nickel salts, importers Vienna lime, crocus
etc. Condit. Hanson \& Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.
The American Electric Co., Proprietors and Manu facturers of the Thomas Houston System of Electri
Lighting of the ArcStyle. See illus. adv., page 125. See Bentel, Margedant \& Co.'s adv., page 125. Machine Diamonds, J.Dickinson, 64 Nassau St., N. Y Steam Hammers, Improved Hydraulic Jacks. and Tub
Expanders. R. Dudgeon, 24 Columbia St., New York. 50,000 Sawyers wanted. Your full address for Emer
on's Hand Book of Saws (free). Over 100 illustrations son's Hand Book of Saws (free). Over 100 illustration
and pages of valuable information. How to straighten and pages of valuable information. How to straigh
saws, etc. Emerson, Smith $\&$ Co., Beaver Falls, Pa. Peerless Colors-For coloring mortar. Fre
ards \& Co., 410 Callowhill St., Philadelphia, Pa
For Pat. Safety Elevators, Hoisting Engines. Friction Clutch Pulleys, Cut-off Coupling. see Frisbie's ad. p. 126. Tight and Slack Barrel machinery a special ty. John
Greenwood \&Co., Rochester, N. F. See illus. adv. p. 126 Cylinders, all sizes, bored out in present pos Blake's Belt Studs. The strongest fastening fo
eather and rubber belts. Greene, Tweed \& Co., N. Y. Elevators, Freirbt and Passenger Shed Co., N. Y. Elevators, Freight and Passenger, Shafting, Yulleys
and Hangers. L. s. Graves \& Son, Rochester, N. Y. For Heavy Punches, etc., see illustrated advertise ent of 1 liles \& Jones, on page 125
Steam Engines; Eclipse Safety Sectional Boiler. Lam-
bertville Iron Works. Lambertville, N. J. See ad. p. 125 . Beet Band Saw Blades. See last week's adv., p. 125. Reed's Sectional Covering for steam surfaces; any one can apply it; can be removed and replaced wit
injury. J. A. Locke. \& Son, 40 Cortlandt St., N. Y. Linen Hose and Rabber Hose suited for all pur Mineral Lo., Pa. Diamond Drill Co. Box 423, Pottsvifle, Pa. See p.125. For best low price Planer and Matcner, and latest
improved Sash, Door, and Bllny Machinery, Send for improved Sash, Door. and Blint Machinery, Send fo
catalogue to Rowley \& llermance. Williamsport, Pa. The only economical and practical Gas Engine in the market is the new "Otto" Silent. built by Schleicher
Schumm \& Co., Philadelphia. Pa. Send for circular. Penfield (Pulley) Blocks, Lockport, N.Y. See ad. p. 124 , Tyson Vase Engine, small motor. 1-33 H. P.; efficient Use Vacuum Oil Co.'s Lubricating Oil, Rochester, N.Y Lightning Screw Plates and Labor-saving Tools, p. 125. Hotchkıss' Mechanical Boiler Cleaner, 84 John St., of them, they are all infringements. Engineers make ten per cent selling other parties than employers. Clark Rubber Wheels adv. See page 109.

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INTS TO CORRESPONDENTS.
No attention will be paid to communications unless accomp
writer.
$\underset{\text { given to }}{\text { Name }}$
We renew our requestthat correspondents, in referring
to former answersor articles, will be kind enough to to formeranswersor articles, will be kind enongh to
name the date of the paper and the page, or the number name the date of the paper and the page, or the number
of the question. Correspondents whose inquiries do not appear after
a reasonable time slould repeat them. If not then pub a reasonable time slould repeat them. If not then pub
lished, they may conclude that, for good reasons, the Editor declines them.
Persons desiring special information which is purely
of a personal character, and not of general interest, of a personal character, and not of general interest,
should remit from $\$ 1$ to $\$ 5$, according to the subject, as we cannol be expected to spend time and la
obtain such information without remuneration. obtain such information without remuneration.
Any numbers of the Scientiric American Supple. MENT referred to in these columns may be had at this officc. Price 10 cents each.
(1) R. L. W. asks: How much water evaporated from $212^{\circ}$ is a horse power ? Some say 21
lb ., others 27 lb ., 30 lb , and some as high as 36 lb ; if there is a rule, I would like to know it. A. It depends upon the perfection of he machine or en ine though
which the steam is used. 21 lb . h horse power would
be deemed an excellent result. It is a very good engine be deemed an excellent resultt. It is a very good engine
that uses less than 24 or 25 lb .; a very poor engine may
not only use 36 lb ., but even more
(2) J. B. V. inquires: Has there ever been so early a winter as the present ? What is the cause of
the polar waves or cold snaps ? Can you send a record preetell what kind of a winter we wil bave can ac preetell what kind of a winter we wil have? Can ac-
curate predictions be made as to what kind of we will have a day, week, mor h , or year in advance? Have you published anything ab.jut tbe weather in the Scientific American or Supplement if if so,
please refer to the number
A. There are certain things that are quite unknowis to any one on the
staff of the Scientific American, and the ability to give an "accurate pridiction" of the weather daily, monthly, or a year in advance. is a fair type
of those matters that transcend their powers. Our corre spondent will have to propound his queries to some of
those entities which are said to be hovering about in those entities which are said to be hovering abont in
mid air, and who may thus be assumed to be cognizant of such matters, for to answer them is clearly beyond (3) A. and E. ask: Can you tell us of a cementthat will cement cloth or felt to ron? A. Seema-
rine glues, page 2510, No. 158, Scientricic American rine glues, pa
SOPPLEAENT.
(4) G. F. H. asks: How can I drill a onevery hard steel drill with slow speed, or a copper o oft iron drill with emery or diamond dust and highe locity.
(5) R. F. M. asks: What is used for thin nin . printer's inks, both common and fine inke? A.
Printer's varmish, or a thinner printer's ink Printer's varaish, or a thinner printer's ink. The var
nish is prepared by inflaming boiling linseed oil and stirring it while it burns untila black " varnish " of the proper consistence is obtained. The flame is extin-
guished by placing a tightly fitting cover over the pot.
(6) F. L. B. asks: 1. Do the directions give in Scientific American, of January 25, 1881, No. 35, under Notes and Queries, make a similar pad to that advertised as the hektograph $\boldsymbol{P}$ A. Yes. 2. Would no
a tin trough or plate answer as well as one of zinc \& A Nearly as well. 3. Will Cos's gelatine, such as can b ought at the grocers (used in cooking), do for the yelatine part ? A. Yes. 4. When you say, "parts,"
vu mean by weight or bulk ? A. Parts by weight. (7) W. E. J. asks: 1. Are oscillating en gines used now and for what ? A. Yes, for many pur
poses. 2. Would there be any value in an engine with poses. 2. Would there be any value in an engine wit
similar valves to an oscillating toy engine, but with sta tionary cylinder, thus saving the power required to
move the latter? Would such an engine make a good move the latter? Would such an engine make a good
motor? A. We think it would not be desirable fo ctual use
(8) A. J. C. asks: Will wood 3 feet long in astove a little over 3 feet high and 2 feet wide las longer than wood cut short enough to lay across th
stove? A. In either case, its slow or rapid burning de pends upon the manner it is laid. If the sticks are laid parallel and close, tbey will burn slowly; if laid par tially crossing each other, so as to be open, they will
burn rapidly.
(9) F. L. S. asks how much more power a steam engine would have if there was no dead center, or, in other words, with the fuil force of crank for full
revolution. A. The difference would hardly be apprerevolution. A. The difference would ha
ciable, using the same amount of steam.
(10) A. S. L. writes: We have a boiler and furnace connected with our establishment; is it cheaper
to run both with pea coal, or to run the first with pea to run both with pea coal, or to run the first with pea
and the latter with firnace coal ? A. It depends upon
a the prices of the different kinds of coal in your market;
butas a rule the pea coal is most economical.
(11) C. J. H. writes: I have a quantity of granulated test lead carrying, say, one ounce silver to the
ton. How snall I desilverize the lead and reduce to ton. How shall I desilverize the lead and reduce to
absolutely pure metallic lead \& If reduced to a nitrate how shall I desilverize and manipulate the resultant salt after evaporation $?$ A. For small quantities the following will answer. Dissolve in a small quantity of
hot nitric acid diluted with half its volume of water and evaporate by heat nearly to dryness. Decompose with
an excess of dilute sulphuric acid (acid 1 , Let stand (in the dark) with the liquid several hours Let stand (in the dark) with the liquid several hours, the white lead sulphate with fresh dilute sulphuric acid, dry, heat to low redness then intimately mix with dry bicarbonate of soda and powdered charcoal in the proportion of 1 oz . lead sulphate, half an ounce bicar-
bonate of soda, and 40 grains of charcoal. Charge into a clay crucible, cover. and fire at a bright red for fifteen
minutes. Pour, or cool and break. Assayers rarely minates. Pour, or cool and break. Assayers rarely
desilverize their lead; it is preferaole to determine accurately by assay the amount of silver present in a (12) D. P abs the paint used in painting window curtains or shade cloth is made. mixed, and applied 8 .A. Consult "The Painter's and Gilder's Companion." See addresses of
book dealers in our advertising columns. 2. How book dealers in our advertising columns. 2. How
can I perforate heavy paper for transferring designs? The perforations in postage stamps is what I want on manila paper. A. The perforations in postage stamps
are effected by passing the sheets between two cylinders, one above the other, and provided with a series of raised bands which are adjusted to a distance apar equal to that required between the rows of perforations. Each ring on the upper cylinder has a series of cylin-
drical projections or punches depressions in the bands of the lower cylinder; by these the perforations are punched out. An endless band requivic pressing to remove the roughness caused by the perforating machine. The machine was inv
and patented in 185\%, oy M:: Archer, of England.
(13) A. B. asks (1) for a simple test by which to distinguish clkali water from pure water. A
Add to the water a small quantity of strong ceacral tincture of litmus. If the water is alkaline the hitmus will changs in cior to a deep purplish blue. 2, How
is the quantity of alkali in a giver quantity of water devermined $t$ h. The quantity of alkalifin a water is most readily determuned by titrating a measured sample with
a stanaardized solution of acid. Consult Thorp's Chemi cal analysis. 3. What is the best filter I can use to purify water that contains foreign matcer, so as omake
it suitable for raising steam! A. Consult our advertisir ; columns for filters.
(14) E. H. L. asks (1) whether a lawn sprinkler would revolve if worked in a vacuum. A. it the difference of pressure of the water on the insid and at the openings, or is it the resistance of the air
to the small streams? A. It is the difference of pres-
(15) A. Y. F. asks for the process by which the ribbons used in type writers, hand stamps, etc., are made and prepared. A. Saturate the ribbon
with a strong solution of one of the soluble aniline dyes
(16) W. S. R. writes: I bave a Wedg wood sirup cup that is cracked and leaks, although the crack is only visible on the inside. Can you give me a receipt for some varnish, or cement that can be water, and stop the leak? A. See the thrtieth cement in the list, page 251G, No. 158, Scientifio American
Supplement.
(17) J. L M. asks: Is meerscbaum a manu factured article $\%$ Is it manufactured from sea foam
A. True meerschaum (Ger., seafooam) is a native mine ral, a hydrous silicate of magnesia. Much of the so anlled meerschaum in the market is manufactured ot from sea foam, but from waste chips and powder of of magnesia, water, silicate of soda, sulphate of mag
(18) J. F. S. asks for some simple way o endering horns soft and pliable (without destroying their original shape). Have tried steam at 80 lb . with out any satisfactory result. A. Digest them in pure
ydrochloric acid diluted with three volumes of wate hydrochloric ac
intil softened.
(19) G. B. S. writes: I bave a small saw. mill engine 10 inches by 20 inches, and the connecting rod is only 34 inches. I think it a very poor propor ion. Give me a better one, and give dimensions the fif
wheel should be, also the speed? A. A connecting ro wheel should be, also the speed ? A. A connecting rod
in length $2 \%$ times the stroke is considered a good pro in length $2 \nless 2$ times the stroke is considered a good pro-
portion. According to the usual proportions your wheel should be about 6 feet 6 inches diameter an weig' $3,000 \mathrm{lb}$. If your engine is well balanced it may run from 130 to 160 revo
(20) E. A. C. writes: In putting up the feed water pipe on one set of boilers, which of the two valves must be near to the boiler, the stop valve or the
check valve? A. The stop valve should be placed next he boiler
(21) J. D A. asks: What ingredient can be mixed in the manufacture of tinner's solder (hal and half) which will be harmless to use and give a
quick fiow to the solder? Should such solder be quick fiow to the solder ? Should such solder be
moulded hot or cool ? A. Try a small quantity of bismoulded hot or cool ? A. Try a small quantity of bis
muth; mould cool.
(22) C. H. H. asks: 1. Do freight trains on N. Y. L. E. \& W. R.R. haul broad and standard gauge cars indiscriminately on same train ? A. Yes. 2. I
so, how are draw bars arranged 9 A. Draw bars fo , bssengertrains by special link and A. Draw bars fo for freight trains by three-link coupling. 3. Are some trains made tip of broad and others of standard gauge
cars \& A. Yes but all one gauge if possible. 4. Do cars : A. Yes; but all one gauge if possible. 4. Do
they use broadgauge passenger coaches ? A. Yes, on branches running through to Jersey City. 5. Is there third rail whole length of road; if not, between what stations ?
to Buffalo.
(23) H. J. C. asks: Will the thickness of a elt run over the same size pulleys make any difference
(24) W. S. wants to know how much a one (24) W. S. wants to know how much a one and one-eighth inch ship cable cbain will sustain and
what size hook it will take. A. Ultimate strength $19 \cdot 7$ tons to $21 \cdot 5$ tons; proof test $15 \cdot 2$ tons to 1575 . Shnuld not be worked regularly over oue-fourth the ultimate
(25) H. S. asks: 1. Would a balf-inch board hold up a piece of earth 10 feet thick $\%$ A. It would hold up a piece of earth 10 feet thick A. It Would sized battery (Bunsen's) would be required to light a
room 10 feet high, 15 feet long, and 12 feet wide ? A. room 10 feet high, 15 feet
20 to 25 quart Bunsen cells.
(26) P. writes: Scientific American, Feb ruary 12, 1881, page 106, Notes and Queries, No. 19,
"Should be thicker than if vulcanized " ought to read galvanized. There is no such thing as vulcanized iron. Clearly a mistake the typo. Our correspondent
(27) C. P. T. asks; 1. Does the pitch of a propelling screw increase or decrease its resistance to
the motive power? A. Increased pitch requires power, and decreased less. 2. Does a sharp pitch prore at a greater speed than a less pitch? A. It propels at a greater speed, if you have the power to drive it at the same velocity as the wheel with less pitch. 3. Suppos ing I had sufficient power, so that the question of necessary power was not considered, what pitch would
give the greatest speed ? A. There is no fixed pitch, give the greatest speed $\boldsymbol{q}$ A. There is no fixed pitch,
for it depends upon many conditions, and each case for it depends upon many conditions, and each case
must bedetermined by its own conditions. 4. Would a shaft 20 feet in length, upon which were four pairs of wings, 5 teet apart, give more propelling power than a single pair-that is, supposing the wings or screws to
be all of the same pitch and diameter ? A. We think
(28) W. R. H. writes: With a $10 \times 24$ en gine r?nning 100 revolutions, sleam ports $114 \times 4$ inch,
exhaust $\approx 24 \times 4$ inch, bridges seven-eighths inch, valv steam lap half and briages seven-eighths inch, valve what would be the right travel of valve, and are the steam ports too small tor the speed of engine? A 3 inch travel, $11 / 2$ inch each way. Reduce the exhaust
(29) G. R. asks: Does the strain on belt driving an emery wheel increase with an increase of speed. If so, in what ratio A. Not appreciably, the
amount of work done by the wheel remaing tie same
(30) D. E. T. asiss. 1. What number of Callaud cells is required to work bell cals, ordinary single stroke, on a half mile line of No. 12 wire, one
each end? A. It will require five cells. 2 . How is relay constructed, and what purpose does it serve \& A. A relay is much the same as a sounder. Its magnet is
wound with finer wire, and its armature lever, which is wound with finer wire, and its armature lever, which is
very light, is made to open and close a 10 cal circuit. I is used in lines $1:$ which the current is too weak to work
is and a sounder 3. In the transmitter described by M Hopkins, in Scientific American of May 8, why coul not the bottle be constructed with a cork in the top platinum wire inserted at the side of the small tubc and save the glass blowing, which seems to be the only par
of any difficulty for amateurs with limited facilites to make ? A. The experimental transmitters of this kind

