## Busiats amf ersonal.


The Buckeye Engine Co. make a specialty of fitting plain engines with their Automatic Cut-off and Conden guaranteed. 8 亿 Liberty St., N. Y.
Vertical Scientiffc Grain Mills. A.W.Straub \& Co.,Phila. For Town and Village use, comb'd Hand Fire Engine Bristol Machine Works For Sale. Facilities for ald Bristol Macche for fale. Facilities for al chine Works, Bristol, Pa.
Climax Washing Machine. Reliable Agents wanted. Descriptive circulars furnished. N. C. Baughman \& Co York, Pa.
The great Wheelock Engine, which furnishes the
power to the machinery of the AmericanExhibit at the Parls Exposition this year, is lubricated by Patent Lubricene and Cups. Our exhibit will equal that which we N . Y. city.
N. Y. city.
Wanted-A Back Geared, ScrewCutting, Foot Power
Lathe. W. J. G., P. O. Box 29.5, N. Y. Lathe. W.J. G., P.O. Box 29.5 , N. Y.
A Microscope with 100 mounted objects for one dol; circula fin Velvet Looms Wanted.-Manufacturers please send
price lists to W. Lilienthal, 40 Lispenard St, N.Y. Electrical and Mechanical Engineer and Expert. Wanted.-Cash prices and description, 15 and 30 hores
power stationary Engines and Boilers. Newell Sanders, Cuattanooga, Tenn.
Wanted cheap for cash.-A good second.hand Back
Geared Screw Machine. Address, giving maker's name, where to be seen, size of hole in spindie, and full par ticulars, H.A.B. We ymer, 52 N. 6th St., Philadelphia, P For New und Second Hand Boilers, send to Hilles \& Jones, Wilmington, Delaware
Friction Clutches for
Friction Clutches for heavy work. Can be run at high
speeds,and start gradual. Safety Elevators and Hoisting speeds,and start gradual. Safety Elevators and Hoisting
Machinerya specialty. D. Frisbie \& Co., New Haven, Ct. Machinerya specialty. D. Frisble \& Co., New Haven, Ct.
Polighing Tools and Supplies. Send for new price
list. Greene, Tweed \& Co., 18 Park Place, N. Y.
For Mill Gearing, Shafting, Pulleys, and Hangers, ad For Mill Gearing, Shafting, Pulleys, and Hangers, ad-
dress T. B. Wood \& Co., Manufs., Chambersburg, Pa., fress price.
Steam Yacht " Hiawatha " for sale.-Length, 40 ft .; beam, 8 ft .5 in.; engine, 12 H. P.; speed, 12 miles. For
particulars apply to J. M. Meredith, Exr., Maiden Creek particulars apply to
P. O., Berks Co., Pa.
24 inch Second-hand Planer, and 12 inch Jointer, or Buzz Planer, both in frrst-class ord
Margedant \& Co., Hamilton, Ohio.
Wrenches.-The Lipsey "Reliable" is strongest and best. Six inch sample by mail 60 cents. Roner Caloric
Engine Manufacturing Co., 91 Washington St., N. Y. Cornice Brakes. J.M. Robinson \& Co., Cincinnati, O. Bolt Forging Machine \& Power Hammers a specialty. Send for circulars. Forsaith \& Co., Manchester, N. H. The Cameron Steam Pump mounted in Phosphor
Bronze is an indestructible machine. See ad. back page. Bronze is an indestructible machine. See ad. back page.
Painters' Rapid Graining Process. J.J.Callow,Clev'd,0. For Solid Wrought Iron Beams, etc., see advertise-
ment. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.
Safety Linen Hose for factories, hotels; and stores; as protection from fre. Greene, Tweed \& Co., 18 Park
Place, N. Y.
John T. Noye \& Son, Buffalo, N. Y, are Manufacturers of Burr Mill Stones and Flour Mill Machinery of all kinds, and dealers in Dufour \& Co.'s Bolting Cloth. Send for larke illustrated catalogue.
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scriptive price list. Forsaith \& Co., Manchester, N. H. Steel Castings from one lb. to five thousand lbs. Invaluable for strength and durability. Circulars free Pittsburgh Steel Casting Co., Pittsburgh. Pa.
For Best Presses, Dies, and Fruit Can Tools, Bliss \&
Williams, cor, of Plymouth and Jay Hydraulic Presses and Jacks, new and second hand Lathes and Machinery for Polishin
E. LJon \& Co., 470 Grand St., N. Y
Sperm Oil, Pure. Wm. F. Nye, New Bedford, Mass. Bound Volumes of the Scientific American.-Thave 1 will sell (singly or together) at $\$ 1$ each, to be sent by express. See advertisement on page 318. John Edwards,
P. O. Box 786, N. Y. For Boult's Paneling, Moulding, and Dovetailing Machine, and other wood-working mac
Machinery Co., Battle Creek, Mich.
Best Wood Cutting Machinery of the latest improved kinds, eminently superior, manu
Margedant \& Co., Hamilton, Ohio.
Water Wheels, increased power. O.J.Bollinger, York, Pa.
Patent Scroll and Band Saws. Best and cle
Mill Stone Dressing Diamonds. Simple, effe
durable. J. Dictiso 64 Noea St, N. and
Weldless Cold-drawn Steel Boiler and Hydraulic
For Best Insulated Telegraph Wire, Tel
and Flexible Cordage, Eugene F. Phillips. 67 Stene Wire
and Flexible Cordage, Eugene F. Phillips, 67 Stewart St.,
Providence, R. I W. H. Sawyer, Electrician and Supt.
Hand Fire Engines, Lift and Force Pumps for fire
and all other purposes. Address Rumsey \& Co., Seneca
Falls, N.Y., U.S.A.
The Turbine Wheel made by Risdon \& Co., Mt. Holly,
The Turbine Wheel made by Risdon \& Co., Mt. Holly,
N. J., gave the best results at Centennial test. Vertical \& Yacht Engines. N.W.Twiss, New Haven,Ct. Dead Pulleys, that stop the running of Loose Pulleys
and Belts, taking the strain from Line Shaft when Ma

## NEW BOOKS AND POBLICATIONS.

Ld Homes made New. By William M.
Woollett. Published by A. T. Bickneli Woollett. Published b
$\&$ Co., New York city.
This is a collection of plans, exterior and interior views, illustrating the alteration and remodeling of how buildings of the homely types commonly found in country towns may at small expense be converted into tasteful and even elegant structures. Many of Mr. Woollett's designs have been practically applied, and all are pleasing.
We have received the reports and awards of the Judges of Groups 21, 23, 24, 26, and 27 from the pubThe classes considered are Agricultural Machines, Med icine, Architecture, Plastic and Graphic Art, and certain machine tools. These documents will perhaps be to what they might be, we scarcely think them of any particular value.

## 4athes

W. McE.-See answer 36, p. 155, vol. 37. T. W.-Fromyour description we are unable to judge. Possibly the ax, storm, or fire may have been the cause.
-R. F. B.-See "Business and Personal" column, for addresses.-M. B. H. - You can find descriptions and M. E. s - Weisbach's H . Bourne's "Catechism of the Steam Engine," and Forney's "Catechism of the Locomotive," contain useful issue of April 13.-J. T. E.- You do not send enough details to enable us to form a decided opinion, but we
imagine that the area of the chimney or some of the flues is too small. A simple remedy would be to make will be better to use a non-metallic handle.-W A. S See answer No. 19, p. 155, issue of March 9, 1878. For our purpose the core need not be a permanent mag-
(1) C. H. \& Co. write: We are manufacs what to mix with the clay to have.it a red color atter it is burnt. A. Use a small quantity of red oxide of ron or red ocher.
(2) H. P. S. asks how to make an umbrella olution of soap, then solution of alum, sulphate of al umina, or lead acetate (sugar of lead): again the soap mina, or lead acetate (sugar of lead, aga
olution, and finally wash with hot water.
(3) W. D. S. asks: 1 . Would it be possible orme to run hydrogen gas through the gas pipes of my house for lighting purposes instead of common illumin-
ting gas? A. Hydrogen gas, when burning, gives a very pale bluish flame, insufficient for illuminating purposes 2. Would there be any danger of the reservoir bursting, or could I keep it in the cellar safely? A. There would bedanger. 3. How is hydrogen gas made? A. It is ob-
tained in quantities by the action of dilute sulphurie acid upon scraps of iron or zinc contained in a large airtight vessel, connected by a pipe with the gas receiver, or by passing steam through red hot iron flings contained in an iron pipe, and collecting the gas over
(4) W. C. S. writes: Please give me a reipe for making a good quality of shoemakers' ink, to blacken the sole edges and heels of boots and shoes made for the to be afterward Dissolve an equal quantity each of ferrous sulphate (copperas) and gum arabic in small quantity of boiling water, and add a very little extract of logwood solution. If it gums, dilute it a lithot aqueous solution of borax is sometimes used in place of a portion of the gum.
(5) F. L. W. writes: The ceramic fever has ed me to ask if there is any mode of transferring an engraving from the paper on which it is originally
printed to any object, without requiring pressure to any great amount? A. Paper is prepared with bichromated gelatin, dried, and exposed to strong sunlight for some time beneath, and in contact with, a drawing or wood cut rendered translucent by oil (castor oil answers).
The excess of chrome salt is removed by washing. The The excess of chrome salt is removed by washing. The paper is then transferred, picture sides obtained from a ositive drawing, as only the unaltered gelatin sinks with enamel colors designs can be printed on and burned into unglazed porcelain, etc.
(6) R. H. L. writes: I wish to etch broad letters and figures on glass by means of hydroftuoric
cid gas. What wax or varnish is used which can be readily removed from the surfaces to be etched? A. Use beeswaxor paraffin; warm the glass.
(7) C. A. A. writes: After the fruit is re moved from peach cans we find the tin inside beauti-
fully mottled like pearl. 1. Can this peculiar pearl-ike mottle begiven to common sheet tin artifcially at a low cost? A. Wash the tin plate quickly with a misture of 3 parts hydrochloric acid, $\mathbf{1}$ part nitric acid, and 3 parts
water; rinse in water and dry with warm sawdust. The mother-of-pearl appearance-moire metallique-is pre served by a thin lacquer of pale shellac in alcohol. 2. Can the mottles be made small orlarge at will? A. No: whir size depends in a great measure upon the rapidity bath. (8) J. S. B. asks: Does the Jablochkoff lectric candle throw out much heat? A. Compared with the illuminating power, the amoun
ated from the candle is relatively small.
(9) S. K. S. asks: What quantity and number of covered wire must I use to make the strongest Daniell battery of six cups, and what length should
each coil be? A. Wind a sufficient quantity of No. 20 copper wire (magnet insulation) to ma
inch in diameter and $31 / 4$ inches lomg.
(10) C. W. asks: 1. How strong should elephone magnets bep A. They should be able to lif about their own weight of iron. 2. Should the spool
wire touch the magnet? A. No; the core should be wire touch the magnet?
first covered with one
then wound with the insulated wire. 3. Will ferrotype then wound with the insulated wire. 3. Will ferrotyp
plateanswer for the disks? A. Yes. 4. Will two par allel cotton-covered wires, the size of fine sewing needles, laid close together, do to connect the instruthough I used about $1 / 2$ oz. of No. 40 silk covered wire on each spool, the same length on both. A. Use more magnet wire wound in the manner mentioned in the an
swer to your second question, and see answer No. 19, p. 155, ScIENTIFIC AmERICAN of March 9 , 1878
(11) G. A. A. writes: I wish to run a steam pipe from a boiler to my house, a distance of 300 feet underground. What is the best non-conductor, for packing the pipe, and how should it be laid? A. As-
bestos is one of the best non-conductors, but is rather expensive. You can do pretty well by laying the pipe
in a box, surrounded by coal ashes.
(12) F. B. M. asks: What is the rule for making a counterbalanced face wheel for enginesp The crank end of the connecting rod and fittings weigh 11 lbs., and the wrist pin 2 lbs. A triangular piece said to be right, but it is no better than before. Th engine is $6 \times 12$ inches, running 170 revolutions per min ate. A. It is a common practice to place the counter weight directly opposite the crank, with its center of gravity at the same distance from the center of the shaft as the center of the crank pin, making its weight
equal to weight of piston, piston rod, crosshead, and equal to weight of piston, piston rod, crosshead, and
crank pin, plus half the weight of the connecting rod. (13) C. H. S. asks: In fastening two pieces ing, to bore the outside piece, or force the nail throug ing, to bore the outside piece, or force the nail
in the common way? A. The latter, we think.
(14) D. C. asks: How is the cold rolled shafting made so true as it is? A. By being passed
(15) E. C. asks: 1. Which would be the best boiler to use for driving a thrashing machine, one
built on locomotive style, or verticals A. There is not built on locomotive style, or vertical? A. There is not
a great deal of difference. There may possibly be a a great deal of difference. There may possibly be a
little advantage in the use of the locomotive type. 2. be any danger of explosion from turning and jolting A. No. 3. Could an 8 horse power engine be moved with its own power without the use of horses to hau it? A. Yes.
(16) S. W. H. writes: A person here says that it takes 25 per cent more coal to make steam from water that is returned to the boiler from the water from a river or well were used. Is it soo A. Or dinarily it is more economical to use the condensed (17)
(17) G. F. P. writes: I think that a 2 horse power engine will give 4 horse power by connecting a 5
inch pulley on its main shaft to a 10 inch pulley on its drivershaft, by a belt, losing, of course, half the orig nal speed. Is this
(18) R. N. writes: J. C. can melt small with a good draught, using hard coal, and setting the crucible well down into the fire. I have tried melting on (10) W. A. P.
(19) W. S. P. asks: How can I make a ood quality of lemon sirup? A. Lemon juice (strained or defecated), 1 pint; sugar, 21/1bs.; dissolve by gentle
heat and set it aside; in 24 hours remove the scum and heat and set it aside; in 24 hours remove the scum and decant the clear liquid. The common soda water sirups
are made by dissolving in a gallon of water 8 lbs. of sugar, 2 ozs. of gum arabic, and about $1 / 2$ oz. of tar taric acid; strained through uncolored fiannel, and fiavored to suit with any of the fruit extracts or ethers. (20) J. C. L. asks: Is steam visible before
(21) A. E. R. asks: 1. How can the power of the voice be increasedp A. The effect, in public halls, may be increased by sounding boards and by at
tention to the laws of acoustics in constructing build tention to the laws of acoustics in constructing build-
ings; the actual power can only be increased by practice. 2. Will the phonograph make less demand for shorthand reporters? A. It may.
Minerals, etc.-Specimens have been re ceived from the following correspondents, and examined, with the results stated:
G. M. P.-The specimen in the red box is a micaceous clay; might be useful to makers of wall papers.-J. F K.-The talcose schist may be auriferous. The sample
does not appear to be.-G. F. L.-No. 1 is brown hemadoes not appear to be.-G. F. L.-No. 1 is brown hema-
tite and shale. No. 2 has every appearance of being a slag. It gives the reactions for iron. No. 3 is litho

## COMMUNICATIONS RECEIVED

The Editor of the SCIENTIFIC AmIERICAN acknowledges with much pleasure the receipt of original
Pendulum Experiment. By O. T
Aerial Navigation. By H. C. H
Quackery. By T. A.
Rapid Locomotive Building. By J. M. D.
Duration of Impressions on the Retina By $\mathbf{B}$ T. Estimation of Sulphur in Organic Compounds. By W. W.I. and C. F.

The Metric System. By G. N. W.
Astronomic Discrepancies. By L. S. B.
Does the Sun Move?
New OpticalApparatus. By J. V.C.
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