## Thesines ama ersonat.

The Chargefor Insertion under this head is one Dollar - line for each insertion: about tight words to a line. Advertisements must be received at publication office The publishers of this pa per guar rentee to advertisers acirculation of not less iizan 50,000 copies every weekly issue.
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 of air, steam. or water. Used in breweries, paper mills,
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stitutions and upon steamers, ferryboats, rrivate eachts stitutions. and upon steamers, ferry boats, private yachts,
and inhthous as. See card, with 1ll ustrations, in February number of Export Edition, under "Busmess Cards." National Steel Tube Cleaner for cleaning boiler tubes. Adjustable, strong, durable. Chalmers--spence Co.,
John St., N. $\mathbf{Y}$. Wanted.-A good second-hand Pile Driving Engine.
Address S. L. Wiley, Greenfeld, Mass. Wanted. - An oil Mill of the most improved pattern, for the manufacture of cotton seed oil from the seed of
the Sea Island cotton. State price and terms. Address the sea Island cotton. State prit.
Spirit of the Times, Jasper, Fla.
For Sale, in one lot, cheap, 200 "Mead" Sewing Machines,
Canada.
For Sale.-The large factory building, at Marion Station. on the Pennsylvania Railroad, in Jersey City, for-
merly occupied by the United States Watch Co., together with the boilers, engine. shafting. The premises comprise three acres, inclosed by iron fence. Building 250 x
27 , wing, $40 \times 90$. Apply to Jas. A. Alexander, No. 27. wing, $40 \times 90$. Apply to
Cortlandt St., New York city.

A thoroughly practical mechanic desires to correspond with a firm in want of a draughtsman, who can design,
construct, and execute. Has had many years' experience in improved steam power, millwork,
Address J. C. D., Box 773 , New York.
Carre's French Cylindric Carbons for Electric Lights; Front St., New York city.
New Tubular Boiler
New Tubular Boiler, about five H. P., for sale cheap.
Address w. N. W., Box 773, New York. Scroll Saws; cheapest and best. D.S.Abbott,Olean,N.Y. H. W. Johns' Asbestos Liquid Paints are strictly firstclasspure linseed oil paints, and contain n o water. They
are the best and most economical paints in the world for structural purposes. H. W. Johns M'f'E Co., 87 Maiden
Lane, sole manufacturers.
For Wood-Working Machinery, see illus. adv. p. 125. Competent man wanted understanding wire rope con-
veyers for luraber, coal, etc. Address Rathbun \& Co., veyers for luin
Oswego, N. Y
Steel Name Stamps, 15 cents per letter; steel figures, ${ }^{1} 1$ per set. C. L. A nderson, Cleveland, Ohio
or Mill Mach'y \& Mill Furnishing, see illus. adv p. $\mathbf{1 2 5}$. Wanted.- A few sober, industrious Machinists and
Moulders. Address H. B. Smith Machine Co., SmithMoulders. Address
New Inventions examined and tested. Designs and
mprovements. Reports for investors. Recipes and inmprovements. Reports for investors. Recipes and in-
formation on all industrial processes. Benjamin's Sci. Expert Office, 37 Park Row, New York.
Latest improved methods for working hard or soft
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Drill Co., Woonsocket,
For best Portable Forges and Blacksmiths' Hand
Blowers, address Buffalo Forge Company, Buffalo, N. Y. steam Hammers, Improved Hydraulic Jacks, and Tub
Chase's Pipe Cutting \& Tbreading Machine Send f
Chase's Pipe Cutting \& Threading Machine. Send for
ircular. Chase Machine Co., 120 Front St., New York. Sawyer's Own Book, Illustrated. Over 100 pages o Sent free by mail to any. How to straighten of saws. etc
par world. Send your fuli address to Emerson, Smith \& Co., Beaver Falls, Pa
Eatile Anvils, 9 cents per pound. Fully warranted. Ice Machines selected. Information on all kinds.
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special Tools for Railway Repair Shops. L. B. FlanSpecial Michine Works, Philadelphia, Pa
For Pat. Safety Elevators, Hoisting Engines, Friction
Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 12 j .
The "Fitchburg " Automatic Cut-off Horizontal Engines. The "Haskins" Engines and Boilers. Send for
pamphlet. Fitchburg Steam Engine Co., Fitchb'g, Mass Tight and Slack Barrel machinery a specialty. John Elcrators, Freight and Passenger, Shafting, Yulleys and Hangers. L. S. Graves \& Son, Rochester, N. Y. Blake's Belt Studs. The most durable fastening for
rubber and leather belts. Greene, Tweed \& Co., N. Y. The Horton Lathe Chucks; prices reduced 25 per cent $\$ 100$ Vertical Engine, 30 H. P. See page 125.
Emery Whecls of all kinds, and Machines at reduced Steam Engines; Eclipse Safety Sectional Boiler. Lam-
Patent Steam Cranes. See illus. adv. , page 125.
Nellis' Cast Tool Steel, Castings from which our spe cialtyis Plow Shares. Also all kindsagriculturalsteelsan
ornamental fencings. Nellis, Shriver \& Co., Pittsburg. Pa Best Turkey Emery in bbls., kegs , and cases. Special Wheels and Pinions, heavy and light, remarkably and similar work. Circulars on application sugar mills Steel Casting Company, Pittsburg, Pa.
Mineral Lands Prospected, Artesian. Wells Borad, by
Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 125 . Deoxidized Bronze. Patent for machine and engine Renshaw, Palpha melting Co., Phila, Pa. Renshaw's Ratchet (short spindle) uses taper and
square shank drills. Pratt \& Whitney Co., Hartford, Ct

Rue's New "Litlle Giart" Injector is much praised
or its capacity, reliability, and long use without repairs. Rue Manufacturing Co., Philadelphia, Pa.
Catechism of the Locomotive, 625 pages, 250 engrav-
ings. The most accurate, complete. and easily understood book on the Locomotive. Price $\$ 2.50$. Send for Broadway, New York.
Elevators.--Stokes \& Parrish, Phila., Pa. See p. 126. Machine Knives for Wood-working Machinery, Book Also manufacturers of Soloman's Parallel Vise. Taylor, The Twiss Automatic Cut-off; also Vertical and Yach Engines. N. W. Twiss, New Haven, Conn
J. F. Tallant, Engineer, Burlington, Iowa, makes a pecialty of saving fuel and
Mica in sheet and scrap for sale in quantity to suit. Parties using Mica in any form please send for samples.
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L. Oudesluys \& Son, 6 : Exchange Place, Baltimore, M Portable Forges, $\$ 12$. Roberts, 107 Liberty St., N. Y For Sale.-Foundry and Machine Shop, third
Hydraulic Jacks and Presses. Polishing and Buffing Machinery. Patent Punches, Shears, etc. E. Lyon \& Co., 4\% Grand St., New York.
Steam Engine
on another page
A Rare Chance.-We have on hand a 40 H. P. Horizontal Oscillating Engine, built for special work, bu never used. It is first-class in all respects; has patent
guides to prevent wear; has balance wheel, but no pulCarice ${ }^{3} 350$. Heald, Sisco \& Co., Baldwinsville, N. Y best in the market. Models and terms to the trade. 85 Centre St., New York.
Forsaith \& Co , Manchester, N. H., \& 213 Centre St. N. Y. Bolt Forging Machines, Power Hammers, Comb'd
Hand Fire Eng. \& Hose Carriages, New $\& 2$ hand Machinery. Send stampfor illus. cat. State just what you want Electrical Indicators for giving signal notice of extremes of pressure or temperature. Costs on1y ${ }^{\$ 20 \text {. At- }}$ tached to any instrument. T.Shaw, 915 Ridge Ave.Phila. Instruction in Steam and Mechanical Engineering. A horough practical education. and as soon as competent, can be obtained at the Natiozal
Institute of Steam Engineering, Bridgeport, Conn. For particulars, send for pamphlet.
Collection of Ornaments.-A book containing over 1,000 different designs, such as crests, coats of arms, vignettes, scrolls,corners, borders, etc, sent on receipt
of $\$ 2$. Palm \& Fechteler, 403 Broad way, New York city. Best Oak Tanned Leather Belting. Wm. F. ForeTo To stop leaks in boiler tubes, nse Quinn's Pate
rules. Address S. M. Co., So. Newmarket, N. H.
Nickel Plating. - Sole manufacturers cast nickel anodes, pure nickel salts, importers Vienna lime, crocus,
etc. Condit, Hanson \& Van Winkle, Newart, N. J., and 2 and 94 Liberty St., New York
Wright's Patent Steam Engine, with automatic cutright, Manufacturer, Newburgh. N. $\mathbf{Y}$.

For Solid Wrought Iron Beams, etc.. see advertise. ment. Address Union Iron Mills, Pittsburgh, Pa., for Presses, Dies, and Tools for working Sheet Metal. etc Fruit \& other can tools. Bliss \& Williams. 1’'klyn, N. Y.
Bradley's cushioned helve hammers. see illus. ad. p. 110. Split Pulleys at low prices, and of same strength and apearance as Whole Pulleys. Yocom \& Son's Shaftin orks, Drinker St., Phidel
Stave, Barrel, Keg, and Hogshead Machinery a spe
cialty, by E. \& B. Holmes, Buffalo, N. Y.
Solid Emery Vulcanite Wheels-The Solid Original Caution.- ur name is stamped in full on all our best Standard Belting, Packing, and Hose. Buy that only. The best is the cheapest. New York Belting and Pacbing Company, 37 and 38 Paris Row. N. $Y$
Sheet Metal Presses. Ferracute Co., Bridgeton, N. J. Telephones repaired, parts of same for sale. Sen
stamp for circulars. P. O. Box 205 , Jersey City, N. J. Eclipse Portable Engine. See illustrated adv., p. 94. For best low price Planer and Matcher, and latest improved Sash, Door, and Blind Machimery, Send for
catalogue to Rowley \& Hermance, Williamsport, Pa. The only economical and practical Gas Engirie in the narket is the new ' Otto" Silent, built by Schleicher Special Wood-Working Machinery of every varle Special Wood-Working Machinery of every var
Levi Houston, Montgomery, Pa. See ad. page 45 .

## NEW BOOKS AND PUBLICATIONS

The Alienist and Neurologist. Quar-
terly, Vol. I. No. I. Edited by C. H.
Hughes, M.D. St. Louis: Ev. E. Car-
Hughes, M.D. St. Louis: Ev. E. Car-
reras. Price $\$ 5$ a year. is jo. Price $\uparrow 5$ a year.
This journal of scientific, clinical, and forensic psychiatry and neurology, is intended especially to meet the
wants of the general practitioner of medicine. Its fundamental idea is that these departments of medical practice are parts of the trunk rather than special branches of medicine; and it will be devoted to the pro-
mulgation, among general practitioners of medicine, of mulgation, among general practitioners of medicine, of
sound teaching respecting the nature and treatment of sound teaching respecting the nature and treatment of
neuro-psychic and nervous diseases, the proper manage$m$ mnt and care of the insane, and kindrod matters. The initial number shows a good list of con ributions by capable writers.
Visitor's Guide to the Smithsonian In-


Rhees. Washington: Judd \& Detweiler Paper, pp. 96 . Price 35 cents.
Contains an illuetrated description of the present
building, and a cutof thenew building; also a descriptive guide to the cases and objects displayed in the everal departments of the museum.

HINTS TO CORRESPONDENTS.
No attention will be paid to communications unles accomp
Namesand addresses of correspondents will not be given to inquirers.
We renew our request that correspondents, in referring to former answers or articles, will be kind enough to
name the date of the paper and the page, or the number of the question.
Correspondents whose inquiries do not appear after reasonable time should repeat them. If not then pubished, they may conclude that, for good reasons, th Persons desiring special information which is purely o personal character, and not of general interest hould 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 SuppleAENTreferred toin these columns may be had at this office. Price 10 cents each.
(1) II. I). P. writes: In No. 21 of Scien fific American of 1879, you give receipt for making
ink to be used with copying pad. In the receipt occurs ink to be used with copying pad. In the receipt occurs in maling the ink 1 b. Ye asked a in making the ink. I bave asked a great maly who
should know, but they cannot tell me. A. The terms 2B, 3B, etc., are technical expressions descriptive of certain grades or degrees of color, as bluish blue, blue blue
(2) H
(2) H. J. D. asks: 1 . Will brass make urable cylinder for a small steam engine bore 3 inches,
troke 4 inches)? A. Yes. 2. Will Babbitt metal do to pack the piston head, melt and run it in? A. It coul be done, but would remain tight but a short time. Cast
ron rings would be better. 3 . What size should the duction ports be for cylinder $3 \times 4$ inches? A. 3 , by inches.
(3) E. N. J. writes: I am using stationary tubular boiler, 44 inches shell, 483 -inch tubes, 12 feet long, fire passing underneath and returning through
flues; have lined up fire box so that it is at least 4 imches narrower than the boiler. I claim that fire box ought to be at least 2 inches wider than the boiler toget the full
benefit of our fuel, wood. Am I correct? If not, why? enefit of our fuel, wood. Am I correct? If not, why A. It is not necessary that the grate should be 4 inches
wider than the diameter of the boiler, but the firecham-

## (4)

4) G. H. S. asks if in the celebrated nd hammer-head weigh together one hundred tons and if so, is this the usual method of expressing the power of steam hammers. A. We suppose it to be the
weight of the "tup." that is, hammer-head, piston, and rod, as theweightof steam hammers is geverally spoken of in that way.
(5) C. L. H. asks. Can you give me any further instruction for making ink to use on the copy-
ing pad, in your Scientific American, No. 21? I have made some after that direction, as far as I understood it, and can get only about 10 fair copies; and by using ink urnished with other pads, can get 50 copies. Should be glad to receive any instructions you can give on the subject. A. You have probably used impure or im
proper aniline violet. Use pure $3 \mathbf{B}$ methyl aniline
(6) W. A. M. writes: I am desirous of ullding a steam yacht after the model of the one in feet long by 10 feet beam. How many larger, 45 feet long by 10 feet beam. How many passengers
will she carry, and what power engines will be needed? A. 18 to 22 passengers. 9 imch cylinder and 10
(7) W. T. R. asks: 1. How can I prepare battery? A. Dissolve the a plyering bath to use with arm nitric acid. Evaporate nearly to dryness in a porcelain vessel, redissolve in pure water and add
slowly selition (aqueous) of potassium until no further precipitate forms. Better decant the clear liquid wash and dry the precipitated cyanide of silver. 2. Is chloride of gold used in its purity for a gilding solution? If not, please give directions for preparing it. A. No
use the cyanide of gold and potassium. use the cyanide of gold and potassium. 3. Will a have been using it for plating some small articles, bu have not had very good success. I prepared the soluthe battery process from silver coin. A. If pro perly managed, yes. 4. Is silver com fit to prepare so-
lution from or to nse for anodes? A. Coin sil ver will not answer; it contains copper. 5. How much mercury does it take to operate a Sprengel air pump? A. From
00 to 50 lb are commonly employed.
(8) W. S. B. asks: Is there any rule that will ascortain the pressure per square foot on a ship at
different depths down its side? A. The pressure is 144 ifferent depths down its side? A. The pressure is 144
lut 2. Supposing a hollow tube could be plunged through the bottom of a ship, would the water rise and retain a position in the tube above the outside water level? A.
No; it would rise to the height of the level of the wate outside.
(9) J. K. writes: A states that the pressure ing bell is no greater at a depth of 500 feet than it is when the bell is only at a depth of 50 feet in the water B states that on the contrary the greater the depth bo which the bell is sunk in the water, the so much reater pressure of air is required to counterbalance the upward pressure of the water. Please state which is right, A or B. A. A is wrong. The pressure of air must be at least equal to the pressure due to the depth water. B is right.
(10) W. E. K. asks how to take a large coal oil spot out of a carpet. A. Try benzole and woolen cloths.
(11) M. W. asks: 1. Is there any rotary engine equal in point of power to the best type of re-
ciprocating engines? If so, who is the inventor and where is it manufactured? A. No. 2. Suppose a reciprocating engine turns 100 revolutions per minute, does it give an y clearance? A. It must havesome cle ance to allow for the spring and play of the parts.
(12) H. D. writes: 1. I have an engraved copper plate which 1 wish to electroplate with steel. Can do it, and how? A. Consult Gore's and Napier Elecpurpose? A. Yes.
(13) J. T. A. writes: There is a difference of opinion between a man and myself about a small steam boat as regards the government law. He says a
small steam boat under five tons capacity has nothing to pay. I say they have to pay license and also inspec. ion. A. You are right.
Minerals, etc.-Specimens have been recei ved from the following correspondents, and examined, with the results stated:
M. F.-1. Mica schist with hornblende. 2. Syenite. Zinc. 4. Red Jasper. 5. Quartz, feldspar, and chalcopyrite. 6. Quartzose rock. 7. Sardstone. 8. Musco-
vite. 9. Sandstone. 10. Granite. 11. Quartzan vite. 9. Sandstone. 10. Granite. 11. Quartz and trap.
12. Mica schist. 13. Limestone. 14. Chalcopyrite in 12. Mica schist. 13. Limestone. 14. Chalcopyrite in

## communications received.

How to File the Champion Saw. By J. A. H.
How to File the Champion Saw. By J.
On Limestone Built Cities. By J. S.
Five Sundays in February. By H. G. On Limestone Built Cities.
On Inventors. in February.
H. s. B.

## [OFFICIAL.]

## INDEX OF INVENTIONS

Letters Patent of the United States were

## January 27,1880,

## AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]
A complete copy of any patent in the annexed list, inpatent issued since 1867 will be furnishe frometh or any for one dollar. In orderingplease state the numberand ate of the patent desired, and remit to Munn \& Co., 37

## Bedstead fastening, F. S. Clarkson ................. 223,837 Beehive, E. H. Key.............................. 223,924



Blacking box, J. Lamont .............................
Blast furnace, P. L. Weimer...............929
223,870
Blower or exhauster, jet, J. Zellweger............. 223,830
Boot and shoe tree, P. Marsiel je................... 223,811
Box for holding embroideries, etc., W. Stauder... 223,958
Bretzel
Bretzel machine, H. Huber.......................... 223,917
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Car brake and starter, J.
Car, dum ping, J. Jones.
Car,
ar, stock, s. Bray............................................... 223,3867
ars, mechanism for making ladder irons and
hand holds for freight, Briggs \& Dougherty..
Carpet tacker, s. s. Grannis
Carriage top brace, c. Fockler
Carriage top brace, c. Fockle
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Clarkson .......
Caster, W. C. Coddington
Caster, O. Pederson
Caster, O. Pederson .......
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Casting, flexible core for
Cement and artificial stone, making, F. Ransome.
ereal, prepared, J. F. Gent, ... .............
ham, ornamental, G. B. Whitney
Chandelier, extension, C. Deavs
Cheese bandage, B. W. Horton .


Cider press, G. Ziegler..

Cultivator, B. M. Root.....
Currycomb. W. G. Schaefe
Currycomb, W. G. Schaefer.
Curtain fixture, M. Brown ..
Door hanger, A. N. Monteer
rums, jacket for shipping, J. H. ..............
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Electrical switch pin, J. H. C. Watts ............ 223,969
Exercising machine, D. P. Butler.................. 223,79,

Farm gate, J. S. Padon
Faucet, T. F Conklim

ile, bill, J. P. Patterson ..
Flush tank, G. E. Waring, Jr
olding chair and settee, G. W. Chamberlin...
rain binder, A S . Hogt....
Grazing post, T. B. Ashford. E. Fr
Grinding mill, middings, J. Mills
Gear. stopmotion, P. F Hodges.
Guard finger, M. Howard ..........
Harness gag runner, M. R. Dowlin
Harrow, rotary, w. W. Vanhorn.
Harrow, rotary, W. W. W.
Harvester, W. F. Olin
Harvester, hand binding, S. Jo
Hinge, awning blind, T. O. Memer
Hinge, gate, J. E. Davis...
Hoop coiling machine, A. F.
Hoop lock cutter, H. A. \& W. Tripp
Hop picking machine. S. D. Locke
Horse power, R M. Beebee.
Hydrant, $\mathbf{S}$. A. Jenks..
Hydrant, S. A. Jenks .. ......
Hydraulic motor, J. A. Myers
Inking apparatus, S. G. Ames
Jewelry, etc., ornamentation of, L. J. Falize. J..... 223,832

