## Business and Personal.

The chargefor Insertion under this head is one Dollar a line for each insertion; about eight words to a line. as early as Tluarsday morning to appear in next issuce. $\underset{\substack{\text { machi } \\ \text { Mass. }}}{\text { Mitt }}$
Steamboats supplied with Pumps for every service by Valley Machine Works, Easthampton, Mass.
Send for Special List of Second Hand Machinery.
The patent right of Brill's patent Printer's Chase, il lustrated in this number, is for sale.
Pleyte, 1719 Wallout St, Milwaukee, Wis.
Wanted-First class Wood Pattern Maker,experienced $\underset{\substack{\text { in making pat } \\ \text { Lorann, onio. }}}{ }$
Iron Planer, Lathe, Drill, and other machine tools of modern design. New Haven Mfg. Co., New Haven, Conn.
The leading Non-conducting Covering for Boilers Pipes, etco., is Wm . Berkefeld's Fossil Meal Composition S inch thickness radiates less heat than any other cov-
ering does with two inches. Sold in in dry state by the

Machinists.-Spring Calipers and Dividers, with pa tent washers,
Falls, Mass.
Try our Corundum and Emery Wheels for rapid cut Thg. Vitrifled Wheel Co., 38 Elm St., Westileld, Mass. The Providence Steam Engine Co., of Providence, R
., are the sole builders of " The Improved Greene En

Every variety of Rubber Belting, Hose, Packing, Gas kets, Springs, Tubing, Rubber Covered Rollers, Deckle
Straps, Printers' Blankets, manufactured by Boston Belting Co., 226 Devonshire St., Boston, and 70 Reade St New York.
Stephens' Pat. Bench Vises and Planer Chucks. See
dv., p. 76. For sale.-Large Air Compressor, $24^{\prime \prime} \times 24^{\prime \prime}$ air cylin der; steam cylinder, $11^{\prime \prime} \times 24^{\prime \prime}$; coupled to one shaft,
with cranks at rikht angles; also has $10^{\prime}$ band, wheel $16^{\prime \prime}$
face. Good as new. Will be bold very low. Address Henry I. Snell, 135 N. 3d St., Philadelphia, Pa.
Experimental Machinery Perfected, Machinery PatTroy, N. Y.
Bermuda Scientıfic Collections. Naturalist, Box3359,
Wanted.-A first-class man to superintend a Sash,
Blind, and Door Factory; outfitted with all late and imBlind, and Door Factory; outfitted with all late and improved machinery; working about one hundred hands.
Must be sober, a good manager, and estimator on job work. To the right man a good salary and permanent employment will be given. Or I will sell a half interest
in the above well established business. Address, with full in the above well established business. Address, with ful

Whistles, Injectors, Damper Regulators; guaranteed Brush Electric Arc Lights and Storage Batteries. Twenty thousand Are Lights already sold. Our largest
machine gives 65 Arc Lights with 45 horse power. Our Storage Battery is the only practica
Brush Electric Co., Cleveland, 0 .
The Cyclone Steam Flue Cleaner on 30 days' trial to reliable partles.-Grescent Mfg. Co. Cleveland, 0.
For Steam and Power Pumping Machinery of Single pressure pumps, independent condensing outfits, vac pum, hydraulic, artesian, and deep well pumps, air comSt., Boston; 97 Liberty St., N. Y. Send for catalogue.
Stationary, Marine, Portable, and Locomotive Boil
Wanted--Patented turie and introduce. Lexington Mfg. Co., Lexington, Ky

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James F. Hotchkiss, 86 John St., New York.
Mills, Enginos and Boilers for all purposes and of Mill Co., 10 Barclay Street, N. Y.
Presses \& Dies. Ferracute Mach. Co., Bridgeton, N.J. ForPower \& Economy, Alcott's Turbine, Mt. Holly, N.J Steam Boilers, Rotary Bleachers, Wrought Iron Turn
Tables, Plate Iron Work. Tippett \& Wood, Easton, Pa. Send for Monthly Machinery List
to the George Place Machinery Company,
21 Chambers and 103 Reade Streets, New York
If an invention has not been patented in the United States for more than one year, it may still be patented in Canada. Cost for Canadian patent. \$40. Various other
foreign patentsmay also be obtained. For instructions address Munn \& Co., Scientific
akency, 361 Broadway, New York.
Guild \& Garrison's Steam Pump Works, Brooklyn,
v. Y. Steam Pumping Machinery of every description. Send for catalogue.
Nickel Plating.-Sole manufacturers cast nickel an odes, pure nickel salts, polishing compositions, etc. Complete outfit for plating, etc. Hanson \& Van Wind
Newark, N. J., and 92 and 94 Liberty, St., New York.
Supplement Catalogue.-Persons in pursuit of infor-
mation of any special engineering, mechanical, or scienmation of any special engineering, mechanical, or scien-
tifc subject, can have catalogue of contents of the ScItifc subject, can have catalogue of contents of the Sci-
ENTIFIC AMERICAN SUPPLEMENT sent to them free. The SUPPLEMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physical
scienee. Address Munn \& Co., Publishers, New York.
Madchinery for Light Manufacturing, on hand and
built to order. E. E. Garvin \& Co., 139 Center St., N. Y. C. B. Rogers \& Co., Norwich, Conn., Wood Working Maobinery of every kind. See adv., pag̣e 78.
Curtis Pressure Regulator and Steam Trap. See p. 14.
Woodwork'g Mach'y, Rollstone Mach. Co. Adv, p. 14.
Drop Forgings, Billings \& Spencer Co., Hartford, Conn. We are sole mianufacturers of the Fibrous Asbestos
Remiovable Pipe and Botler Coverings. Wie make pure Removable Fipe and Boiler Cos.
asbestos goods of all kinds. Th.
419 East Sth street, New York.

Rubber Skate Wheels. See advertisement, page 18.

Steam Hammers, ImprovedHydraulic Jacks, and Tu
xxpanders. R. Dudgeon, 24 Col wmbla Emersons Book of Saws Jree. Reduced prices
or 1885. 50,000 Sawyers and Lumbermen. Address Hoin, Hoisting Engines, Friction Clutch Palley,
Couplings. D. Frisbie $\&$ Co., Fhiladelpha, Pa.
Barrel, Keg, Hogshead, Stave Mach'y. See adv. p. 78. Swift's Patent Coffee Roasters and Mills, 30 sizes
Lane Bros., makers, $\mathbf{B o x}$ 276, Poughkeepsie, N. $\mathbf{y}$. Munson's Improved Portable Mills, Utica, N. Y. Machine for grooving chilled rolls for flour mills. ratt a Whitney Co., Hartford, Conn.
For best low price Planer and Matcher, and latest
mproved Sash, Door, and Blind Machinery, atalogue to Rowley \& Hermance, Williamsport, Pa.
The Porter-Allen High Speed Steam Engine. Southwark Foundry \& Mach. Co., 430 Washington A ve., Phil.P
Seaming and Looping Machines, Patent Burr Wheel Brushing Machines. Tubbs \& Humphreys, Drawer 1637, Young Men ! Read This!
The Voltaic Belt Co., of Marshall, Mich., offer The Volpaic Belt Co., of Marshall, Mich., offe
to send their celebrated Electro- Voltaic Beld
and other Electric Appliances on trial fo and ors, to men (young or old) a aficted with
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nervous debility, loss of vitality and manhood, and
all kindred troubles. Also for rheumatism, neu-
tise all kindred troubles. Also for rheumatism, neu-
ralgia, paralysis, and many other diseases. Com-
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guaranteed. No risk is incurred, as thirty days' trial guaranteed. No risk is incurred, as thirty days' tria
is allowed. Write them at once for illustrated

Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Yocom \& Son's Shaftin

## NEW BOORS AND PUBLICATIONS

Locomotive Engine Running and tive engines. By Angus Sinclair. John Wiley a Sons, New York. This book will be found especially valuable to eng neers and mechanics who have worked their way into responsible positions, or who are doing so, through
their personal energy and perseverance rather than by their personal energy and perseverance rather than by
the aid'of a regnlar course of study and the advantages of the aidof a regnlar course of study and the advantages o
favorable connections. It is plainly written throughou so that not only firemen and machinists, but those in no way connected with such business, can readily under stand its statements and reasoning, yet it gives a vast amount of detail, derived from long experience of the
writer as a practical engineer, and one having had writer as a practical engineer, and one having had
charge of the motive power and repairs of a prominen branch of railway. It does not pretend to be anything more than an elementary work in mechanical engineer ng, but will form a valuable addition to a class of prac public.

## Original Researches in Mineralogy

AND CHEMISTRY. By J. Lawrence
Smith. Edited by J. B. Marvin.
Printed at Louisville, Ky., for pre-
Printed at Louisville, Ky.: for pre-
sentation only.
This is a memorial volume, prepared at the request of the widow of the late Professor Smith, and contain-
ing a sketch of his life written by Dr. Marvin, at the reing a sketch of his life written by Dr. Marvin, at the re From 1842 to 1873 Professor Smith was prominent as an original investigator in the departments of chemistry
and mineralogy, having been a lecturer in the Charles ton Medical College and Professor of Chemistry in the University of Virginia, and afterward succeeding Professor Silliman in that department in the Uni versity of Louisville. He was one of the earliest to was for a number of years a mining engineer in Tur-
key, where he went on solicitation of the Sultan key, where he went on solicitation of the Sultan
through our Secretary of State. Professor Smith died February 12,1883 , in his 65th year.
SEASONAL Climatic MAPS OF THE United States. By Charles Deni
son. Rand, McNally \& Co., Chicago. These maps em brace five different presentations of the climatology of the United States on a substantially
mounted chart 40 by 60 inches. One side of the chart mounted chart 40 by 60 inches. One side of the chart
has four different views-one each for spring, summer,
autumn, winter-and each showing for those autumn, winter-and each showing, for those seasons, wet and dry winds, altitudes, etc., while the other sidet shows the averages in the conditions in one large map
for the whole country together. The various degrees between extreme moisture and extreme dryness are in-
dicated by eight shadings, from deep blue to deep red. The data of the United States Signal Office, but the way in which
the information is here presented enables one to cover a very large field understandingly at a glance.
The Magazine of American History edited by Mrs. Martha J. Lamb, has now entered upon
its thirteenth volume. Each number of this publicaits thirteenth volume. Each number of this pablica-
tion always presents an admirable collection of papers, and maintains the high character of the gifted editor, who, in her history of New York city, displayed the highest qualities of an author. The magazine is as in-
structive as it is entertaining, its frontispiece in the February number being a portrait of the eminent Mohawk chief, GeorgeH. M. Johnson, or Onwanonsyshon, accompanied by a spirited sketch. Arpong other inter Early New York Post Office." "Benedict Arnold's March to Canada," "The Character of Andrew Jackson," and Andre's Landing Place at Haverstraw." The maga-
ine is handsomely printed and illustrated, and is sold for 35 cents a copy, $\$ 5$ ay ear. Ofllce of publication, 30 LafayettePlace, New York city.

## Ređeivèd.





## M dies (2) Muries

HINTS TO CORRESPONDENTS.
Names and Add ress must accooupany. all letters,
or no attention will be paid thereto. 7 fis is for out $\underset{\substack{\text { or no } \\ \text { infor }}}{ }$ Refrere
Inque
bei



(1) G. F.-For ascertaining the volume of steam used in lifting water by an injector: From neasurements of the suction tank and receiving tank
ascertain the increase of bulk of receiving tank after a run of the injector in cubic feet of water, which ter, will give the amount of water derived from the steam in boiler. Multiply the weight of water thus as
certained
and per pound of water for the pressure that you carry in per pound of water for the pressure that you carry in
the boiler, for the volume of steam used. You will find this table in most works on steam for every pound of
variation in pressure. Thusfor:

| 15 lb. | essu | 1312 | fe | ste | $\mathrm{n}=1 \mathrm{lb}$. | r. |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 20 lb . | " | 111/2 | * | " | $=1 \mathrm{lb}$. | " |
| 25 lb . | " | $10_{5}^{27}$ | " | " | $=1 \mathrm{lb}$. | ' |
| 30 lb . | " | 918 | " | " | $=1 \mathrm{lb}$. | " |
| 40 lb . | * | $7 \frac{1818}{805}$ | " | " | $=1 \mathrm{lb}$. | " |
| 50 lb . | " | ${ }^{6.98}$ | " | " | $=1 \mathrm{lb}$. | " |
| 60 lb . | " | $5^{\frac{88}{100}}$ | " | " | $=1 \mathrm{lb}$. | " |
| 70 lb . | " |  | " | " | $=1 \mathrm{lb}$. | " |

dinary computation, as the volume of water discharge modifies the temperature and becomes the absolute basis of calculation.
(2) B. asks: What is considered the general analysis of ground beef bones? A. The following
analysis by Heintz is given in Ure. It is of the femur fan ox:

## Animal matter.

Phosphate of lime.
Fluoride of calcium
.30 .58
.57 .67
.69
Carbonate of lime...
$2 \cdot 69$
6.99
2.07
(3) J. M. C.-Roofing tile when properly laid have a life of several hundred years more or less,
according with climate. Slate a little less. Slate is the
(4) G. P.-Make soft solder from tea )
(5) H. A. P.-We presume annatoine is coloring matter
(6) J. H. D. asks for a cement or paste that will fasten cotton cioth on sheet iron, that will cement made by melting equal parts of asphalt and gutta percha, and applying the mass hot under a press. See also waterproof cement, Scientific American Sup plement, No. 158.
(7) F. W. S. asks: What can be added to ashes from batuminous coal. that will form good and
inexpensive walks for yards and grounds used only for inexpensive walks for yards and grounds used only for
pedestrians? How made and how put down? A. Good hydraulic cement, equal parts by measure. Mix dry,
then wet the whole quickly as in making mortar, and spread smoothly with shovel. Two inches thick is suffient for ordinary paths.
(8) W. J. S. asks: What will remove ose black flesh worms from the face? A. Cover the
orts affected with a pomade consisting of kaolin 4 parts ycerine 3 parts, acetic acid 2 parts, with the addition of a small quantity of some ethereal oil.
(9) B. F. S.-For removing ink see the nswer given to queries Nos. 39 and 41, in our issue of
November 22, 1884. Manhattan Island is $133<$ November 22,1884 . Manhattan Island is
and 214 miles in width at certain points.
(10) J. B. asks how many steamboilers there are in the United States. A. According to the
census of 1880 , there were 72,304 boilers in use in manufacturing industries, and 5,403 steam vessels. Poor also gives the number of locomotives at $\$ 5,000$.
(11) W. C. B.-Flexible tubes, such as ubber hose and the like, are largely used fortransmit ing the elements of power, such as steam, air, and
water; but the motion due to such power has to be de veloped at the exit end of such tubes by appropriate appliances. Your half horse power from a blast is feasi-
ble, but we cannot construct your appliance.
(12) E. A. P. asks for receipt for makng green ink that will copy. A. The receipt for reen ink is given on page 2498 of Scientific Ameri-
an Supplement. No. 157 . The addition of a small quantity of glycerine will cause it to copy. An aniline green soluble in water and mixed with glycerine with
(13) E. W. A. $\rightarrow$ Locomotive wheels and car wheels vary nuch in size. If you will multiply the
diameter of any wheel by 3.1416 , and divide the number of feet in 40 miles by this sum, you will obtain the whole number of revolutions in 1 hour; divide this
(14) J. E. L. asks: How many pounds to the square inch is called high, and how many pounds is called low, pressure of steam, when used in buildings
for hedting purposes and return to boiler? A. From 10 oundsupward is generally called high pressure; from 0 pound to 10 pounds, low pressure. Much of our low
(15) E. R. asks (1) what to add to China ink to make it flow easily and without interruptions on racing cloth. A. It has been found that if genuin Indian ink be rubbed with good black ink until it will low easily from a pen, excellent results wing ensue.
Whether there is any possibility of restoring the tran parency of tracing cloth, when it has been damaged by water drops, so that in copies made by the blue process the purpose? A. Tracing cloth is coated with a varnish an be restored by coating them with the proper vainish, whatever it may be. Frequently equal parts of Canad
(16) P. B.-Encke's comet is not visible as yet to the naked eye. For otherparticulars see illus-
rated article in Scientific American, January 24 885. A planet is said to be stationary when the bital motion of the earth and the planet so coincide that the planet appears for a short time not to move in its position among the stars. The nodes are the point here theorbits of the planets intercept the ecliptic descending south, ascending north.
(17) P. H. McN. asks: Is there any loss motor power in the use of the reciprocating steam en o the rotary motion, through the crank and its conne ions to the main shaft? If so, what per cent? I find thatengineers differ this subject. A. Engineers do ot differ so much as to the fact as they do in th methods and necessity of overcoming the apparent loss by special contrivances. Although the actual loss may be about 37 per cent, the smoothness of motion of the crank and its ease of reversion are well worthy of its engineering practice has long since settled the theoretical dispute in favor of the crank.
(18) F. J. C. asks for a receipt for frost ing silver. A. Dip the article in a solution of nitric acid and water, half and half. for a few minutes, the wash well in clean water, and dry in hot sawdust oft brush, and burnish the parts required to be bright.
(19) F. H. W. asks: 1 . Is there anything etter than fluoric acid with which to etch on glass? A o. The sand blast if ther certain exten. . How is he matter applied, if there is any other way than by
he use of wax? A. Two slightly differing rocesses by means of fluoric acid are described, the first on page 2690 of Scientipic American Supplement, No. 169, and the second on page 4994 of Scientific Amerioan Supcalled diamondink, used to etch glass? A. Diamond ink is a trade name given to some particular variety of etch ing ink. See page 232 of Scientipic American, for
October 11, 1884, for method of manufacturing the (20) Merlin asks for a formula for mak ing violet or purple (the best) ink for using with the
hektograph. A. The ink you desire is prepared by di hektograph. A. The ink you desire is prepared by dis. parts water and one of alcohol.
(21) W. T. G. asks the most effective stain for ash. I desire to stain a dark color, say imitation of ebony. If this wood can be effectively stained ebony, will you be good enough to give me a good recipe
for such a stain, and say whether it should be put on or such a stain, and say whether it should be put on
hot or cold. A. We recommend the following: Dis hot or cold. A. We recommend the following: Dis solve 4 ounces shellac with 2 ounces boraxin $1 / 2$ gallon of
water. Boil until a perfect solution is obtained. then add $1 / 2$ ounce glycerine, after which add, in sufficient water soluble aniline black, and the mixture is ready for use
und See also process given under "Dyeing Wood Black," in Scientific American Supplement, No. 207.
(22) J. E. J. desires a formula for mixing water colors, so as to form cakes that won't crack in
drying. A. Water colors mixed with gelatine, and after ward fixed by washing with a solution of alum or with ward ixed by washing with a solution of alum or with
curd of milk, washed and pressed, then dried on fine curd of milk, washed and pressed, then dried on fine
net, and, when required for use, mixed with water and the coloring matter.
(23) Q. C. A. asks: 1. Is there any known chemical or substance that will remove the stain or scar produced by the burn of sulphuric acid (on the red stain and scar. A. We know of nothing that will remove the scar, except time. The skin is burnt, and it will take time for a new cuticle to grow. 2. Please give me a receipt for gold ink. I can mak it, set les. A. For gold the bronze held in sold $1 / 2$ ounce bronze gold; 30 grains best honey; 4 drachms gum arabic; 30 drops spirits of wine; 4 ounces rain water. Rub the gold with the honey and gum, and having mixed it with the water, add the spirit.
(24) V. C. H.-To definitely express an
(inion concerning the proper means of preventing opinion concerning the proper means of preventing boiler scale is almost impossible without an exact know-
ledge of the composition of the water a ed, etc. On ledge of the composition of the water a ed, etc. On
page 4553 of Scientift American Supplement, No. 286, you will find an article on the "Complete Preven tannates tannates of soda are recommended. In general all
woods rich in tannin are used. Filtering through iron woods rich in tannin are used. Filtering through iron
may be advantageous for drinking purposes, but we do not see that it will affect the lime salts contained in
(25) A. P. C. asks how to remove painted etters from a brick building. A. To properly answer explained. To remove paint from stone, use three pounds of common washing soda dissolved in a gallon of boiling water. This, if applied hot, will so soften the paint that in a short time, it can be readily removed with a stiff ecrubbing brueh.

