## 3H5ithess and ersomat.

The Charge for hisertion u
a line for each insertion.
For Sale Cheap-A 4 inch Refr. Telescope with ac cessories. Address H. Harrison, P.O. Box 179, Jersey
City, N. J. Magic Lanterns and Stereopticons of all prices. Views able business for a man with a small capita terns for college and home amusement. 74 page cata-
ta logue free. McAllister Mf. Optician, 49 Nassau St., N. F
Lansdell's Steam Siphon pumps sandy and grity wa Lansdell's Steam Siphon pumps sandy and gritty wa-
ter as easily as clean. Leng \& Ogden, 212 Fearl St., N.Y. Lipsey "Reliable" Wrench; strong, convenient. Best. oind building a We intend building a Foundry. Parties having Cupo-

Ice Machines. Clayton \& Cook, Daretown, N.J.
Corliss Engine Builders, with Wetherill's improvements, Engineers, Machinists, Iron Founders, and Boil Hobt. Wetherill \& Co., Chester, Pa
The Niles Tool Works, Hamilton, O., have
hand Machine Tools in first class order for sale.
Auction Sale of 17 Screw Cutting Engine Lathes, Planers, Engine, Boilers, etc., at 301 Cherry St., Phila., Pa., 11 A.M.,. Dec. 3d. Send for Catalogue
\& Sons, Auctioneers, S. 4th St., Phila., Pa
Electrical Qoods of every description. Annunciators, Co., Melrose, Mass.
For Steam Engines with Corlss Valve, all sizes, apply to Watts, Campbell \& Co., Newark, N.J.
Wanted to Manufacture small Articles or light Machinery (Wood or Iron)
Box 401, Westerly. R.I.
Don't Infringe. See notice of $P$
Bound Volumes of the Scientifc American.-I have he Scientifc Amer(can, which I will sell at 81 each,
Wanted.-A New or Second-hand Brown \& Sharp No Universal Milling Machine. Address, giving full par-
ticulars and price, Lidgerwood Manufacturing Co., P.O. ticulars and price,
Box $2,132, ~ N . ~ Y . ~$
Wanted.-A Partner with $\$ 4,000$, to buy a half inter
ness in St. Louis, established several years. A young man with a knowledge of Mechanics and Engineering preferred.
The Best Mill in the World, for White Lead. Dry aste, or Mixed Paint, Printing Ink, Chocolate, Par White, shoe Blacking, etc., Flour, Meal, Feed, D
Cork, etc. Charles Ross, Jr., Williamsburgh, N. J.
Boilers set with the Jarvis Furnace will burn screengs and little soft coal without blower
If you have a good thing you wish introduced into Canada,adaress w.H.Sheppard, General Man acturer gent, 183 queen St., Toronto, Canada,
A good Machinist or Pattern Maker having $\$ 2,000$ may secure ${ }^{\text {n/ }}$ interest in an old, valuable, and pleasant
business. For particulars, address T. B. Jeffery, Canal St., Chicago, Ill.
The expariments in testing the efflciency of different Covings for Steam Pipes at Trinity College Buildings, Hartford, Conn., which resultedin favor of he Chalmer spence "Air-space" covering, were conducted under buildings
For Sale.-The Patent of a new Water Elevator. Address P.O.Boz 470, N. Y.city
A German gentleman, of large experience, speaking the modern languages fluently, wishes to represent one or two best American frms at the
dress L. B. 1,000 , Youngstown, 0 .
For Sale, Exchange, or To Let.-Large Factory, with Root Blowers
Blower-all suitable for cupola or forges-and a No. Hot Blast Heater, in perfect order, at very low prices. Address Hill, Clarke \& Co., Boston, Mass.
Bishop Stave-Sawing Machine for light work, Novelty Iron Works, Dubuque. Iowa, sole manufacturers. It grain, and makes 6,000 to 9,000 per day. We also build Barrel Machinesy for "Slack Work," Gauge Lathes, etc.

## Send us your add ress for circulars.

Noise-Quieting Nozzles for Locomotives, Stea
etc. T.Shaw, 915 Rldge A ve., Phtladelphta, Pa.
For New Illustrated Catalogue of Foot Lathes, Scro aws, Small Steam Engines and Amateur's Tools, send Shaw's Mercury Gauges, U. S. Standa
Shaw's Mercury Qauges, U. S.
15 Ridge Ave., Philadelphia, Pa.
Bolt Forging Mach. \& Power Hammers a specialty
Bolt Forging Mach. \& Power Hammers a specialty
Send for circulars. Forsaith \& Co., Manchester, N. H. For Town \& Village use, Comb'd Hand Fire Engine \&
Hose Carriage, 8350 Forsaith \& Co., Manchester, N. H. Best and Cheapest Wagon Tire Upsetter. only $\$ 12$.
Circular free. H. W. Seaman \& Co., Millport, N. Y. John T. Noye \& Son, Bxifalo, N. Y., are Manufactur ers of Burr Mill Stones and Flour Mill Machinery of all
tuds, and dealers in Dufour $\&$ Co.'s Bolting Cloth kinds, and dealers in Dufour \&
Send for large illustrated catalogue.
Power \& Foot Presses, Ferracute Co., Bridgeton, N. J. Solid Emery Vulcanite Wheels-The Solid Original Caution.-Our name is stamped in fullon all our best Standard Belting, Packing, and Hose. Buy that only.
The best is the cheapest. New York Belting and Pack The best is the cheapest. New Yorks B
ing Company, 37 and 38 Park Row, N. Y.
Steel Castings from one 1 lb . to flive thousand libs. In-
valuable for strength and durablity Circular valuable for strength and durability. Circ
Pittsburgh Steel Casting Co., Pittsburgh, Pa.
For BestPresses, Dies, and Fruit Can Tools, Bliss \& Hydraulic Presses and Jacks, new and second hand athes and Machinery for Polishing and Buffing metals Lyon \& Co., 470 Grand St., N. Y.
Reliable information given on all subjects relating to Mechanics, Hydraulics, Pneumatics, steam Eng

For the best Qate Valves of all kinds, apply to ennedy \& Co., 88 John St., N. Boulter's Superior Muffes, Assayers and Cupellers Portable Furnaces, Slides, Tile, Fire Brick
for sale. 1,609 North St., Philadelphia, Pa.
"Little All Right," the smallest and most perfect Revolver in the world. Ractizais newboth in principle and
operation. Send for circular. All Right Firearm's C 0 awrence, Mass., U.S. A.
For Solid Wrought Iron Beams, etc., see advertise ment. Addres
Felt of every description for Manufacturers' purposes especially adapted for Polishing, can be furnished in any thickness, size, or shape. Tingue, House \&c Co., Manu-
facturers. Salesroom, 69 Duane St., N. Y. Factory at

## lenville, Conn.

Improved Wood-working Machinery made by Walker
Best Pulleys and Couplings made; secured to shaft logue. Taper Sleeve Pulles Works, Erie, Pa
Articles in Light Metal Work, Fine Castings in Bras Malleable Iron, \&c., Japanning, Tin
Welles' Specialty Works, Chicago, Il
Clia and
Hartford, Conn.
The Varnishes and Japans of Hyatt \& Co., established r2 ("The London Manuf. Co."), made from scientific ormula by a practical maker of materials, free of delefor color, purity, and durability, with cheapness, givin hem meritorious pre-eminence. Try them. Send for treet, $\mathrm{N} . \mathrm{Y}$
c. C. Phillips, 4,048 Girard Ave., West Phila., man factures Vertical and other Burr Mills adapted to a Wind Engines, for general use, where economy and edinar power is required. Estimates given and prin .W.Kennedy, 516 Fairmount A ve., Philadelphia, Pa. Silver Solder and small Tubing. John Holland, Cin Diamond Saws. J. Dickinson, 64 Nassau St., N. Y Patent Scroll and Band Saws. Best and ch
For Boult's Paneling, Moulding, and Dovetailing Ma chine, and other wood-working machinery, address B.c.
Machinery Co., Battle Creek, Mich.
Chester Steel Castings Co. make castings for heavy gearing, and Hydraulic Cylinders where great strengt
is required. See their advertisement, page 382 .

## 

(1) H. S. asks: What is the cause of a per. on sweating after death? There was a case of that kind Probably it was caused by the condensation of vapor ne case of a pace of the body, similar to
(2) R. C. A. asks why the drive wheels of a and slip when up? A. It is due to the action of the counterbalance.
(3) W. W. W. asks for a recipe for clean(4) B. T. M. says: I had a large brick house on my hands, although not an old one. The own and build a smaller one, using the same bricks. hery much on the brick more especially mortar show ers. Is there any way of cleaning off the old mortar with acid, and what acid, what proportion, and how done: A. It would be very difflcult to clean the old
lime off so as to look well. It would be better to clean he house a light cream color. However, if you can ouch the red spots with a little red paint of the color
of the brick, you could then give the house a coat of of the brick,
linseed oil.
(5) W. G. R. says: In painting on china with oil colors I find that the paint will not stick, or rubs off. Can yougivea recipe to prepare the object so Youmight scratch the glaze with fine emery paper and use thick colors; but there is no way of permanently applying colors to china except by burning them in.
(6) W. R. K. says: I am desirous of becoming a surveyor, can you tell me where I can learn ain practice in surveying to join a surveying party in some humble capacity, and work his way up. There
are also technical schools in which strveyl:g is taught. The profession, like most others, hassome vacant seats in the front row.
(7) I. G. R. says: I have a mill and well which stand 160 yards from the bed of the creek; from The bed of the creek to the top of the well is 30 feet. creek. Can Idraw 'he water from the creek into the
(8) S. A. H. can free his pot plants from
(8) S. A. H. can free his pot plants from
ice by enclosing themin a tight chamber and fumigatlice by enclosing themin a tigh
ing them with tobacco smoke.
(9) E. R., in answerto R.P. N., says that the ndian summer is caused by the heat which is absorbed by the Lakes, which is gi
atmosphere grows colder.
In answer to W. A. P., who inquires what angle the under side of the teeth of an upright saw should mase with a horizontal line, E. R. suggests to make the angle $2^{\circ}$, and to hang the saw forward for cutting softwood. (10) I. J. I. asks: What are the kinds of trout and do they belong to the same species?
What is the difference between the salmon and the salmon trout? A. All truat are but a species of the sal
mon family, inhabiting principally freah water. The
salmon trout belong to the genus fario, having one row welding if the parts are cleaned on leaving the fire
of teeth on the vomer, true salmons having a smooth with a steel wire brush; try Borax as a flux. of teeth on the vomer, true salmons having a smooth
palate. It is very much larger than the true trout, of a
palate. It is very much larger than the true trout, of a
different color, and is found in larger lakes and rivers. Its habits resemble those of the salmon. There are several species of salmon trout in the lakes of Maine. The
brook trout is the salmo fontinalis and inhabits streams. To the genus salmo also belong the char of the British nd Swiss lakes, the gray troutor ogue, and the siskiitof our own great
(11) T. G. B. asks: Is there such an instruDoes not the wheat crop of California exceed that of Michigan? A. Yes.
Which are the most valuable, the copper mines o
Michigan or the gold mines of Califoroia? mines.
(12) H. W. W. asks how to prepare electroplates fromengravings on lead? Have obtained an imith plaster of Paris, but cannot copper plate i. A. Take your impression in beeswax and dustly over with finely posdered plumbago. There
light should then be no difficulty in obtaining a copper de-
(13) E. T. H. asks for a recipe for polishing show cases of German silver? A. A good polishing powder consists of rock alum, burned and finely
powdered, 5 parts; levigated chalk, 1 part. Mix. Ap powdered, 5 parts; lev
ply with a dry brush.
(14) H. F. B. asks: How to mix paints? Buy yourpaints ready mixed insealed cans in color o suit your taste.
What is the best and shortest way of building a con tinued stairway? A. To learn how to build a stairway
with continuous rail, you require a treatise on stairbuilding. If, however, you send the dimensions set apart nish the stairs for you, and send a man to put them up Consult a New York business directory if youdo no
ad what you want in our advertising columns.
(15) R. W. asks for a method of rendering anvas or cotton goods impervious to water, yet pliable A. Plunge the fabric in a solution containing 20 per cent soap, and afterward into another solution contain-
ing the same percentage of sulphate of copper. Wash ing the same
afterwards.
(16) H. R. H. asks: What is the correct an wer to the following example? 714--714-( $34-\cdot 034 x$
 dispute arose as to how it should be solved. The fol lowing are the solutions of the disputants;

\section*{First. | $714-\cdot 714=713 \cdot 286$ |  |
| ---: | :--- |
| $34-034$ | $=306$ | <br> $\cdot 25$ of $6=1 \cdot 5$

$.3061 \cdot 6=: 499$
$713 \cdot 286 \div \cdot 459=1554$; answer.}

## .25 of $6=1 \cdot 5$ $.034 \times 1.5=0.51$ $.34-.051=289$

$714 \div-289=2 \cdot 47058+$
$714-2 \cdot 47058+=71152942+$ answer.
Should the signs of multiplication and division
preference to those of addition and subtraction? A
The second solution is the correct one. For the first solution the example should be given thus: (714-0714) $[(0.34-0.034) \times 0.25$ of 6.$]$
(17) H. S. asks how to make a powder or solution whereby he can silverplate without a battery? pearlash, $11 /$ paits common salt, and 1 part whiting. Rub the mixture on the metal, previously well cleaned by means of a piece of soft leather. When properly
silvered the metal should be washed in hot water slightsilvered the
y alkaline.
(18) C. S. F. says: The indicator on my steam gauge before using was down to the pin (zero).
After a few days' use it rests at 10 with the boiler After a few days' use it rests at 10 with the boiler
empty. Can I safely consider it as indicating 10 lbs too much ander all pressures? It is in working order. You cannot, in the absence of a test.
(19) A. A. W. asks whether any better re ults would be obtained in setting the valves of a locoeccentric more lead than the go-ahead one? A. Other things being equal, we thinknot.
(20) A. A. asks: What is the strength of a
 No. $10, \mathrm{I}$ think) in thickness? A. It should be able to
eara strain of from 10,000 to $12,000 \mathrm{lbs}$., if the ends are properly welded; a little more than 13 as much if
(21) J. W. P. asks: Does not the compres ion of exhaust steam in the cylinder retard the motion of the engine, and is it a disadvantage only in taking up he lost motion? I find my engine runs smoother with fuel. A. It is economical to cushion to economy of ent. Compression beyond the economic point is frequently required, in order to make the engine work
(22) I. T. S. asks whether a reciprocating engine can be so balanced at a given speed as to stand steady? A. A horizontal engine can be so balanced
hat there is notendency to move in a horizontal directhat, there if no tendency to move in a horizontal direc-
tion, and if it sufficlently heavy, it will also be steady
(23) S. B. asks: 1. Has an artificial rainow ever been produced? A. Yes; by projecting a ne spray. fine spray. 2. Can it be produced, and how? A. See
the ScIENTIFIC American Suppiement No. 52 , and Scrence Record for 1874 and 1875.

1. How can I construct the simplest machine (to work y water power) to produce the electric light? A. Six-
to one hundred carbon or Grove cells are connected in series-the zinc of the first and the carbon of the next, and so on. A wire from either end of the serie
(24) W. M. says: I have got Bessemer steel shoes ready made for my horse, but the blacksmith
cannot weld on caulks of common steel of the Bessecannot weld on caulks of common steel of the Besse-
(25) G. C. says: 1. Please inform me if I will get more pressure of water by having my tank bot tom made like a funnel, and have a pipe from bottom do m want pump, than to have it fat? A. No. 2. Also with two engines than from one, using same steam on both, as one? A. No. 3. Also if one engine has more strokethan the other, will it work all right, both on same shaft, crank on each en d, one $8 \times 17$ and one $10 \times$ 15? A. It can be made to do so. 4. Can I runtwo engines with as much economy, providing one would do the works A. Qenerally, no. 5. Ihave two rigged up, one? I use two boilers, locomotive built. A. It makes very little difference, if they are equally well designed and built. 6. Please say how fast I should run both, and how fast one if used alone? A. You can run them at a piston speed of between 400 and 500 feet per minif they are properly constructed.
(26) 'I'. E. M. says: A friend has a horsechestnut tree in front of his house, a limb of which weather gets down to zero the the winter, when the es toward the south: when it becomes warm again it resumes its former position. Will yon please give me to unequal contraction in the trunk of the be due
(27) E. F. says: I have a small seed microscope with 2 lenses, $1_{1}^{5}{ }^{5}$ inch in diameter and $21 /$ inch
focus. Can I make a camera obscura with them A. How thick is a bound volume of the Scientific American? A. 13 inches including covers
(28) D. F. asks: How is gaseous ammonia tort and apply heat. Thegas will immediately begin to come over; it is nearly all expelled from the water by boiling for a few minutes. Ammonia is also obtained niac) with a solution carbonate or chloride (sal ammoniac) with a solution of caustic potash. 2. How can I
make gaseous chloride? A. If you mean chlorine, heat an ounce of peroxide of manganese with an equal weight of hydrochloric acid. Chlorine is very poisonous when inhaled. 3. How can I distil chloroform? A. Place the chloroform in a glass retort gentiy heated. The vapor must be passed through a glass worm sur-
rounded by water, which condenses it.
(29) E. S. asks how to tin cast iron pipe? A. File brightthepiece of iron required to be timed, of spirits of salt put a piece of zinc the size of a quar of spirits of salt, put a piece of zinc the size of a quar-
ter dollar; the spirits of salt will eat it away; wet the places required to be tinned with the solution, then while wet use a copper bit with fine solder, and it will immediately tin.
(30) N. B. asks for a good freezing mixture? A. Pounded ice, salt, and a little sal ammoniac, or ice drochloric acid.
(31) A. J. wishes to polish mother of pearl? Qo over it with pumicestone finely powdered, and ter by a rubber, which will produce a fine gloss and
(32) B. F. asks for a cheap invisible black nk: A. Dissolve 1 fuid oz. of common oil of vitriol
in a pint of soft water. Stir well and allow to cool. Write with a clean pen. When dry it will beinvisible; Write with a clean pen. When dry it will
held to the fre it turns an indelible black.
Minerals, etc.-Specimens have been received from the following correspondents, and examined, with the results stated:
L.H.-Itis quartz-of little value.-J. H. M.-A is a with small particles of marcasite. An analysis would be necessary to determine the exact composition of the samples.-C. M. H.-It is an alloy of tin and lead; the
amounts of each can only be determined by a chemical mounts of each can only be determined by a chemical nalysis.-E. B.-No. I is hoinblende. No. 2 is haus-manite-an ore of manganese.-J.S. H.-The rock con-worked.-E.J. F.-It is a ferruginous sand. It does not contain precious metals.-H. F. L.-It is partially altered fibrous talc-a hydrous silicate of magnesia.
The mineral is extensively used in the manufacture of The mineral is extensively used in the manufacture of writing paper and fireproof roofng paper and paints. ders. See $p$ cont many anti-fiction powders. See p. 309, current volume of the Scientifio

## COMMUNICATIONS RECEIVED.

The Editor of the Scientific American acknowledges with much pleasure, the receipt of original On a Method of Ventilating Rooms. By H. E. V

HINTS TO CORRESPONDENTS.
We renew our request that correspondents, in referring of former answers or articles, will be kind enough to of the question.
Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude hat, for good reasons, the Editor declines the
Inquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given,
are thrown into the waste basket, as it would fll half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address

## WANTS AND BUSINESS INQUIRIES <br> and that of a busi-

by advertisingin the colymn of "Business and Personal," which is set apart for that purpose subject to he charge mentioned at its head.
We have received this week the following inquiries,


Pall, scrubbing, F. N. Burk ........
Paper dish, Crume \& Aulabaugh
Pen, stencil, T. A. Ed
Pen, stencill, T. A. Edison..............................
Phosphates, treatment of, P.G.L. G.Designolle Piano, action frame, K ranich \& Bach
Pianofortes, stringing, J. D. Ellot tr)
Pipe coupling, E. s. Chapeli.............
Pipe elbow seaming m,
Pipe elbow seaming machine, G. Choa
Pipe, water supply, C. L. Irtesslein....
Planing machines, chip breaker, E. Benjami
Plant setter and seed planter, J. C. Terrill
Planter and grain drill, sulky corn,T. Terry
Planter, corn, H. Jones...
Planter, corn,. . Rydbeck
Planter, corn, , R. Rybeck....
Planter, cotton, J. W. Elliott.
Planter, cotton, D. W. Reed.
Planter, cotton.seed and corn, J. R. Palmero.
Planters, check row, E. M. Wilco
Planters, check row, E. M. Wilcox....
Plastic composition, mixing, A. Dietz
Plate lifter, W. Beattie
Plow, R. Coreth.........

Plow, M. ronew, and se.............. Hoffa
Plows, cultivators, T. W. Lerch.
Pocket book and revolver, 0. Frankenau.
Potato bug gatherer, H. Charles, Jr
Potato digger, H. More...... .......
Potato digger, H. More......
Pulley, counter hhaft, $\mathbf{G}$. Sog
Pulp engine, S. L. Gould......
Pump,force, J. Tallent...
Quilting machine, A. Beck
Railroad track, L . Hall ( r )
Reck holder, G. Jennings.
Rocill, U . Cumming.
Rooflng tile, H. Stripe.
Roving frame, worsted, H. N. Craven Sad fron, L. Passmore........
Sash fastener, W. P. Hudson
Sash holder R. Sash holdener, R. B. P. Hugun
Saw, C. J. Wilson....................
Saw frame attachment, G. W. Higgins Saw frame attachment, G. W. Higgin
Sa weeth, insertable, w. Hawkins....
Saws, hanging circular, F. Hamiliton Saws, hanging circular, F'. Hamilton
Saws, scroll, J. R. Vellacott .........
Sawing machine, scroll, J. Glove
Scales, weighing, C. L. Bellamy
Scoops, making wooden, R. Richardi (r).. Screw tap, J. Cook
Sewing machine, wax thread, , J. Keith
Sewing machines, Rose \& Sors Swing machines, Rose \& So
Sewing machines, T. Keith..
Shaft couplings, clutech for,
Shaft holder, vehicle, W. H. \& J. A. Froman
Shaft tug lining, E. C. Bickford Shaft tug lining, E. C. Bickford.
Shafts, bearing for, L. T. Jones. Shoe, , M. How........ ..........
Shutle motion, E. H. Graham. Skins, scouring, C. T. \& S. A. Skglight, F. M. Campbell.
Soap, foating, A. Quentin Spoke socket, G. F. Graves Staves, chamfering, B. W. Sutherlen. Steam engines, condenser, J. Haupt.
Steam generator, Renshaw \& Tower Steam generator, Renshawa
Steamtrap, C. F. Pike..........
Stilts, adjustable, C. S. Shute. Stilts, adjustable, C. S. Shute
Stirrup, H. M. Hollingsworth Stove, warming, R. E. C. Ifrver.............
Sulphuric acid, purifying, R. w. Wallace Surgical bandages, preparing,
Tablet. grave, F. C. Bushway.
 Tine detecter, watchmande of, J. M. Sanders.

```
Tire bending and upseting,
Tire upsetter, J. G. Mole.
```

$\qquad$ Torpedofor oil wells, C. A. McCo
Toy moner box, J. H. Bowen
Toy money box, J. H. Bowen.................
Toy scroll sawingmachine, S. N. Trump (r) Toy whirligig, C. E. Steller
Track lifter and spike puller, Traction Wheel, W. H. Trenwith...
Transom lifter, J. F. Wohensak.... Treadle, H. Shogren .. Truss, L. Westinghouse......
Tucker, E. A. Vance...........
Twine holder, A. J. Morrison Type-setting machine, Resnolds \& Thorne Valve cut-oft. T. Whittaker. Vehicle, side spring, Magner \& Thomas. Vehicle, spring, F. Oppenheim Velocipede, Smith \& Thurston. ventilator, smoke, C. K. Edwards..
Vessels, buoging. J. C. Wheeden... Vessels, buoying. J. C. Wheeden....
Violins, chin rest for, H. W. White Vise, anvil, A. H. Anderson
V ulcanized fiber, T. Hanna. Vulcanized flber, waterproof, T. Hanna
Wagon tongue support J. Wagon tongue support J. M. Hunter..........
Wash bows. tubs, baths. etc., valve for, H.O Washing machine, Harrington \& Watch case spring, A. N.
Water closet, N. Folsom. Water closets, porcelain bowl for, C. Harrison
Watermeter, D. P. Wetr Water tube boiler, C. Tyson
Wheelbarrow, W.H. Stevens. Whip and cane handle, W. H. Rice...
Whip socket and line holder, A. Smith Whip socket and line holder, A. Smith
Wire-drawing machine, J. S. Winsor. Wire stretcher, C. F. Roth

DESIGNS PATENTED Printing Type.-D.W Bruce, New York city.
ry Brehmer, Stapleton, S. I., N.Y.
10,292.-FONT OF ORNAMENTAL PRINTING TyPE.-Julius Herriet, New York city.
10,233to 10,255.-CARPETS. ETC.-
Dutchess Co., N.Y. John Hamer, Mattewan
burg Pa, Glassware.-Jenkin Jones, Pitts 10,298 to 10,504 ,-Oil Cloth.-O. T. Meyer et al., Ber10,305. -SPICE CADDIES.-Edimin Norton, Chicago, 111. Moson and 10,907.-CARPETS.-Thomas J. Stearns, Bosto




## Bound Volumes

 Scientific Amorican.

STEAM PUMPS.







NILESENGINE
COTTON GINS, CORN MILLS, PRINTING OFFICES, FIOTELE ADORESS NILES TOOL WORKS,
Hamilion, Ohio.

| 1898. | NEW YORK. | 18 |
| :---: | :---: | :---: |
| As the time approaches for the renewal of subserip- |  |  |
| tion, THB SUN would remind its friendsand well righers everymere, that it is stain a candiaatconsideration and support. |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
| been extended to it from every quarter of the Union. The Daily Sun is a four-page sheet of 28 columns; |  |  |
| The Daily Sun is a four-page sheet of 28 columns; price by |  |  |
| TheSunday editionof Tresun isan eifht.page sheet of 56 columngs. While giving the news of the (wy, thalso matter specilaty prepared forit. TYE SUNDAY SUX has |  |  |
|  |  |  |
|  |  |  |
| The Weekly Sun. |  |  |
| Who does not know The Weeki S SUN? It cinculates yond. Ninety thousand families ercet its, welcome |  |  |
|  |  |  |
| pages weekigy and regard it in the light of guitu, coun- |  |  |
|  |  |  |
| iterary departments make it exseentilalily jurulal for |  |  |
| the family and the fireside. Terms: One Dollar a year, the family and the iresie. fity considered, makes it the cheapest newspayer pubished. For cIubs of ten, with |  |  |
|  |  |  |
| cheapest newepayer pubdished. For clubs of ten, with 810 cash, we will send an extra copy free. Address |  |  |
|  |  |  |







## Jarvis Gas Consmming Finnace,  <br> Šientific Ammricaur. <br> The Jost Popular Scientific Paper in the World.

Euproved slide Valve far steam Fugines.


Locomotives on Street Tramways,

$\qquad$


 THIRTY-SECOND YEAR.
Only \$3.20a Year including Postage. Weekiy. 52 Numbers a Year.

This widely circulated and splendidly illustrated paper is published weekly. Every number contans six-
teen pages of useful information, and a large number of original engravings of new inventions and discoveries,
representing Engineering Works, Steam Machinerg New Inventions, Novelties in Mechanics, Manufactures, Chemistry, Electricity, Telegraphy, Photography, ArchlAll Classes of Readers find in THE ScIENTIFIC formation of the day; and it is the aimof the publishers to present it in an attractive form, avoiding as much as
possible abstruse terms. To every intelligent mind, this journal affords a constant supply of instructive eading. It is promotive of knowledge
every community where it circulates.
Terms of Subscription.-One copy of THE SCIENTIFrC American wil be sent for on year - 52 numbers-
postage prepaid, to any subseriber in the United States or Canada, on receipt of three dollars and twenty
cents by the publishers; six months, 81.60 ; three cents by the
months, 81.00 .
Clubs.-One extra copy of ThescientificameriCAN will be supplied gratis for every clubof fivesubscribers
at fasio each, additional copies at same proportionate Postage prepaía.
of The Scientific Amprican Suppican and one cop for one year, postage prepaid, to any subscriber in the the publishers.
The safest way to remit is by Postal Order, Draft, or Express. Money carefully placed inside of envelopes,
securely sealed, and correctly addressed, seldom goee astray but 18 at the sender's risk. Address all letters,

MUNN \& CO
37 Park Row New York.

