

See "The Lathe and Its Uses," and Knight's "Mechanism and Construction."

(32) N. N. B. asks: Does the north pole rise and the south pole sink from December 21 to June 21 (thus giving us the seasons), and vice versa from June 21 to December 21? Cannot it be properly said that the earth has three motions, namely, its diurnal rotation, its annual revolution, and its polar inclination? A. The earth's equator is always inclined $23^{\circ} 17'$ to the plane of its path round the sun. To illustrate this, make two balls of wood or cork representing earth and sun. Put a wire axis through the earth at an angle of $23^{\circ} 17'$ into the pivot of a hanging weight, fastened to a stick which turns in a vertical plane around the sun. The action of gravity will then keep the earth's axis continually pointing in the same direction.

(33) F. G. S. asks: How can I make a white paint that cannot be softened by alcohol? A. Mix any powdered white pigment with water glass.

Is there an optical instrument in use by which I can measure distances at a glance? A. Take a spy glass, a wooden rod, and a fat spider. Toss the spider from hand to hand to make him spin. Wind the thread spirally on a forked stick or wire. Gum two parallel spider lines on a ring of metal or card board, and place this ring in the focus of the terrestrial eyepiece. Mark the space included between the spider lines on the rod, 100 feet distant. Then as the space on rod included between the spider lines at 100 feet is to the space included at an unknown distance, so is 100 feet to the distance required. Simpler methods are described in Wingate's "Manual of Rifle Practice."

(34) A. F.—The sun's amplitude at summer solstice depends upon the obliquity of the ecliptic, and not upon his distance, as you suppose.

(35) A. S. asks: Is there any means by which I can render canvas or heavy muslin airtight, so as to make a pair of bellows? A. Yes. See p. 379, vol. 30. In the end, leather would be much the cheapest.

(36) J. F. and others ask, in reference to S. E. S.'s query as to where he would arrive if he took a northeasterly course: Will you please explain how a man would arrive at the pole by traveling this course? It is our opinion that he would not, but would travel in a spiral direction, approaching nearer and nearer, but never reaching the pole. A. S. E. S. would come nearer to the pole than any of the north pole expeditions, because if he kept sailing he would be nearer than any conceivable distance; and unless we suppose his ship to be an inconceivably small one, some part of it would eventually reach the pole.

(37) P. M. C.—The moon's axis, during the eclipse, was very much inclined to the horizon, the latter being inclined to the equator, besides the inclination caused by the obliquity of the ecliptic and the inclination of the moon's orbit. These three causes, with the moon's motion from west to east, account for all correct observations.

(33) F. A. W. says, in reply to S. C. H., who asks as to the philosophical reason that a circular saw cuts better at a certain speed than it does if run faster: Circular saws of over 40 or 50 inches in diameter are or should be hammered to run at a certain speed. This is more important when the speed is as high as from 700 or 800 revolutions per minute. If a saw is so hammered as to do good work at 300 or 400 revolutions per minute, it will not do as good work at 500, for the reason that the high speed expands the outside or rim, causing it to dish, or "hop aound," as sawyers sometimes express it. In such cases, and when it is inconvenient to reduce the speed, it will be necessary to guide the saw out of the log so as to cause the central part to rub against the log enough to heat it slightly, thus expanding the portion that needs hammering. An expert sawyer can in this way manage indifferently well, though at an expense of considerably more power. A largesaw, to run well at high speed, should be hammered in the center part until it is slightly dish, or as it is variously expressed, "loose at the eye," or "rim-bound." It may be loose at the eye when it is the reverse of rim-bound, namely, too open at the rim, which is the most frequent trouble with such saws, and they all become so eventually from use, and then they should be re-hammered. I would not advise any one that has not had previous experience to undertake to hammer one, for the operation is a very delicate one, and requires considerable skill. A. We have known of several cases in which large saws seemed to do equally well under considerable changes of velocity, and we imagine that saws are quite as often run at different speeds as those recommended by the makers. Within limits, however, our correspondent's views are quite correct.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

A. J. R.—It is impossible to say whether a stone is lithographic, or suitable for printing from, from a small fragment.—H. C. T.—We have examined your queer specimen, but must request, before answering your questions, to know whether it is a manufactured or a natural product. How and where was it found? Is it genuine? If natural, has anything been done to alter it?—J. H. A.—The specimens contain iron pyrites in quartz.—We have received two specimens in an envelope, without any letter. No. 1 is magnetic pyrites or pyrrhotine, containing 40 per cent of sulphur and 60 per cent of iron. No. 2 is a mixture of small scales of black mica, carbonate of lime, and a rock composed of siliceous iron, and magnesia.

J. C. C. asks: If it is high water at the Battery, New York city, at noon, how high will the tide be at Albany?—A. B. asks: What is the source of the disagreeable odor of corduroy, when that fabric becomes wet from any cause?—J. H. M. asks: How is the oil finished upon melodeons and sewing machines, and what kind of oil is used?

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects:

On the Crystallization of Carbon. By C. T.
On Hydrophobia. By C. R.
On a Suicidal Scorpion. By J. B. T.
On the National Currency. By —
On Fruits and Electricity. By N. B.
On a Withdrawn Charge. By C. G. F.
On Gas Machines. By W. H. E.
On Smoke Consumption. By O. F. M.

Also enquiries and answers from the following:

S. L. W.—J. B. M.—H. V. M.—T. A. J.—A. J. N.—W. H. N.—H. T.—J. T. N.

HINTS TO CORRESPONDENTS.

Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Enquiries 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 wastebasket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

Hundreds of enquiries analogous to the following are sent: "Who sells the best garden seeds? Where can tobacco paper for fumigating greenhouses be obtained? Are there any agencies for imported raw silk in New York city? Who publishes the best work on electroplating? Whose book on mechanical drawing is considered the best?" All such personal enquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were

Granted in the Week ending

December 22, 1874,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

Alkalies, putting up caustic, A. K. Lee	158,094
Alkalies, restoring spent, A. S. Lyman	157,919
Auger, C. F. King	158,090
Auger, earth, A. S. Ballard (r)	6,189
Auger, earth, J. B. Christian	158,092
Auger hole, earth, W. H. Beach	158,016
Bag filter, J. Cline	157,986
Bale tie, J. N. Smith	157,940
Bale tie, cotton, R. M. Taylor	158,145
Bath apparatus, medicated, J. L. & P. A. Brémond	158,022
Bee hive, M. Davis	158,045
Bell ringer, automatic, T. M. Brintnall	157,905
Bellows, M. Doyle	157,910
Belt, making rubber, T. J. Mayall	157,921
Beverage or summer drink, C. Neumann	157,964
Bill file, E. J. Smith	157,938
Bird cage, J. Maxheimer	157,996
Black, harness liquid, J. A. Sefton	157,996
Blind stop, F. G. Boggs	157,983
Boiler incrustation compound, J. J. Lavo	157,917
Bollegusset connection, J. T. Connelly	158,037
Bolter watergate, C. C. Redmond	158,002
Bolter rod cutter, A. W. Gray	157,990
Bolts, machine for heading, A. Alexander	157,911
Bookcloth, cutting, J. W. Jones	157,964
Books with metal, stitching, E. D. Averell	158,013
Boot and shoe, J. Lanham	158,093
Boot heel, L. W. Buxton	157,965
Boot uppers and soles, uniting, McKay & Fairfield	158,107
Bottle cleaner, J. R. Smith	158,141
Brass duster, J. T. McNally (r)	6,183
Brush, tooth, M. A. R. Lowd	158,099
Buckle, M. C. Swift	157,943
Burner, Argand gas, S. G. Dare	158,044
Burnishing machine, N. F. Mathewson	157,967
Butterworker, J. A. J., & S. L. Lindbeck	158,097
Butterworker, A. Whitaker	158,159
Can holder, preserve, J. H. Winslow	158,161
Can sewing machine, J. H. Perkins	158,119
Caraxies, cooling, W. E. Tinney	158,151
Car coupling, N. H. Beal	158,017
Car coupling, L. C. Eaton	158,053
Car coupling, E. N. Gifford	158,059
Car coupling, W. H. Gruver	158,064
Car coupling, H. Luther	158,100
Car coupling, C. E. McCormick	157,999
Car coupling, J. W. Meikle	158,106
Car coupling, C. Surplice	158,144
Car coupling, J. H. Wiele	157,980
Car gear, railway, O. McC. Chamberlain	158,031
Car ventilator, F. N. Clark	158,034
Car wheel, lubricating, S. & S. L. Hall	158,067
Car wheel oil box, Callahan & Gallagher	157,907
Cars, lifting railroad, B. F. Phelps	158,118
Carding machine teeth, L. M. Pichard	157,925
Carriage, child's, H. J. Shill	157,977
Cartridge case, B. B. Hotchkiss	157,916
Caster stand, H. Schade	157,985
Casting, pattern for, S. Reynolds	158,127
Cesspool, H. W. Atwater	157,957
Chair, reclining, E. Collins (r)	6,180
Chuck, W. F. Toothaker	158,007
Churn dasher, R. M. Case	158,029
Cigar box, C. A. Slecke	158,137
Cigars, aging, J. L. Boone	158,021
Cleat or buckle, belt, B. F. Pike	157,995
Cleave, G. Shelton	157,976
Cleave, L. E. Smith	158,140
Clock movement, R. Hitchcock	158,084
Cloth measure, H. Carlon	158,127
Clothes washer, E. Crowell	158,039
Coaming machine, G. M. Read	158,123
Coffin handle, D. Leonard	158,096
Collar, fur, A. D. Levy	157,966
Column, iron, J. M. Cornell	157,908
Compounds, anti-corrosive, A. K. Lee	158,095
Cop tubes, making, J. F. Wilkinson	157,963
Corn bucker, D. Babbitt	157,982

Cradle and crib, W. A. Weant	157,919
Cullinary vessel, J. H. & N. Weare	158,155
Cultivator and seeder, M. Green	158,062
Curry comb, M. Sweet	157,942
Jigger, potato, H. D. Herrington	157,991
Distilling spirits, R. C. Brooks	158,024
Dress elevator, A. B. Smith (r)	6,184
Drill, steam rock, J. C. Githens	158,060
Drill, portable rock, T. E. Mendenhall	157,969
Drill, rock, E. S. Winchester	158,009
Drill, well, Morgan & Kelly	158,113
Electrotype mold, S. P. Knight	157,965
Engine, automatic pumping, H. S. Mazim	158,105
Engine, rotary, A. C. Gallahue	158,058
Engine, self-propelling, N. S. Bean	157,904
Engine slide valve, steam, R. Goss	158,061
Engine spark extinguisher, Smith & Helmke	158,006
Fabrica, creasing, J. Shepard	158,135
Feathers, shaving, G. M. Richmond	158,128
Fence, iron, Devoe & Walker	158,047
Filter, Hanck & Voegelé	158,076
Fire arm, magazine, Sheekler & Gregory	158,004
Fire escape, J. B. Gathright	157,912
Fire escape, Strong & Peterson	157,978
Gaseller, drop light, F. C. Hamilton	158,068
Gate, farm, L. & J. C. Merrill	158,106
Gearing, shifting, M. Kolp	158,093
Generator, steam, A. L. Bogart	158,019
Girder and column, J. Manes	157,930
Glove, E. B. Whitney	158,008
Grain header, D. T. Gillis	157,961
Graining, transfer sheet for, F. W. Littell	158,098
Hame tug, J. W. Denton	158,046
Hammer, bush, H. H. Harvey	158,074
Harness liquid blacking, J. A. Sefton	157,936
Harness saddle joint stay, W. Elgabroadt	157,911
Harrow, D. T. Gillis	157,960
Harrow and planter, W. J. Covington	158,040
Harvester finger bar, R. Dutton	158,051
Harvester platform, S. Luce	157,918
Harvesting machine, J. F. Seiberling	157,937
Hat bodies, stretching, E. Hechler	158,079
Hat finishing machine, J. W. Corey	158,038
Hay loader, C. W. Williams	157,954
Heater, steam, W. H. Slock	158,136
Heating apparatus, G. H. Perkins	158,117
Hogcatching implement, Stafford & Sherman	158,142
Hog ring blank, J. J. Hutson (r)	6,187
Hoop dressing machine, P. Flanders	157,959
Horse power, J. G. Taylor	158,146
Horse power, endless chain, D. S. Heebner et al.	158,078
Inkstand, S. Hall	158,066
Iron bars, etc., straightening, J. S. Seaman	158,133
Key fastener, S. T. Proudman	158,121
Knife, progressive, F. E. Hoffman	158,085
Knife sharpener, J. B. Bollinger	158,020
Knife, shoe, M. A. Tyler	157,948
Knife, table, A. Grimm	158,063
Knife, table, J. O. Ely (r)	6,182
Lamp, R. Marsh	158,103
Lamp lighter, head, S. M. Davies (r)	6,181
Lamp wicking, E. Waite	157,949
Lantern chimney, Richards & Bohonan	157,928
Lantern, street, J. M. Bruce	157,906
Latch, locking, H. Rogers	158,130
Lead into bars, forming molten, W. A. L. Kirk	157,994
Lead, cutting and setting, W. A. L. Kirk	157,993
Leather dressing machine, O. C. Smith	157,939
Life preserver, A. Schuster	158,132
Lime and cement, hardening, F. W. Colby	158,036
Links, forming and welding, A. Alexander	158,010
Lock for furniture, etc., H. Willard	158,160
Locomotive and car, H. Handyside	158,070
Locomotive watering pipe, Dodge & Palmer	158,049
Loom, Crompton & Wyman	157,909
Lubricator, Hoffmann & Belsinger	157,992
Map drawer and exhibitor, J. A. Knight	157,996
Mat wooden, W. Groat (r)	6,186
Mill, grape, W. McClucas	157,923
Mop head, C. B. & J. J. Clark	158,033
Motion, converting, Tisdale & Allen	157,946
Motion, transmitting, G. H. Cliff	158,035
Mower, lawn, L. J. Youngs	158,162
Nut lock washer, G. C. Thomas	158,149
Ore washer, W. B. Frue	158,057
Organ treadle, W. Murphy	158,000
Oven, baking, J. M. Case	158,028
Oyster refrigerator, J. C. Jones	158,089
Padlock, etc., D. K. Miller	158,111
Paper barrel machine, C. V. Mottram	157,970
Paper box, E. D. F. Shelton	158,134
Paper, compound for gluing, C. E. Sawyer	157,934
Paper barrel head, C. V. Mottram	157,971
Paper prints, transferring, E. Velthen	158,154
Pawl and ratchet, E. M. Krum	157,997
Pegging machine, E. P. Richardson	157,929
Photographic picture holder, A. Thomas	157,945
Photometer, electrical, W. W. Goodwin	157,962
Picture exhibitor, S. Guerrin	158,065
Pin, safety, L. E. Andrews	157,931
Pipe coupling, G. Westinghouse, Jr.	157,951
Plant shelves, hanger for, W. Higgs	158,062
Planter, hand corn, G. W. Robinson	157,129
Plow, T. Canty	157,036
Plow, gang, R. Hance	158,069
Plow, wheel, W. Dickie	157,048
Plug, tamping, G. A. Kelchert, Jr.	158,126
Printer's quoin, W. Quail	158,001
Printing, photo-mechanical, J. Albert (r)	6,188
Propeller, vibrating, C. P. Macowitzky	158,101
Propeller, vibrating, C. Theobald	158,148
Pump, force, J. C. and S. Chambers	158,080
Pump, submerged rotary, T. C. Workman	157,956
Pump valve, R. J. Gould	157,963
Pumps, valve for chain, B. G. H. Hathaway	158,075
Purifier, middlings, D. H. Buckwalter	158,025
Purifier, middlings, C. Custer	157,958
Railway switch, B. T. Dutton	158,052
Railway switch, Murchison & Haney	158,114
Railways, station ticket for, C. W. Harvey	158,072
Rake, horse, F. G. Butler	157,984
Reaming apparatus, D. W. Siprell	158,138
Rock, bit for boring, G. M. Read	158,124
Roller and harrow combined, W. W. Anderson	158,012
Rolling springs, machine for, Powell & Munger	157,927
Roofing compound, H. W. Johns (r)	6,190, 6,191
Roofs, metallic tile for, J. Ravoux	158,123
Rope rack and measurer, C. Hutchings	158,068
Rope, wire, C. G. Roebbing	157,931
Satchel and traveling bag handle, G. Havell	158,077
Saw mill, A. R. Ehlers (r)	6,185
Sawing machine, W. W. Duffield	157,989
Sawing machine, scroll, I. Hird	158,083
Sawing machine, wood, Filley & Wood	158,056
Scissors, sewing machine, S. L. Fawcett	158,064
Seeder and cultivator, W. A. Van Brunt	158,152
Seeders, teeth for, C. P. Hewett	159,081
Separator, grain, W. F. Humphrey	158,122
Separator, oil, H. Moore	157,111
Sewing cabinet, S. R. Ruckel	157,723
Sewing machine treadle, E. Falro	158,111
Sewing machine tuck creaser, Sampson & Muther	157,985

Shingle machine, W. A. Durrin	158,050
Shingling bracket, J. M. and C. T. Schramm	158,131
Shovel indicator, W. R. Rightor	157,930
Shoe fastening, R. A. Pruett	157,972
Shoe knife, M. A. Tyler	157,948
Shot, machine for rolling, W. A. L. Kirk	157,995
Sifter, ash, J. Michel	158,110
Sinks, etc., strainer for, S. Porter	158,120
Slat adjuster, blind, G. T. B. Hosley	158,087
Spinning frame, J. M. Stone	158,143
Stamp, rotary chromatic band, C. E. Baldwin	158,014
Starb pollah for linen, M. A. Marney	158,104
Steering wheels, brake for, P. M. Kinseila	158,091
Stills, manufacture of oil, C. Cunningham	158,042
Stove, G. W. Walker	157,950
Stove, cooking, E. O. Brinckerhoff	158,023
Stovepipe elbow, S. Smith	158,005
Stove-lining composition, L. R. Witherell	157,965
Stoves, platform for, W. Westlake (r)	6,192
Stud for wearing apparel, D. Heaton	157,914
Stump extractor, B. W. Thurman	158,150
Table, ironing, J. and E. K. Dearbaugh	158,988
Table ware, covered, H. Vasseur	158,153
Telegraph paper, perforator for, C. Wheatstone	158,158
Telegraph wire, pipe-encased, S. R. Honey	158,086
Telegraph receiving instrument, C. Wheatstone	158,156
Telegraph transmitter, automatic, C. Wheatstone	158,157
Thill coupling, O. E. Mallory	158,102
Thill coupling, C. J. Sanford	157,974
Tobacco, treating, J. Barton, Jr.	158,015
Toy puzzle box, P. McGurk	158,106
Trap, animal, G. Richardson	157,973
Trunk fastener, J. J. Cowell	158,041
Trunk, portable, M. Fletcher	158,056
Tumbling rod covers, J. Heuermann	158,080
Type writer, H. R. M. J. Hansen	158,071
Umbrella runner, J. J. Higgins	157,915
Vacuum pan, J. Colwell	157,987
Valve, check and throttle, Smith & Osborn	157,941
Vehicle axle box, P. B. Cunningham	158,043
Vehicle lubricating axle, G. H. Rugg	158,033
Vehiclespring, W. B. Whitney	157,962
Ventilator, car, F. N. Clark	158,034
Violin, J. H. Payne	158,116
Violins, chin rest for, White & Watson (r)	6,193
Wagon running gear, J. Skeen	158,139
Wagon top, adjustable, E. M. Saunders	157,975
Washing machine, T. E. McDonald	157,922
Watch case lifting spring, C. L. Thierly	157,914
Watch center pinion, D. Gruen	157,913
Water wheel, turbine, O. N. and A. J. Angell (r)	6,178
Water wheel, turbine, S. T. Teachout	157,147
Weir trimmer, M. A. Tyler	157,947
Window screen, L. S. Thompson (r)	6,179
Wrench, D. McFarland	157,969
Yokes, tongue ring for neck, S. D. Bingham	158,018

- horses from jumping, kicking, or running away, called "Chisholm's Device for Preventing Horses from Jumping, Kicking, and Running Away." Dec. 1874.
- 4,192.—H. S. Cole, Milwaukee, Wis., U. S. Improvements on a machine for regulating the supply of water to steam boilers, and for sounding an alarm whistle when the water therein becomes dangerously low, called "Cole's Water Regulator and Alarm for Steam Boiler." Dec. 18, 1874.
- 4,193.—J. F. Gordon, Rochester, Monroe county, N. Y., U. S. Improvements on self-binding grain harvesters, called "Gordon's Self-Binding Harvester." Dec. 19, 1874.
- 4,194.—D. Bissell, Detroit, Wayne county, Mich., U. S. Improvements on leg splints, called "Bissell's Leg Splint." Dec. 19, 1874.
- 4,195.—J. F. Gordon, Rochester, Monroe county, N. Y., U. S. Improvements on self-binding grain harvesters, called "Gordon's Self Binding Grain Harvester." Dec. 19, 1874.
- 4,196.—D. Bissell, Detroit, Wayne county, Mich., U. S. Improvements on leg splints, called "Bissell's Leg Splint." Dec. 19, 1874.
- 4,197.—G. C. Surle, Rochester, Beaver county, Pa., U. S. Improvements in furnaces for burning kilns, called "Surle's Patent Kiln." Dec. 22, 1874.
- 4,198.—J. J. Fitzpatrick, Philadelphia, Pa., U. S. Improvements in drawers for men and boys' use, called "Fitzpatrick's Patent Improved Crotch Drawers." Dec. 22, 1874.
- 4,199.—J. Nelson, Sunderland, Durham county, England. Improvements on machine for cutting and finishing the ends of studs and bolts, called "Nelson's Machine for Cutting and Finishing the Ends of Studs and Bolts." Dec. 22, 1874.
- 4,200.—J. H. Weare and N. Weare, Cincinnati, O., U. S. Improvements on cooking utensils, called "Weare Brothers' Improved Cooking Utensil." Dec. 22, 1874.
- 4,201.—S. S. White, Philadelphia, Pa., U. S., assignee of J. W. Gilbert, same place. Improvements on hand pieces for dental engines, called "Improvements on Dental Hand Pieces." Dec. 22, 1874.
- 4,202.—J. W. Dunn and G. B. Boyle, Niagara, Lincoln county, Ont. Improvements in the method of heating and protecting steam boilers, called "The Royal Arch Flue and Hot Air Attachments to Furnace Doors." Dec. 22, 1874.
- 4,203.—F. D. Brodhead, Boston, Mass., U. S. Improvements on cans, called "Brodhead's Sectional Can." Dec. 22, 1874.
- 4,204.—W. Jones, Philadelphia, Pa., U. S. Improvements on bed springs, called "Jones' Compound Bed Spring." Dec. 22, 1874.
- 4,205.—G. Huntington, Brantford, Brant county, Ont. Extension of No. 192, called "Huntington's Clothes Washer." Dec. 23, 1874.
- 4,206.—A. N. Christie, St. Louis, Mo., U. S., and Hon. Sir A. T. Galt, Montreal, P. Q. Improvements on smokestacks of railway locomotive engines, called "Improved Spark Arresters." Dec. 28, 1874.

Advertisements.

Back Page - - - - - \$1.00 a line.
Inside Page - - - - - 75 cents a line.
Engravings may be had at the same rate per line, by measurement, as the letter press. Advertisements must be received at publication office as early as Friday morning to appear in next issue.

PATENT FOR SALE.—An improvement in Spring Fish Hooks. Patented December 30, 1874.
R. W. JONES, Remsen, Oneida Co., N. Y.

STEEL STAMPS.

List and samples free. E. M. DOUGLAS, Brattleboro', Vt.
KIND reader, if you are in any way interested in Bees or Honey, we will with pleasure send you a sample copy of our Monthly "GLEANINGS IN BEE CULTURE." Simply write your address plainly on a postal card and address A. I. ROOT & CO., Medina, Ohio.
(Any Periodical giving this one insertion and sending us marked copy, will receive Gleanings one year.)

**TWO MILLION
FIVE HUNDRED THOUSAND
DOLLARS**

Will be distributed, in 20,000 Cash Gifts, at the Fifth and Last Gift Concert in aid of the

**Public Library of Kentucky,
FEBRUARY 27, 1875.**

Positively no Postponement.

A DRAWING ON 27TH, OR

Money Refunded.

POSITIVELY LAST CHANCE.

POSITIVELY LAST CONCERT.

Whole Tickets \$50; Halves \$25; Tenths \$5.
Apply to THOS. E. BRAMLETTE, Agent,
Louisville, Ky.,
Or THOS. H. HAYS & CO., 609 Broadway, N. Y.

WORCESTER FREE INSTITUTE.—A SCHOOL OF PRACTICAL SCIENCE.—APPRENTICE CLASS ENTER JANUARY 30.

C. O. THOMPSON, Worcester, Mass.

5,000 AGENTS WANTED. Samples sent free by mail, with terms to clear from \$5 to \$10 per day. Two entirely new articles, saleable as flour. Address H. B. WHITE & CO., Newark, N. J.

TELL ME TRULY, LITTLE DARLING. Song and Chorus by Frank Linnard. Let Me Dream of Home, Sweet Home. Song and Chorus by W. T. Porter. The above are two of the most beautiful songs ever published; are selling rapidly. Price 40c. each; sent postpaid anywhere in the United States. Address F. W. HELMICK, Music Dealer, 278 West Sixth St., Cincinnati, Ohio.

A NEW VOLUME!—The ILLUSTRATED PHRENOLOGICAL JOURNAL, January number, with some thirty engravings, gives portraits of our new Postmaster General; Charlotte Cushman; two Colored Bishops; Don Carlos; the late Mayor; Our Tell-Tale Lips; Death without Pain; Our Ears; and what they signify; Connection of Mind and Body; Ethnology, Physiology, Phrenology, Psychology, &c. Only 50 cents, or \$3 a year. Sent first post by S. R. WELLS, Publisher, No. 389 Broadway, N. Y.

THE 'ECLIPSE' FAN BLOWER for Blacksmiths, Coopers, chinkers, Machinists, and all using smith or forge fire. Works by hand or power. Suits any fire. Guaranteed. Illustrated Circular & Price List free. E. F. LANDIS, Lancaster, Pa.

The Toll-Gate! Prize Picture sent free! An ingenious game! 50 objects to find! Address, with stamp, E. C. ABBEY, Buffalo, N. Y.

BAIRD'S BOOKS

FOR PRACTICAL MEN.

My new, revised and enlarged Catalogue of PRACTICAL AND SCIENTIFIC BOOKS—96 pages, 8vo.—will be sent, free of postage, to anyone who will favor me with his address.

HENRY CAREY BAIRD,

INDUSTRIAL PUBLISHER,
406 WALNUT STREET, Philadelphia, Pa.

\$5 & \$20 per day at home. Terms free. Address G. O. STINSON & CO., Portland, Me.

BLAKE'S PATENT
Stone and Ore Breaker
Crushes all hard and brittle substances to any required size. Also, any kind of Stone for Roads and for Concrete, &c. Address BLAKE CRUSHER CO., New Haven, Conn.

LE COUNT'S PATENT LATHE DOGS, both Steel and Iron; Iron and Steel Clamps. Expanding Mandrels, &c. Sold at wholesale prices during the hard times. Send for Illustrated List to C. W. LE COUNT, South Norwalk, Conn.

PATENT

Planing & Matching
and Molding Machines, Gray and Wood's Planers, Self-oiling Saw Arbors, and other wood-working machinery. S. A. WOOD'S MACHINE CO., 91 Liberty St., N. Y. Send for Circulars, etc.

LUDLOW VALVES.
FRED. STONE & CO., 3 Park Place, New York.

Beard's A NEW DISCOVERY!
A Chemical Triumph. Luxurious Whiskers or Moustaches produced in 21 days. A success in every case. Price, 25 cents a Package. Address, LEE & CO., 536 Sixth Avenue, New York. Safe and sure.

PUNCHING AND DROP PRESSES. MIDDLETOWN, CONN.
For the Best and Cheapest address THE STILES & PARKER PRESS CO., MIDDLETOWN, CONN.

\$60 to \$90 a week and expenses to all. Articles new, staple as flour. Samples free. C. M. LININGTON & BRO., N. Y. or Chicago.

Free to Sewing Machine Agents.

The Wilson Reflector—An Illustrated Sewing Machine Journal, published monthly, devoted to the interest of Sewing Machines, and everything manufactured by Sewing Machines, Literature and General News. Eight pages and forty columns of choice miscellany and reading matter. WILSON SEWING MACHINE CO., PUBLISHERS. Subscription price FIFTEEN CENTS per annum, with an elegant chromo free, postage prepaid. FREE TO AGENTS and DEALERS in SEWING MACHINES and ATTACHMENTS. Address, WILSON'S CLEVELAND OHIO W. S. A.

HAND SAW MILL—Saves the labor of 3 men. S. C. HILLS, 51 Courtland St., New York.

WOOD-WORKING MACHINERY GENERALLY, Specialties, Woodworth Planers and Richardson's Patent Improved Tenon Machines. Central, corner Union St., Worcester, Mass. WITHERBY, ROGGE & RICHARDSON

COLD ROLLED SHAFTING.
The fact that this Shafting has 75 per cent greater strength, a finer finish, and is true to gauge, than any other in use, renders it undoubtedly the most economical. We are also the sole manufacturers of the CELEBRATED COLLINS' PAT. COUPLING, and furnish Pulleys, Hangers, etc., of the most approved styles. Price list mailed on application to JONES & LAUGHLIN, Try Street, 2nd and 3rd Avenues, Pittsburgh, Pa. Stocks of this Shafting in store and for sale by FULLER, DANA, & FITZ, Boston, Mass. GEO. PLACE & CO., 121 Chambers street, N. Y. PIERCE & WHALING Milwaukee, Wis.

THE
PHRENOLOGICAL JOURNAL
AND LIFE ILLUSTRATED began its 5th volume with January, 1875. It teaches the true Science of Mind as applied to the reading and improvement of Character; the Choice of Pursuits; the Selection of Life Companions, and the Proper Training of Children. Ethnology, Phrenology, Physiognomy, Physiology, Psychology, Biography, are all treated by able writers. What the Papers say:

"Few works will better repay perusal in the family."
—N. Y. Times. "We do not know of any periodical which presents such a great variety of interesting and instructive matter."
—Stern, Mead. "A great amount and variety of useful and instructive matter finds its way into the Phrenological." Sunday School Times. "It abounds in good."
—Christ. Adv.

Published monthly, at \$3.00 a year. Subscribers now. Address S. R. WELLS, 389 Broadway, N. Y.

THE LEHIGH VALLEY
Emery Wheel Co.,
WEISSPORT, PA.,
Manufacturers of
Emery Wheels under a
new patent.
Send for circular.

Niagara Steam Pump.
CHAS. B. HARDICK,
28 Adams St., Brooklyn, N. Y.

SCREW CHASERS. DRILL GAUGE.
One pair of Chasers sent free to any address for 75c. No. 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 36, 40, 48 threads to in. Drill Gauge, indispensable to all who use Twist Drills, sent free by mail for \$1.50. Price List of Small Tools free. GOODNOW & WIGHTMAN, 28 Cornhill, Boston, Mass.

BANKRUPT'S SALE OF HORIZONTAL
and Vertical Steam Engines. Also new and second and machinist's tools. Send for circular at THE YALE IRON WORKS, New Haven, Conn.

\$77 A WEEK to Male and Female Agents, in their locality. Costs NOTHING to try it. Particulars FREE. P. O. VICKERY & CO., Augusta, Me.

GLASS MOULDS, for Fruit Jars, Lamps, Bottles, Ink Stands, etc., made by H. BROOKE 15 years COR. WHITE and CENTRE STS., N. Y. For any thing new in glass, you will require a mould (or die). PARTICULAR ATTENTION paid to MOULDS for INVENTORS. Send model or drawing; inclose stamp.

AGENTS WANTED.
Men or women. \$34 a week. Proof furnished. Business pleasant and honorable with no risks. A 16 page circular and Valuable Samples free. A postcard on which to send your address costs but one cent. Write at Once to F. M. REED, 8TH ST., NEW YORK.

Andrews' Patents.
Noiseless, Friction Grooved, or Geared Hoists, suited to every want. Safety Elevators. Prevent Accident, in Rope, Belt, and Engine Break. Smoke-Burning Safety Boilers. Oscillating Engines, Double and Single, 1-2 to 100-Horse power. Centrifugal Pumps, 100 to 100,000 Gallons per Minute. Best Pumps in the World, for Hard, Sand, Gravel, Coal, Grain, etc., without injury. All Light, Simple, Durable, and Economical. Send for Circulars. WM. D. ANDREWS & BRO., 414 Water Street, New York.

STENCIL DIES For cutting business Stencils all sizes. Also complete outfit for Clothing Stencils and Key Checks, with which young men are making from \$5 to \$20 a day. Send for Catalogue and samples to S. M. SPENCER, 117 Hanover St., Boston, Mass.

7000 IN USE
BLAKE'S STEAM PUMPS
FOR EVERY POSSIBLE DUTY
GEO. F. BLAKE MFG CO. 79 & 81 LIBERTY ST. N.Y.
CAUSEWAY & FRIEND STS. BOSTON.
50 CANAL ST. CHICAGO.
SEND FOR ILLUSTRATED CATALOGUE.

Ladies at Home
And Men who have other business, wanted as agents. Novel plans, pleasant work, good pay. Send 3-cent stamp for particulars. THE GRAPHIC COMPANY, 39-41 Park Place, New York.

MAGNETS—Permanent Steel Magnets of any form or size, made to order by F. C. BEACH & CO. 263 Broadway, New York. Makers of the celebrated Tom Thumb and Miniature Telegraph Instruments.

PORTABLE STEAM ENGINES, COMBIN ing the maximum of efficiency, durability and economy, with the minimum of weight and price. They are widely and favorably known, more than 1,000 being in use. All warranted satisfactory or no sale. Descriptive circulars sent on application. Address THE J. C. HOADLEY CO., Lawrence, Mass.

WROUGHT IRON BEAMS & GIRDERS

MACHINERY.
The Union Iron Mills, Pittsburgh, Pa. The attention of Engineers and Architects is called to our improved Wrought-Iron Beams and Girders (patented), in which the compound welds between the stem and flanges, which have proved so objectionable in the old mode of manufacturing, are entirely avoided. We are prepared to furnish all sizes at terms as favorable as can be obtained elsewhere. For descriptive lithograph add Geo. Carnegie, Kilmarnock & Co., Union Iron Mills, Pittsburgh, Pa.

IRON & WOOD WORKING MACHINERY
OF EVERY DESCRIPTION.

Cold Rolled Shafting.
HANGERS, PULLEYS, COUPLINGS, BELTING, &c. &c. Send for Illustrated Catalogue and Price List. GEORGE PLACE & CO., 121 Chambers & 108 Reade Sts., N. Y. City

Planing & Matching,
Moulding, Re-sawing and Tenoning Machines. Scroll Saws and General Wood-Working Machinery. JOHN B. SCHENCK'S SONS, Matteawan, N. Y. Send for Catalogue. 118 Liberty St., N. Y. City

NEW & IMPROVED PATTERNS—MACHINISTS' TOOLS—all sizes—at low prices. E. GOULD, 97 to 113 N. J. R. Ave., Newark, N. J.

A FORTUNE FOR ALL in the Rubber Stamp and Engraving Business. Address DORMAN'S STENCIL AND STAMP WORKS, Baltimore, Md.

Machinery of Improved Styles for making SHINGLES, HEADING, AND STAVES Sole makers of the well known IMPROVED LAW'S PATENT SHINGLE and HEADING SAWING MACHINE. For circulars address TREVOR & CO., Lockport, N. Y.

RICHARDSON, MERIAM & CO., Manufacturers of the latest improved Patent Daniels' and Woodworth Planing Machines, Matching, Sash and Molding, Tenoning, Mortising, Boring, Shaping, Vertical and Circular Re-sawing Machines, Saw Mills, Saw Arbors, Scroll Saws, Railway, Cut-off, and Rip-saw Machines, Spoke and Wood Turning Lathes, and various other kinds of Wood-working Machinery. Catalogues and price lists sent on application. Manufacturing, Worcester, Mass. Warehouse, 107 Liberty Street, New York.

ADVERTISERS! Send twenty-five cents to GEO. P. A. ROWELL & CO., 41 Park Row, New York, for their Pamphlet of one hundred pages, containing lists of 3,000 newspapers, and estimates showing cost of advertising.

PERFECT
NEWSPAPER FILE.

The Koch Patent File, for preserving newspapers, magazines, and pamphlets, has been recently improved and price reduced. Subscribers to the SCIENTIFIC AMERICAN can be supplied for the low price of \$1.50 by mail, or \$1.25 at the office of this paper. Heavy bound sides; inscription, "SCIENTIFIC AMERICAN, in gilt. Necessary for every one who wishes to preserve the paper."

Address **MUNN & CO.,**
Publishers "SCIENTIFIC AMERICAN."

THE TRADE ENGINE.
Noiseless in operation—Perfect in workmanship—all light parts of Cast Steel. Every Engine Indicated, and valve corrected to give the highest attainable results. Warranted superior to any semi-portable Engine in the market. Send for Price List and Circular. HERRMAN & HERCHEL, RODE MFG. CO., Dayton, Ohio.

OTIS' SAFETY HOISTING Machinery.
OTIS, BROS. & CO.
No. 348 BROADWAY, NEW YORK.

55 SUCCESS BEYOND COMPETITION. 55
STATE FAIR FIRST PREMIUMS WITHIN. Mowers, awarded Nello's Original Haysmower Horse Hay Fork. Also, mowers all kinds. Agt's Stools & Irons, tempered by Nello's Process to suit all kinds of soil. Facts & merits in Pamphlet from A. J. NELLIS & CO., Pittsburgh, Pa.

EAGLE FOOT LATHES,
Small Engine Lathes, Hand Planers for metal—Slide Rests, Circular and Foot Scroll Saws—all of the newest design and superior finish. Our catalogue describes every tool necessary to fit out the Artisan or Amateur, as well as the Boys for the Holidays. WM. L. CHASE & CO., 95 & 97 Liberty St., New York

FACTORIES TO LET—At Haverstraw, N. Y., on Hudson River. Two large brick factories, respectively 3 Stories 94x30, with Extension 1 Story 94x38, and 3 Stories 90x38. Abundant water power in each. Turbine and overshot wheels. For particulars, address JOHN PECK, Haverstraw, N. Y.

SHINGLE & BARREL MACHINERY.
EVART'S IMP. HEADING AND SHINGLE SAW, STAVE CUTTERS, JOINTERS, EQUALIZERS, AND HEADING TURNERS. BAILEY GAUGE LATHE—For turning all kinds bandies and cabinet work. Simplest and best in use. We manufacture a full line of Wood and Iron Working Machinery, Steam Engines, &c. Address T. R. BAILEY & VAIL, Lockport, N. Y.

REESE'S ADJUSTABLE STENCIL LETTERS

PIPE COVERING FOR BOILERS AND PIPES saves Twenty per Cent in Fuel. OUR FELT, CEMENT, AND PAINT FOR ROOFS is the best in the market. **Asbestos Felting Co.** 316-322 Front St., N. Y.

GEO. W. READ & CO.,
STEAM BAND SAW AND VENEER-CUTTING MILL, 186 to 200 LEWIS ST., foot 5th & 6th Sts., E. R., N. Y. Always on hand, FULL STOCK of SEASONED

Hard-Wood Lumber
AND CHOICE FIGURED VENEERS. THE LARGEST STOCK! THE GREATEST VARIETY! The Lowest Prices! Enclose Stamp for Catalogue and Price-List. Orders by mail promptly and faithfully executed.

TURBINE Water Wheels.
More than four times as many of James Leffel's Improved Double Turbine Water Wheels in operation than any other kind. 24 sizes made, ranging from 5 1/2 to 96 inches diameter, under heads from 1 to 250 feet. Successful in every purpose. Large new pamphlet, the finest ever published, containing 160 pages and over 30 fine illustrations, sent free to parties interested in Water Power. JAMES LEFFEL & CO., Springfield, Ohio, & 109 Liberty St., New York City.

To Electro-Platers.
BATTERIES, CHEMICALS, AND MATERIALS, in sets or single, with books of instruction, manufactured and sold by THOMAS HALL, Manufacturing Electrician, 19 Bromfield Street, Boston, Mass. Illustrated catalogue sent free on application.

GRIFFITH & WEDGE,
MANUFACTURERS OF THE

VERTICAL PORTABLE ENGINE and CIRCULAR SAW MILLS.
ZANESVILLE, OHIO.

BEAUTIFUL DECALCOMANIA or Transfer Pictures, with full instructions and 34 pages catalogue, sent post-paid for 10 cents. 100 for 50 cts. They are Heads, Landscapes, Flowers, Autumn Leaves, Animals, Birds, Insects, Grotesque and Comic Figures, &c. They can be easily transferred to any surface as to imitate the most beautiful paintings. Also 50 beautiful Gilt Chromos for 10 cents, 50 for 40 cents. Agents wanted. Address J. L. PATTEN & CO., 71 Pine St., New York.

10