

tity to cool under cold water, and if not found sufficiently firm, allowing to simmer longer, or have more tar and resin added. The cement should be poured in the angles of the aquarium while in a liquid state, but not when boiling, or it would most assuredly crack the glass. The cement will become firm in a few minutes, and the aquarium may then be tilted up in a different position while a second angle is treated likewise. This composition adheres firmly to the glass, is so pliant that it may be pressed into any shape by the fingers, and it does not communicate any poisonous quality to the water.

(32) J. C. D. asks: 1. Is there any method by which drawings or facsimiles of handwriting can be transmitted by telegraph? A. There are several. 2. And if so, why has it not come into more general use? A. On account of the complication of the apparatus and the time consumed in working it. 3. If there is any method, where could I get a description of it? A. You will find several of them described in Prescott's "Electricity and the Electric Telegraph."

(33) J. K. B. asks: 1. How many revolutions must a fan have, 12 inches in diameter, 4 inch buckets? I wish it to blow the trash out of corn as it enters the millstone to be ground. A. If it is well made, you can run it from 5,000 to 6,000 revolutions a minute. 2. The engine that we are using is badly eaten with tallow; if not tallow I do not know what it is. I supposed it to be the tallow. I have recently fitted up the piston and partly the steam chest, and now I am using West Virginia lubricating oil and beeswax, in proportion 2 of oil to 1 of wax. A. The oil alone will answer very well. We do not think the wax will do any harm.

(34) Engineer asks: 1. Is the curve traced through the points found by the method explained by you in No. 29, "Notes and Queries," of the SCIENTIFIC AMERICAN for August 17, adiabatic, or only hyperbolic, having a slightly larger valuation than the one formed from the equation  $x a' = b a$ ? A. The curve is an approximated one for dry saturated steam. 2. Will you please construct a formula or equation, and give an example, from the symbols  $P \propto n^{-3/5}$ , as given in Rankine's "Manual of the Steam Engine," p. 385, article 282? A.  $a$  = piston stroke (clearance added) to point of release.  $a'$  = piston stroke (clearance added) to any other point.  $P$  = initial pressure of steam.  $P'$  = pressure at point  $a'$ .  $P' = P \times \left(\frac{a'}{a}\right)^{5/3}$ . Example:  $a = 60$ .  $a' = 30$ .  $P = 100$ .  $\frac{a'}{a} = 0.5$ .

Log. 0.5 — 1.6989700  
Multiply by 10

Log. of 10th power of 0.5 4.9897000  
Divide by 9 4.9897000

Log. of 1/10th power of 0.5 — 1.6653222  
Add log. of 100 — 2

Log. of pressure at  $a'$  — 1.6655222  
Corresponding number, pressure at  $a'$ , 46.3.

(35) R. C. K.—See p. 139 (11), current volume.

(36) C. K. asks: 1. In vertical engines, how much weight should be counterbalanced, the pitman, piston rod and head, or the pitman and crank? A. Connecting rod, piston rod, crosshead, piston, and crank. 2. Which is the best way to screw crank pins into the crank, by riveting or by nuts? A. Nuts, generally. 3. Can a correct judgment be given as to the merits of an engine by the working of a small one, say a 1/2 inch bore and 3 inch stroke, double cylinder? A. Many points can be determined in this way, but not all.

(37) J. L. K. writes: Please give me the lifting power of a cask, 100 gallons capacity, attached to a dead weight and pumped full of air, at a depth of 10 or 12 fathoms. A. It will be equal to the difference between the weight of water displaced, and the weight of the cask and its contents. For power of windmills see vol. 32, p. 241.

(38) B. S. & M. ask: Do the driving wheels of a locomotive slip in passing an ordinary curve? I contend that they do not, as the face of the wheels on steam roads is beveled. In curving the inside wheel comes to the small or narrow part of the face, the outside wheel must ride on the high or large part. A. If the curving is right for one curve, it may not suit another having a different radius, so that there may be cases where a slip will occur.

(39) J. M.—We do not know that there is any advantage in placing water at the bottom of the ash pit.

(40) C. O. H. asks: What is the best blacking for dressing up a steam boiler and smoke stack? A. A black varnish made from mineral oil answers very well.

(41) S. P.—It is impossible to make a cheap heliostat with one mirror which will keep a beam of sunlight fixed in any given horizontal direction. The double mirror heliostat, described by Mayer in his work on light, may, however, be cheaply converted into an automatically movable one, by connecting a pulley on its polar axis with another of half the circumference on the hour axle of a common spring clock by means of a band. The theory of the single mirror heliostat in its numerous forms must be sought in special works, e. g., Jamin's "Cours de Physique de l'Ecole Polytechnique."

(42) G. C. L. writes: 1. I want to make a telephone, and hear that I can purchase in New York all the necessary parts ready to put together. A. Full directions for making a telephone are contained in the SCIENTIFIC AMERICAN SUPPLEMENT, No. 142. 2. Do I render myself liable to patent suits? A. See "Rights of Inventors," p. 123, current volume of SCIENTIFIC AMERICAN.

(43) E. G. B. writes: Suppose that we have a line shaft running about 180 or 200 feet, the power at one end and a fan at the other. Now if we would move the fan up close to the power, still leaving the line shaft in its original place, would it require any more power at one place than it would at the other? A. We think there would be no essential difference if the shaft is of sufficient size and well supported.

(44) E. R. D. writes: I have been troubled the same as T. T. writes in your issue of September 21, 1878, and, after trying all the experiments that he relates, have found that the only material that will withstand the action of steam, oil or tallow is pure asbestos. A. This is often good, but we scarcely think that it is the only material.

(45) G. G. L. writes: I propose going from New York to Florida in a staunch 25 foot steam yacht, and I wish to ask if you think it is safe, or if it is a dangerous undertaking. What would I need besides coast charts and compass to aid me? A. It would not be very dangerous with a good boat. You should have lanterns, a sounding line, two good anchors, and some life preservers, in addition to the articles you have named.

(46) M. S.—Weissenborn's "American Engineering" contains full details of beam engines.

(47) I. T. S. asks: What is the composition of a good flux for purifying metals, such as brass, pewter, hard lead, etc.? My object, for instance, is to separate in brass turnings the iron filings. A. The metals cannot be separated by fluxes alone. The brass and iron filings or turnings may be most economically separated by means of good electro-magnets, arranged on the periphery of a wheel or in any other suitable manner.

(48) F. K. asks: 1. Is a Smee battery with center plate of carbon a good battery for silver plating? A. Yes. 2. If so, what surface of zinc and anode is required to a given surface of work? A. Your anode may have twice the surface of the zinc. 3. What is the standard used by platers for 4, 8, and 12 oz. plate, or, in other words, how many table or tea spoons is 4 ozs. of silver put on for a single plate? A. For 4 oz. plate 4 ozs. of silver are put on a gross of spoons. 4. Is it any more necessary that different cells of a battery should be charged alike for quantity than for intensity? A. No.

(49) O. H. asks: Could you inform me of the existence of any substance which will make metal adhere to wood? A. Melt together equal parts of clear pitch and gutta percha. Apply hot.

(50) G. W. K. asks: What is the best English publication on numismatics? A. Consult Prime's "Coins, Medals, and Seals," Dickinson's "American Numismatic Manual," Faure's "Catalogue de Medailles antiques et Monnaies du Moyen Age composant sa Cabinet."

(51) F. W.—The star Mira Ceti will be found on the horizon at about 5° south of east.

(52) W. R. S.—To secure an artificial mustache you may try the cements recommended on p. 171 (3), current volume, SCIENTIFIC AMERICAN. Also p. 11 (3), vol. 38. These "masks" are, we believe, usually held in position by small springs entering the nostrils.

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

J. S. R.—A fragment of quartz.—J. S. R.—Please send larger sample of the ore.—T. S. B.—No. 1. The sample of earth does not contain phosphates. No. 2 is dolomite or magnesian limestone. It may be used for building purposes.

#### COMMUNICATIONS RECEIVED.

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

On the Steam Ram. By S. S.  
A Climax to Mechanical Invention. By E. L. T.  
Egyptian Lotus. By J. S.  
Elephantiasis vs. Leprosy. By T. C.  
How to make a Simple Beam Compass. By M. A. B.  
Mechanical Stoker. By D. S.

#### HINTS TO CORRESPONDENTS.

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.

Many of our correspondents make inquiries which cannot properly be answered in these columns. Such inquiries, if signed by initials only, are liable to be cast into the waste basket.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

#### [OFFICIAL.]

### INDEX OF INVENTIONS FOR WHICH Letters Patent of the United States were Granted in the Week Ending August 13, 1878, AND EACH BEARING THAT DATE. [Those marked (r) are reissued patents.]

A complete copy of any patent in the annexed list, including both the specifications and drawings, will be furnished from this office for one dollar. In ordering please state the number and date of the patent desired, and remit to Munn & Co., 37 Park Row, New York city.

Advertising card, O. J. Ramsdell ..... 206,999  
Advertiser, illuminated, G. H. Chatterton ..... 206,861  
Alkali balls, composition for coating, A. Mendleson ..... 206,891  
Amalgamator and washer, ore, Firmin & Forster ..... 207,023  
Apple corer and slicer, Pfeiffer & Ulrich ..... 206,967  
Bag holder, W. B. Allen ..... 206,915  
Baking powder, W. P. Clotworthy ..... 206,930  
Bale tie, A. Roeder ..... 207,071  
Basket, flower, F. C. Tennyson ..... 207,083  
Bed, camp, F. J. De Morambert ..... 207,060  
Bed, sofa, S. Squires ..... 206,980  
Bedstead, table, E. Kiss (r) ..... 8,375  
Belt fastener, A. J. Johnson ..... 207,038  
Bird cages, fastener for, C. M. Neubauer ..... 207,063  
Bird cages, food holder for, B. A. Drayton ..... 206,867

Blasting wedge, O. F. Brockhausen ..... 206,927  
Blind stop, A. F. Fuller ..... 207,026  
Blind, window, J. E. Goodrich ..... 207,022  
Blotter, tablet, C. M. Cott ..... 207,017  
Boats, outrigger, etc. for, Roberts & Knight ..... 207,070  
Bolt threading machine, T. Thomas ..... 207,084  
Boot and shoe, A. Van Wagenen ..... 206,985  
Bottle and bottle stopper, H. Codd (r) ..... 8,372  
Bottles, pliers for wiring, B. P. Kincaid ..... 206,951  
Bung, W. Bender ..... 206,923  
Button, F. A. Comey ..... 206,931  
Can and vent for oil, jacketed, J. S. Lester ..... 207,046  
Can lids, locking device for, W. E. Jenkins ..... 206,879  
Can, sheet metal, G. D. Brooks ..... 207,007  
Can, sheet metal, Miller & Coll ..... 207,058  
Canvas, making artists', W. Levin ..... 206,885  
Canvas, painters', W. Levin ..... 206,886  
Car coupling, J. Ballard ..... 207,094  
Car coupling, A. Rice ..... 207,068  
Carpet sweeper, F. Kammerer ..... 207,040  
Carriages, hanging, C. Schmitt ..... 207,075  
Cattle and sheep, marker for, T. Madden ..... 206,889  
Chair, window cleaning step, A. Dormitzer ..... 206,935  
Chandelier, extension, H. Tucker (r) ..... 8,371  
Chimney or ventilator cup or cowl, D. Scott ..... 206,978  
Churn, T. A. Irick ..... 207,037  
Churn, Tise & Kester ..... 207,085  
Clear tip protector, C. R. Becker ..... 206,921  
Clamp, H. W. Atwater ..... 206,851  
Clamp for holding bolts, J. W. Leete ..... 206,954  
Clasp for supporting garments, S. Porter ..... 206,896  
Cloth shearer, rest for, A. Woolson ..... 207,090, 207,091, 207,092  
Cock, steam, J. Dowling ..... 206,937  
Coffee, etc., cleaner and polisher, M. Doyle ..... 206,866  
Coffee roaster, J. B. & W. H. Wiggerman ..... 206,911  
Collar, M. Hermann ..... 207,034  
Collar, J. K. P. Pine (r) ..... 8,339  
Colors on glass, etc., producing, F. S. Shirley ..... 207,077  
Cooler, beer, W. B. Frantz ..... 206,941  
Cooler, milk, S. R. Bryant ..... 207,008  
Corn marker, D. S. Harner ..... 207,031  
Corset, C. L. Olmstead ..... 206,964  
Corset, J. K. Ross ..... 206,900  
Corset, H. S. Strauss ..... 206,906  
Cotton scraper and chopper, Gibson & McDaniel ..... 206,871  
Crocheting fabrics, machine for, H. A. House ..... 206,878  
Cultivator, C. D. Bradley ..... 206,925  
Cultivator, C. E. Sackett ..... 206,974  
Cultivator, S. R. Stanton ..... 206,903  
Cultivator wheel, J. E. Mustard ..... 206,961  
Cut-off valve for steam engines, R. Sanderson ..... 206,975  
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Door alarm, F. C. Renner ..... 206,899  
Door securer, W. D. Rumsey ..... 207,073  
Drill hoe, grain, A. Landis ..... 206,884  
Drilling metal, A. J. Smart ..... 206,979  
End gate for wagons, W. H. Parkin ..... 206,966  
Engine, portable steam, W. H. Tappey ..... 207,082  
Evaporator, liquid, J. J. Johnston (r) ..... 8,373  
Evaporating liquids, process for, J. J. Johnston (r) ..... 8,374  
Excavator, C. Pontez ..... 207,064  
Fan, automatic, W. Duchemin ..... 207,022  
Fence, J. D. & W. E. Mandeville ..... 207,050  
Fence, E. D. Youngs ..... 206,938  
Fertilizer and grain distributor, S. S. Morton ..... 207,062  
Fertilizer distributor, B. Kuhns ..... 207,043  
Filter, water, P. P. Emory ..... 206,938  
Firearm, breech-loading, F. J. Mesle ..... 207,056  
Firearms, look for, J. M. Wittman ..... 206,991  
Fire escape, C. H. Ames ..... 206,916  
Fire extinguisher, H. S. Parmelee (r) ..... 8,376  
Foot power, W. F. Lane ..... 206,952  
Fork, M. Naumier ..... 206,894  
Forks, ferrule for spading, W. H. Buckley ..... 207,009  
Fruit drier, A. C. Burdick ..... 206,860  
Funnel, measuring, D. Hitchcock ..... 206,946  
Furnace, ore-roasting, etc., A. Ramage ..... 207,065  
Garbage holder, R. Cook ..... 207,016  
Gas light extinguisher, Brand & King ..... 206,926  
Gas, preparing nitrogen, G. A. Treutler ..... 207,086  
Gas regulator for retorts, L. G. McCauley ..... 207,052  
Gate, Hastings & Cook ..... 207,032  
Gate, farm, H. W. Goodwin ..... 206,942  
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Glove fastening, A. B. Kittson ..... 206,883  
Grain separator, R. Clarke ..... 206,920  
Grain separator, M. P. Korsgaard ..... 207,042  
Grain separator, A. M. Sutherland ..... 206,982  
Grate holder, Howdon & Wood ..... 207,036  
Gun, machine, F. L. Bailey ..... 206,852  
Harrow, S. Becker ..... 206,922  
Harrow, J. Johnson ..... 207,039  
Harrow and seeder, wheel, J. S. Foster ..... 207,025  
Harvester, T. S. Brown ..... 206,857  
Hay carrier, E. A. Walters ..... 206,987  
Hay tedder, E. W. Bullard ..... 207,010  
Hay tedder, W. M. Saunders ..... 207,074  
Hedges, constructing orange, J. Kline ..... 207,041  
Hides, unhairer, scourer, etc. for, J. A. Talpey ..... 207,081  
Hinge for folding seats, R. T. Hambrook ..... 206,875  
Hinge, lock, H. M. Ralston ..... 206,897  
Hog choker, compound, J. P. Cole ..... 206,863  
Hoister, tobacco, J. M. Wadlington ..... 206,986  
Hoisting apparatus, tobacco, W. A. & W. S. Guy ..... 207,030  
Holdback for vehicles, E. E. Morse ..... 207,061  
Honey comb, foundation for, M. Metcalf ..... 207,057  
Hops, sack for baling, C. A. Sands ..... 206,976  
Horse nail machine, J. Mills ..... 207,059  
Horse power, C. E. Macarthy (r) ..... 8,366  
Horse power equalizer, L. B. Rowland ..... 206,973  
Horse shoe, D. F. Fetter ..... 206,939  
Horse shoe nail machine, J. D. Sumner ..... 206,907  
Horse shoes, die for making, G. Bryden ..... 206,859  
Horse shoes, manufacture of, G. Bryden ..... 206,858  
Hot air register and evaporator, W. L. McDowell ..... 206,890  
Hydrant for watering stock, J. Compton ..... 207,015  
Insect destroyer, J. P. Ruhmann ..... 206,901  
Ironing table, W. C. McGill ..... 207,054  
Knife scales, manufacture of, W. Baker ..... 206,919  
Knitting machine cylinder, A. Greiss ..... 207,029  
Lamp, Stephens & Lameroux ..... 206,904  
Lamp and stove, R. R. Moore ..... 206,960  
Lamp burner, W. O. Lincoln ..... 207,048  
Lamp, carbureting, C. E. Ball ..... 206,999  
Land leveler, S. Griffin ..... 206,943  
Lantern, L. J. Atwood ..... 206,917  
Lantern, C. H. Viereck ..... 207,088  
Lantern, signal, S. Coxon ..... 206,938  
Lock, time, J. L. Hall ..... 206,872  
Lock, time, S. M. Little ..... 206,887  
Lock, time, E. Stewart ..... 206,931  
Lubricator, C. F. Raymond ..... 207,067  
Lumber trimming machine, G. W. Nichols ..... 206,962  
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Medicament, coated compressed, C. Carter ..... 207,013  
Middlings separator, W. H. Fruen ..... 206,889  
Mill attachment, grinding, C. V. Stevens ..... 206,905  
Mill, cider, J. L. Barnes ..... 207,001  
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Millstone dress, W. D. Odendahl ..... 206,963  
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Millstone driver, P. H. Childress ..... 207,014

Mower, lawn, A. H. Rau ..... 207,066  
Numbering machine, T. S. Bowman ..... 206,924  
Nut lock, W. J. Brassington ..... 207,006  
Nut lock, J. C. Lewis ..... 207,047  
Odorless closet, W. Glover ..... 206,874  
Oil, transporting petroleum, R. A. Wilder ..... 206,990  
Oil for locomotives, O. A. Haynes ..... 207,033  
Paper pulp, separating, P. & G. C. Rose ..... 206,971  
Paper pulp washer, H. Hollingsworth ..... 206,877  
Pen holder, T. B. Jeffery ..... 206,950  
Photographs, coloring, Price & Klingaman ..... 206,968  
Pins, making wooden, A. M. Kendall ..... 206,882  
Pitheer, S. W. Rabbitt ..... 206,907  
Planter, corn, Goodwin & Hurlburt ..... 207,028  
Plow, F. Johnson ..... 206,880  
Plow, C. P. McWane ..... 206,958  
Plow point, White & Francis ..... 206,910  
Plow, sulky, J. C. Welsh ..... 206,989  
Pocket books, etc., clasp for, Wolf & Loeb ..... 207,089  
Potatoes, removing the skin of, A. R. Davis ..... 206,834  
Press, baling, P. K. Dederick ..... 206,865  
Press, hop, C. A. Sands ..... 206,972  
Printing press, Rosser & Briggs ..... 206,977  
Propelling vessels, Cowles & Brewer ..... 207,018  
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Pump bucket, chain, M. C. Bignall ..... 206,854  
Pump bucket chain, J. S. Wilcox (r) ..... 8,370  
Pump chains, making, J. Adt ..... 206,995  
Pump, oil well, M. Lytle ..... 206,888  
Punkas, apparatus for working, Parsons & Palliser ..... 206,895  
Quilting frame, W. E. Barker ..... 207,000  
Railway spike, E. J. Remillon ..... 206,898  
Railway switch, street, J. V. McIlroy ..... 206,957  
Railway track, A. Herring ..... 206,876  
Rake, horse hay, T. S. Miller ..... 206,959  
Rein for two horses, driving, G. R. Woolsey ..... 206,912  
Rein holder, R. Floryanowicz ..... 207,024  
Rice hulling machine, W. G. Stevenson ..... 207,080  
Riveting machine, H. Mac Coll ..... 207,049  
Roofing, etc., material for, D. S. Armstrong ..... 206,850  
Ruling paper, machine for, E. Goupel ..... 206,873  
Sash and frame skylight, J. L. Cox ..... 207,019  
Sash fastener, Fogelstrand & Sparks ..... 206,940  
Saw handle, crosscut, M. E. True ..... 206,908  
Saw tooth, insertible, J. L. Berry ..... 207,003  
Screw cutting stock and tool, E. P. Berville ..... 206,920  
Sewing machine, T. Lamb ..... 207,044  
Sewing machine, Young & Dimond ..... 206,892  
Sewing machine, blind stitch, Hoffman & Meyers ..... 207,035  
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Spring, vehicle, W. Chegwinn ..... 206,842  
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Springs, retarding recoil of, C. J. A. Dick ..... 207,021  
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Steamer, feed, Craine & Gaylord ..... 206,964  
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Stove attachment, Lawrence and Strawbridge ..... 206,953  
Stove polish, H. J. Dreher ..... 206,868  
Stoves, fender for cooking, B. S. Hite ..... 206,947  
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Target, ball, C. A. Tatum ..... 206,983  
Telephone resonator, C. E. Carmon ..... 207,011  
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Thill coupling, W. S. Palmer ..... 206,965  
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Truck and bag holder, Bissell & Van Buren ..... 206,845  
Turbine wheel, etc., U. S. & W. H. Sheffer ..... 207,076  
Twine holder, J. W. Turner ..... 206,984  
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Boot and shoe blacking, Boyer & Co ..... 6,473  
Brushes, J. L. Whiting ..... 6,479  
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Cooking stoves, S. S. Jewett & Co ..... 6,475  
Drygoods, C. M. Williams ..... 6,490  
Dry hop yeast, Judd Brothers Yeast Company ..... 6,465  
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Carpet, H. Christie ..... 10,778  
Carpet, C. Magee ..... 10,779, 10,780  
Carpet, J. Neil ..... 10,781  
Font of types, D. W. Bruce ..... 10,777  
Rocking chairs, S. Willershausen ..... 10,782

[For the week ending August 6th.]

#### TRADE MARKS.

Baking powder, G. W. Kendall ..... 6,450  
Cassimeres, F. Glazier ..... 6,437  
Churns, Tiffin Union Churn Company ..... 6,451  
Cigars, H. Welsh ..... 6,445  
Coffee and spices, J. Prusso ..... 6,439  
Fertilizers, H. Duvall & Co ..... 6,434  
Flour, G. V. Hecker ..... 6,438