

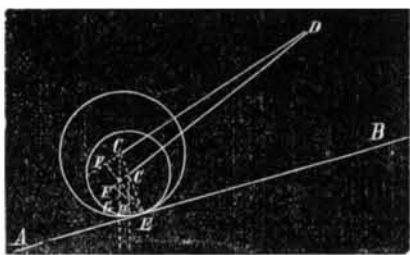
A. The principal difference will be that, in the first case, the steam will be condensed more rapidly: so that, using the same size of pipe and steam pressure in each case, the water will be heated the most, in a given time, in the first case.

(28) H. C. F. asks: 1. How can I make a solution for plating with a battery out of old gold rings? A. Add one volume of nitric to three of muriatic acid and dissolve the rings in the menstruum so formed. When this has been done, drive off any free acid that may remain by gently heating the whole. No yellow powder should result from the operation; if it does, a drop or two more of acid must be added to redissolve it. The solution should then be much diluted, and cyanide of potassium added as long as any precipitate is formed. Separate this from the liquid, wash, and redissolve it in cyanide of potassium, and the solution is ready for use. About half an ounce of the precipitate to a gallon of the cyanide (water and cyanide) is a good working strength. One Smee cell is sufficient to cause the deposit. The solution should be heated to about 190° Fah., and pure fine gold is needed for the anode. By properly regulating the battery power and heat, the color of the gold may be considerably modified. As cyanide of potassium is a deadly poison, too much care cannot be exercised in handling it. 2. Can I plate articles that have been nickel-plated with such a solution? A. Yes. 3. Would 5 cells Daniell's battery be sufficient? A. Five cells of Daniell's battery would probably cause the evolution of gas, which is to be carefully avoided. One cell in good condition would do well.

(29) S. A. T. says: In an old building in Philadelphia resides a man about 75 years of age, who has been at work on a machine composed of levers, without springs or weights, for years. He is very eccentric, lives alone, and no person knows who he is or whence he came. The machine is nearly all composed of wood; it is completed, and has been running for weeks. He is now building one very much larger, from which he intends deriving power. The man is not a man to deceive any one, and there is nothing about the machine hidden from view. I understand that the man has been working at this problem for 40 years. When I say "he has a machine which supplies its own power," I say what my eyes tell me. I am no believer in perpetual motion; but what is this? A. This is the old story that we have heard so often. We have in our possession numerous circulars, describing just such wonderful inventions and endorsed by the most wonderful names, but they do not seem to have much effect upon our views, and we are constrained to think that, while your eyes may be all right, you did not use them as judiciously as was desirable, directing them by your reason.

(30) C. W. P. says: I have two iron tanks in the top of my house, holding 125 barrels each. One is for soft water, the other for drinking purposes. What is the best paint or composition to coat them with to keep them from rusting? White lead will not do. A. Trautwein says: "White lead applied directly to the iron requires incessant renewal, and probably exerts a corrosive effect. It may, however, be applied over the more durable colors when appearance requires it. Red lead is said to be very durable, when pure. An instance is recorded of pump rods, in a well 200 feet deep, near London, which, having first been thus painted, were in use for 45 years, and at the expiration of that time their weight was found to be precisely the same as when new; thus showing that rust had not affected them." A slate paint is sometimes used to coat the interior of tanks. Iron, well cleaned and washed with hot linseed oil, will sometimes be thus preserved from rusting.

(31) N. G. W. says, in commenting on M. W. W.'s answer to the question why a given load can be moved up a given incline on a small wheeled truck with less power than would be necessary to move the same load up the same incline on a large wheeled truck: Let P=power, W=weight, R=radius of wheel, b=angle of inclination of road=E C G, a=angle made by line of traction, D C, with road=FE C. E is the center of moments. The



power, P, acts to raise the weight, W, over the point, P; the weight, W, resists the action. FE, the lever arm of P=R sin. a. GE, the lever arm of W=R cos. b. Writing out the equation by moments, we have P R sin. a=W R cos. b, or (reducing) we have P sin. a=W cos. b, that is, the power multiplied by the sine of the angle made by the line of traction with the road is equal to the weight multiplied by cos. angle of inclination of the road. The angle, a, varies inversely as R; hence, as the wheel becomes smaller, the angle, a, increases, as is shown in the figure. The sine of an angle varies directly as the angle, consequently, as a increases, sin. a increases. Resuming the last equation: Considering the weight constant and the angle of inclination of the road also, it would follow, to keep up the equality, that, as the diameter of the wheel is diminished, less power would be required to move a given weight up a given incline.

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

J. N. D.—Both are argillaceous shale, containing a small amount of micaceous red oxide of iron.—

E. McD.—No. 1 contains iron and manganese, along with silver and alumina. No. 2 is galena with a small percentage of iron. It is not arsenical. No. 3 is plumbago with siliceous lime. No. 4 is silica and alumina, iron in small amount, and lime.—J. H. P.—The smaller piece contains galena, pyrite, talc and quartzite. The larger is galena in limestone rock.—E. W. W.—No. 1 is iron pyrites which has lost a part of its sulphur and been partly converted into oxide of iron. No. 2 is excellent iron ore. It contains neither black lead nor quicksilver.—H. L. C.—They are of two kinds. The glossy kind is quartz, the waxy variety is chalcodony. Tampa Bay, Fla., has long been celebrated for the chalcodony found near it.—R. W. Z.—No. 1 is zinc ore. No. 2 is willamite. No. 3 is mica schist, containing a small amount of red hematite. No. 4 is calamine. No. 5 is strontianite. No. 6 is calamine.—C. H. P.—It is probably a siliceous scoria, its density being only 2.14. Besides siliceous, of which it is mostly composed, it contains iron, lime, and carbonaceous matter.—J. J. F.'s specimen, supposed to contain silver, did not arrive.—C. A. W.—The clay contains silica, alumina, lime, iron (as sesquioxide), magnesia, potash, and traces of soda. The above ingredients are arranged in order of the amounts as existing in the specimens sent.—W. H. G.—We find none of the precious metals present. It is a deposit of carbonate of lime and magnesia upon quartz. It contains about 10 per cent of sesquioxide of iron.—C. W.—It is a fossil belemnite. These curious fossils vary in size and form; some are small, delicate, transparent like amber; others are opaque, and from ten to twelve inches in length. They are very common, having been met with in all ages and countries, and giving rise to much speculation as to their real character.—C. B. K.'s and D. M. S.'s minerals did not come to hand.—A. M. D.—No. 1 is a handsome chrysolite, which is a silky variety of fibrous serpentine. No. 2 is hornblende. No. 3 is beryl.—J. L.—The water has been examined. It has taken up alumina, lime, and organic matter. The latter is to be dreaded; and it would be safer to boil the water before using.—A. B. P.—Nos. 1, 2, 3, and 4 (both hard and soft) are varieties of shale rock containing an amount of oxide of iron. By fluxing, No. 1 gives a black slag. They are not entitled to the name of iron ores. The paints are others of inferior quality. No. 5 is impure iron alum.—A. B. P.—The two bottles labeled No. 1 and those marked Nos. 2 and 3 contain lime and alumina with organic matters. In No. 3, the two latter substances are in considerable quantity, and there is likewise present a large percentage of iron.

COMMUNICATIONS RECEIVED.

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

- On Large and Small Wagon Wheels. By M. G. P.
On the Tides in the Gulf of Mexico. By W.
On a New Explosive. By E. G. A.
On Steam Boiler Phenomena. By L. M. K.
On State Laws regarding Patents. By W. W.
Also inquiries and answers from the following:
A. G.—J. W. D.—P. S.—C. L.—D. F.—A. L.—J. B.—
F. J. C.—J. R. N.—A. W.—E. J. N.—S. M. S.

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 waste basket, 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 inquiries analogous to the following are sent: "Whose is the best process of making gas from petroleum? Who publishes working drawings of steam engines? Whose is the best steam siphon valve? Whose is the best machine for reducing sand and small gravel to a fine powder?" All such personal inquiries 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

September 14, 1875.

AND EACH BEARING THAT DATE.

(Those marked (r) are reissued patents.)

- Alarm, burglar, J. B. Allen. 167,725
Alphabet exhibitor, B. B. Whaley. 167,812
Auger, earth, J. P. Summers. 167,628
Awnings, frame for hinged, H. Sykes. 167,709
Baby walker, Nickerson and Tripp. 167,683
Barrels, device for pitching, G. Meyer. 167,681
Bed, camp, H. R. Mills. 167,617
Bedstead, sofa, R. S. McEntire. 167,680
Blind stop, W. Wright. 167,815
Boats, propelling canal, A. Bugbee. 167,641
Boiler, wash, O. Davis. 167,748
Boot heels, making, S. W. Baldwin. 167,728
Boot-pegging stand, A. Stone. 167,802
Boots, insole for, C. F. Hill. 167,762
Boots, lasting, R. C. Lambert. 167,676
Bottle stopper fastening, W. H. Bate. 167,683
Bottle stoppers, bending wire, C. De Quillfeldt. 167,650
Brick machine, Wilson and Smithson. 167,720
Burner, gas, T. Trudeau. 167,713
Burner, lamp, P. S. Underhill. 167,714
Calendar, J. F. Tapley. 167,629
Cans, handle for milk, E. B. Curtis. 167,614

- Capstan, A. Russell. 167,693
Car brake shoe, M. Madden. 167,616
Car brake, steam, Taylor and McCamish. 167,804
Car brake, vacuum, F. W. Eams. 167,750
Car coupling, W. R. Hunter. 167,767
Car coupling, G. Wernimont. 167,718
Carbureter, D. L. Wescott. 167,811
Carpet beater and cleaner, J. Leiss. 167,770
Carriage bows, forming ends of, C. Renton. 167,690
Carriage step, E. A. Cooper. 167,646
Carriage top, A. W. Gilbert. 167,658
Cartridge-loading device, W. Noyes. 167,778
Casting mold boards, J. Oliver (r). 6,642
Casting mold boards, chill for, J. Oliver (r). 6,647
Cement, hydraulic, C. F. Dunderdale. 167,653
Chair, reclining, G. Hunzinger (r). 6,641
Chimney soot arrester, M. Brinkerhoff. 167,602
Chuck, planer, J. C. Mulberry. 167,618
Churn, J. W. McClure. 167,774
Cigar box revenue guard, O. T. Earle. 167,752
Clay, etc., pulverizing, J. K. Caldwell. 167,742
Clothes clamp, G. W. Kniffen. 167,673
Clothes dryer, M. N. Lovell. 167,615
Clothes dryer, C. Schifferley. 167,694
Clothes dryer, J. Sutton. 167,708
Cock, stop, O. T. Earle. 167,751
Coffin, Richey and McDougall. 167,691
Collar and muff, combined, C. Stettmann. 167,799
Colliery plant, R. A. Wilder. 167,719
Condenser, H. W. Bulkeley. 167,642
Cotton gin, O. W. Massey. 167,679
Crimping machine, T. J. Greenwood. 167,661
Crozing and leveling tool, Steel and Reel. 167,704
Curtain fixture, L. H. Gano. 167,758
Cuspadore, G. Booth. 167,735
Dental fillings, preparing, R. S. Williams. 167,813
Dinner box, J. S. Davis. 167,648
Ditching machine, F. Taylor. 167,805
Dip pipes, rotary valve for, W. Farmer. 167,606
Dip pipes, movable, W. Farmer. 167,605
Dovetailing machine, C. P. Balle. 167,727
Dray, three-wheeled, J. W. Minor. 167,776
Drills, manufacturing twist, C. B. Hunt. 167,766
Drills, tripod for rock, J. C. Githens. 167,659
Egg batter, desiccating, W. O. Stoddard. 167,801
Egg beater, F. E. Schomeyer. 167,696
Eggs, preserving, J. K. Boone. 167,637
Engine, rotary, Roth and Barker. 167,692
Engine, rotary, Stream and Miller. 167,803
Engine, rotary, Vanorder and Savage. 167,808
Explosive compound, C. Dittmar (r). 6,645
Fare register, A. F. Johnson. 167,670
Fare register, W. Miller. 167,682
Fare register, J. Sangster. 167,623
Farrier's tool, M. Baltes. 167,632
Fats, etc., separating constituents of, T. M. Fell. 167,607
Feed water regulator, C. M. Bridges. 167,639
File holder, H. Baumgarten. 167,731
Fire arm, magazine, E. A. F. Toepferwein. 167,712
Fire arms, elastic butt plate for, H. A. Silver. 167,701
Fire extinguisher, Hart and Dillon-Lee. 167,664
Fishing lines, sinker for, E. Pitcher. 167,687
Fishing, spoon hook for, G. R. Pierce. 167,784
Flower pot, C. J. Sands. 167,790
Furnace door casing, H. F. Hayden. 167,665
Furnace for destroying insects, W. F. Woolsey. 167,722
Furnace, iron and steel, W. A. Stephens. 167,800
Furnace, hot air, H. D. Freer. 167,657
Furnace, hot air, N. Teye. 167,631
Gage, siding, C. Sargent. 167,791
Game apparatus, J. J. Weber. 167,716
Game counter, C. E. Hackley. 167,662
Gas governor, W. D. Show. 167,795
Gasifier, extension, J. H. Seaman. 167,697
Generator, steam, R. H. Thom. 167,711
Glassware, manufacture of, J. C. Gill. 167,608
Grain dryer, J. Soute. 167,797
Grate, J. Habermehl. 167,609
Harness, rosette, Ulrich & Hachmeister (r). 6,643
Harrow, wheel, J. S. Snively. 167,708
Harvester, J. Gore (r). 6,640
Hat bodies, forming, W. H. Croke. 167,746
Heat regulator, W. S. Hill. 167,611
Heating drum, Munson & Dick. 167,777
Hoisting apparatus, N. W. Hoffman. 167,763
Hook for hanging pictures, C. Richards. 167,620
Horse-ditching apparatus, J. W. Glover. 167,660
Horses, toe weight for, W. H. Abbott. 167,599
Horseshoe, A. Albright. 167,600
Horseshoe, M. S. Roberts. 167,789
Hose and pipe coupling, H. G. Koehler. 167,675
Hydrant, J. Fleming. 167,656
Hydrocarbons, burning, J. W. Nystrom. 167,684
Ice pick, M. Cowles. 167,745
Key fastener, J. Knight. 167,674
Lamp, B. B. Schneider. 167,792
Lamp support, wagon, Boudren & Johnson. 167,736
Lantern, A. M. Duburn. 167,651
Lard dryer and cooler, G. Bogen, Jr. 167,636
Lathe, universal turning, Koch & Mueller. 167,614
Leather finishing machinery, E. Settle. 167,698
Leg, artificial, J. O'Brien. 167,779
Line fastener, W. Haddock. 167,610
Liquid measure, G. W. Aldrich. 167,601
Liquors, forcing, J. F. Bennett (r). 6,639
Lock, combination, H. C. Hovey. 167,764
Locomotives with water, supplying, H. Howe. 167,765
Loom shuttle, A. Edwards. 167,753
Loom shuttle spindle, Logan & Thomson. 167,678
Lounge, invalid, A. Shiel. 167,700
Lubricating compound, B. F. Bartlett. 167,730
Mains, preventing tar in, D. H. Fox. 167,755
Measure, liquid, G. W. Aldrich. 167,601
Meat cutter, D. I. Degroat. 167,645
Meat in cutting, holding, W. Tetley. 167,710
Medical composition, L. P. Brand. 167,737
Mill, smut, Richmond, Ryan, and McGill. 167,788
Nail extractor, I. N. Burdick. 167,740
Nipple, rubber, A. M. Knapp. 167,613
Ore crusher and amalgamator, C. Braids. 167,638
Ore feeder, C. P. Stanford. 167,625
Paint oil compound, D. S. Robinson. 167,622
Painting cloth machine for, H. H. Phillips. 167,783
Paper box, C. A. Young. 167,723
Paper box machine, G. L. Turney. 167,807
Paper, machine for cutting roll, Cohen & Frank. 167,645
Paper pulp from palm, making, J. P. Herron. 6,646
Pen holder, E. Barberot. 167,729
Pen, ruling, J. R. Gisburn. 167,759
Picker staff check, Stevenson & Nuttall. 167,707
Pictures, etc., hanging, H. D. Pope. 167,786
Pipe cutter, F. I. Maule. 167,773
Plane, carpenter's, M. C. Mayo. 167,772
Planer chuck, J. C. Mulberry. 167,618
Planing machine, Doane & Passel. 167,749
Planing machine cutter holder, W. B. Smith. 167,738
Planter, corn, J. Kelly. 167,612
Plow, I. Freeman. 167,756
Plow, M. Ormond. 167,686
Pocketbook lock, Hanau & Bendit. 167,663
Press, cotton and hay, W. H. Burgess. 167,747

- Printer's quoin, A. J. O'Shea. 167,780
Printing press, A. E. Redstone. 167,787
Propelling canal boats, A. Bugbee. 167,641
Pumps, valve for pneumatic, W. B. Chisholm. 167,604
Purifier, middlings, H. F. Notbohm. 167,619
Railroad frog point, J. Johnson. 167,671
Railroad switch, D. F. Cavanaugh. 167,743
Railroad switch, safety, J. A. Duggan. 167,652
Refrigerator, J. Schmelzer. 167,695
Refrigerator, B. A. Stevens. 167,706
Rein holder, Owen & Custer. 167,781
Revenue guard for cigar boxes, O. T. Earle. 167,752
Roll for rolling metal, A. R. Boluss. 167,734
Sash balance, W. J. Lewis. 167,677
Sash cord fastener, H. N. Connor. 167,744
Sash fastener, P. T. Share. 167,624
Saw, band, G. F. Wood. 167,721
Saw bucks, wood holder for, S. Hollingsworth. 167,667
Sawing machine, scroll, E. Smith. 167,794
Sawing machine, stone, S. Thompson. 167,806
Scales, weighing, T. D. Stetson. 167,705
Scraper, road, E. Huber. 167,668
Sewing machine, S. B. Brown. 167,640
Sewing machine, C. S. Cushman. 167,747
Sewing machine caster, L. A. Parker. 167,782
Slinging bracket, W. H. Seymour. 167,649
Shoes, elastic goring for, H. A. Blanchard. 167,732
Sifter, ash, A. C. Ferris. 167,655
Sleigh, T. Brown. 167,739
Sleigh, J. M. Story. 167,672
Snow plow, S. M. Miner. 167,775
Soap, compound for, G. L. S. Jenifer. 167,669
Soap holder, W. J. Johnson. 167,769
Soda water fountains, making, A. D. Puffer. 167,688
Spark arrester, Brayton, June, & French. 167,738
Speculum, E. W. Higbee. 167,666
Speeders, etc., bearing for, S. Dyer. 167,654
Sphygmoscope, W. R. Pond. 167,785
Stamp, hand, S. F. Robinson. 167,621
Stone sawing machine, S. Thompson. 167,806
Stove, hot blast, Cochran & Cowper. 167,644
Swaging machine feed, R. Thompson. 167,630
Table, steaming, A. J. Randell. 167,689
Telegraph, electromagnetic, J. Olmsted. 167,685
Tooth pick, G. S. Boice. 167,733
Torpedo envelope machine, Wolfe & Lillendahl. 167,814
Toy, balancing, F. Markee. 167,771
Toy, chime, E. C. Barton (r). 6,644
Toy whistle, H. B. King. 167,672
Trunk stay, M. A. Waas. 167,809
Tubing, making of metal, D. M. Somers. 167,796
Type setting machine, R. T. P. Allen. 167,726
Tyre setting machine, I. H. Spelman. 167,798
Universal joint and clamp, T. J. Carrick. 167,603
Valve, oscillating balanced, A. W. Eldredge. 167,754
Vinegar, apparatus for making, E. Burlingame. 167,643
Wagon, dumping, T. Weaver. 167,715
Wagon lamp support, Boedren & Johnson. 167,736
Washing machine, G. Friend. 167,757
Washing machine, G. W. Grubb. 167,761
Watches, hollow staff for, Belcher & Plume. 167,634
Water closet, R. D. O. Smith. 167,702
Wells, tools for setting tube, J. B. Stellwagen. 167,626
Windmill, J. A. Allen. 167,724
Window sash tightener, J. Benson. 167,635
Window shade clasp or fastening, H. M. Wells. 167,810
Wire, machine for screw threading, L. Goddu. 167,760
Wrench, R. J. Welles. 167,717
Yoke coupling, neck, N. E. Irish. 167,768

DESIGNS PATENTED.

- 8,647.—MEDAL.—W. B. Cunningham et al., Phila., Pa.
8,648.—PIANO-FORTE LEG.—C. E. Hoffmeister, N. Y. city.
8,649.—CASTING.—A. P. Reger, Philadelphia, Pa.
8,650.—GRIDIRON.—W. P. Warren, Troy, N. Y.
8,651.—CAPS.—M. Isidor et al., New York city.
8,652.—WAIST BELT.—W. C. Shimoneck, Washington, D. C.
8,653.—BACK COMB.—W. C. Shimoneck, Washington, D. C.
8,654.—FAN.—H. B. Sommer, Philadelphia, Pa.

SCHEDULE OF PATENT FEES.

- On each caveat. \$10
On each Trade mark. \$25
On filing each application for a Patent (17 years). \$15
On issuing each original Patent. \$20
On appeal to Examiners-in-Chief. \$10
On appeal to Commissioner of Patents. \$20
On application for Reissue. \$30
On filing a Disclaimer. \$10
On an application for Design (3 1/2 years). \$10
On application for Design (7 years). \$15
On application for Design (14 years). \$20

CANADIAN PATENTS.

LIST OF PATENTS GRANTED IN CANADA, September 14 to 20, 1875.

- 5,178.—H. Bolton, Elizabethtown, Ont. Potato digger. Sept. 14, 1875.
5,179.—J. A. MacKinnon, Sandwich, Ont. Whiffletree. Sept. 14, 1875.
5,180.—W. R. Fenerty, Halifax, N. S. File and tool handle. Sept. 20, 1875.
5,181.—G. Keely, London, Ont. Feather-renovating machine. Sept. 20, 1875.
5,182.—J. W. Johnson et al., Towanda, Pa., U. S. Grain separator. Sept. 20, 1875.
5,183.—G. H. Bliss, West Stockbridge, Mass., U. S. Culinary apparatus. Sept. 20, 1875.
5,184.—A. Cunningham, Milwaukee, Wis., U. S. Saw mill dog. Sept. 20, 1875.
5,185.—F. K. Kalbfleisch, New York city, U. S. Carrier for acids. Sept. 20, 1875.
5,186.—G. Walling, Port Henry, Ont. Suction meal and flour-saving fan. Sept. 20, 1875.

Advertisements.

Back Page \$1.00 a line.
Inside Page 75 cents a line.
Engravings may head advertisements 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.

FOR ONE OF THE BEST FILE GUIDES EVER made, for guiding the file while filing saws. Manufactured by E. ROTH & BRO., New Oxford, Pa.

5000 AGENTS WANTED—To Sell the Oriental Stationery and Jewelry Package, the largest and fastest selling package in the world. Mailed for 20c. Address R. L. FLETCHER, 111 Chamber St., New York.

TOOL CHESTS
WITH BEST TOOLS ONLY
FOR CIRCULAR ADDRESS
J. PRATT & CO
53 FULTON ST. N.Y.