A. Light passing through a magnetized ring is not refracted, but in the case of polarized light, its plane of polarization is rotated. 15. Is there any known mechanical means of feeding a wheel forward through successive steps, which steps shall be perfectly gaugeable, and be as desired any portion of the circumference? I desire a positive motion, with stops to prevent slipping or the passage of wheel beyond proper points. A. We think a worm wheel, driven by a worm operated by a pawl and ratchet, would answer your purpose.

(3167) S. M. K. asks: 1. Have you any description of a simple air engine of about one-eighth to one-sixteenth horse power? A. You will find caloric engines described in SUPPLEMENT, Nos. 49, 162,623, 633, 536, 573. 695 and 727. 2. Have you a description of a simple steam engine of about one-eight or one-sixteenth horse power? A. SUPPLEMENT, No. 279, contains a description of such an engine. 3. How can I make a boiler to be put on a stove for use in connection with a small steam engine? A. For small boilers consult SUPPLEMENT, No. 702. 4. Have you directions for making a simple electric motor? A. See SUPPLEMENT, No. 641. 5. How to make a dynamo for 6 or 8 lights? A. Consult SUPPLEMENT, No. 600. 6. How to make a battery for running small electric lights? A. See SUPPLEMENT, No. 792. 7. What is a good treatment for dandruff? A. Wash the head in a weak solution of borax.

(3168) E. J. H. asks: 1. How can a luxuriant growth of beard be permanently removed from the face without serious injury to the skin? Will you suggest a course of experiments likely to give the desired result? A. In our SUPPLEMENT, Nos. 176 and 353, you will find the results of the electrolytic method. 2. By Act of Congress, March 22, 1862, $60,000,000 in currency was made full legal tender money. How long did it remain in circulation at par with gold, and at what time, and for what reason was it withdrawn from circulation? A. In December, 1861, the banks suspended specie payments, and there was thereafter a premium on gold until the resumption of specie payments by the government in 1879. The government was sustained, through 1861, by treasury demand notes, payable in coin, but the first legal tender act was for the issue of $150,000. It passed the House of Representatives February 24, 1862, and passed the Senate and was signed by the President the next day. The total authorized issues of legal tenders were $450,000. Subsequent to the war up to 1874, $44,000,000 of legal tenders were retired, as part payment of an acknowledged debt by the government, further payments being restricted because of their acknowledged convenience as currency when the ability of the government to maintain them at par had been demonstrated. During the war and up to 1874, $48,151,000 of fractio currency were issued, the greater part of which been redeemed before the resumption of specie p. ments.

(3169) C. E. R. asks for the mode used in varnish works to bleach shellac, and if chlorine is used, the cheapest form to make it. A. Two pounds chloride of lime are made into a paste with water, which is strained through a cloth. The residue on the cloth is washed out with two pints of water. For each pound of chloride of lime add 4 ounces carbonate of potassium diesolved in 1 pint of water. Two pounds of shellac have meanwhile been digested in 1 gallon of alcohol for a few days. The above fluid is added with constant stirring to the alcoholic solution. After half an hour enough hydrochloric acid is added to show an acid reaction. The shellac is precipitated as a white tough mass, which is freed from the acid by rinsing and is washed with hot water until the latter comes off clear. The shellac is kneaded or worked into strips and is dried upon a platform or board in the air. The alcohol can be recovered by distillation. Enough carbonate of potash should be added to the original chloride of lime solution to precipitate all the lime. The quantity given is approximate only. Each sample will require a different amount.

(3170) C. I. sends following receipt and asks concerning its merits: "A patented shoe blacking, which contains no acid, is made in Germany by dissolving casein in a solution of borax or soda and adding resinate of iron, besides the usual boneblack, grease, and sugar. A brilliant luster is imparted by casein. and the resinate of iron gives a deep black color." A. The receipt is suggestive and worth trying. The doubtful point is as to its lasting black color. The resinate of iron is made by saponifying resin with caustic soda. dissolving in water and adding to a solution of copperas. The iron salt will be precipitated. Filter, wash, and dry it for use. Carbon blackings are given in many places in the SCIENTIFIC AMERICAN.

(3171) S. L. asks: 1. Which is the best non-conductor of heat—felt, asbestos, or air? A. Asbestos. 2. Will air inclosed in a vessel hermetically sealed expand by heat? If so, how much, and with what force? A. Air, at atmospheric pressure and with a temperature of 32° Fah. will, when heated to 680°, give a pressure of 15 pounds above that of the atmosphere. 3. Is a partly vacuum a better non-conductor of heat than air? A. Yes. 4. What causes the explosion of kerosene lamps, and stoves. Is it because the gas from the oil comes in contact with the oxygen of the air or with the flame? A. The explosion of kerosene lamps and stoves is caused by the mixture of petroleum vapor driven off by the burner and air. 5. Which is the lightest of all gases? A. Hydrogen. 6. If a vacuum were created in a vessel, would it be lighter than if charged with the lightest gas? A. Yes.

(3172) P. C. T. asks: 1. What is the so-called "bottled electricity" used for headache and the curing of catarrh? A. The bottle contains no electricity. It is simply filled with sponge, and the sponge is saturated with oil of mustard. 2. Where does the first electrical impulse come from in the dynamo, as there is no magnetism present when the machine is at rest? A. If there were no magnetism in the cores of the field magnet the machine could not be started. The field magnet of every dynamo retains a little magnetism, which is sufficient to start the inductive process.

(3173) R. E., Jr., says: We want to use the water in our mines for boilers, and it is impregnated with sulphur, iron, copper, etc. What method can we use to purify it so as not to be destructive to the iron? A. The best chance of purifying the water is to add enough lime water to precipitate its impurities, and to allow it to settle. Or you may let it stand in wooden tanks with scrap iron. Either method is imperfect and your boilers will undoubtedly suffer whatever you do. After standing over scrap iron, the lime treatment might be used in addition.

(3174) H. McD. asks for any known liquid, outside of alcohol, that will not evaporate by exposure, and only freezes at a very low temperature. A. Glycerine.

(3175) S. M. B. writes: Can you give me any information of any one who has a process or method of removing salt and alkali from water so that it will render or make the water fit or suitable for making steam? A. Salt and alkali cannot be removed from water in any practical way for boiler use. Run the boiler by the hydrometer, adding new water to keep it at a constant degree of saturation. Blow off frequently from the bottom to expel deposited matter.

(3176) F. A. S asks how many pounds of wire there are on armature and on field magnet of the small electric motor described in "Experimental Science," page 497. A. We cannot give the exact amount of wire on the motor referred to, but we think there is about one-third pound on the armature and 1 pound on field magnet.

(3177) E. V.—To make a mould for ornaments, etc.: Soak 12 ounces of gelatine for a few hours in water until it has absorbed as much as it can, then apply heat, by which it will liquefy. If the mould is required to be elastic, add 3 ounces of molasses and mix well with the gelatine. If a little chrome alum be added to the gelatine, it loses its property of again being dissolved in water. A saturated solution of potassium bichromate brushed over the surface of the mould, and allowed to become dry and afterward exposed to sunlight for a few minutes renders the surface so hard as te be unaffected by moisture. To prevent the plaster sticking, brush with olive oil.

(3178) F. H. F.—Since making our former answer as to the heaviest locomotive used on any railroad in the world, we are informed that the Canadian Locomotive Works, at Kingston, Ont., is building four locomotives for the Chignecto Ship Railway, each of which will have a weight of 45,000 pounds on each of four pairs of drivers, or a total of 180,000 pounds, light, for each locomotive. We know of no locomotives so heavy as this at present in use.

(3179) A. D. B. asks (1) for the relative proportion of piston area and length of stroke in gasoline engines, considering the expansive force of the gas (not any particular make of engine). A. There is no fixed rule for the proportions of gas engines; some makers think a stroke at least double the diameter of the cylinder is advisable, while others make the diameter of the cylinder and the stroke the same. 2. How many volumes should the charge be compressed? A. About three. 3. What are the best proportions of gasoline gas and air for greatest force? Also for greatest expansion. A. Eight or nine volumes of air to one of gasoline vapor gives the best results. 4. Would it be practical (considering economy) to admit gas and air (of the proper mixture) in proportion to the load, the same to be compressed in the same space of a full charge? A. A variable mixture does not work well in practice.

(3180) C. A. H. asks: In rewinding a small electric motor, say about one-eighth horse power, to adapt it to Edison 105 volt circuit, what should the resistance be in the fields and armature, and the best way to connect up shunt or series? A. The resistance of the machine should be such as to use the amount of current required for the power needed. An electrical horse power is 746 watts. A watt is one ampere multiplied into a volt. If you require one-eighth horse power, you will need about 93 watts. Your E. M. F. is 110 volts; therefore, if you divide the voltage by the number of watts, you will have the current in amperes required, which is 1·18 amperes. Now, to arrive at the total resistance of the machine, you will divide the voltage by the amperage, which will give you 92 ohms. Of this amount, if the machine is series wound, the resistance of the field magnet should be about one-half that of the armature, while if it is shunt wound, the resistance of the field magnet should be about fourteen times that of the armature.

(3181) S. R. S. asks: How can I remove a wart? A. Cover the skin around the wart with lard; apply over the surface of the growth one or two drops of strong hydrochloric or nitric acid; then keep the part covered up until the scab separates.

(3182) C. G. C. asks: How can I remove rust stains from nickel plate? A. Grease the rust stains with oil, and after a few days rub thoroughly with a cloth moistened with ammonia. If any spots still remain, remove them with dilute hydrochloric acid and polish with tripoli.

(3183) W. P. S. asks: 1. How can I make the black enamel used on bicycles? A. For temporary use to cover places where the enamel has been chipped, use asphaltum dissolved in turpentine. If the whole machine needs japanning, send to the factory and have it japanned. 2. What cement must I use to cement on the tire? A. Melt together equal parts of pitch and gutta percha; use hot. 3. What cement can be used to mend cuts? A. Use the following: carbon bisulphide, 5 oz.; gutta percha, 5 oz.; pure unvulcanized rubber, 10 oz.; fish glue, 2½ oz. Use no more than necessary, and bind the tire firmly with string until the cement has set. 4. What oil is used to oil bicycles and typewriters? A. Use sperm oil.

(3184) E. H. R. asks how to remove ink stains from an oak desk. A. Try a mixture of two parts of cream of tartar and one of powdered alum.

(3185) F. B. D. asks how to make tin foil labels adhere to block tin collapsible tubes. A. Use a mixture of the best fish glue and gum arabic dissolved in water. A little glycerin may be added to advantage.

(3186) J. C. asks: 1. What kind of wax is used in making wax flowers, and how is it prepared? A. Use nothing but the purest virgin white wax; a little of the finest grade of Venice turpentine is added to render it ductile. It must not be melted in an iron pan; use tin or enamel ware; when stiff leaves are to be made, a little spermaccti may be added. The colors in fine powder are mixed with essence of lavender and this paste is mixed in with the wax. Pour in moulds while still warm. 2. How is beeswax bleached? A. Melt the wax in a jar and put into it sodium nitrate in the proportion of one ounce to the pound of wax; add afterward by degrees two ounces of sulphuric acid diluted with ten times its weight of water. Keep the wax warm and stir. Let it stand a short time, then fill up the jar with hot water, and allow the whole to cool. Afterward wash with water to remove any nitric acid stains that may remain, or finely shred it and expose to the sun for several days.

(3187) A. M. asks: How can I obtain a fine gloss on collars and cuffs? A. Melt 2½ lb. of the very best A 1 paraffine wax over a slow fire. When liquefied, remove from the fire and stir in 100 drops of citronella. Have ready some round tin pie plates (new); place them on a level table, coat them slightly with sweet oil, and pour about six tablespoonfuls of the enamel into each tin. The pan can be floated on water to cool it. Break up into pieces the size of a lozenge. Two of the pieces added to each pint of starch will cause the smoothing iron to impart the finest possible finish, leaving the clothes perfumed. See SUPPLEMENT 577.

(3188) W. S. B. says: 1. In toning prints they sometimes assume a deep red color, which cannot be removed, although the print is left in the solution for hours. The redness sometimes covers the whole print and is sometimes in spots. I wash my prints in running water for half an hour. What is the cause and how can it be remedied? A. The redness is due to too acid a toning bath, or insufficient gold in the bath. See that the toning bath is alkaline, and test with a piece of red litmus paper, which should turn blue if the bath is alkaline. 2. Are time exposures preferable to instantaneous? A. Yes.

(3189) T. P. R. asks how to prevent photographs from fading. A. See formula on page 10621, SCIENTIFIC AMERICAN SUPPLEMENT, No. 665. Keep the photograph in a dark place.

(3190) J. Z. G. asks why lead castings sometimes crack while cooling. A. The cracking of lead castings is due to shrinkage, and generally occurs in sharp angles. All metals are liable to shrinkage cracks in the recessed angles, unless filleted.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

July 14, 1891.

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Acid, manufacture of tartaric, R. W. Schedler ... 455,768
Addressing machine, G. S. Couch ... 455,814
Armature for dynamo-electric machines, E. W. Rice, Jr. ... 455,887
Armature for dynamos, F. L. McGahan ... 455,971
Assorting machine, H. H. Hutchins ... 456,002
Axle coupling, vehicle, J. J. Morrison ... 455,849
Axle cutter, J. Swegles ... 455,935
Axle, self-oiling car, R. P. Sholl ... 455,841
Bag fastening, traveling, C. F. Kurz ... 456,040
Bait cage, S. Moulsong ... 455,758
Baling press, C. E. Bates ... 455,731
Baling press, E. M. Pine ... 456,057
Ballot box, A. Reppmann ... 456,768
Banjo, F. Gretsch ... 456,029
Barrel, Tinker & Benjamin ... 456,099
Bating powder, H. Poydenot ... 455,851
Batteries, terminal for electric, Hayes & Hibbard 455,986
Battery plate, secondary, J. R. MacLaughlan ... 455,968
Bed couch, G. Goldschmidt ... 455,921
Bedstead, etc., iron, C. A. Sprague ... 456,976
Beer buck, F. T. Cladek ... 455,937
Bell, E. D. Rockwell ... 456,062
Belt, electric, L. N. Fancher ... 456,021
Belt tightener, C. A. Norlin ... 455,799
Belting, C. A. Schieren ... 455,852
Berth safe, J. A. Brittain ... 456,010
Bevel, P. J. Mabye ... 456,044
Bicycle, W. F. Cornelius ... 455,864
Bicycle, Huelsen & Nagel ... 455,945
Blind, Venetian, Simmons & Angus ... 455,912
Board. See Game board.
Boiler. See Dinner boiler. Steam boiler.
Boiler, O. W. Noble ... 456,090
Book support and desk, H. J. Harrison ... 456,089
Books, binding, J. H. Workman ... 455,894
Boom stick, D. W. Case ... 455,996
Boot or shoe, S. C. Howard *et al.* ... 455,847
Bottle stopper, G. S. Chamberlin ... 455,737
Bouquet holder, N. R. Sheets ... 455,928
Box. See Ballot box. Fare box. File box. Letter box. Locomotive sand box.
Brake. See Car brake. Vehicle brake.
Brake regulator, automatic, F. Moore ... 455,902
Brake staffs, pawl and ratchet mechanism for, Emerson & Emery ... 456,026
Brick mould and press, C. W. Raymond ... 455,951
Brush, F. Consene ... 455,740
Buoy, bell, J. Gibson ... 455,746
Bureau and commode, Merritt & Taylor ... 455,883
Burner. See Vapor burner.
Butter moulds and vinegar measures out of wood, machine for manufacturing, F. K. Winsor ... 455,862
Button, J. M. Crews ... 455,908
Car brake, S. R. Lewis ... 455,753
Car brake, T. D. Osborne ... 455,927
Car, cable, J. Stephenson ... 455,774
Car coupling, J. M. Birtels ... 456,080
Car coupling, M. Howe ... 455,795
Car coupling, J. Kormil ... 456,039
Car coupling, S. W. Wright ... 456,074
Car gate, railway, F. C. Cash ... 456,017
Car safety attachment, B. C. Seaton ... 456,126
Car seat, E. L. Busbnell ... 456,015
Car, street, Smith, Jr., & Williamson ... 455,842
Car trolley, electric, W. H. Knight ... 455,796
Cars, street and station indicator for, G. H. Tietjen ... 456,098
Carding engines, grinding the flats of traveling flat, W. Dobson ... 455,983
Carpet stiffener, M. Lincoln ... 456,002
Carpet stretcher, clamp, L. Hinkle ... 456,001
Carriage, baby, Davis & Dicks ... 455,909
Carriage, spring, J. D. Brunner ... 455,736
Carriages, shifting seat for, J. T. Clarkson ... 455,738
Cart, road, Kirkpatrick & McDaniel ... 455,831
Cart, road, S. D. Palmer ... 456,056
Cart, road, L. M. Smith ... 455,868
Case. See Display case. Show case.
Cash register, C. Angus *et al.* ... 455,916
Caster, furniture, A. E. Brown ... 455,906
Centrifugal machine, T. Muller ... 455,832
Chair iron, tilting, A. E. Quinlan ... 455,866
Chamber attachment, noiseless, V. M. Cone ... 455,907
Chart, dress, E. Hood ... 455,749
Chimneys, construction of, A. Boettcher ... 456,109
Churns, means for operating, L. H. Conner ... 455,739
Cigar stamping machine, G. F. & J. W. McIndoe ... 455,820
Clamp. See Easel clamp.
Clasp. See Pocketbook clasp.
Clip. See Thill coupling clip. Yoke clip.
Closets, etc., hermetical cover with cleansing apparatus for, Siemang & Gufttmann ... 455,975
Clothes line elevator, E. E. Taylor ... 456,070
Clothes rack, W. R. Freeman ... 456,874
Clover hullers, feeder for, A. B. Reeves ... 455,886
Clutch, W. C. Wright ... 455,978
Coat hook, H. C. Hart ... 456,030
Comb. See Curry comb.
Commutators, holder for carbon brushes of, C. H. Farrington ... 455,856
Cooking utensil, I. Stegemann ... 455,803
Copier, letter, E. W. Wickey ... 455,823
Cork, treating, J. T. Smith ... 456,068
Corkscrew, D. W. Davis ... 455,826
Coupling. See Axle coupling. Car coupling. Thill coupling. Vehicle coupling.
Cultivator, A. Lindgren ... 455,755
Cultivator, H. S. Moore ... 456,050
Cultivator, J. V. Webster ... 455,914
Cultivator, lister, W. Y. Smith ... 456,005
Cultivator, tongueless wheel, A. Lindgren ... 455,754
Current motor, alternating, Stanley, Jr., & Kelly. 455,773
Curry comb, C. S. Starr ... 455,930
Curtain fixture, W. Bishman ... 455,982
Cutter. See Axle cutter.
Damping apparatus, W. N. Cornell ... 455,741
Dead centers, mechanism for overcoming, L. Hauck ... 456,031
Dice throwing apparatus, M. Vogelgesang ... 456,091
Dinner boiler, R. J. Nourse, Jr ... 456,760
Dish washer, F. S. Miller ... 455,988
Display case, I. M. Smith ... 456,770
Doormat, W. B. Curtis ... 455,085
Draught equalizer, J. G. Stowe ... 455,861
Drain pipe, H. E. Ogden ... 455,926
Drill. See Rock drill.
Drinking fountain for fowls, L. B. Lord ... 455,756
Dyestuff, brown, C. Ris ... 455,962
Dyestuff, red, M. Ceresole ... 456,081
Easel clamp, E. H. Friedrichs ... 455,844
Electric cut-off apparatus, E. W. Rice, Jr ... 455,900
Electric indicator, E. C. Eldredge ... 455,855
Electric machine or motor, dynamo, J. B. Entz ... 455,790
Electric motor, H. H. Porter ... 455,765
Electric motor or dynamo-electric machine, C. G. Curtis ... 456,898
Electric switch, Dahlgren & Svensson ... 455,837
Electricity, apparatus for administering, G. H. Bethel ... 455,981
Elevator. See Clothes line elevator. Skirt elevator. Sucker rod elevator.
Elevator, C. W. Baldwin ... 456,106
Elevator, T. W. Heermans ... 455,794
Elevator, G. B. Mills ... 456,048
Elevator controller, C. W. Baldwin ... 456,107
Elevator control ing device, G. H. Reynolds ... 456,121 to 456,123
Elevator indicator, C. Ludovici ... 455,947
Elevator operating machine, N. C. Bassett ... 456,108
Elevators, means for controlling, G. H. Reynolds. 456,124
Embossing machine, F. Berner, Jr ... 456,079
Engine. See Rotary engine. Steam engine. Traction engine.
Engine indicators, device for operating steam, J. Gill ... 455,999
Engines, accumulator for direct-acting, C. C. Worthington ... 455,935
Extractor. See Honey extractor. Juice extractor.
Fare box, J. L. Kail ... 455,881
Feed water heater and purifier, W. Webster ... 456,072
Fence, M. A. Fenner ... 455,940
Fence, G. P. Ruble ... 456,064
Fence making implement, wire, McCormack & Craig ... 456,093
Fence strands, tool for joining wire, J. D. Jones ... 455,869
Fence, wire, A. F. Dickey *et al.* ... 456,022
Fencing, die used in making sheet metal, T. V. Allis ... 455,867
File box, knockdown, H. C. Yeiser ... 455,075
Filter, Manwaring & Vanderhoef ... 456,119
Fire alarm apparatus, Chase & Eaton ... 455,812
Firearm sight, W. Lyman ... 455,911
Fire escape, Schneider & Maschino ... 456,003
Flask. See Moulder's flask.
Flower holder and fly trap, combined, J. Rosenfeld ... 455,888
Folding gate, Bayer & Scherbner ... 455,960
Fork, T. Hausler ... 456,032
Fountain. See Drinking fountain.
Frame. See Sewing machine quilting frame.
Game board, G. M. Snow ... 456,069
Garment hook, H. M. York ... 455,992
Gas in gas service pipes, means for equalizing the pressure of, W. A. Walker ... 455,913
Gas, machine for generating illuminating, D. S. Green ... 456,116
Gas, prepayment attachment for vending, R. W. Brownhill ... 456,011
Gate. See Car gate. Folding gate.
Gate, G. H. Damon ... 456,020
Glove, Hooper & Moore ... 456,035
Governor, J. H. Hamilton ... 456,095
Grain cleaning, mill, L. Bartholomew ... 456,077
Grain separating screen, C. Closz ... 455,998
Grain separator, C. Closz ... 455,997
Gun, air, C. J. Hamilton ... 455,942
Hammer, A. F. Street ... 455,776
Hammer, automatic, E. Thomson ... 455,905
Handle. See Pendent handle.
Harness, E. Walrath ... 455,991
Harvester, corn, W. Orcutt ... 456,055
Hatchway doors, device for operating, C. K. Rogers ... 456,063
Hay rack, C. Zengler ... 455,895
Hay stacker, P. Bernard ... 455,936
Heater. See Feed water heater.
Heater, J. Shackleton ... 456,004
Heel burnishing machine, E. P. Richardson ... 455,871
Heel burnishing machine, W. F. Sampson ... 456,066
Heel seat trimmer, A. McDowell ... 456,884
Holder. See Bouquet holder. Flower holder. Sash holder. Shade or globe holder. Spool holder. Train order holder. Type holder.
Honey extractor, centrifugal, A. J. Lawson ... 456,043
Hoof expander, G. T. Chapman ... 456,082
Hook. See Coat hook. Garment hook.
Hoop sawing machine, barrel, J. C. Ballew ... 455,980
Horse driver, O. M. Bryan ... 456,013
Hose pipes, clamping collar for, Lusk & Hinkle ... 456,907
Hydrant, P. White ... 455,782
Ice creeper, M. E. Reilly ... 456,080
Index, W. H. Tucker ... 455,807
Index, marginal, F. W. Hewes ... 455,817
Indicator. See Electric indicator. Elevator indicator. Street and station indicator.
Inseam trimming machine, A. La Bonte ... 456,041
Insulated conductors, manufacturing, C. Cuttriss 455,789
Insulated electric conductor, E. D. McCracken ... 456,120
Insulated electrical conductor, E. D. McCracken. 455,904
Iron. See Chair iron. Sad iron.
Jack. See Lifting jack.
Jambs, cushioning and padding for, H. W. French ... 455,791
Juice extractor, H. E. Davidson ... 455,938
Knife. See Pocket knife.
Knife and burglar alarm, combined, A. Iske ... 455,797
Knife and shears sharpener, J. S. Blood ... 456,917
Knitting machine stop motion, D. C. Bellis ... 455,786
Knitting machines, device for regulating the yarn tensions in, H. P. Ballou ... 455,896
Ladder, step, Parr & Edwards ... 455,793
Lamps, cut-out for arc, C. E. Scribner ... 455,853
Lamps or oil stoves, safety appliance for, J. A. Secor ... 456,127
Lasting machine, T. O'Bolger ... 455,762
Latch, A. H. Applegate ... 456,008
Latch, A. A. Page ... 455,949
Lathe for tuning cones and disks, C. E. Albro ... 456,076
Lathe, wood turning, C. A. Wagner ... 455,780
Letter box, house door, Wiles & Goldthwait ... 455,783
Level, spirit, R. Forwood ... 456,086
Lifting jack, J. Barrett ... 455,993 to 455,995
Lightning arrester, Van Nuis & Vail ... 455,955
Lint coating and packaging machine, J. W. Johnson ... 455,865
Liquid tester, J. M. Bell ... 455,733
Liquid treating apparatus, F. W. Wiesebrock ... 455,893
Litter, M. Tell ... 455,778
Locomotive sand box, J. McDonald ... 456,054
Loom shuttle box operating mechanism, G. W. Stafford ... 455,772
Loom temple, C. A. Littlefield ... 456,118
Loop switch, W. M. Goodridge ... 455,747
Magnetic separator, H. G. Fiske ... 455,984
Magnetic separator, J. Wenstrom ... 455,809
Mat. See Door mat.
Matrix making machines, alignment bar for, Beckwith & Street ... 455,732

Measurer, automatic grain, J. Dietz 456,744
Measuring vessel, for filling ink wells, Bradbury & Winterbottom 455,734
Medical lighting apparatus, electro, Oudin & Kratz-Boussac 455,972
Metal balls, machine for grinding, E. A. Jones 455,879
Metallic balls, machine for making, E. A. Jones 455,880
Mill. See Grain cleaning mill.
Mining machine, H. B. Wyman 455,824
Mould. See Brick mould.
Moulder's flask, R. Taylor 456,097
Motion machine for converting, C. H. Brandt 455,961
Motor. See Current motor. Electric motor. Elevator motor. Wave motor.
Mower, lawn, E. G. Passmore 456,974
Musical instrument, G. A. Ernst 456,027
Nailing machines, horn for, L. Goddu 456,113
Necktie fastener, E. C. Sohn 455,801
Oil, air, and steam, and for injecting the same into furnaces or retorts, apparatus for effecting the admixture of, J. Burns 456,111
Ordnance, hydraulic brake for, J. B. G. A. Canet 456,016
Ore separator, electro-magnetic, J. Wenstrom 455,808
Ore separator, magnetic, H. G. Fiske 455,985
Oven door opening and closing mechanism, W. J. Keep 455,750
Packing, piston, F. McFadden 455,989
Pad. See Sweat pad.
Paper making machines, consecutive-numbering attachment for, A. Chaix 456,094
Paper making machines, register for, C. J. Richardson 456,061
Pasteboard box machine, Saltzkorn & Nicolai 455,767
Pattern. See Sleeve pattern.
Pendent handle, F. W. Smith 455,769
Phonometer and phonoscope, electro, I. H. Farnham 455,815
Photographic plates with emulsion, apparatus for coating, J. H. Smith 455,954
Piano pedal, J. V. Goodman 456,098
Picture mats, gauge for, T. M. Adams 456,105
Pictures, producing surprise, O. Meyer 456,047
Pinchers, lasting, F. W. Witcher 455,892
Pipe. See Drain pipe.
Plane, bench, C. F. Young 455,957
Plane bit fastening, C. F. Young 456,104
Plant duster, H. B. Adams 455,785
Planter, W. W. Jones 456,038
Planter, corn, J. Selby 455,839, 455,840
Pliers, W. J. Montieth 456,049
Plow, N. H. Harris 455,830
Plow, O. & E. Swedburg 455,834
Plows, corn planting attachment for, F. Green 455,922
Pocket book clasp, J. E. Ortner 455,850
Pocket knife, R. H. Franklin 456,087
Pole fastening, carriage, H. Killam 455,946
Powder. See Baling powder.
Press. See Baling press.
Printing machine, stop cylinder, J. Michaud 456,901
Printing machines, inking apparatus for, C. B. Cottrell 455,897
Propellers, jury shaft for, T. P. C. Halsey 455,964
Pulley and constructing the same, separable, H. J. Gilbert 455,875
Pulley, separable wood, H. J. Gilbert 455,876
Pump, J. Darling 456,128
Pump, double-acting force, J. H. Anslyn 455,979
Pump, steam, A. F. Hall 455,868
Punch for bank checks, Smith, Jr., & Williamson 455,929
Rack. See Clothes rack. Hay rack.
Rails, making combined guard and guide, Turner & Brown 456,100
Railway, electric, R. M. Hunter 455,796
Railway spike, H. Greer 455,900
Railway switch stand, J. T. Richardson 456,125
Railway system, electric, Wilcox & Partello 455,956
Railway tie, C. P. Howell 456,096
Railway time signal, Dickover & Scott 456,023
Railways, metal tie for, G. H. Pond 455,885
Railways, subway and connection for electric, W. Osner 455,763
Refrigerator, J. Stanard 455,891
Refuse, apparatus for the treatment of city, Stanley & Russell 455,80
Register. See Cash register.
Regulator. See Brake regulator. Water supply regulator.
Rifle rest, chin, W. Duncan 455,827
Rock drill, R. A. Farrar 455,963
Rolling pin combined with other implements, J. L. Landrith 456,042
Roof cresting, J. Aens 455,958
Rotary engine, A. Cleland 455,863
Rubber balls, machine for coloring printing, or ornamenting India, G. L. Hille *et al* 455,877
Ruler, parallel, C. A. Terry 455,779
Sad iron, H. Koepp 455,848
Saddle girths, device for tightening, F. Von Eulenfeld 455,745
Safe doors, bolt support for, A. B. Curtis 456,084
Sash fastener, A. Johnson 456,129
Sash holder, O. Beebe 456,078
Sash, window, J. B. Cohen 455,825
Screen. See Grain separating screen.
Screws, making, J. Stehli 455,931
Sealing packages, C. C. Conroy 455,962
Seaming tubes, machine for, A. D. Prentice 456,059
Seat. See Car seat. Vehicle seat.
Separator. See Grain separator. Magnetic separator. Ore separator.
Sewing looped fabrics, trimming attachment for machines for, N. H. Bruce 456,012
Sewing machine quilting frame, J. M. Stukes 455,777
Sewing machine, sole, H. F. Nason 455,870
Shade or globe holder, L. S. Hillyer 456,034
Sheet metal elbow or shoe, W. J. Gordon 455,910
Shells, cutting, R. A. Hadfield 455,816
Shoe uppers, button marker for, A. B. McCoy 455,759
Show case and ice box, Weiss & Kunze 455,915
Shutter fastener, etc., E. G. Brower 455,735
Shutter fastener, A. A. Goubert 456,114, 456,115
Sifter, W. T. Hain 455,845, 455,846
Sifter, ash, Hunt & Cash 456,036
Sign, reversible, H. Cochran 455,919
Signal. See Railway time signal.
Signaling apparatus, H. F. Eaton 455,873
Sink and drip board, combined folding, S. J. Seymour 456,067
Skate, R. E. Krause 455,751
Skirt elevator, A. Lange 455,752
Sleeve pattern, S. Bisceglia 455,811
Sole edge trimmer, B. W. Marr 455,969
Sounding post setter for stringed instruments, F. Weber 455,822
Spice, device for grinding, Mader & Heinz 455,818
Spinning spindles, bobbin holder for, Murdock & Ashworth 455,857
Spool holder, I. C. Cooper 456,003
Spout, sap, E. Willis 455,784
Spring. See Carriage spring.
Stand. See Railway switch stand. Wash stand.
Steam boiler, W. W. Sutcliffe 455,805
Steam engine, H. R. Stickney 455,775
Sterilizing apparatus, J. F. H. Gronwald 455,923
Sterilizing apparatus, G. H. Neuhauss *et al* 455,925
Stock from barns, apparatus for removing live, W. Jones 456,087
Stocking, G. A. Lorentz 455,757
Stone, artificial, W. Naf 455,924
Stopper. See Bottle stopper.
Store service apparatus, C. W. McCormick 455,903
Stove shelf, J. J. Graves 456,000
Street or station indicator, W. T. Snedden 456,006
Sucker rod elevator, L. Vaughan 456,071
Sulky, H. C. Hill 455,987
Sulky, S. C. Wharton 455,781
Suspenders, E. Altman 455,959
Suspending device, J. I. Johnson 455,878
Sweat pad, H. Ryburn 456,005
Switch. See Electric switch. Loop switch.
Switch, W. A. Lee 455,838
Syringe, C. B. Dickinson 455,939
Table, P. Muntz 456,052
Tap wrench, A. J. Smart 455,859
Tapping mains, apparatus for, A. P. Smith 455,890
Telegraph keys, automatic circuit closer for, J. W. Brown 456,110
Terret, R. Tumbleson 455,836
Thermometer, clinical, G. W. Simpson 455,833
Thermostat, H. A. Chase 455,788
Thermostat, Chase & Eaton 455,813
Thill coupling, J. Cook 456,019
Thill coupling, W. E. Hannan 456,117
Thill coupling, I. H. Mulford 456,051
Thill coupling, F. G. Tallerday 455,806
Thill coupling clip, Tilghman & Goldsborough 455,843
Tie. See Railway tie.
Tile, illuminating, C. W. Mark 456,045, 456,046
Timepieces, balance wheel for, H. Bilgram 455,787
Tire, pneumatic, W. R. Foster 456,028
Tongue support, T. C. Churchman 456,018
Torpedo dropping gear, universal, C. Dann 455,742
Toy bell, N. N. Hill 455,943
Traction engine, J. M. Smelser 455,889
Train order holder, C. E. Biddison 456,009
Trimmer. See Heel seat trimmer. Sole edge trimmer.
Trousers, J. J. Devine 455,920
Truck, car, J. Taylor 455,990
Truck for elevated railways, motor, E. M. Turner *et al* 456,103
Truss, L. A. & C. Smith 455,771
Truss for elevated structures, E. M. Turner *et al*, 456,101 456,102
Type holder, T. S. Buck 456,014
Typewriting machine, J. L. Edland 456,025
Typewriting machine, A. Hitt 455,748
Typewriting machine, F. W. Howe 455,944
Typewriting machines, key locking mechanism for, D. Heston 456,033
Urinal washout, P. White 456,073
Valve, air, J. B. Dunlop 455,899
Valve and seat for steam engines, J. Wheelock 455,810
Valve, back pressure, W. L. Shepard 455,853
Valve gear, engine, Woolf & Peebles 455,872
Vapor burner, Lannert & Jeavons 455,966
Vaulting horse, F. Medart 455,819
Vehicle, J. J. Gilbert 456,112
Vehicle body, S. R. Bailey 455,730
Vehicle brake, H. C. Strout 455,804
Vehicle coupling, E. Nuessle 455,761
Vehicle seat, extension, C. A. Timmons 455,933
Vehicle, two-wheeled, V. Parks 455,764
Velocipede, ice, L. Terski 456,932
Velocipede saddle, E. G. Latta 455,882
Vending device, coin-operated, H. D. Mugerditchyan 455,948
Wagon, J. A. Gendron 455,941
Wagon box fastener, M. E. Hunt 455,965
Washstand and commode cabinet, T. A. Galt 455,792
Washer. See Dish washer.
Washers, machine for forming, C. T. Grilley 455,793
Water closet lid, C. Anderson 456,007
Water supply regulator, automatic, T. O. Perry 455,950
Wave motor, R. B. Davy 455,743
Weather strip, Poe & Angus 456,058
Weed turner, J. McAvry 456,053
Wheels, grease box for vehicle, W. R. Doolin 456,024
Whiffletree, J. Caldwell 455,918
Windmill, T. Pepper 455,868
Winnowing apparatus, centrifugal, O. Sundgren 455,977
Wire covering machine, J. McCahey 455,970
Wire working tool, J. L. Eaby 455,828
Wrench. See Tap wrench.
Wrench, F. F. Schofield 456,821
Yarn, machine for scouring and dyeing, W. Blackburn *et al* 455,854
Yoke clip, neck, J. T. Hamilton 456,829

DESIGNS.

Carpet, E. Fisher ..... 20,934 to 20,939
Carpet, H. Horan 20,940, 20,941
Carpet, C. W. Swapp 20,944, 20,945
Ceiling panel, F. G. Caldwell 20,933
Stage setting, F. P. Dodge 20,930
Spoon, etc., W. H. Jamouneau 20,942, 20,943
Spoon, etc., G. P. Tilton 20,931
Spoon, etc., C. C. Wientge 20,947
Stove, heating, W. H. Wilkinson 20,946
Wrench handle, J. J. Tower 20,932

TRADE MARKS

Ale and beer, P. Zang Brewing Company 19,888
Bicycles, safety, G. R. Bidwell Cycle Company 19,886
Braids and bindings, M. M. Beeman 19,872
Car couplings, Thurmond Car Coupling Company 19,889
Cement, Braunschweiger Cementwerke 19,874
Cigars, J. Gener 19,887
Earrings, ear knobs, and ear wires, J. Bulova 19,870
Ear rings, finger rings, and bracelets, J. Bulova 19,871
Flour, J. L. Rodgers & Co 19,879
Flour, wheat, R. T. Davis Mill Company 19,877, 19,878
Garments, men's and boy's, Solidarity Co-operative Manufacturing Company 19,880
Gems, artificial, G. H. Cahoone & Co 19,876
Hats, caps, and other head coverings, B. Herzberg & Co 19,885
Insect destroyers, G. L. Baldauf & Co 19,884
Magnesia, F. Henry 19,867
Mineral water, Lystra Mineral Water Company 19,869
Plasters, Carter Medicine Company 19,875
Remedies for certain named diseases, Smith Brothers 19,868
Remedies for diseases of horses, G. K. Bailey 19,873
Shirtings and fine cambric, P. Whitin Manufacturing Company 19,882
Shoes, men's, women's, and children's, J. S. Allen 19,866
Velocipedes, Raleigh Cycle Company 19,881
Waterproof cloths and other textile or fibrous materials, Aktiebolaget Thetis 19,883

A printed copy of the specification and drawing of any patent in the foregoing list, or any patent in print issued since 1863, will be furnished from this office for 25 cents. In ordering please state the name and number of the patent desired, and remit to Munn & Co., 361 Broadway, New York.

Canadian patents may now be obtained by the inventors for any of the inventions named in the foregoing list, provided they are simple, at a cost of $40 each If complicated the cost will be a little more. For full instructions address Munn & Co., 361 Broadway, New York. Other foreign patents may also be obtained.

Advertisements.

Inside Page, each insertion - - 75 cents a line
Back Page, each insertion - - - - $1.00 a line

The above are charges per agate line—about eight words per line. This notice shows the width of the line, and is set in agate type. Engravings may head advertisements at the same rate per agate line, by measurement, as the letter press. Advertisements must be received at Publication Office as early as Thursday morning to appear in the following week's issue.