(7) M. E.—Ordinary hemlock tanned sole leather may be said to be hardened without any material alteration of its nature by the following treatment. Prepare a bath as follows:

Slaked lime	½ pound.
Sal soda	2 "
Water	½ gallon.

Boil together, cool, and add:

Slaked lime	½ pound.
Water	½ gallon.

Put the leather into this for three days, then remove and put it into a bath of:

Slaked lime	3 pounds.
Water	1½ gallons.

and let it soak in this for from two days in summer to three days—or even four days—in winter. When taken out of this, pass through water heated to about 180° Fah., and then pass between heavily weighted rolls, or, if a denser material is demanded, press in a hydraulic press. When subjected to the latter, a product nearly as hard as vulcanite is obtained, but one still possessing the appearance and nature of leather quite distinctly.

(8) G. C. W. asks how to make a cheap white metal that will beat thin, same as gold leaf is beat. It is to be used for gilding on plaster of Paris. A. The common white gilding leaf is composed of tin and lead—2 parts tin, 1 part lead make a very white tough leaf. Equal parts of each is a little darker; 1 part tin to 2 parts lead is about as low as you can go with this compound and have it keep bright. There is a plastic metallic alloy described in the *Journal of the Franklin Institute*, vol. xxxix., page 55, which might be of use to you.

(9) C. C. C.—To soften sheet brass for stamping, heat to low red and quench in water. Some kinds of brass need be only heated to what is called the black heat. As the composition of yellow brass varies very much, you would do well to order your sheets annealed and of the kind used for stamping.

(10) G. E. Z. asks: How can I cut out round glasses that will not crack easily? I now heat the glasses almost to a melting point and press them out to the size required, three-fourths and one-half inch diameter, but find that heating the glass makes it very brittle. I cannot use a diamond, as they must be exactly alike, and the glass will not always break where cut, without the edge chipping. The glasses are used between two lead washers held by a nut against a boss, and are tested to 150 pounds pressure to the square inch. A. The process of stamping or pressing glass makes it brittle because of uneven cooling. The pieces can be made as tough as the nature of glass will allow by thoroughly annealing in the same manner as is done in the glass houses. You can construct a small oven, somewhat after the style of a baker's oven, or get what is called a muffle and set it in small furnace if your work is small in quantity.

(11) D. P. K.—Back draught or explosions in fire chamber are generally due to imperfect combustion at the commencement of firing, caused by accumulation of carbonic oxide above the fire, when upon opening the door it takes fire by the contact of air. At other times, when the ash pit door, and fire door are entirely closed to prevent steam making, the fire chamber will fill with carbonic oxide and will take fire upon opening the door. It is well to allow a little air through the fire door at all times. For "sun dial" see Notes and Queries, No. 3, September 30, 1882, which is correct for New York.

(12) J. O. B.—The enameling of cast iron is done by brushing upon the surface for the first coat, the following composition, of the consistency of paint: 66 parts powdered calcined flint, 34 parts borax; mix, melt, and pulverize, then add 12 parts potter's clay. Grind together in water enough to spread with a brush. Paint the work and put in a warm place to dry. For the second or glaze coat take 15 parts borax, 73 parts of powdered glass that has no lead in it, 12 parts caustic soda; thoroughly pulverize and mix with enough water to make it flow under a brush. Lightly and quickly brush a thin coat of the last mixture over the dry coat of the first mixture, and dry. Then fuse the enamel in an oven at low red heat. To tin cast iron is difficult and unsatisfactory. You can galvanize cast iron with zinc and then redip in tin, if necessary to have a tin surface. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 176, for galvanizing process, also SUPPLEMENT, 161, for zinc bath for galvanizing.

(13) E. K. asks: 1. How is resin oil made? A. Crude resin oil is obtained by heating the lower grades of resin in an iron still up to 158° to 160° C. First water, pyroligneous acid, and naphtha pass over. Then the temperature is raised to near the red heat of iron, when the resin boils, and crude resin oil distills over. 2. What percentage will it give? A. 20 to 25 per cent. 3. Is it necessary to have a copper condenser, or would an iron one do? A. Iron will answer. 4. A receipt to make yellow axle grease. Also receipt to make black axle grease. A. The following is a receipt for a thick oil grease:

1. For use in winter:

Tallow	35 parts.
Oil of resin	10 "
Olive or rape oil	65 "

2. For use in summer:

Tallow	60 parts.
Oil of resin	8 "
Olive or rape oil	40 "

The blue color is due to the dark violet tint of the oil referred to, while the yellow tint is produced by the addition of a solution of turmeric root in caustic soda.

(14) W. H. F. asks how powder is made. What is mealed powder? How is it made? A. The composition of powder varies according to the use for which it is intended; thus sporting and rifle powder has a composition equal to:

Saltpeter	74·84 per cent.
Sulphur	11·84 "
Charcoal	13·32 "

The pulverized ingredients, thoroughly mixed, without the addition of water, form "meal" powder.

(15) H. R. E. writes: In your last issue, on page 298, A. G. G. asks, What are the ingredients of Spencer's acid? I have used the following for the past nine years, with very satisfactory results, on steel and copper plates. (*a*) Dissolve 1 ounce granulated silver in 5 ounces of pure nitric acid and 5 ounces water. (*b*) Dissolve 3 ounces mercury in 5 ounces nitric acid and 5 ounces water. For strong Spencer acid take 2 ounces of (*a*), 2 ounces of (*b*), 1 ounce nitric acid, and 24 ounces soft water. Mix and keep in a dark bottle. It may be interesting to state that the above acid does not take effect on steel unless started off by touching the steel under the acid with a piece of clean zinc, when instant and rapid action takes place. It might remain on the steel plate forever without biting if the zinc is not applied.

(16) G. T. R. writes: In your issue of April 28, you gave an account of a meeting of the "Elmira Farmers' Club" to inquire into the best method of *preserving fruit trees* after being girdled by mice or rabbits. A very simple treatment by my father a number of years ago, in the State of Missouri, was wholly successful in *preventing* the girdling. About a year after he had planted a large orchard, the rabbits commenced "barking" his trees so rapidly that, unless a stop was immediately put to it, he would soon have only dead trunks. He accordingly went to work and wrapped old newspapers around those yet unbarked, commencing at the ground, and wrapping for a distance of, say, two feet up, tying the paper with an ordinary cotton string. These trees were never afterward touched by the rabbits.

(17) G. B. asks for the mode of making "neatsfoot oil." A. The ox feet—the feet and hocks of neat cattle cut off about 18 inches above the hoof—are denuded of skin and slit up longitudinally. Near the hoof is a small mass of soft fat, which is scooped out with the knife, and set aside for the preparation of the best quality of oil. The hoofs are washed in cold water, and then boiled in open pans set in brickwork, and heated by a fire beneath. A certain quantity of oil is thus boiled out of them, and when skimmed off, forms an inferior grade of neatsfoot oil. After about three hours' boiling, the tissues between the horny hoof and the last digit bone are sufficiently softened to allow of the latter being easily scooped out of the hoof with a knife. These "cores" consist of bone, gelatinous matter, and fat, and, together with small pieces of fat previously alluded to as being removed by the knife before boiling, are put into a separate pan of fresh water and all boiled together for the extraction of the oil. This forms the best kind of neatsfoot oil.

(18) M. C. B. writes: Can you tell me how to make the copper paint? A. Precipitate metallic copper out of any solution of a copper salt by introducing scrap iron into the liquid. Then mix the precipitated copper with linseed oil or varnish.

(19) H. B. writes: Having seen an article from the SCIENTIFIC AMERICAN relating to the green caterpillar, or worm which destroys so many cabbage heads, I will send you my sure cure. I put a quantity of green tansy into a barrel and add cold water, let it stand a day or two, then sprinkle the cabbage heads (using a fine sprinkler) with the liquid about twice a week. I have never found a worm on them after the third sprinkle. Continue to sprinkle, or they will come.

(20) W. asks: What is "salt of gold"? I am advised to try "an ammoniacal solution of an oxide or salt of gold," and ask your suggestions as to how I am to proceed. What is "salt of steel"? A. The chloride of gold, which is the usual commercial salt, can be used for the purpose. Salt of steel is probably a solution of steel in some acid, and may, we think, be replaced by using the iron chloride.

(21) J. V. S. writes: I find that a very reliable rubber cement which I am using evaporates so rapidly that in a short time it becomes too thick to use. I have tried thinning it with benzine; but when I put on a patch with the cement diluted with benzine, the rubber peels off the patch, leaving only the cloth sticking to the patched surface. 1. Can you inform me through your Notes and Queries how I can thin the cement without impairing its value? A. Most all rubber cements consist of rubber dissolved in either carbon disulphide, chloroform, or benzine, and you must add some one of these. 2. What is the best India rubber solvent? A. A mixture of methylated ether and petroleum spirit.

(22) J. C. McR. asks (1) for a mortar for adhering tiles to the walls of a Turkish and Russian bath, which would resist the action of heated air and steam. A. Use a mixture of commercial glycerine and finely powdered litharge. This compound will resist a temperature of 225°. 2. Also a kalsomine or paint for the walls of baths, which would resist the action of heat and steam. A. Use zinc white in dammar varnish; let it dry very thoroughly.

(23) M. Bros. write: We are trying to find a white enamel paint that will resist the action of water. We use it on the inside of a pine pail for dairy purposes. Have tried dammar varnish mixed with linseed oil, and put on four to five coats; and although it makes a nice enamel it does resist the action of water for any length of time. A. Use zinc white in dammar varnish and let dry very thoroughly before putting the liquid into it.

(24) W. A. I. asks for the best method of polishing brass work, and the best way of retaining a polish for a length of time. I am assistant engineer of one of our fire companies, and find it very difficult to obtain a good polish. I have been looking over back numbers, but cannot find desired information. A. For keeping up the polish upon your brasswork, do not scour with coarse powders. Get "electro silicon," or rotten stone; even whiting does well when the others are not at hand. Use a little kerosene oil in rubbing off the work; it does not oxidize or become acid like vegetable or animal oils. After you get the article well cleaned up, you need use only whiting for rubbing off the every day stains, and wipe off with the oily cloth. It prevents the action of moisture and air, and reduces the labor.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

May 8, 1883,

AND EACH BEARING THAT DATE.

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

Holder. See Cuspidor holder. Flower pot holder. Horse tail holder. Lamp holder. Lead or crayon holder. Life preserver holder. Sewing machine attachment holder. Shot holder. Stencil holder.
Hook. See Button hook. Ice hook
Hoop skirt. L. Gallaher ... 277.263
Horse blanket. E. W. Allen ... 277,184
Horse power. A. Stuart ... 277,375
Horse power and capstan, C. C. Brush ... 277,216
Horse tail holder, A. C. Smith ... 277.431
Horseshoe nails, machine for forging, R. Ross ... 277,063
Hub attaching device, G. W. Patterson ... 277.425
Hub, vehicle wheel, M. L. Senderling ... 277,355
Ice, aiding the formation of atmosphericor natural, ●. Guthrie ... 277,024
Ice cream freezer, F. Espel ... 277,250
Ice hook, J. Winebrener ... 277,437
Ice machine, A. W. Eldredge ... 277,249
Ice tool. combination, G. M. Patten ... 277,334
Incrustation preventive. G. Downie ... 277.122
Indicator. See Pneumatic indicator. Speed indicator.
Injector, ointment, A. W. Brinkerhoff ... 277,213
Ink, stamping, W. Reissig ... 277,342
Insects, destroying, J. Cole ... 277,008
Insulated conductor of electricity, electroplated, N. H. Edgerton ... 277,248
Insulated electrical conductor, W. Smith ... 277,366
Iron. See Polishing iron. Waffle iron.
Ironing board, B. F. Mong ... 277,324
Joint. See Sheet metal pipe joint.
Journals, take-up box for shaft, F. I. Pearce. ... 277,157
Jute, butts, and animal hair, treating, I. Ohnstein. 277,054
Kiln. See Brick kiln.
Knife. See Channeling and grooving knife.
Knife bandle, G. S. Hastings ... 277,132
Knitting machine, W. W. Clay ... 277.004
Knitting machine, G. Lindley, Jr ... 277,299
Lamp, electric arc, A. Shedlock ... 277,166, 277,167
Lamp holder, electric, A. Shedlock ... 277,168
Lamp hood, electric, S. H. Tacy ... 277.377
Lantern, N. Tufts ... 277,086
Lathing device, S. Perry ... 277,058
Lead or crayon holder, W. H. H. Knight ... 277,138, 277,139
Leather splitting machine, J. A. Enos ... 277,413
Leveling instrument, W. W. Le Grande ... 277,037
Life preserver holder, W. P. Gray ... 277,269
Lifting jack, M. Eaton ... 277,247
Lock. See Combination lock. Door lock.
Locket, F. B. Gould ... 277,022
Lockets. manufacture of, C. S. Pine ... 277,339
Locomotive, O. Rothrock ... 277,428
Lubricating apparatus. O. Colvin ... 277,410
Lunch box, W. Felstead ... 277,251
Magneto-electric machine, C. A. Seeley ... 277.069
Malting apparatus, C. G. Bosch ... 277,107
Mechanical movement, Hadley & Grout ... 277,025
Milk can cover, J. W. Lane ... 277,140
Milk, preserving, E. Scherff ... 277,352
Mill. See Crushing mill. Curd mill. Roller mill. Rolling mill.
Mill stuff recovering machine. D. H. Lord ... 277,301
Millstone balance, W. C. Hale ... 277,273
Mixing sugar. etc., apparatus for, C. C. Miller ... 277,319
Molasses evaporator, J. S. Boren ... 277,206
Mold, J. Harrison ... 277,131
Motion. device for converting, J. R. Ricketts ... 277,345
Musical instrument, mechanical. A. H. Hammond 277,129
Musical instrument, mechanical, N. R. Marshman 277,309
Musical instruments, key board attachment for, J. Schwertner ... 277,067
Nail plate feeder, automatic, W. Brown ... 277,215
Neck bow fastener, W. D. Slocum ... 277,362
Nut lock, J. M. Perry ... 277,336
Odorless excavating apparatus, Boyér & Henry ... 277,209
Oil as a substitute for linseed oil, manufacture of, P. G. Oster ... 277.331
Oil can, J. F. Lockwood ... 277.040
Oil can nozzle, F., Sr., & W. Hummel ... 277,287
Ore crushing machine, W. Clark ... 277.233
Organ blow pedal, J. C. Vetter ... 277.435
Packing for steam joints, D. N. Melvin ... 277,048
Packing, steam, C. H. Newman ... 277.151
Pad. See Harness pad.
Paging machine, J. McAdams ... 277,310
Pail, dinner, Starbuck & Taylor ... 277,371
Pan. See Dust pan. Vacuum pan.
Paper bag, J. P. Onderdonk ... 277,153
Paper bag filler, automatic, T. H. Hill ... 277,383
Paper, making luminous, W. Trotter, Jr ... 277,383
Paper pulp, machine for reducing wood to, J. Prickett ... 277,060
Paper pulp screen, P. H. Cragin ... 277,239
Pen rack, R. Charles ... 277,003
Pen, stylographic fountain, E. W. Morton ... 277,149
Pessary, stem. G. W. Lutz ... 277,424
Pick, W. A. Wright ... 277,183
Pin. See Blanket pin. Tuning pin.
Pipe. See Soil and waste pipe.
Piston, S. Maltby ... 277,305
Planter and fertilizer distributer, combined seed, M. H. Lincoln ... 277.038
Planter check line reel, corn. G. D. Haworth ... 277,030
Planter cut off, hand. S. P. Babcock ... 276,995
Planter, potato. L. A. Aspinwall ... 276,994
Planter, seed. G. D. Haworth ... 277,031
Planter, seed, D. Wise ... 277,397
Planters, spring metal cut off for hand, S. P. Babcock ... 276.996
Plow, C. Anderson ... 277,185
Plow, L. I. Bodenhamer ... 277,205
Plow, E. D. Meagher ... 277,314, 277,315
Plow, A. Mekenney ... 277,047
Plow for subinarine work, curved rotating, A. W. Von Schmidt ... 277,177
Plow, sulky, G. H. Fowler ... 277.258
Pneumatic indicator and speaking tube, J. Capron 277,110
Polishing iron, C. Ball ... 277,193
Polishing wheel, F. H. Morse ... 277,325
Pot. See Stove fire pot.
Power. See Horse power.
Power loading apparatus, F. Peteler ... 277,337
Press. See Cider press. Cotton and hay press.
Printing press feed gage, T. H. Winchester ... 277,396
Puller. See Staple puller Stump and grub puller.
Pulp extractor, automatic. S. L. Gould ... 277,208
Pump, double acting, J. Henwood ... 277,279
Purse or bag clasp, E. Sontheimer ... 277,064
Puzzle or toy, F. W. Davenport ... 277.120
Rack. See Pen rack.
Railway signal, W. C. Beckwith ... 277.300
Railway signals. apparatus for operating, A. G. Cummings ... 277,118
Railway signals, circuit instrument for electric, J. Weis ... 277,390
Railway skid, reversible, S. Lowe ... 277,302
Railway sleeper and chair, Bronson & Armstrong 277,000
Railway trains, electric signaling apparatus for, Shaw & Judkins ... 277,358
Rake. See Hay rake.
Rake straightening de ice, G. N. Sweet ... 277,077
Ratchet wrench, W. D. Forbes ... 277,356
Rattan scraping machine, G. S. Colburn ... 277,235
Reel. See Clothes reel. Planter check line reel.
Reelette, C. B. Clark ... 277,231
Refrigerating chamber, car, and apparatus, Myer & Bayley ... 277,150
Refrigerator, filter, and water cooler, combined, T. C. Nativel ... 277,330
Register, J. L. Harley ... 277,130
Ring. See Ear ring.
Rivet setting machine, E. E. Spencer ... 277,369
Rock drilling machine, H. Dunham ... 277,244
Roller. See Elastic roller. Friction roller. Spring roller.
Roller mill, D. W. Marmon ... 277,307
Rollers with toothed metal, apparatus for covering, W. T. Leech ... 277,297
Rolling mill, continuous. W. W. McCallip ... 277,044
Roofing. machine for flattening the seams of sheet metal, Painter, Murrill & Keizer ... 277,332
Roofing. metallic, T. F. & J. Fitzberger ... 277,254
Rotary cutter, O. J. Beale ... 277,405
Rubber dam clamp, J. P. Carmichael ... 277,224
Sail hank, W. H. Peteler ... 277,338
Salt and apparatus for use therein and for other purposes, manufacture of, H. Frasch ... 277,419
Salt, etc., and apparatus therefor, graining or crystallizing. H. Frasch ... 277,418
Sandpapering machine. Weirback & Bitting ... 277,090
Saw. E. H. Gabus ... 277,021
Saw, buck, E. A. Learned ... 277,141
Saw guide, horizontal, J. J. Sadler ... 277,351
Saw handle, Hall & St. André ... 277,026
Saw jointer, W. H. Smith ... 277,364
Scale, wheat and flour, G. M. Knight ... 277,292
Screen. See Paper pulp screen. Window screen.
Screen frame. G. N. Joss ... 277,135
Screw driver, A. Benson ... 277,202
Screw, coffin, G. Rogers ... 277,348
Seat. See Car seat.
Secondary battery, E. R. Whitney ... 277,394
Sediments or precipitates, apparatus for depositing and collecting, G. Bacher ... 277,191
Seeder and fertilizer distributer, combined, B. Kuhns (r) ... 10.323
Separator. See Coffee separator.
Sewing machine, G. W. Burgess ... 277,217
Sewing machine, E. T. Thomas ... 277.084
Sewing machine attachment holder, E. T. Thomas 277,083
Sewing machine attachments, clamp for, G. A. Brady ... 277,108
Sewing machine button hole attachment, J. P. Hallenbeck ... 277,128
Sewing machine tension, automatic, R. W. Whitney ... 277,094
Sewing machine tension device, H. Holden, Jr. ... 277,281
Sewing machines, clamp guide for button hole, Bolton & Pentz ... 277,106
Shavings and dust feeder, pneumatic, H. C. Baer. 277,192
Sheet metal can. E. P. Follett ... 277,255
Sheet metal, machine for wiring, Wilson & Bools. 277,180
Sheet metal pipe joint, C. Recht ... 277,427
Shirt, R. Cluett ... 277,006
Shot holder, J. C. Turner ... 277.384
Sifter, flour, J. Henninger ... 277,278
Skating rinks and other purposes, compound for, Lumbye & De Bevoise ... 277,043
Slate cleaner, C. E. Ramage ... 277,341
Slate frame. school, D. Scrymgeour ... 277,164
Slate, school, J. B. Walsh ... 277,387
Soil and waste pipe, J. Barrett ... 277,196
Soldering machine, can, L. W. Counselman ... 277.011
Sole trimming and channeling machine, J. H. Wiegand ... 277.395
Soles or heels, apparatus for and method of cutting elastic, L. T. Tougas ... 277,085
Speculum and vaginal irrigator. G. W. Lutz ... 277,042
Speed indicator, magnetic, E. Weston ... 277,179
Spinning frame flier, H. B. Frost ... 277,262
Spinning frame spindle bearing, McCracken & Hamer ... 277,312
Spoon rest, M. A. Maeder ... 277,304
Spring. See Bed spring. Bed bottom spring. Vehicle spring.
Spring roller, balanced, J. H. Russ ... 277,429
Spring shackle, C. W. Saladee ... 277,162
Staple puller, H. A. Gore ... 277,420
Steam boiler, B. N. & D. W. Payne ... 277,426
Steam engine, W. E. Hill ... 277,034
Steam trap, G. B. McCracken ... 277,045
Stencil holder, J. W. Bennett ... 277,201
Stopper. See Boiler tube stopper.
Store service apparatus, H. H. Hayden ... 277,276
Stove, cooking, Cooper & Conwell ... 277,009
Stove fire pot, J. A. Miller ... 277,050
Stove pipe shelf, J. Kurtis ... 277,294
Straw stacker, A. H. Allison ... 277,400
Straw stacking machine, W. C. Swindler ... 277,080
Stump and grub puller. D. Cornelius ... 277,117
Sugars, centrifugal machine for treating sorghum and other, R. B. Palmer ... 277,155
Tag and envelope, combined, J. T. Dunham ... 277,245
Tank. See Water closet tank.
Tap wrench. A. J. Smart ... 277,430
Telegraph, automatic, J. H. Rogers ... 277,349
Telegraph cable splice, W. R. Patterson ... 277,335
Telegraph line, underground, W. Cohlman ... 277,007
Telephone, H. Clay ... 277,112
Telephone, receiving, M. L. Baxter ... 277,199
Telephone, transmitting, M. L. Baxter ... 277,198
Telephonic and other electrical purposes, line changer for, C. H. Lothrop ... 277,145
Thermostat, W. G. Day ... 277,241
Thill coupling, J. H. Foote ... 277,416
Thill coupling for sleighs, A. J. Allen ... 277,099
Thrashing machine, S. E. Oviatt ... 277,056
Thrashing machine, Roberts & Schafer ... 277,347
Tie. See Bale tie. Cross tie.
Tooth crown, artificial. H. Weston ... 277,392
Truck for handling brick, J. S. Armstrong ... 277,187
Trap. See Steam trap.
Tug box loop, hame, W. A. Underwood ... 277,434
Tuning pin for stringed instruments, W. R. Briggs 277,211
Universal joint, E. W. Vogel ... 277,176
Vacuum pan, W. A. Hoeveler ... 277,280
Vacuum pans, device for cleaning, G. Dinkel ... 277,012
Valve. balanced slide, J. Murphy ... 277.328
Valve cover, removable, E. E. Carter ... 277,227
Valve for steam fire engines, relief, R. H. Atwell. 277,189
Vehicle brake and starter, H. Marneffe ... 277,308
Vehicle hound socket, H. McFarlane ... 277,313
Vehicle spring, L. F. Betts ... 277,204
Vehicle, spring, A. E. Hermann ... 277,032
Vehicle, two wheeled, J. A. Chapman ... 277.409
Vehicle wheel, E. G. Ferguson ... 277,252
Velocipede, D. E. Dutrow ... 277,246
Vise, bench, G. W. Pittman ... 277,158
Waffle iron, Harker & Wilkins ... 277.422
Wagon, buckboard, J. H. Sinclair ... 277,359
Wagon platform gear, W. S. Applegate ... 277,186
Wall paper, apparatus for drying, H. Hilbers ... 277,033
Washboard, E. Butzbach ... 277,109
Washing machine, C. Dodson ... 277.243
Washing machine, R. S. Harrington ... 277,028
Water closet apparatus, K. E. Kritch ... 277,293
Water closet tank or cistern, H. & W. Sutcliffe ... 277,172
Well tubing clamp, oil, D. L. Lewis ... 277,142
Wheel. See Abrasive wheel. Buffing wheel. Polishing wheel. Vehicle wheel.
Whip socket, F. Baumgartner ... 277,197
Window screen, J. W. Carman ... 277.111
Wire and cord stretcher, J. Sedgwick ... 277,068
Wire, barbed, C. S. Locke ... 277,423
Wire straightener, rotary, Goodyear & Morris ... 277,267
Wrench. See Ratchet wrench. Tap wrench.
Wrench, I. W. & T. F. Giles ... 277,265

DESIGNS.

Buckle, C. V. Goddard ... 13.898
Flower pot. C. S. Reed ... 13,896
Fringe, T. Abbott ... 13,889. 13,890
Fringe, C. Cresson ... 13.891
Fringe, G. E. Goucher ... 13,892 to 13,895
Seal press, R. H. Smith ... 13,897

TRADE MARKS.

Beer. bottled, P. Best Brewing Company ... 10,258
Cigars, cigarettes, and smoking tobacco, S. Jacoby & Co ... 10,262
Dress shields, I. A. Canfield Company ... 10.253
Cotton sheetings and shirtings, Jackson Company ... 10,256, 10,257
Flour, J. F. Imbs & Co ... 10,255
Hydrocarbon fluid, Hopkins & Milnor ... 10,254
Medicinal preparations, G. L. Beck ... 10,260
Medicine, cathartic, Francis Brothers ... 10,261
Tobacco, cigars, and cigarettes, fine cut and plug chewing and smoking, G. H. Spear ... 10.259
Washing powder, Benk Manufacturing Company ... 10,252

A printed copy of the specification and drawing of any patent in the foregoing list. also of any patent issued since 1866. will be furnished from this office for 25 cents. In ordering please state the number and date of the patent desired, and remit to Munn & Co., 261 Broadway, New York. We also furnish copies of patents granted prior to 1866; but at increased cost, as the specifications, not being printed, must be copied by hand.

Canadian Patents may now be obtained by the inventors for any of the inventions named in the foregoing list, at a cost of $40 each. For full instructions address Munn & Co., 261 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.
(About eight words to 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 Thursday morning to appear in next issue.

THE CASCADE BATTERY.—DESCRIPTION, by F. Higgins, of a battery of the circulating kind, for telegraphic purposes, in which the alimentary fluid employed passes from cell to cell by gravity, and maintains the action of the battery as long as the flow continues. Illustrated with one figure. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 363. Price 10 cents. To be had at this office and from all newsdealers.

INSTRUMENT FOR DRAWING CONVERGING Straight Lines.—A paper by Prof. F. Sinigagli, descriptive of the theory and mode of construction of a simple and easily constructed instrument for drawing converging straight lines and arcs of circles whose center falls outside the paper. Illustrated with ten figures. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 363. Price 10 cents. To be had at this office and from all newsdealers.

REMEDY FOR SICK HEADACHE.—Abstract of a paper by Surgeon Roehring, giving the favorable results obtained by him from the use of salicylate of sodium in nervous headache. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 363. Price 10 cents. To be had at this office and from all newsdealers.

PATENTS.

MESSRS. MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN, continue to examine Improvements, and to act as Solicitors of Patents for Inventors.

In this line of business they have had *thirty-eight years' experience*, and now have *unequaled facilities* for the preparation of Patent Drawings, Specifications, and the prosecution of Applications for Patents in the United States, Canada, and Foreign Countries. Messrs. Munn & Co. also attend to the preparation of Caveats, Copyrights for Books. Labels, Reissues, Assignments, and Reports on Infringements of Patents. All business intrusted to them is done with special care and promptness, on very reasonable terms.

A pamphlet sent free of charge, on application, containing full information about Patents and how to procure them; directions concerning Labels, Copyrights, Designs, Patents, Appeals, Reissues, Infringements, Assignments, Rejected Cases, Hints on the Sale of Patents, etc.

We also send. *free of charge*. a Synopsis of Foreign Patent Laws, showing the cost and method of securing patents in all the principal countries of the world.

MUNN & CO., Solicitors of Patents,
261 Broadway, New York.
BRANCH OFFICE —Corner of F and 7th Streets, Washington. D. C.