

ing cast solid metal throughout, and the third having a wrought iron shaft 4 inches in diameter cast in the middle the whole length of the shaft: which of the three will stand the greatest weight in the middle, if the shafts are suspended at both ends? A. The third.

(51) C. W. W. asks for a white fusible alloy that will take a fine impression when cast in plaster of Paris moulds? A. Lead 9 parts, antimony 2 parts, bismuth 1 part. This alloy expands as it cools and brings out a fine impression.

(52) G. N. asks for a process by which brass can be kept a bright color? A. In $\frac{1}{2}$ pint of best alcohol dissolve $\frac{1}{2}$ lb. of best seed lac. Warm the work and apply the dissolved lac, with a soft fine brush.

(53) C. L. asks how the process of enameling or glazing is done on cast iron? A. The enamel is made of powdered flints, ground with calcined borax, fine clay, and a little felspar. The mixture is made into a paste with water and brushed over the metal to be glazed, which has been previously cleaned and made bright with dilute sulphuric acid, and washed clean. While the glaze is still moist it is dusted over a mixture of felspar, carbonate of sodium, borax, and a little oxide of tin. The glaze is gradually dried and then fused in a muffle at a red heat.

(54) F. W. W. asks: Can you give me a recipe for making white ink, to write on a black or blue surface? A. With some papers an aqueous solution of bleaching powder with a little gum will answer. A solution of oxalic acid thickened somewhat with filtered dextrin solution has also been used. Or use a solution of gum arabic and sugar in water, through which has been diffused finest precipitated chalk or ground starch.

(55) N. H. says: I bought a piece of corned beef and cooked it. The following night I opened the refrigerator in the dark and the beef lighted up with a phosphorescent light. What was the cause and is the meat healthy to eat? A. The phosphorescence noted was very probably due to the saccharine matter or salts used in curing the meat. A change of temperature, which induces crystallization in solutions of these, often gives rise to the phenomena, after removal from strong light. The meat may be fit to eat.

(56) Mrs. G. W. L. asks for a recipe for canning green corn so it will keep? A. Among fruits, etc., green corn is one of the most difficult to preserve by canning. The following is the method in use by many of the large canning establishments. The corn, after removing from the cob, is filled into the clean cans so as to leave no air spaces. These are placed in a large oven or other airtight vessel, and subjected to hot steam under pressure. The harder the corn the longer the exposure required to thus cure it; it is said that in some cases as much as eight hours is requisite, but usually much less than this. A large vessel of boiling water, in which the cans are immersed, may be used instead of the steam oven, but is not so effective. On removal from the oven or water bath, as the case may be, each can (they must be filled to the cover with fruit) has the cap with a very small hole tapped in its center immediately soldered on. As soon thereafter as the can stops blowing, as the escape of steam and air through the vent is termed, the hole is quickly soldered. This must be done before the air begins to enter. Other fruit is cured and canned in like manner—tomatoes rarely require longer than 15 to 20 minutes steam curing. Where the pits are left in fruit a longer time is requisite to completely destroy all fermentative germs.

(57) J. F. C. asks, 1, for a quick process of bleaching cotton thread? A. In practice the following is found one of the best: The cotton is banked for 8 hours in a lye made from $6\frac{1}{2}$ lbs. soda crystals and 2 lbs. 3 ozs. quicklime. After washing out it is passed into a chloride of lime (bleaching powder) solution for two hours, and then at once into weak sulphuric acid for 20 minutes. Use 11 lbs. chloride of lime and 23 fluid ozs. sulphuric acid. These quantities are for 220 lbs. of cotton. The cotton is then washed in running water, and taken once or twice through a hand-warm soap beck, using for the above weight 2 lbs. 3 ozs. palm oil soap. 2. Is there more power in the same quantity of water after night than there is in daytime? A. No.

(58) J. H. D. S., in giving an account of a table knife that was left for a few days in the remains of a water melon, and found nearly eaten up or consumed, asks what acid there is in the melon to cause this? A. Carbonic, and the various vegetable and organic acids rapidly corrode iron or steel in the presence of air and moisture. In substance, over 89 per cent of the common, well-ripened watermelon consists of water. In summer weather the decay of broken melon, when once begun, is very rapid, and is accompanied by the formation of carbonic, acetic, and other peculiar organic acids. Under such favorable conditions it is not surprising that the knife was eaten by the melon.

(59) F. W. S., of Toronto, asks how to make a buff wheel for polishing steel? A. Turn up the wooden disk to form the wheel on the mandril on which it is to run. Cover the periphery of the wheel with good glue, prepared as for gluing wood, stretch the leather around and confine it with shoe pegs driven in about two inches apart. When dry turn off true with a sharp chisel. Give the leather a coat of glue and roll it in the emery, so as to make it retain it by being imbedded in the glue. Set the wheel dry until the glue is hard and it is ready for use.

OFFICIAL.

INDEX OF INVENTIONS

FOR WHICH

**Letters Patent of the United States were
Granted in the Week Ending**

August 14, 1877,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

principal product would be carbonic acid, hydrogen, and carbonic oxide—the latter gas is very poisonous and inflammable. The amount of gas would be directly proportional to the quantity of charcoal burned. 5. If charcoal was heated red hot and then cooled off, would it regain its carbon gas from the atmosphere? A. Charcoal is capable of absorbing about 35 times its bulk of carbonic acid. This it gives out on heating, and on cooling may absorb again. 6. Is not carbon gas heavier than the air? A. Yes, about half as heavy again. 7. What acids will dissolve carbon? A. It is insoluble in acids, but is oxidized by nitric acid. 8. Will not water boil quicker in a copper dish than in an iron dish, other things being equal? A. Yes, a little.	Armor plating for ships, etc., W. Rowlinson..... 194,053 Awl haft, M. A. Bartlett..... 194,063 Awning frame, J. Werner, admin. of C. Werner..... 194,273 Bag holder, L. L. Klinefeiter..... 194,155 Bale bands, N. T. Edson..... 194,080 Barrelstand, E. C. Wells..... 194,200 Bayonet, E. Rice..... 194,051 Beastead, W. W. Rogers..... 194,177 Bee hive, Murff & Kyle..... 194,165 Beehive, Potter & Barnebee..... 194,048 Beton, manufacture of, J. C. Goodridge, Jr..... 194,085 Binder, temporary, P. England..... 194,230 Blind slot operator, S. M. Sherman..... 194,204 Boat cleaner, Fordon & Thomas..... 194,036 Boot and shoe, C. Edwards..... 194,081 Boot and shoe insole, Smith & Cochran..... 194,184 Bottle stopper, W. C. Hornfager..... 194,088 Bottle stopper, W. M. Morgenstern (r)..... 7,847 Bottle stopper, C. E. G. Winter..... 194,204 Brake shoe, wagon, I. H. S. Alexander..... 194,118 Barn duster, W. Y. Eakle..... 194,285 Breastpin tongue, L. Van Doren..... 194,277 Bridge bit, R. E. Whitman..... 194,205 Bronzing machine, L. Poitier..... 194,261 Broom, W. M. Jackson..... 194,042 Brush, J. L. Whiting (r)..... 7,846 Buckle, G. Quackenbush..... 194,049 Buckle, E. M. Kinne..... 194,248 Building block, Krackowizer & Schulze..... 194,250 Bung-cutting machine, W. L. Standish (r)..... 7,843 Buoy, alarm, S. G. Cabell..... 194,126 Burglar alarm, T. Powell..... 194,173 Button fastening, M. Johnson..... 194,094 Button hole machine, L. Dustin..... 194,079 Can and measure, J. Sears..... 194,112 Cane and camp stool, D. B. Reynolds..... 194,175 Car axle, W. H. Haynes..... 194,239 Car axle box, T. A. Bissell..... 194,213 Car coupling, F. Roy..... 194,054 Car, sleeping, E. C. Kellogg..... 194,154 Car starter, J. Mallon..... 194,159 Car wheels, G. W. Swett..... 194,113 Carpet sweeper, B. W. Johnson..... 194,095 Chain links, Schinneller & Fitzpatrick..... 194,181 Chair, G. S. De Bonald..... 194,135 Chisel, J. S. Russell..... 194,180 Chronometer regulator, G. Newton..... 194,105 Churn, W. Earle..... 194,227 Churn, C. P. Greene..... 194,145 Churn, H. S. Lowry..... 194,044 Churn, Wilcox & Benedict..... 194,203 Cigar lighter, H. Iden..... 194,248 Clipping machine, P. Casey..... 194,128 Cloth-finishing machines, J. H. Smith..... 194,057 Cloth-finishing machines, Springfield & Bausch, Jr. 194,186 Clothes device, E. B. Gildersleeve..... 194,083 Clothes wringer, E. A. Cooke..... 194,032 Collar, J. W. A. Cluett..... 194,031 Collar, cuff, etc., fastening, T. Moore..... 194,099 Copying book, W. A. Anderson..... 194,026 Copying press pad, S. W. Cox..... 194,182 Corn harvester, J. H. McNall..... 194,046 Corset, M. E. Clark..... 194,030 Corset, C. B. McGee..... 194,045 Cotton gin, R. Dickinson..... 194,136 Crane, traveling, W. H. Elliott..... 194,035 Crib, child's folding, H. W. Rope..... 194,266 Culinary vessel, G. B. Culbertson..... 194,224 Cultivator, T. D. Guthrie, Jr..... 194,146 Cultivator, T. D. Guthrie, Jr. 194,108 Cultivator, J. C. B. Thomas..... 194,190 Cultivator, S. J. Hinkle..... 194,150 Curtain fixture, Connally & Bickell..... 194,073 Cutter head, F. S. Clarkson..... 194,221 Derricks wheel, W. J. McKee..... 194,162 Dish, grocer's, Wilcox, Percy & Daggett..... 194,280 Door knobs, attaching, A. B. Shaw..... 194,056 Doors, S. S. Spear..... 194,058 Draft equalizer, T. R. Cook..... 194,075 Dredging bucket, J. McKeever..... 194,163 Drill chuck, H. B. Beach..... 194,122 Drill chuck, H. L. Pratt..... 194,100 Dry goods, machine for rolling, J. K. Somes..... 194,114 Egg carrier, S. P. Hodgen..... 194,250 Electrical lighting, W. E. Sawyer..... 194,111 Evaporating pan, H. Wood..... 194,283 Fan attachment, J. F. Rakes..... 194,174 Feed cooker, M. B. Mills..... 194,164 Fence, J. V. Richardson..... 194,176 Fence, C. P. Parker..... 194,260 Fence, J. G. Sutton..... 194,187 Filter press, J. Bowing..... 194,124 Fire escape, J. Eichler..... 194,228 Fire escape, H. Elbe..... 194,138 Fire escape, L. Falk..... 194,082 Fire escape, J. A. Tixier..... 194,192 Fire escape, etc., J. Kellner..... 194,153 Fire grate, S. Regan..... 194,263 Fire placegrate, shield, etc., E. C. Cooke..... 194,074 Fishtrap and bucket, J. M. Lasater..... 194,253 Furnace stand, J. N. Muller..... 194,101 Fuse for projectiles, M. Zeroni..... 194,210 Game counter, A. Pohl..... 194,172 Gas burner, T. R. Almond..... 194,025 Gas exhausters, R. K. Huntoon..... 194,041 Gas motor engine, N. A. Otto..... 194,047 Gases from tanks, deodorizing, C. J. Trotter..... 194,194 Glass furnace, J. Johnson..... 194,043 Glove fastener, L. Bonesteel..... 194,069 Governor, marine engine, J. W. Fowle..... 194,032 Grain binder, E. Woodbury..... 194,117 Grain conveyer, H. G. Seeger..... 194,185 Grain cradle, G. E. Clow..... 194,131 Grain drill, C. F. Scholz..... 194,268 Hame clip, J. Butterfuss..... 194,125 Harrow, E. Vandawater..... 194,196 Hay rack, J. Porter..... 194,262 Hedge trimmer, Knette & Force..... 194,249 Heels, machine for trimming, etc., A. E. Strickler..... 194,115 Hitch, horse, P. J. Fischel..... 194,234 Hoisting jack, H. Sells..... 194,055 Horsehay rake, J. E. Wisner..... 194,282 Horse power, E. R. Lancaster..... 194,156 Horseshoe blanks, J. D. Billings..... 194,028 Hydrant, E. Hand..... 194,087 Hydraulic cement, J. C. Gostling..... 194,143 Hydrocarbon apparatus, E. F. Rogers (r)..... 7,848 Ice house, J. E. Lippitt..... 194,097 Ironing apparatus, F. M. Sanderson..... 194,267 Ironing board, Young & Sheldon..... 194,209 Kiln, H. W. Adams..... 194,024 Laces, etc., restoring crepe, E. B. Reid..... 194,264 Ladder, T. Hauerwas..... 194,099 Lamp, A. Burbank..... 194,071 Lamp, W. W. Austin..... 194,121 Lard, fruit, etc., press, E. W. Fawcett..... 194,232 Latch, cupboard, O. F. Fogelstrand..... 194,139 Latch, gate, A. Newbrough..... 194,106 Latch, reversible, W. E. Sparks (r)..... 7,844 Latch machine, W. S. Davis..... 194,077 Launching apparatus, boat, M. Bourke..... 194,123 Lightning rod, etc., J. C. Chambers..... 194,220 Mirror, toilet, J. G. Diroll..... 194,078	Motion, W. Adriance..... 194,211 Napkin supporter, S. Houghton..... 194,040 Nut lock, Crocker & Wilcox..... 194,133 Nut machine, J. Johnston..... 194,246 Oil, grease, etc., purifying, R. D. Turner..... 194,275 Ore jigger, S. Stutz..... 194,059, 194,060 Painter's striping implement, L. Homann..... 194,039 Paper bag, L. W. Pope..... 194,170 Paper box, Rogers & Wolf..... 194,178 Paper, etc., polishing machine, H. Braunhold..... 194,214 Patterns, instrument for drafting, C. H. Griffin..... 194,086 Peanut thrasher, J. L. Underwood..... 194,195 Pen and pencil case, S. M. Brougham..... 194,216 Pen fountain, C. A. Atkinson..... 194,120 Pen holder, J. W. Green..... 194,038 Pen holder, G. W. Mable..... 194,158 Phosphoric acid, recovering, N. B. Rice..... 194,050 Pianos, Hull & Raynor..... 194,151 Pipe elbow blanks cutting, Amann & Harker..... 194,066 Pipe tongs, W. Lomas..... 194,254 Plaiting iron, J. G. Gingras..... 194,142 Planter, corn, J. Case..... 194,127 Plow, English & Whyte..... 194,231 Plow, J. Nourse..... 194,257 Plow and corn planter, combined, J. T. Hughes..... 194,091 Plow hook, reversible, J. A. Vann..... 194,276 Plow, sulky, H. H. Canaday..... 194,072 Plow, sulky, W. T. Orr..... 194,258 Plow, sulky, S. Pennock..... 194,167 Plow, wheel, T. Bruner..... 194,029 Plows, attaching coulters to, G. V. H. Whitbeck..... 194,116 Pocketbook lock, E. Suhr..... 194,188 Printing machine, W. J. Ingram..... 194,152 Printing press ink fountain, A. Campbell..... 194,218 Printing press inking apparatus, H. R. Winn..... 194,065 Pumping engines, valve, N. W. Condit, Jr. 194,223 Pulleys, oiling journals of loose, C. H. Weigle..... 194,199 Rail, compound railroad, T. W. Travis..... 194,198 Reciprocating steam engine, W. Walker..... 194,198 Refrigerator, E. Clark..... 194,130 Refrigerator, J. A. Kunkel..... 194,251 Rotary disk steam engine, G. B. Winkler..... 194,281 Ryd, balance, Smith & Snashell..... 194,185 Sad iron heater, J. B. Woolsey..... 194,284 Safe and vault doors, H. R. Towne..... 194,274 Sand paper, treating worn out, R. Glover..... 194,235 Saw buck, H. C. Emery..... 194,229 Saw guide, J. N. Babbs..... 194,027 Saw handle, C. A. Root..... 194,052 Sawmill band, Doane & Bugbee..... 194,225 Sawing machine, F. D. Green..... 194,237 Sawing machines, D. K. Overhiser..... 194,259 Screw machine, A. L. Munson..... 194,103 Sealed machine stamping, W. D. Doremus..... 194,226 Sewers, etc., M. G. Field..... 194,233 Sewing machines, Baker & Porter..... 194,067 Shearing sheet metal, G. H. Perkins..... 194,168 Sheet metal machine, H. Fuchs (r)..... 7,849 Shirred fabric, S. Wales..... 194,062 Shot press bed, J. W. Rogers..... 194,265 Shot machine, E. Shiver..... 194,271 Shutter and blind fastener, G. Marshman..... 194,255 Sieve, metallic, M. E. Dayton..... 194,033 Sizing and dressing cotton, F. P. Jenkins..... 194,245 Sleigh runner for wheeled vehicles, M. C. Wright..... 194,208 Spinning mule, H. M. Schon..... 194,269 Spirits from spent charcoal, E. A. McKeever..... 194,256 Spring head, vehicle, R. B. Hughes..... 194,093 Spring, spiral, J. Ludlam..... 194,157 Spring, wagon seat, G. P. Sweezy..... 194,189 Stamps, W. W. Bierce..... 194,212 Steam engine, R. H. Edson..... 194,034 Steam engine crosshead, D. A. Woodbury..... 194,207 Stench and gas trap, B. P. Bowers..... 194,070 Stitching horse for harness makers, F. Huot..... 194,241 Stove, gasoline, W. C. North..... 194,106 Stove, hydrocarbon, A. B. Hutchins..... 194,242 Stove, parlor, D. E. Paris..... 194,107 Street sprinkler, J. A. Bancroft (r)..... 7,845 Sugar, machine for cutting, W. Jasper..... 194,244 Sugar machines, L. Hopken..... 194,092 Tablet, G. M. Dimmock..... 194,137 Tanning, H. Hein..... 194,090 Testing machine, R. Cerero..... 194,129 Thill coupling, J. Carr..... 194,219 Ticket box, E. Hambujer (r)..... 7,842 Ticket envelope, J. H. Culver..... 194,076 Time lock, Towne & Stockwell..... 194,273 Tire tightener, wagon, W. G. McGreight..... 194,161 Tobacco, Wilson, Sorg & Auer..... 194,064 Tobacco leaves treating, Kimmel et al. 194,247 Tobacco package, A. Villaret..... 194,197 Tobacco, stripping and drying, W. Davies..... 194,134 Toy, sounding, C. Arpiseila..... 194,119 Transom opener, J. F. Wollensak..... 194,035 Truck, warehouse, Grable & Pickles..... 194,236 Tuyere, P. L. Weimer..... 194,063 Umbrella holder, W. H. Pettibone..... 194,169 Valve, balanced, W. Hardwick..... 194,147 Valve for steam engines, W. Hardwick..... 194,238 Valve, pump, E. Lannay..... 194,252 Vegetable and fruit slicer, G. R. Thompson..... 194,191 Vehicle draft tip, A. Marshall..... 194,098 Vehicle spring seat and reach, A. J. White..... 194,201 Vine clamp, G. F. Muller..... 194,102 Wagon, platform, Wood & Fitch..... 194,206 Wagon running gear and brake, T. G. Mandt..... 194,160 Wagon tongue, A. J. Clemons..... 194,222 Wagon top and cover, R. W. Thompson..... 194,061 Wagon wheel, C. S. Tegnander..... 194,272 Washing machine, J. C. Grannan..... 194,144 Water and air closet, G. R. Moore..... 194,100 Water in boilers, purifying, S. D. Gilson..... 194,084 Water meter, Simons & Wallace