woodwork of the cornice; or the contraction and expansion may have worked the joints loose. The latter should be closely examined, and, if loose, repaired before painting. We find no difficulty here in keeping gutters, that are simply lined with tin, tight.

(35) C. F. S. asks: 1. Is the radiation of the method of heating private dwellings with furnace in basement and tin pipe leading to different rooms at the floor called direct or indirect? A. Indirect. 2. When this method is used, where should fresh air be admitted to the room thus heated, at the floor or near ceiling? A. Fresh air should be taken from the exterior of the house at the basement, and supplied to the air chamber of the furnace by a special pipe or shaft, which may be of wood; it is this air, when warmed, that becomes the fresh air of the rooms. The fireplace flue will carry off the vitiated air, having its opening near the floor.

Can cast iron be casehardened with prussiate of potassa? A. Yes.

(36) L. W. asks: Will any injurious effects arise from working over and inhaling the vapor or steam arising from boiling or hot aniline dye? A, Yes, it is extremely unhealthy, if from no other cause than induced predisposition of the system to take cold and contract pulmonary complications.

(37) A. H. S. asks: Is it injurious to a person's health to sleep in a printing office after working in it all day? It is said that the antimony in type metal is poisonous. A. If the office is well ventilated, and free from the odor of benzine and other exhalations, it will not be unhealthy. The antimony does not evaporate.

(38) G. G. says: I need a flexible tube to use in kerosene oil. What is the best material to make it of? A. Try one of leather. Rubber will not answer. 2. In a lamp burning kerosene oil, what is the best distance to have base of flame from surface of oil? A. About 2½ inches.

(39) E.T. M. says: I am about to construct a flume for carrying off the smoke from a quicksilver furnace, the smoke being strongly impregnated with sulphurous acid. What effect will it have on a four feet flue constructed of Portland cement, gravel, and sand? A. The effect will be to speedily convert the exposed surfaces of the lime into an oxysulphide, and finally into sulphate of lime, which will resist any further change.

(40) J. W. says: My cellar is always wet. If I dig a drain or two in it, and dig a well down to the gravel, the drains going into it, will the water soak in the gravel? A. It depends upon the nature of the several strata over which your house stands. Better consult some of the older residents of your neighborhood. See query 20, p. 107, vol. 35.

(41) M. E. A. asks: 1. I wish to build an icehouse on my farm, to hold about 8 tuns of ice, in which to keep meat, etc. A. You will find a description of one of this size on p. 251, vol. 31 (in which read "7 feet square" for interior chamber instead of 6.) 2. Is it best to build it into a bank and cover the top with earth, or build it all above ground? If the former, how shall I construct it? A. It is not necessary to build it in a bank; let the building be isolated, but the floor about 2½ feet below ground. 3. How should the door be made? A. Provide a canvas on the inside that will allow it to be packed with about 6 inches thick of sawdust. 4. Should the provisions be kept in the same room with the ice? A. No; but in the surrounding passage, as in the description above referred to.

(42) W. D. asks: Can vinegar be made directly from corn or corn meal without first converting the corn into starch, then to dextrin, and then to grape sugar, and then to vinegar? A. No.

(43) J. H. P. says, in reply to B. D., who says: "I have a piece of gold which has been polished with mercury. What will remove the mercury?" A. Cover the gold in a glass vessel with nitric acid. The acid will eat the mercury all off, and will leave the gold less brittle than if heat had been applied to it.

(44) E. P. says, in answer to C. B., who asks how to plow with three horses abreast, and regulate the running of the plow: We often do this by shifting the outer end of the clevis off the beam towards the land, and fastening it at the right distance with a guide pin.

(45) J. M. L. says, in reply to H. P. B., who asks if eggshells can be utilized: Eggshells form one of the best clarifiers for cider and wine. One pint of pulverized eggshells will clarify one barrel of cider or wine in from 24 to 48 hours, according to the clearness of the weather. As eggshells cannot always be had in sufficient quantities, can you tell me of a substitute for eggshells? What is the lime composition of the same? A. It is the small quantity of residual adhering albumen, and not the lime salts composing the shell, that exerts the clarifying action upon the liquor. A good substitute for the expensive egg albumen may be obtained from water that has been used to wash the starch from wheat flour or scraped potatoes, by allowing it to stand until it becomes clear, and then boiling it. By this means it is rendered turbid, and, after a short time, a flaky white substance deposits, which has the same properties as white of egg, and is known as vegetable albumen. The shells are chiefly composed of the carbonate and phosphate of lime, together with a little organic matter. In some parts of Europe and elsewhere, it is common to clarify wines, etc., by heating for a short time with ordinary clean *papier maché*, and then filtering through bags of fine linen.

(46) N. A. B. asks: 1. Can I arrange the motive power of an electric clock so that a regulator will not be necessary, and so that slight variations in the force of the current will make no difference in the time kept? A. No. 2. I have an instrument for producing shocks by the extra current; it has no secondary coil. If I should attach a condenser to it, could I obtain any of the effects of frictional electricity, or is the secondary coil necessary? A. A secondary coil is necessary to obtain static effects of any considerable tension.

(47) J. V. A. says: Is there any metal or other substance that is perfectly or almost perfectly impenetrable to magnetism? If I take a magnet and place a plate of some substance above it, could the magnetism be prevented from going through it, so that it would have no influence on a piece of iron placed above it? A. No. There is nothing which will cut off magnetism except iron, which does so by itself absorbing the magnetism produced.

(48) W. H. asks: 1. How can hard cistern water be made soft and good for table use? The hardness arises from the cistern being built of cement. A. Boiling the water usually causes precipitation of some of the foreign matter. 2. Is a partition of common brick laid in cement, dividing the receiving conductor from discharge pump pipe, a good filter for a cistern? A. We think not.

COMMUNICATIONS RECEIVED.

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

On Water Supply for Seaboard Towns. By H. B. M.
On Shrunk-On Parts of Machinery. By T. I. B.
On the Radiometer and its Uses. By S. H. T.
On the Pyramid and the Sphynx. By C. R.
On the Sinking of a Large Pond. By J. N.
On Working Men's Demonstrations. By J.E.E.
On a Submarine Railway. By P. S.
On Building Prisons. By H. G. K.
On the Hidden Key. By J. E. W.
On Preparing Ornamental Leaves. By M.A. K.

Also inquiries and answers from the following:
T. P. P.—J. B. H.—W. G. W.—W. W. K.—M. W. W

M. G. P. asks: Are not meerschaum pipes sometimes boiled in wax etc., to bring out the color? If so, what is the process?—F. S. K. asks: Please give me a recipe for keeping the weavil from corn after it is cribbed in the shuck.

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 fent: "Who sells bicycles? Who bores for water by driving well tubes, and what is the cost of the operation? Who sells wooden clocks? Who makes envelope machinery? Who makes machinery for preparing moss for upholsterers' use?" 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

August 15, 1876,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

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

Alarm, electric burglar, J. N. Larned 181,078
Animal tether, P. Francis 181,163
Ax, J. W. Warner 181,227
Baking and broiling, J. H. Bruce 181,139
Bale band tightener, C. H. Chase (r) 7,260
Bale tie tightener, J. Thayer 181,020
Bale tie, wire cotton, P. F. King 181,188
Ballthrower, mechanical, C. H. Bagley 181,128
Bark, rossing and grinding, S. R. Thompson (r) .. 7,264
Bellows, valve for, A. Smith 181,111
Belt, chain, J. Behel 181,028
Belt fastener, J. P. Burnham 181,035
Belt shifter, A. Crosby 181,049
Bill holder, revolving, S. W. Maynard 181,089
Bin, meal, D. C. Clous 181,141
Bits, etc., holding, W. H. Barber (r) 7,263
Boiler and setting, steam, T. R. Butman 181,237
Boiler furnace, steam, W. Swindell 181,222
Boiler furnace, steam, J. E. Wootten (r) 7,267
Bolts, etc., rolling screw threads on, T. T. Prosser 181,010
Bone black, drying, P. Farley (r) 7,266
Boot heel, C. Schwerdtfeger 181,109
Boots, etc., screw for, A. Angst 181,126
Bosom form, A. W. Thomas 181,019
Bottles, cork fastener for, W. D. Balcom 181,026
Bracket, Jenks & Hyatt 181,178
Brick machine, R. A. Drawdy 181,058
Broom, S. Hobbs 181,170
Brush, R. Rosenthal 181,209
Brush and sprinkler, G. Birtwistle 180,985
Buckle, Clinton & Bassett 180,992
Buckle, A. B. Woodard 181,023
Buckle and snap, R. S. B. Chinnery 181,043
Buckle and snap hook, F. J. Deisz 181,052
Buckle, harness, W. F. Whitney 181,229
Building block, cellular wall, N. J. Clayton 181,043
Bustle, E. J. Ham 181,068
Butter package, B. Beller 181,130
Button pliers, C. M. Platt 181,204
Can, square, J. H. Scott 181,011
Cannon, R. B. H. Leighton 181,061
Car coupling, E. Zorger 181,023
Car draft bar, railway, W. R. Cross 181,048
Car, sleeping, W. H. Paige 181,005
Car truck, J. Ireland 181,177
Cars, dust guard for, W. Carr 181,038
Carpet fastener, U. S. Dieffenbacher 181,149
Casting, collapsing core for, J. K. Dimmick 181,151
Casting die plates, J. B. McCune 181,194
Chain, C. W. Levalley 181,082
Chair, folding, W. B. Cogger 181,143
Chair, folding, A. Matthiessen 181,088
Chair, folding, F. F. Parker 181,100
Chair, folding, J. H. Travis 181,225
Chair, perambulating, T. Divine 181,056
Chair, reclining, T. M. Brintnall 181,187
Chair rocker, P. C. Ingersoll 181,176
Chair, tilting, H. Parry 181,207
Chamber and urinal, P. F. Campbell 181,037
Chimney cowl, J. M. Davies 181,050
Churn, P. K. Parkhurst 181,006
Cigar box, T. A. Dodd 181,057
Cigarette papers, case for, Beebe *et al* 180,984
Clock dial, H. F. Henderson 181,001
Cloth-cutting machine, R. B. Sanson 181,107
Clothes dryer, E. B. Gildersleeve 181,164
Coal hods, bottom for, G. F. Sawyer 181,013
Commode, S. E. Smith 181,216
Cooler, beer, W. Lawrence 181,079
Cooler, milk, T. Sexsmith 181,110
Corkscrew, R. Decker 181,147
Cotton, baling, R. De Gray 181,052
Cotton chopper and scraper, W. M. Sanders 181,211
Cotton, borated, C. G. Am Ende 181,024
Cotton gin, H. A. Stearns 181,017
Cotton gin feeder, F. W. Flynn (r) 7,261
Cradle for children, Frawley & Eviston 181,162
Cultivator, J. W. Chase 181,041
Cultivator, H. D. Green 180,999
Cultivator, corn, G. Bradley 180,987
Cultivator, prairie sod, W. J. Robertson 181,106
Curtain tassel clasp, J. M. Homiston 181,171
Cutter head, J. H. Whitaker 181,230
Desk, C. A. Atkinson 181,025
Digger, potato, E. Bartlett 181,027
Digger, potato, A. L. Libbey 181,191
Digger, potato, S. Martin 181,193
Dish and clothes washer, A. C. Jackson 181,075
Disks of metal, etc., cutting, D. Brix 181,138
Distilleries, mashing, etc., for, G. Ellenberger. 181,060
Dock, floating, T. J. Wneeden 181,021
Drag teeth clasp, J. Gmeiner 180,997
Drawing frame stop, I. N. Edgerly 181,059
Dryer, Adams & Blondin 181,122
Elevating and carrying, B. T. Snyder 181,219
Elevator, J. G. Kurtz 181,077
Elevator and purifier, water, T. T. Bishop 181,134
Elevator, brick and mortar, T. Mann 181,085
Elevator, hydraulic, T. Stebins 181,113
Engine, compound, E. F. Althans 181,124
Engine cut-off, steam, J. C. Debes 181,051
Engine, rotary, A. C. Speer 181,112
Engine valve, pumping, Cope *et al* 181,045
Engines, valve for steam, T. & A. Shary 181,212
Eyeglass, J. S. Spencer 181,016
Faucet-locking device, L. Bieler 181,031
Feather renovator, W. M. Shelton 181,213
Fire kindler, S. S. Brown 181,033
Flour bolt, W. D. Murray 181,095
Flying machine, F. X. Lamboley 181,186
Fountain for mineral waters, etc., A. D. Puffer. 181,103
Frame for family records, L. Patterson 181,008
Fruit and jelly masher, etc., A. Conrady 181,044
Fruit dryer, A. M. Mortimer 181,094
Fruit jar, H. D. Hall 181,067
Furnace for roasting ores, H. G. Livermore 181,083
Furnace, heating, T. Angell 181,125
Gas machine, A. C. Rand 181,204
Gasaliers, tube retainer for, J. C. Cassidy 181,140
Gate, U. W. Hardy 181,071
Gearing, double, J. Smith 181,218
Generator water indicator, E. H. Ashcroft 181,127
Glove, J. L. E. Ranniger 181,011
Governor attachment, C. Neer 181,096
Grate, transverse rocking, H. Swindell 181,221
Grating, burglar-proof, C. P. Haughian 181,070
Gravestone, metallic, W. J. Dew 181,148
Grindstone hanging, C. Hefft 181,000
Gun barrels, turning, H. C. S. Dyer 181,154
Gun, battery, A. E. Miltimore 181,093
Hame, A. H. W. Michaelis 181,092
Harness pad, Ridgley *et al* 181,207
Harrow, J. De Moss 181,054
Harrow tooth, D. W. Hughes 181,173
Harrow teeth blanks, making, G. Donaldson 181,152
Harvester, W. H. Pritz 181,203
Harvester spring lever, T. S. Brown 180,988
Hay and stock rack, J. F. Temple 181,116
Hay for fuel, twisting, J. S. Foster 181,160
Hinge, spring, I. Buckman 180,989
Hoof spreader, McIntosh *et al* 181,091
Horse collar, C. J. Fox 181,161
Hydrant or water plug, E. R. Jones 181,076
Ice cream freezer, C. L. Dexter 181,055
Ironing board, M. A. Bryant 181,034
Knitted goods, finishing, J. L. Williams 181,232
Lamps, torch for lighting, F. Billingham 181,030
Lantern, T. B. Osborne 181,097
Lantern, signaling, H. H. Schulte 181,108
Latch and lock, W. H. Taylor 181,115
Lathe, gage, L. Hull (r) 7,262
Lathe shaping attachment, W. Brede 181,032
Limekiln door, W. Gwynn 181,238
Lubricating compound, Lyon *et al* 181,080
Match holder, W. Ferguson 180,995
Mattress, life-preserving, G. N. Torrence 181,118
Metals, refining, Corson *et al* 18.,046
Microscope, J. Zentmayer 181,120
Millstone dress, J. K. Snavely 181,015
Mosquito bar, A. L. Edwards 181,157
Mowing machine coupling, D. Manning 181,192
Music leaf turner, O. W. Clark 180,991
Nut lock, Haldeman & Stewart 181,166
Ores, reducing, M. Lafiin 181,003
Ornamenting surfaces, M. Dietrich 181,150
Overalls, G. R. Eager 181,155, 181,156
Overalls, S. Laskey 181,190
Painter's duster, etc., J. V. Richardson 181,206
Paper bag, J. S. Ostrander 181,198
Pen-handle attachment, W. H. Foye 181,062
Penholder, fountain, L. Berg 181,182
Pianoforte, bell, Hill & Wing 181,169
Pistols, extensible stock for, E. Wilson 181,238
Planter, corn, S. E. Owen 181,499
Pliers, W. P. Huntoon 181,175
Plow draft, A. B. King 181,180
Plow, stock, J. A. Price 181,102
Plow, sulky, A. Hamilton 181,069
Plow, sulky, J. M. Payne 181,200
Plows, weed turner for, W. Banworth 181,129
Post hole borer, Caler & Merrick 181,036
Press, cotton, W. Golding 180,998
Printing press, E. Hely 181,073
Privy seat, Howard & Allard 181,172
Pump, chain, J. S. Corbin 181,145
Pump, submerged, J. W. Collet 181,144
Pump valve, Hill & Rowland 181,168
Pump bucket, chain, Potter *et al* 181,202
Railway gate, M. Fulcomer 181,163
Railway rail joint, J. De Pew 180,994
Railway signal, automatic, J. E. Ross 181,012
Railway time signal, J. C. Paige 181,098
Railway track, lifting, R. Aldred 181,123
Rake and tedder, hay, E. J. Knowlton 181,184
Rake, horse hay, A. W. Coates 181,142
Refrigerator, J. J. Ross 181,210
Rivets, etc., making, E. E. Pierce 181,101
Roofing, making composition, C. L. Fowler 180,996
Ruler and protractor, G. D. Wyckoff 181,236
Saw tooth, A. Boynton 180,986
Scales, automatic, C. A. Whedon 181,228
Scales, weighing, A. Pangburn 181,090
Seeds, coating, W. R. Brandriff 181,136
Separator, grain, T. C. & J. W. Jory 181,181
Separator, middlings, C. F. Keller 181,182
Sewers, expansible gate for, Brady & Manning 181,135
Sewing machine, shuttle carrier, A. W. Eldredge 181,158
Sheet metal box, O. M. Sloat 181,215
Shirt bosom, S. Laskey 181,189
Shoes, etc., fastening, G. W. Lascell 181,187, 181,188
Sign, revolving, J. O. Belknap 181,029
Skirt elevator, A. W. Thomas 181,018
Smoke, consuming, J. Todd 181,117
Soda fountain, G. F. Heinichen 181,167
Spinning filer, F. P. Holt 181,002
Stone channeling machine, N. J. Green 181,066
Stool, blacking, A. Waterman 181,119
Stove attachment, cooking, T. R. Timby 181,224
Stove, cooking, J. C. McClamroch 181,090
Stove leg or foot, self-locking, W. W. Tice 181,223
Stove, summer, C. H. Chase 181,040
Studs, etc., making, Potter & Buffington 181,009
Sugar machine, centrifugal, E. Rochow 181,208
Sugar, refining, J. Wilhelm 181,231
Swing, A. Sleaforth 181,214
Syringes, etc., piston for, R. Vander Emde 181,226
Tanning process and compound, W. Farris 181,061
Telegraph circuit, fire alarm, J. P. Barrett 180,983
Toilet cabinet, D. Daggett 180,993
Tool, combination, M. Reynolds 181,104
Toy blow horn, C. W. Fallows 184,1
Toy gun, C. W. Fries 181,0
Toy spring gun, S. G. Stryker 181,114
Transplanter, J. E. Goodwin 181,065
Trap, animal, J. Martin 181,086
Trap, animal, F. E. Rice 181,105
Trap, fly, C. Olson 181,197
Trap, roach, R. Hagen 181,165
Umbrella, G. Bockstaller (r) 7,265
Umbrella, Hayward & Hoyland 181,072
Umbrella supporter, A. H. Wright 181,235
Valve, cut-off, F. B. Rice 181,205
Valve gear for reversing, W. H. Downing 181,155
Valve, oscillating, W. Bellis 181,131
Wagon beds, attaching derricks to, G. H Smith .. 181,217
Wagon cover, C. Cremer 181,047
Wagon, steam, S. B. Stone 181,220
Washer, steam, C. C. Carter 181,039
Washing machine, J. J. Daly 181,146
Washing machine, G. W. Marlatt 181,087
Washing machine, G. L. Witsil 181,234
Washing machine, J. Zeller 181,121
Watch key, W. S. Hicks 181,074
Water conductor fastener, L. Berger 181,133
Water wheel, B. C. Lambeth 181,185
Water wheel, L. Long 181,084
Weather strip, J. H. McIntire 181,195
Windmill, M. T. & M. C. Chapman 180,980
Windmill, A. Humphrey 181,174
Windmill, W. W. Marsh 181,004
Windmill, D. Nysewander 181,196
Writing instrument, C. M. Johnson 181,179

DESIGNS PATENTED.

9,437.—UMBRELLA.—G. Bockstaller *et al*., St. Louis, Mo.
9,438.—SKIRT BORDERS.—G. Bowman, New York city.
9,439.—EMBROIDERY.—E. Crisand, New Haven, Conn.
9,440 to 9,443.—CENTER PIECES.—S. Kellet, San Francisco Cal.
9,444.—FLOWER BOXES.—J. Rogers, New York city.
9,445.—STOVE.—E. Smith, Albany, N. Y.
9,446.—MIRROR FRAME.—R. W. Myers, New York city.
9,447.—FORK HANDLES, ETC.—C. Osborne, New York city.
9,448.—FAN.—J. T. Rowand, Jr., Camden, N. J.

[A copy of any one of the above patents may be had by remitting one dollar to MUNN & CO., 37 Park Row, New York city.

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 (3½ years) $10
On application for Design (7 years) $15
On application for Design (14 years) $30

THE VALIDITY OF PATENTS.

We recommend to every person who is about to purchase a patent, or about to commence the manufacture of any article under a license, to have the patent carefully examined by a competent party, and to have a research made in the Patent Office to see what the condition of the art was when the patent was issued. He should also see that the claims are so worded as to cover all the inventor was entitled to when his patent was issued; and it is still more essential that he be informed whether it is an infringement on some other existing patent. Parties desiring to have such searches made can have them done through the Scientific American Patent Agency, by giving the date of the patent and stating the nature of the information desired. For further information, address

MUNN & CO.,
37 PARK ROW, New York