

# LIST OF PATENTS

## MR. THOMAS E. MURRAY

*Volume 1*

|                                             | Date of Issue.    | No. of Patent | Page     |
|---------------------------------------------|-------------------|---------------|----------|
| <b>PIPE AND COUPLING</b>                    |                   |               |          |
| Lock and Coupling for Barrels...            | November 8, 1892  | 485,847       | A 1 to 6 |
| Clamp for drawing Liquids from Barrels..... | November 20, 1894 | 529,355       | B 1 to 4 |
| <b>PIPE AND POCKETS</b>                     |                   |               |          |
| Clamp for Pockets.....                      | January 17, 1893  | 490,258       | C 1 to 6 |
| Clamp for Pockets.....                      | August 8, 1893    | 503,097       | D 1 to 8 |
| <b>PIPE-CLAMP</b>                           |                   |               |          |
| Clamp and Holder.....                       | December 8, 1908  | 905,905       | 1— 6     |
| .....                                       | March 2, 1909     | 913,755       | 7— 16    |
| .....                                       | April 13, 1909    | 918,188       | 17— 24   |
| .....                                       | April 20, 1909    | 918,891       | 25— 30   |
| .....                                       | May 25, 1909      | 922,801       | 31— 36   |
| .....                                       | June 1, 1909      | 923,439       | 37— 44   |
| .....                                       | June 8, 1909      | 924,092       | 45— 52   |
| .....                                       | July 27, 1909     | 928,999       | 53— 60   |
| Clamp for Circuit.....                      |                   |               |          |
| Wire Connections.....                       | June 22, 1909     | 925,823       | 61— 64   |
| <b>PIPE-CLAMP</b>                           |                   |               |          |
| .....                                       | April 7, 1908     | 39,253        | 65— 68   |
| Electric Clamp Holder.....                  | July 28, 1908     | 39,435        | 69— 72   |
| Electric Pipe Case.....                     | December 29, 1908 | 39,735        | 73— 76   |
| .....                                       | December 29, 1908 | 39,736        | 77— 80   |
| .....                                       | April 3, 1906     | 816,677       | 81— 86   |
| .....                                       | April 3, 1906     | 816,679       | 87— 92   |
| .....                                       | April 3, 1906     | 816,678       | 93—100   |
| .....                                       | September 7, 1897 | 589,558       | 101—106  |
| .....                                       |                   |               |          |
| Locking Device.....                         | December 29, 1908 | 908,118       | 107—110  |
| Wire Clamp—Electric.....                    | June 29, 1909     | 926,433       | 111—116  |
| .....                                       | March 2, 1909     | 913,754       | 117—122  |
| .....                                       | June 8, 1909      | 924,093       | 123—126  |
| .....                                       | April 27, 1909    | 919,744       | 127—130  |
| .....                                       | July 27, 1909     | 928,998       | 131—134  |
| <b>PIPE REGULATOR</b>                       |                   |               |          |
| Electric Lamps.....                         | March 2, 1909     | 913,753       | 135—144  |
| .....                                       | December 29, 1908 | 908,117       | 145—150  |
| Wire Case and Support—Electric.....         | December 3, 1907  | 872,572       | 151—158  |
| Wire—Electric.....                          | September 9, 1902 | 708,969       | 159—182  |
| .....                                       | September 9, 1902 | 708,656       | 183—194  |
| .....                                       | February 10, 1903 | 720,273       | 195—224  |
| .....                                       | May 4, 1909       | 920,613       | 225—228  |
| <b>PIPE</b>                                 |                   |               |          |
| Feathering Wire.....                        | March 3, 1908     | 880,688       | 229—232  |
| .....                                       | April 14, 1908    | 884,604       | 233—236  |
| .....                                       | April 21, 1908    | 885,634       | 237—240  |
| .....                                       | April 28, 1908    | 886,010       | 241—244  |
| .....                                       | July 28, 1908     | 894,278       | 245—248  |
| .....                                       | December 8, 1908  | 906,052       | 249—252  |
| .....                                       | August 25, 1903   | 737,129       | 253—256  |
| .....                                       | July 16, 1901     | 678,677       | 257—264  |
| .....                                       | July 29, 1902     | 705,597       | 265—268  |
| <b>AUTOMATIC STOKING DEVICE</b>             |                   |               |          |
| For Furnace.....                            | April 14, 1908    | 884,603       | 269—280  |
| .....                                       | April 21, 1908    | 885,635       | 281—296  |

# MR. THOMAS E. MURRAY

Volume 2  
CNY  
brothers

## ENDING DEVICES

|                                           | Date of Issue      | No. of Patent | Page    |
|-------------------------------------------|--------------------|---------------|---------|
| Ending Device for Circuit Conductors..... | September 13, 1910 | 970,087       | 297—300 |
| Ending Post.....                          | September 13, 1910 | 970,089       | 301—304 |

## CONDUCTORS

|                                        |                   |           |         |
|----------------------------------------|-------------------|-----------|---------|
| Shield for Circuit Conductors.....     | December 27, 1910 | 979,544   | 305—310 |
| Support for Electrical Conductors..... | July 18, 1911     | 998,112   | 311—314 |
| Joint for Sheathed Conductors.....     | June 4, 1912      | 1,028,257 | 315—318 |

## CONNECTING DEVICES

|                                                        |                   |           |         |
|--------------------------------------------------------|-------------------|-----------|---------|
| Connecting Device for Circuit Wire Covering Pipes..... | February 15, 1910 | 949,243   | 319—322 |
| Connecting Device for Circuit Conductors..             | June 4, 1912      | 1,028,259 | 323—330 |
| Meter Testing Connection Block.....                    | August 20, 1912   | 1,036,507 | 331—336 |
| Connection Device for Circuit Conductors               | August 20, 1912   | 1,036,508 | 337—342 |

## CUTOUTS AND CUTOUT BOX

|                                          |                    |           |         |
|------------------------------------------|--------------------|-----------|---------|
| Electric Cutout.....                     | November 23, 1909  | 941,165   | 343—348 |
| Electric Cutout.....                     | February 15, 1910  | 949,283   | 349—356 |
| Electric Cutout.....                     | March 8, 1910      | 951,446   | 357—366 |
| Electric Cutout.....                     | April 26, 1910     | 956,135   | 367—374 |
| Electric Cutout.....                     | June 14, 1910      | 961,308   | 375—378 |
| Service Cutout and Metering Apparatus... | June 28, 1910      | 962,455   | 379—388 |
| Electric Cutout.....                     | September 13, 1910 | 970,088   | 389—400 |
| Electric Cutout.....                     | March 14, 1911     | 986,744   | 401—410 |
| Meter Testing Service Cutout.....        | May 2, 1911        | 991,004   | 411—422 |
| Electric Cutout.....                     | May 2, 1911        | 991,006   | 423—430 |
| Meter Testing Cutout.....                | June 20, 1911      | 995,627   | 431—438 |
| Electric Cutout Box .....                | June 20, 1911      | 995,628   | 439—442 |
| Electric Cutout.....                     | December 19, 1911  | 1,012,145 | 443—446 |
| Electric Cutout.....                     | March 26, 1912     | 1,021,550 | 447—450 |
| Electric Cutout.....                     | April 16, 1912     | 1,023,326 | 451—458 |
| Meter Testing Cutout.....                | June 4, 1912       | 1,028,254 | 459—468 |
| Electric Cutout.....                     | June 4, 1912       | 1,028,256 | 469—478 |
| Electric Cutout.....                     | June 4, 1912       | 1,028,258 | 479—482 |
| Meter Testing Service Cutout.....        | July 2, 1912       | 1,031,363 | 483—496 |
| Electric Cutout.....                     | October 22, 1912   | 1,041,846 | 497—504 |
| Electric Cutout.....                     | October 22, 1912   | 1,041,847 | 505—508 |

## ELECTRIC FUSE AND FUSE CASE

|                                                                    |                   |           |         |
|--------------------------------------------------------------------|-------------------|-----------|---------|
| Electric Fuse.....                                                 | December 21, 1909 | 943,698   | 509—512 |
| Electric Safety Fuse .....                                         | April 26, 1910    | 956,498   | 513—516 |
| Fuse Case .....                                                    | May 2, 1911       | 991,005   | 517—522 |
| Electric Fuse.....                                                 | May 2, 1911       | 991,007   | 523—526 |
| Electric Fuse Case.....                                            | May 2, 1911       | 991,008   | 527—530 |
| Fuse Case.....                                                     | March 26, 1912    | 1,021,549 | 531—534 |
| Fuse Case.....                                                     | June 4, 1912      | 1,028,255 | 535—538 |
| Electric Fuse.....                                                 | August 20, 1912   | 1,036,510 | 539—542 |
| Guard Device .....                                                 | June 4, 1912      | 1,028,253 | 543—546 |
| Method of Forming Integral Flanges on Bodies of Ductile Metal..... | August 20, 1912   | 1,036,509 | 347—550 |

## FUNCTION BOXES

|                                          |                   |           |         |
|------------------------------------------|-------------------|-----------|---------|
| Function Box.....                        | January 11, 1910  | 945,856   | 551—554 |
| Function Box.....                        | April 16, 1912    | 1,023,220 | 555—558 |
| Function Box for Circuit Conductors..... | June 4, 1912      | 1,028,260 | 559—562 |
| Reactance Coil.....                      | February 13, 1912 | 1,017,348 | 563—568 |
| Self Fastening .....                     | January 11, 1910  | 945,855   | 569—572 |
| Socket for Electric Glow Lamps.....      | March 14, 1911    | 986,743   | 573—576 |
| Spring Contact Plates.....               | February 20, 1912 | 1,018,334 | 577—580 |
| Switch—Underfeed .....                   | July 4, 1911      | 997,206   | 581—588 |
| Switch—Electric .....                    | December 12, 1911 | 1,011,639 | 589—592 |
| Switch Block.....                        | April 26, 1910    | 956,136   | 593—598 |
| Switchboard and Cutout.....              | December 21, 1909 | 943,699   | 599—606 |

Connecting  
Devices



## ELECTRIC FUSE, ETC.

|                                      |          |          |           |         |
|--------------------------------------|----------|----------|-----------|---------|
| Electric Fuse.....                   | January  | 1, 1918  | 1,252,141 | 175—178 |
| Electric Fuse Plug.....              | March    | 12, 1918 | 1,259,268 | 179—182 |
| Electric Fuse Plug.....              | June     | 18, 1918 | 1,270,048 | 183—186 |
| Method of Making Electric Fuses..... | November | 26, 1918 | 1,286,063 | 187—190 |

## SWITCH BOX

|                                                            |          |          |           |         |
|------------------------------------------------------------|----------|----------|-----------|---------|
| Switch Box.....                                            | November | 2, 1915  | 1,158,534 | 191—196 |
| Cutout Switch.....                                         | November | 2, 1915  | 1,158,535 | 197—200 |
| Cutout Switch.....                                         | August   | 21, 1917 | 1,237,370 | 201—206 |
| Water Testing Cutout.....                                  | March    | 13, 1917 | 1,219,132 | 207—212 |
| Outlet Box for Protective Casings for Line Conductors..... | June     | 15, 1915 | 1,142,835 | 213—216 |
| Adapter Device for Pipes and Boxes.....                    | June     | 18, 1918 | 1,270,046 | 217—220 |
| Method of Making Crank Shafts.....                         | March    | 27, 1917 | 1,220,771 | 221—224 |
| Method of Producing Solid Ribs on Sheet Metal Tubes.....   | March    | 27, 1917 | 1,220,773 | 225—228 |
| Method of Making Metal Rings.....                          | May      | 21, 1918 | 1,267,251 | 229—232 |
| Machinist.....                                             | August   | 10, 1915 | 1,149,592 | 233—236 |
| Lining for Tanks.....                                      | October  | 12, 1915 | 1,156,425 | 237—240 |
| Insulating Pipe Coupling.....                              | December | 21, 1915 | 1,165,114 | 241—244 |
| Gear Wheels.....                                           | March    | 27, 1917 | 1,220,775 | 245—248 |

## COUPLING FOR FLANGED TUBES OR PIPES

|                                                                       |          |          |           |         |
|-----------------------------------------------------------------------|----------|----------|-----------|---------|
| Coupling for Flanged Tubes or Pipes.....                              | May      | 22, 1917 | 1,227,179 | 249—252 |
| Coupling for Flanged Tubes or Pipes.....                              | July     | 23, 1918 | 1,273,524 | 253—256 |
| Sheet Metal Hub.....                                                  | June     | 19, 1917 | 1,230,427 | 257—260 |
| Vehicle Hub.....                                                      | March    | 12, 1918 | 1,259,269 | 261—264 |
| Process of Electrical Molding.....                                    | March    | 12, 1918 | 1,259,275 | 265—268 |
| Flanging for Universal Joints.....                                    | May      | 21, 1918 | 1,267,252 | 269—272 |
| Engine Cylinders.....                                                 | May      | 21, 1918 | 1,267,253 | 273—276 |
| Tapered Cartridge Shell.....                                          | May      | 21, 1918 | 1,267,257 | 277—280 |
| Engine Housing.....                                                   | June     | 18, 1918 | 1,270,044 | 281—288 |
| Crude Oil Still.....                                                  | July     | 23, 1918 | 1,273,523 | 289—292 |
| Device for Attaching the Ends of Wire Wheel Spokes to Metal Rims..... | November | 26, 1918 | 1,286,065 | 293—296 |

## VALVES

|             |      |          |           |         |
|-------------|------|----------|-----------|---------|
| Valves..... | May  | 8, 1917  | 1,225,479 | 297—300 |
| Valves..... | July | 31, 1917 | 1,235,150 | 301—304 |
| Valves..... | June | 18, 1918 | 1,270,049 | 305—308 |
| Valves..... | June | 18, 1918 | 1,270,050 | 309—312 |

# MR. THOMAS E. MURRAY

Volume 2  
(contd)

## APPARATUS FOR TRAPPING, ETC.

|                                                                           | Date of Issue      | No. of Patent | Page   |
|---------------------------------------------------------------------------|--------------------|---------------|--------|
| Apparatus for Trapping Particles in Suspension in Gas Currents.....       | March 23, 1915     | 1,132,678     | 1— 4   |
| Apparatus for Trapping Particles in Suspension in Gas Currents.....       | June 17, 1913      | 1,064,984     | 5— 10  |
| Apparatus for Trapping Solid Particles in Suspension in Gas Currents..... | March 17, 1914     | 1,090,490     | 11— 14 |
| Apparatus for Trapping Particles in Suspension in Gas Currents.....       | July 21, 1914      | 1,103,995     | 15— 20 |
| Apparatus for Trapping Solid Particles in Suspension in Gas Currents..... | February 24, 1914  | 1,087,970     | 21— 26 |
| Apparatus for Neutralizing Corrosive Fumes in Gases .....                 | May 11, 1915       | 1,139,053     | 27— 32 |
| Apparatus for Electric Welding.....                                       | October 12, 1915   | 1,156,426     | 33— 40 |
| Device for Trapping Particles in Suspension in Gas Currents.....          | March 23, 1915     | 1,132,677     | 41— 48 |
| Device for Trapping Particles in Suspension in Gas Currents.....          | September 23, 1913 | 1,073,621     | 49— 54 |
| Method of Trapping Particles in Suspension in Gas Currents.....           | September 23, 1913 | 1,073,620     | 55— 60 |
| Method of Trapping Solid Particles in Suspension in Gas Currents.....     | September 23, 1913 | 1,073,622     | 61— 66 |
| Method of Neutralizing Corrosive Fumes in Gases .....                     | March 23, 1915     | 1,132,679     | 67— 72 |
| Sampling Device .....                                                     | July 21, 1914      | 1,103,991     | 73— 76 |

## REFRIGERATING

|                                                                         |                  |           |        |
|-------------------------------------------------------------------------|------------------|-----------|--------|
| Device for Indicating Condition of Gas in Refrigerating Apparatus ..... | July 21, 1914    | 1,103,985 | 77— 80 |
| Refrigerating Apparatus .....                                           | December 8, 1914 | 1,120,220 | 81— 90 |
| Compressor Pump .....                                                   | July 21, 1914    | 1,103,986 | 91— 96 |

## BATH CABINET

|                            |                   |           |         |
|----------------------------|-------------------|-----------|---------|
| Electric Bath Cabinet..... | December 31, 1912 | 1,048,858 | 97—102  |
| Electric Bath Cabinet..... | June 17, 1913     | 1,064,983 | 103—112 |
| Electric Bath Cabinet..... | December 8, 1914  | 1,120,224 | 113—116 |

## ELECTRIC CUTOUT

|                                     |                   |           |         |
|-------------------------------------|-------------------|-----------|---------|
| Electric Cutout .....               | December 8, 1914  | 1,120,225 | 117—120 |
| Electrically Controlled Cutout..... | December 8, 1914  | 1,120,222 | 121—126 |
| Electric Cutout .....               | July 21, 1914     | 1,103,989 | 127—130 |
| Electric Cutout .....               | December 31, 1912 | 1,048,857 | 131—136 |
| Electric Cutout .....               | July 21, 1914     | 1,103,990 | 137—140 |
| Electric Cutout .....               | July 21, 1914     | 1,103,994 | 141—144 |
| Meter Testing Cutout.....           | March 17, 1914    | 1,090,489 | 145—150 |
| Meter Testing Cutout.....           | July 1, 1913      | 1,066,216 | 151—158 |
| Cutout Switch .....                 | November 2, 1915  | 1,158,535 | 159—162 |



# LIST OF PATENTS-CONTINUED

|                                                             | Date of Issue |          | No. of Patents | Page    |
|-------------------------------------------------------------|---------------|----------|----------------|---------|
| FUSES, ETC.                                                 |               |          |                |         |
| Electric Fuse .....                                         | March         | 23, 1915 | 1,132,674      | 163—166 |
| Electric Fuse .....                                         | December      | 8, 1914  | 1,120,221      | 167—170 |
| Electric Fuse .....                                         | July          | 21, 1914 | 1,103,987      | 171—174 |
| Fuse-Holding Device .....                                   | May           | 6, 1913  | 1,060,617      | 175—180 |
| Fuse and Fuse Carrier .....                                 | November      | 18, 1913 | 1,079,018      | 181—184 |
| Fuse Box .....                                              | December      | 8, 1914  | 1,120,223      | 185—192 |
| Fuse Plug .....                                             | December      | 2, 1913  | 1,079,948      | 193—196 |
| Fuse Plug .....                                             | January       | 20, 1914 | 1,084,706      | 197—200 |
| Fuse Switch .....                                           | September     | 29, 1914 | 1,112,156      | 201—204 |
| Fuse Switch .....                                           | February      | 24, 1914 | 1,087,971      | 205—208 |
| BOXES, ETC.                                                 |               |          |                |         |
| Protective Casing for Electric Meters .....                 | December      | 31, 1912 | 1,048,856      | 209—218 |
| Protective Casing for Line Conductors .....                 | July          | 21, 1914 | 1,103,984      | 219—222 |
| Protective Device for Sheathed Conductors .....             | July          | 21, 1914 | 1,103,983      | 223—226 |
| Protective Device for Electric Circuits .....               | July          | 21, 1914 | 1,103,993      | 227—230 |
| Protective Casing for Line Conductors .....                 | March         | 23, 1915 | 1,132,671      | 231—236 |
| Tabular Connection Duct .....                               | July          | 21, 1914 | 1,103,988      | 237—240 |
| Junction Box .....                                          | March         | 23, 1915 | 1,132,673      | 241—246 |
| Junction Box .....                                          | March         | 23, 1915 | 1,132,672      | 247—250 |
| Switch Box .....                                            | November      | 2, 1915  | 1,158,534      | 251—256 |
| Outlet Box for Protective Casings for Line Conductors ..... | June          | 15, 1915 | 1,142,835      | 257—260 |
| Base Lamp Fixture .....                                     | April         | 13, 1915 | 1,135,541      | 261—264 |
| WATCHES                                                     |               |          |                |         |
| Watch .....                                                 | March         | 23, 1915 | 1,132,676      | 265—270 |
| Watch .....                                                 | February      | 24, 1914 | 1,087,969      | 271—274 |
| Watch .....                                                 | August        | 10, 1915 | 1,149,592      | 275—278 |
| SWITCH AND SWITCH BOX                                       |               |          |                |         |
| Electric Switch .....                                       | March         | 24, 1914 | 1,091,155      | 279—284 |
| Protective Switch Box .....                                 | April         | 13, 1915 | 1,135,130      | 285—290 |
| Protective Switch Box .....                                 | October       | 27, 1914 | 1,115,091      | 291—294 |
| VEHICLE WHEELS                                              |               |          |                |         |
| Vehicle Wheel .....                                         | March         | 23, 1915 | 1,132,675      | 295—298 |
| Vehicle Wheel .....                                         | May           | 18, 1915 | 1,139,894      | 299—302 |
| Vehicle Wheel .....                                         | May           | 18, 1915 | 1,139,895      | 303—306 |
| Vehicle Wheel .....                                         | May           | 18, 1915 | 1,139,896      | 307—310 |
| Vehicle Wheel .....                                         | June          | 15, 1915 | 1,142,836      | 311—314 |
| Vehicle Wheel .....                                         | August        | 10, 1915 | 1,149,593      | 315—318 |
| Vehicle Wheel .....                                         | August        | 17, 1915 | 1,150,293      | 319—322 |
| Vehicle Wheel .....                                         | August        | 17, 1915 | 1,150,294      | 323—326 |
| Vehicle Wheel .....                                         | October       | 12, 1915 | 1,156,427      | 327—330 |
| Vehicle Wheel .....                                         | October       | 12, 1915 | 1,156,425      | 331—334 |
| Machine for Tanks .....                                     | October       | 12, 1915 | 1,156,424      | 335—344 |
| Joining Pipe Coupling .....                                 | December      | 21, 1915 | 1,165,114      | 345—348 |
| WHEEL FASTENINGS                                            |               |          |                |         |
| Wheel Fastening .....                                       | February      | 25, 1913 | 1,054,440      | 349—352 |
| Wheel Fastening .....                                       | July          | 28, 1914 | 1,105,037      | 353—356 |
| Wheel Fastening .....                                       | May           | 11, 1915 | 1,139,052      | 357—360 |

MR. THOMAS E. MURRAY

Vol. 3

APPARATUS FOR TRAPPING, ETC.

|                                                                           | Date of Issue      | No. of Patent | Page   |
|---------------------------------------------------------------------------|--------------------|---------------|--------|
| Apparatus for Trapping Particles in Suspension in Gas Currents.....       | March 23, 1915     | 1,132,678     | 1— 4   |
| Apparatus for Trapping Particles in Suspension in Gas Currents.....       | June 17, 1913      | 1,064,984     | 5— 10  |
| Apparatus for Trapping Solid Particles in Suspension in Gas Currents..... | March 17, 1914     | 1,090,490     | 11— 14 |
| Apparatus for Trapping Particles in Suspension in Gas Currents.....       | July 21, 1914      | 1,103,995     | 15— 20 |
| Apparatus for Trapping Solid Particles in Suspension in Gas Currents..... | February 24, 1914  | 1,087,970     | 21— 26 |
| Device for Trapping Particles in Suspension in Gas Currents .....         | March 23, 1915     | 1,132,677     | 27— 36 |
| Device for Trapping Particles in Suspension in Gas Currents .....         | September 23, 1913 | 1,073,621     | 37— 42 |
| Method of Trapping Particles in Suspension in Gas Currents.....           | September 23, 1913 | 1,073,620     | 43— 48 |
| Method of Trapping Solid Particles in Suspension in Gas Currents.....     | September 23, 1913 | 1,073,622     | 49— 54 |
| Method of Neutralizing Corrosive Fumes in Gases .....                     | March 23, 1915     | 1,132,679     | 55— 60 |
| Connecting Device .....                                                   | July 21, 1914      | 1,103,991     | 61— 64 |

REFRIGERATING

|                                                                         |                  |           |        |
|-------------------------------------------------------------------------|------------------|-----------|--------|
| Device for Indicating Condition of Gas in Refrigerating Apparatus ..... | July 21, 1914    | 1,103,985 | 65— 68 |
| Refrigerating Apparatus .....                                           | December 8, 1914 | 1,120,220 | 69— 78 |
| Compressor Pump .....                                                   | July 21, 1914    | 1,103,986 | 79— 84 |

BATH CABINET

|                            |                   |           |         |
|----------------------------|-------------------|-----------|---------|
| Electric Bath Cabinet..... | December 31, 1912 | 1,048,858 | 85— 90  |
| Electric Bath Cabinet..... | June 17, 1913     | 1,064,983 | 91—100  |
| Electric Bath Cabinet..... | December 8, 1914  | 1,120,224 | 101—104 |

ELECTRIC CUTOUT

|                                     |                   |           |         |
|-------------------------------------|-------------------|-----------|---------|
| Electric Cutout .....               | December 8, 1914  | 1,120,225 | 105—108 |
| Electrically Controlled Cutout..... | December 8, 1914  | 1,120,222 | 109—114 |
| Electric Cutout .....               | July 21, 1914     | 1,103,989 | 115—118 |
| Electric Cutout .....               | December 31, 1912 | 1,048,857 | 119—124 |
| Electric Cutout .....               | July 21, 1914     | 1,103,990 | 125—128 |
| Electric Cutout .....               | July 21, 1914     | 1,103,994 | 129—132 |
| Water Testing Cutout.....           | March 17, 1914    | 1,090,489 | 133—138 |
| Water Testing Cutout.....           | July 1, 1913      | 1,066,216 | 139—146 |



# LIST OF PATENTS—CONTINUED

## FUSE BOXES, ETC.

|                             |           |          |           |         |
|-----------------------------|-----------|----------|-----------|---------|
| Fuse Box .....              | March     | 23, 1915 | 1,132,674 | 147—150 |
| Fuse Box .....              | December  | 8, 1914  | 1,120,221 | 151—154 |
| Fuse Box .....              | July      | 21, 1914 | 1,103,987 | 155—158 |
| Fuse Box .....              | May       | 6, 1913  | 1,060,617 | 159—164 |
| Fuse and Fuse Carrier ..... | November  | 18, 1913 | 1,079,018 | 165—168 |
| Fuse Box .....              | December  | 8, 1914  | 1,120,223 | 169—176 |
| Fuse Box .....              | December  | 2, 1913  | 1,079,948 | 177—180 |
| Fuse Box .....              | January   | 20, 1914 | 1,084,706 | 181—184 |
| Fuse Switch .....           | September | 29, 1914 | 1,112,156 | 185—188 |
| Fuse Switch .....           | February  | 24, 1914 | 1,087,971 | 189—192 |

## ENCLOSURES, ETC.

|                                             |          |          |           |         |
|---------------------------------------------|----------|----------|-----------|---------|
| Enclosure Casing for Electric Meters.....   | December | 31, 1912 | 1,048,856 | 193—202 |
| Enclosure Casing for Line Conductors.....   | July     | 21, 1914 | 1,103,984 | 203—206 |
| Enclosure Device for Sheathed Conductors... | July     | 21, 1914 | 1,103,983 | 207—210 |
| Enclosure Device for Electric Circuits..... | July     | 21, 1914 | 1,103,993 | 211—214 |
| Enclosure Casing for Line Conductors.....   | March    | 23, 1915 | 1,132,671 | 215—220 |
| Enclosure Connection Duct .....             | July     | 21, 1914 | 1,103,988 | 221—224 |
| Enclosure Box .....                         | March    | 23, 1915 | 1,132,673 | 225—230 |
| Enclosure Box .....                         | March    | 23, 1915 | 1,132,672 | 231—234 |
| Enclosure Lamp Fixture .....                | April    | 13, 1915 | 1,135,541 | 235—238 |

## ENCLOSURES

|                 |          |          |           |         |
|-----------------|----------|----------|-----------|---------|
| Enclosure ..... | March    | 23, 1915 | 1,132,676 | 239—244 |
| Enclosure ..... | February | 24, 1914 | 1,087,969 | 245—248 |

## ENCLOSURE AND SWITCH BOX

|                           |         |          |           |         |
|---------------------------|---------|----------|-----------|---------|
| Enclosure Switch .....    | March   | 24, 1914 | 1,091,155 | 249—254 |
| Enclosure Switch Box..... | April   | 13, 1915 | 1,135,130 | 255—260 |
| Enclosure Switch Box..... | October | 27, 1914 | 1,115,091 | 261—264 |
| Enclosure Switch .....    | March   | 23, 1915 | 1,132,675 | 265—268 |

# MR. THOMAS E. MURRAY

Vol. 4

|                                                                                          | Date of Issue     | No. of Patent | Page    |
|------------------------------------------------------------------------------------------|-------------------|---------------|---------|
| ELECTRIC WELDING, ETC.                                                                   |                   |               |         |
| Electric Welding.....                                                                    | February 22, 1916 | 1,172,301     | 1— 4    |
| Electric Welding.....                                                                    | February 22, 1916 | 1,172,302     | 5— 14   |
| Electric Welding.....                                                                    | August 29, 1916   | 1,196,473     | 15— 18  |
| Apparatus for Electric Welding.....                                                      | October 12, 1915  | 1,156,426     | 19— 26  |
| Apparatus for Electric Welding.....                                                      | March 28, 1916    | 1,177,260     | 27— 30  |
| Apparatus for Electric Welding.....                                                      | April 18, 1916    | 1,180,096     | 31— 66  |
| Apparatus for Electric Welding.....                                                      | March 13, 1917    | 1,219,136     | 67— 70  |
| Apparatus for Electric Welding.....                                                      | March 13, 1917    | 1,219,137     | 71— 74  |
| Apparatus for Electric Welding.....                                                      | April 17, 1917    | 1,223,092     | 75— 80  |
| Electric Welding Machine.....                                                            | June 20, 1916     | 1,187,543     | 81—108  |
| Electric Welding Machine.....                                                            | February 13, 1917 | 1,215,964     | 109—112 |
| Electric Welding Machine.....                                                            | July 17, 1917     | 1,233,688     | 113—120 |
| Electric Welding Machine.....                                                            | January 1, 1918   | 1,252,143     | 121—158 |
| Electric Welding Machine.....                                                            | March 12, 1918    | 1,259,274     | 159—166 |
| Electric Welding Machine for Making Metal Rings.....                                     | May 21, 1918      | 1,267,254     | 167—178 |
| Method of Electric Welding.....                                                          | June 6, 1916      | 1,186,222     | 179—182 |
| Method of Electric Welding.....                                                          | March 27, 1917    | 1,220,770     | 183—186 |
| Method of Electric Welding.....                                                          | March 27, 1917    | 1,220,774     | 187—190 |
| Method of Electric Welding.....                                                          | March 27, 1917    | 1,220,776     | 191—194 |
| Method of Electric Welding.....                                                          | January 1, 1918   | 1,252,142     | 195—198 |
| Method of and Apparatus for Electric Welding                                             | May 21, 1918      | 1,267,256     | 199—204 |
| Method of and Apparatus for Electric Welding                                             | May 21, 1918      | 1,267,259     | 205—208 |
| Method of Localizing the Bur at Electrical Butt of Edge Welded Joint.....                | July 4, 1916      | 1,189,856     | 209—212 |
| Method of Electrical Edge Welding.....                                                   | December 5, 1916  | 1,206,885     | 213—216 |
| Method of Electrical Spot Welding.....                                                   | December 5, 1916  | 1,206,890     | 217—220 |
| Means for Electrically Welding Tubes in Sleeves.....                                     | February 13, 1917 | 1,215,966     | 221—224 |
| Method of Electrically Welding the End of a Tube within a Sleeve or Socket.....          | March 13, 1917    | 1,219,139     | 225—228 |
| Method of Welding a Threaded Tube in a Sleeve or Ferrule.....                            | March 27, 1917    | 1,220,772     | 229—232 |
| Method of Making Hollow Metal Objects by Electrical Welding.....                         | April 17, 1917    | 1,223,091     | 233—236 |
| Method of Localizing and Eliminating Imperfections in Electrically Welded Joints...      | June 1, 1918      | 1,252,290     | 237—240 |
| Electrically Welded Apparatus for Pipe Coupling.....                                     | May 21, 1918      | 1,267,258     | 241—246 |
| Method of Welding the Butt End of a Tube to a Plate of Thin Metal Having an Opening..... | June 18, 1918     | 1,270,045     | 247—250 |
| Metal Vehicle Welding.....                                                               | December 5, 1916  | 1,206,886     | 251—254 |
| Electrically Welded Tube and Flange Plate...                                             | February 13, 1917 | 1,215,967     | 255—258 |
| Apparatus for Making Metal Chains.....                                                   | May 21, 1918      | 1,267,255     | 259—262 |
| Apparatus for Truing and Removing the Bur from Electrically Welded Work.....             | November 26, 1918 | 1,286,064     | 263—266 |
| Apparatus for Neutralizing Corrosive Fumes in Cases.....                                 | May 11, 1915      | 1,139,053     | 267—272 |
| VEHICLE WHEELS                                                                           |                   |               |         |
| Vehicle Wheels.....                                                                      | May 18, 1915      | 1,139,894     | 273—276 |
| Vehicle Wheels.....                                                                      | May 18, 1915      | 1,139,895     | 277—280 |
| Vehicle Wheels.....                                                                      | May 18, 1915      | 1,139,896     | 281—284 |
| Vehicle Wheels.....                                                                      | June 15, 1915     | 1,142,836     | 285—288 |
| Vehicle Wheels.....                                                                      | August 10, 1915   | 1,149,593     | 289—292 |
| Vehicle Wheels.....                                                                      | August 17, 1915   | 1,150,293     | 293—296 |
| Vehicle Wheels.....                                                                      | August 17, 1915   | 1,150,294     | 297—300 |
| Vehicle Wheels.....                                                                      | October 12, 1915  | 1,156,427     | 301—304 |
| Vehicle Wheels.....                                                                      | March 28, 1916    | 1,177,259     | 305—308 |
| Vehicle Wheels.....                                                                      | April 18, 1916    | 1,180,064     | 309—312 |
| Vehicle Wheels.....                                                                      | April 18, 1916    | 1,180,065     | 313—316 |
| Vehicle Wheels.....                                                                      | December 5, 1916  | 1,206,887     | 317—320 |



# LIST OF PATENTS

Vol 5

## MR. THOMAS E. MURRAY

|                                             | Date of Issue     | No. of Patent | Page    |
|---------------------------------------------|-------------------|---------------|---------|
| <b>VEHICLE WHEELS, ETC.</b>                 |                   |               |         |
| Vehicle Wheels.....                         | January 16, 1917  | 1,212,798     | 1— 4    |
| Vehicle Wheels.....                         | January 16, 1917  | 1,212,799     | 5— 8    |
| Vehicle Wheels.....                         | June 12, 1917     | 1,230,016     | 9— 12   |
| Vehicle Wheels.....                         | June 18, 1918     | 1,270,047     | 13— 16  |
| Vehicle Wheels, Metal.....                  | April 25, 1916    | 1,180,734     | 17— 20  |
| Vehicle Wheels, Metal.....                  | June 6, 1916      | 1,186,223     | 21— 24  |
| Vehicle Wheels, Metal.....                  | June 6, 1916      | 1,186,224     | 25— 28  |
| Vehicle Wheels, Metal.....                  | June 20, 1916     | 1,187,542     | 29— 32  |
| Vehicle Wheels, Metal.....                  | July 25, 1916     | 1,192,548     | 33— 36  |
| Vehicle Wheels, Metal.....                  | July 25, 1916     | 1,192,549     | 37— 40  |
| Vehicle Wheels, Metal.....                  | January 16, 1917  | 1,212,800     | 41— 44  |
| Vehicle Wheels, Metal.....                  | January 16, 1917  | 1,212,801     | 45— 48  |
| Vehicle Wheels, Metal.....                  | January 16, 1917  | 1,212,803     | 49— 52  |
| Vehicle Wheels, Metal.....                  | March 27, 1917    | 1,220,768     | 53— 56  |
| Vehicle Wheels, Metal.....                  | March 27, 1917    | 1,220,769     | 57— 60  |
| Vehicle Wheels, Metal.....                  | April 17, 1917    | 1,223,088     | 61— 64  |
| Vehicle Wheels, Metal.....                  | May 22, 1917      | 1,227,178     | 65— 68  |
| Vehicle Wheels, Metal.....                  | August 6, 1918    | 1,274,930     | 69— 72  |
| Hub for Metal Vehicle Wheels.....           | December 5, 1916  | 1,206,888     | 73— 76  |
| Hub for Metal Vehicle Wheels.....           | December 5, 1916  | 1,206,889     | 77— 80  |
| Metal Hubs for Vehicle Wheels.....          | January 16, 1917  | 1,212,802     | 81— 84  |
| Method of Making Sheet Metal Wheels.....    | February 13, 1917 | 1,215,968     | 85— 88  |
| Demountable Vehicle Wheels.....             | March 13, 1917    | 1,219,133     | 89— 92  |
| Antiskidding Means for Vehicle Wheels.....  | August 21, 1917   | 1,237,369     | 93— 96  |
| <b>SEAL FASTENINGS</b>                      |                   |               |         |
| Seal Fastenings.....                        | February 29, 1916 | 1,173,603     | 97—100  |
| Seal Fastenings.....                        | May 11, 1915      | 1,139,052     | 101—104 |
| <b>MACHINE FOR WASHING DISHES</b>           |                   |               |         |
| Machine for Washing Dishes.....             | October 12, 1915  | 1,156,424     | 105—114 |
| Machine for Washing Dishes.....             | February 22, 1916 | 1,172,300     | 115—126 |
| Machine for Washing Dishes.....             | February 29, 1916 | 1,173,208     | 127—134 |
| <b>SHEET METAL PISTON, ETC.</b>             |                   |               |         |
| Sheet Metal Piston.....                     | February 13, 1917 | 1,215,969     | 135—138 |
| Sheet Metal Rod or Shaft.....               | April 17, 1917    | 1,223,089     | 139—142 |
| Sheet Metal Rod or Shaft.....               | April 17, 1917    | 1,223,090     | 143—146 |
| Sheet Metal Radiator.....                   | October 30, 1917  | 1,245,011     | 147—150 |
| Sheet Metal Sleeve.....                     | May 21, 1918      | 1,267,250     | 151—154 |
| <b>METHOD OF FLANGING METAL TUBE, ETC.</b>  |                   |               |         |
| Method of Flanging the End of a Metal Tube. | January 16, 1917  | 1,212,804     | 155—158 |
| Method of Flanging the End of a Metal Tube. | February 13, 1917 | 1,215,965     | 159—162 |
| Method of Flanging the End of a Metal Tube. | March 13, 1917    | 1,219,135     | 163—166 |
| Electrically Welded Tube and Flange.....    | March 13, 1917    | 1,219,138     | 167—170 |
| Tube Flange and Clamping Device Therefor..  | May 8, 1917       | 1,225,478     | 171—174 |