

# INDEX

## ILLUSTRATIONS.

|   |        |
|---|--------|
| <b>A</b>  |        |
| Aerial Experiment Association, fourth aeroplane         | 433    |
| Aerial navigation, first cross-country flight           | 349    |
| Aeronautic society, first exhib.                        | 338    |
| Aeroplane factory, an                                   | 356    |
| Aeroplane, Farman's exper.                              | 468    |
| Aeroplane in France and United States, Wright Brothers' | 140    |
| Aeroplane, "June Bug"                                   | 13, 45 |
| Aeroplane military scout                                | 445    |
| Aeroplanes, recent foreign                              | 124    |
| Aeroplane trial flight, SCIENTIFIC AMERICAN trophy      | 30     |
| Aeroplane, Wright, at Fort Myer                         | 169    |
| Aeroplane, Wright, construction                         | 209    |
| Air pump, improved                                      | 284    |
| Airships and aeroplanes, latest                         | 357    |
| Airships, United States and British government          | 125    |
| Anti-plague vaccine                                     | 369    |
| Armor-piercing gun, early                               | 210    |
| Arsinothorium, prehistoric giant                        | 253    |
| Automobile hoe  | 376    |
| <b>B</b>  |        |
| Barge Canal, New York State, construction of            | 217    |
| Battle practice, British navy                           | 448    |
| Battleship, steam-driven and gas-driven                 | 58     |
| Bottle, non-refillable                                  | 79     |
| Beds, bracket attachment for                            | 228    |
| Bird's eye view Manhattan bridges and tunnels           | 391    |
| Bird's soaring flight attained mechanically             | 63     |
| Blacksmith's napkin ring                                | 264    |
| Blind, multiple cycle for                               | 336    |
| Blow, evolution of                                      | 105    |
| Boat made of newspapers                                 | 126    |
| Boats, reinforced concrete for                          | 152    |
| Bob sleds, brake for                                    | 340    |
| Bones, opacity of, to Roentgen rays                     | 95     |
| Box, dovetailed, evolution of                           | 247    |
| Bracket attachment for beds                             | 228    |
| Bracket, painter's platform                             | 319    |
| Brake for bob sleds                                     | 340    |
| "Braunschweig," German battleship                       | 12     |
| Bread-slicing machine                                   | 227    |
| Bridge, Baltimore & Ohio, reconstruction of             | 184    |
| Bridge, B. & O. Susquehanna, fall of                    | 240    |
| Bridge cable, Manhattan                                 | 69     |
| Bridge cantilever, Queensborough                        | 400    |
| Bridges, city's giant                                   | 397    |
| Bridge, Curzon, construction of                         | 201    |
| Bronze cannon, antique                                  | 158    |
| Brooms, holder for                                      | 143    |
| Bucket, clam-shell, new type                            | 137    |
| Bucket dredger, "Péluse"                                | 165    |
| <b>C</b>  |        |
| Canal, Suez, widening of                                | 60     |
| Car fender tests, public service                        | 210    |
| Car service and wheel guard tests, public service       | 186    |
| Catskill water supply                                   | 396    |
| Centers, finding of, round work                         | 456    |
| Clam-shell bucket, new type                             | 137    |
| Clock to open furnace drafts                            | 454    |
| Coke, machine for handling                              | 37     |
| Comets, mystery of                                      | 89     |
| Concrete flower pots                                    | 380    |
| Concrete steel, is it a permanent construction?         | 373    |
| Concrete system, novel                                  | 472    |
| Condor, the California                                  | 17     |
| Coney Island, mechanical joys in                        | 101    |
| Controller, no-segment graphite-resistance              | 110    |
| Copper-plating flowers, etc.                            | 379    |
| Croton watershed, development of                        | 394    |
| Culebra cut, excavation of                              | 94     |
| Cullinan diamond, polishing                             | 262    |
| Cutter for shrubbery                                    | 340    |
| Cyclone, Nebraska, work of                              | 78     |
| Cyclones on the sun                                     | 353    |
| <b>D</b>  |        |
| Dam, irrigation   | 3, 293 |
| Dam, Mari Kanavè, India                                 | 149    |
| Diamond, polishing the Cullinan                         | 262    |
| Dish-pan and drainer                                    | 228    |
| Display box, puzzling                                   | 381    |
| Dock and harbor improvements                            | 408    |
| Door check and closer                                   | 283    |
| Drainer and dish-pan                                    | 228    |
| "Dreadnought," launch of first                          | 334    |
| Dredger, bucket, "Péluse"                               | 165    |
| Drill, mechanism of ovipositor                          | 435    |
| Drilling holes in marbles                               | 456    |
| Drilling horizontal holes, guide                        | 319    |
| Driver for small drills                                 | 456    |
| Dry farming, semi-arid districts                        | 120    |
| Drydock construction, modern improvements in            | 175    |

|  |     |
|--|-----|
| <b>E</b>   |     |
| Eclipses, recurrence of                                | 171 |
| Eclipse of sun, December, 1908                         | 372 |
| Egg development into an animal                         | 56  |
| Ejector made out of pipe fittings                      | 359 |
| Elevator for ore concentrators                         | 79  |
| English royalty, how it travels                        | 449 |
| Evolution of the blow                                  | 105 |
| Eyes of plants   | 256 |
| <b>F</b>   |     |
| Feeling, hearing, seeing, and smelling, curiosities of | 6   |
| Fighting tops, past and present                        | 329 |
| Fish hooks, book for                                   | 31  |
| Fire service, high-pressure                            | 24  |
| Fire service, high-pressure test of                    | 332 |
| Flexible mirrors                                       | 379 |
| Flip-flap, Franco-British Exposi.                      | 190 |
| Flower pots, concrete                                  | 380 |
| Flowers, etc., copper-plating                          | 379 |
| Folding tree stand                                     | 378 |
| Foot bridge, wire suspension                           | 136 |
| Foot power compound grinder                            | 264 |
| Forest fire, menace of                                 | 333 |
| Fossil wonders from Fayum                              | 261 |
| Fountain pen   | 143 |
| Freight distribution by subway                         | 413 |
| French and German airships, new                        | 43  |
| French navy of to-day                                  | 181 |
| Fresh water from sea water                             | 247 |
| Frying pans, cover for                                 | 340 |
| Fungus, destructive of white cedar                     | 454 |
| Fuse cap, waterproof                                   | 340 |
| <b>G</b>   |     |
| Ganges, narrowing the                                  | 201 |
| Garden, Christmas tree                                 | 379 |
| Gas lighter, automatic                                 | 228 |
| Gas mantle, new  | 475 |
| Gasoline-propelled gunboats, river                     | 140 |
| German navy of to-day                                  | 85  |
| "Germania," new German racing schooner                 | 173 |
| Glass-sponges, uses of                                 | 318 |
| Gliding boats, paddle wheel for                        | 315 |
| Glue pot, old  | 319 |
| Grand Central terminal station                         | 410 |
| Granite quarrying, lifting process                     | 301 |
| Grinder, compound, foot-power                          | 264 |
| Guide for drilling horizontal holes                    | 319 |
| Guiding lights of our coasts                           | 377 |
| Gyratory stone crusher                                 | 309 |
| <b>H</b>   |     |
| Harbor and dock improvements                           | 408 |
| Harmsworth motor boat race                             | 111 |
| Hatching snakes  | 46  |
| Heavens in August                                      | 71  |
| Heavens in September                                   | 151 |
| Heavens in October                                     | 219 |
| Heavens in November                                    | 302 |
| Heavens in December                                    | 375 |
| Helicopter, Luyties                                    | 21  |
| High-pressure fire service                             | 24  |
| High-pressure fire service, test of                    | 332 |
| High-tension electric currents                         | 142 |
| Hoe, automobile  | 376 |
| Holder for brooms                                      | 143 |
| Hook for garments                                      | 31  |
| Human ostrich  | 139 |
| Hydraulic drive system                                 | 429 |
| <b>I</b>   |     |
| Ice-making machine, domestic                           | 257 |
| Incandescent gas mantles                               | 300 |
| India fighting the plague, how                         | 369 |
| Irrigation of Yuma Valley                              | 73  |
| <b>J</b>   |     |
| Kettle tilter  | 340 |
| Kite, motor-driven                                     | 43  |
| <b>L</b>   |     |
| Lamp extinguisher, automatic                           | 340 |
| Lamp shade, metal, home-made                           | 380 |
| Lathes, fluting and beading attachment for             | 339 |
| Lathes, screw-slott attachment                         | 319 |
| Launch of first "Dreadnought"                          | 334 |
| Letter boxes, attachment for                           | 192 |
| Leyden jar, unbreakable                                | 264 |
| Library in miniature                                   | 175 |
| Lock for cars  | 79  |
| Locomotive, a new British                              | 41  |
| London, models of old                                  | 29  |
| Lunar appulse, December, 1908                          | 372 |
| <b>M</b>   |     |
| Machine for piling timber                              | 88  |
| Machine for handling coke                              | 37  |
| Machine, grain-washing                                 | 436 |
| Machine, Wimshurst, home-made                          | 264 |
| Magic, Hindu   | 228 |
| Mari-Kanavè dam, India                                 | 149 |
| Match safe, convenient                                 | 228 |
| Measles, cannibal                                      | 475 |
| Mechanical joys in Coney Island                        | 101 |
| Metallographs or photographs of metal specimens        | 317 |
| Microbe farm, a municipal                              | 104 |
| Mine explosives, government tests                      | 27  |
| Miner's gallery and rescue training school             | 260 |
| Mirrors, flexible                                      | 379 |

|  |     |
|--|-----|
| Models of Old London                       | 29  |
| Molding machine, multiple                  | 41  |
| Monoplane, No. 8, Bleriot's                | 44  |
| Motor boat race, Harmsworth trophy         | 111 |
| Motor cycle, novel                         | 474 |
| Multiple air propeller, possibilities      | 244 |
| Multiple cycle for blind                   | 336 |
| Municipal microbe farm                     | 104 |
| Music stand or book rest                   | 40  |
| <b>N</b>                                   |     |
| Napkin ring, blacksmith's                  | 264 |
| Naval stores industry                      | 245 |
| Needle, rag carpet                         | 319 |
| No-segment graphite-resistance controller  | 110 |
| Nut lock and bushing for boxes             | 283 |
| <b>O</b>                                   |     |
| Opera records, preserving of               | 62  |
| Optical illusions                          | 158 |
| Ore concentrator                           | 1   |
| <b>P</b>                                   |     |
| Package tie                                | 192 |
| Painter's platform bracket                 | 319 |
| Panama Canal, progress on                  | 431 |
| Paper, consumption of                      | 237 |
| Patuxent, side launching                   | 117 |
| Photometer, a selenium                     | 41  |
| Photographs, stereoscope for               | 320 |
| Photography, table top                     | 224 |
| Pipe fittings, ejector made out of         | 359 |
| Pipe wrench, improved                      | 192 |
| Pipe wrench, substitute for                | 319 |
| Plants, electric currents upon             | 142 |
| Plants, eyes of                            | 256 |
| Plants, faculties of                       | 174 |
| Plow for turning surface soil              | 339 |
| Plow, novel type of                        | 340 |
| Police academy at Rome                     | 172 |
| Poncho and tent                            | 339 |
| Punctures, tool for repairing tire         | 359 |
| <b>R</b>                                   |     |
| Railroad fill, method of making            | 276 |
| Railroad picks, repairing                  | 155 |
| Railway spike, improved                    | 283 |
| Railroad terminal station, Pennsylvania    | 409 |
| Railway terminals                          | 409 |
| Reinforced concrete for boats              | 152 |
| Rescue training school and miner's gallery | 260 |
| Revolving Christmas tree                   | 378 |
| Rocking-chair, rubber-tired                | 228 |
| Roller mounting Christmas tree             | 378 |
| Roots and shoots, growth                   | 126 |
| Rope bracket for swing seats               | 47  |
| Roosevelt Dam                              | 3   |
| Rotary, home-made printing press           | 47  |
| Rubber-tired rocking chair                 | 228 |
| <b>S</b>                                   |     |
| Salt industry, magnitude                   | 465 |
| Salving cruiser "Gladiator"                | 297 |
| Sandpaper, holder for                      | 359 |
| Sapphires, artificial                      | 452 |
| Sawing a building in two                   | 205 |
| Scout cruiser "Salem," trials of           | 25  |
| Screw-slott attachment, lathe              | 319 |
| Sea water, artificial                      | 88  |
| Seal and protector for knots               | 47  |
| Seismograph, home-made                     | 263 |
| Shaft sinking by freezing process          | 191 |
| Shank drills, holder for broken            | 319 |
| Shaving brushes                            | 143 |
| Ships' bottoms, electric scrubber          | 316 |
| Shoots and roots, growth                   | 126 |
| Shore anchor                               | 192 |
| Shutter attachment, new                    | 284 |
| Side launching, "Patuxent"                 | 117 |
| Siphons, starting device for               | 319 |
| Slide rule, how to use                     | 455 |
| Sluice box, improved                       | 79  |
| Snakes, hatching                           | 46  |
| Spring, coiled, method of making           | 264 |
| Steam driven and gas driven battleships    | 58  |
| Step-ladder, collapsible                   | 339 |
| Stereoscope for photographs                | 320 |
| Stone crusher, gyratory                    | 309 |
| Storage battery without chemicals          | 359 |
| Strains, models for illus.                 | 469 |
| Submarines, transportation                 | 468 |
| Subway, freight distribution by            | 413 |
| Subways and tunnels                        | 404 |
| Sugar testing in U. S. customs             | 168 |
| Suez Canal, widening of                    | 60  |
| Sun, cyclones on                           | 353 |
| Sun's radiation, its study                 | 241 |
| Suspension bridge, Manhattan               | 397 |
| Suspension bridge, Williamsburg            | 397 |
| "Swift," 38-knot destroyer                 | 156 |
| Swing seats, rope bracket for              | 47  |
| <b>T</b>                                   |     |
| Table-top photography                      | 224 |
| Tall buildings of New York                 | 400 |
| Telaugraph, new form of                    | 352 |
| Telegraph sounder, improved                | 283 |
| Telescopes, mountain                       | 277 |
| Tetrahedral steamers                       | 473 |
| Timber, machine for piling                 | 88  |

|   |               |
|---|---------------|
| Tire for automobile wheels                                    | 228           |
| Torpedo, Davis projectile                                     | 159           |
| Tourmaline, trick with  | 381           |
| Toys and tricks, recent                                       | 227           |
| Toys, new mechanical  | 453           |
| Trains under East River                                       | 191           |
| Tree candles, Christmas, protect                              | 379           |
| Tunnels and subways   | 400           |
| Two-thousand-foot building                                    | 53            |
| <b>U</b>  |               |
| Universal joint, simple design                                | 247           |
| <b>V</b>  |               |
| Vacuum cleaner, home-made                                     | 320           |
| Vanderbilt cup, fourth automobile                             | 312           |
| <b>W</b>  |               |
| Watches, winding indicator for                                | 436           |
| Water, price of   | 224           |
| Water current motor   | 283           |
| Water supply, Catskill  | 396           |
| Waterproof fuse cap   | 340           |
| Weather instruments, home-made                                | 72            |
| Winch, improved   | 339           |
| Wire fastener   | 340           |
| Wire suspension foot bridge                                   | 136           |
| Wireless telephony, long-distance, Collins                    | 185           |
| Wireless typewriter, Knudsen                                  | 296           |
| Wood, cutting with paper                                      | 247           |
| Workshop, construction of                                     | 359           |
| Workshop, furnishing the                                      | 456           |
| Wrench, handy   | 228           |
| Wright, Wilbur, at Le Mans                                    | 133           |
| <b>Y</b>  |               |
| Yuma dam  | 293           |
| Yuma Valley, irrigation of                                    | 73            |
| <b>MISCELLANY.</b>  |               |
| Figures preceded by a star (*) refer to illustrated articles. |               |
| <b>A</b>  |               |
| Abydos, excavations at  | 167           |
| Acetylene, gas for street lamps                               | 167           |
| Aerial navigation, first cross-country flight                 | 349           |
| Aerolite, mysterious  | 315, 374, 431 |
| Aeronautic contests, coming                                   | 206           |
| Aeronautic Society, first exhibition                          | 338           |
| Aeronautic Society for Inventors                              | 13            |
| Aeronautical trophy, SCIENTIFIC AMERICAN                      | 38            |
| Aeronautics, home and abroad                                  | 240           |
| Aeronautics in war  | 38            |
| Aeroplane disaster, Wright, lessons of                        | 202           |
| Aeroplane factory, an   | 356           |
| Aeroplane, Farman's exper.                                    | 468           |
| Aeroplane, fourth of Aerial Experimental Association          | 433           |
| Aeroplane in France and United States, Wright brothers'       | 140           |
| Aeroplane history, making of                                  | 182           |
| Aeroplane, is it practicable for scouting?                    | 166           |
| Aeroplane, "June Bug"   | 13, 45        |
| Aeroplane military scout                                      | 445           |
| Aeroplane, naval  | 218           |
| Aeroplane records in France, Wilbur Wright's                  | 222           |
| Aeroplane, Santos Dumont latest                               | 433           |
| Aeroplane test in France, Wright                              | 135           |
| Aeroplane transport   | 350           |
| Aeroplane trial flight, SCIENTIFIC AMERICAN trophy            | 30            |
| Aeroplane, what designers ought to consider                   | 315           |
| Aeroplane, Wright, construction                               | 209           |
| Aeroplane, Wright, at Fort Myer                               | 169           |
| Aeroplanes, gear-driven propellers                            | 431           |
| Aeroplanes, military possibilities of                         | 107           |
| Aeroplanes, recent foreign                                    | 124           |
| Aeroplanes, twin propellers                                   | 279, 315      |
| Air pump, improved  | 284           |
| Air scouts and artificial fog                                 | 223           |
| Airship disaster, Jones                                       | 171           |
| Airship disaster, Zeppelin                                    | 102           |
| Airships and aeroplanes, latest                               | 357           |
| Airships, United States and British government                | 125           |
| Ariship, vacuum   | 450           |
| Amido bodies, absorption of from soil                         | 223           |
| Ant, Argentine  | 125           |
| Anti-plague vaccine   | 369           |
| Arc of Peru   | 358           |
| Armor-piercing gun, an early                                  | 210           |
| Arsinothorium, prehistoric giant                              | 253           |
| Artificial food, fallacy of                                   | 310           |
| Aswan Dam, success of   | 5             |
| Attachment for printing stamps                                | 31            |
| Automobile collisions, force                                  | 294           |
| Automobile, commercial, and pneumatic tire                    | 134           |
| Automobile hoe  | 376           |
| Automobile for horses   | 276           |
| Automobile road race, grand prize                             | 392           |
| Automobile tour, Gilded Trophy, fifth annual                  | 54            |

|  |     |
|--|-----|
| Ayrton, Williams Edward, death                 | 355 |
| Antarctic expedition, Shackleton               | 135 |
| <b>B</b>                                       |     |
| Balloon in foggy weather                       | 274 |
| Balloons, military dirigible                   | 135 |
| Ballooning, military, in Japan                 | 103 |
| Barge Canal, New York State                    | 217 |
| Barnes, Oliver Weldon, death of                | 374 |
| Bars at the mouth of the Mississippi           | 46  |
| Battery for converting energy                  | 47  |
| Battle practice, British navy                  | 448 |
| Battleship, steam-driven and gas-driven        | 58  |
| Battleship designs, Newport conference on      | 426 |
| Becquerel, Henri                               | 154 |
| Beds, bracket attachment for                   | 228 |
| Bells of the Metropolitan Tower                | 91  |
| Bird's eye view, Manhattan bridges and tunnels | 391 |
| Birds' soaring flight attained mechanically    | 63  |
| Blacksmith's napkin ring                       | 264 |
| Blind, multiple cycle for                      | 336 |
| Blow, evolution of                             | 105 |
| Boat made of newspapers                        | 126 |
| Boat-propelling device                         | 436 |
| Boats, reinforced concrete for                 | 152 |
| Bob sleds, brake for                           | 340 |
| Bones, opacity of, to Roentgen rays            | 95  |
| Bottle, non-refillable                         | 79  |
| Box, dovetailed, evolution of                  | 247 |
| Bracket attachment for beds                    | 228 |
| Bracket, painter's platform                    | 319 |
| Brake for bob sleds                            | 340 |
| Brake mechanism for wagons                     | 436 |
| "Braunschweig," German battleship              | 12  |
| Bread-slicing machine                          | 227 |
| Bridge, B. & O., reconstruction                | 184 |
| Bridge, B. & O., Susquehanna, fall of          | 240 |
| Bridge cables, Manhattan, foot                 | 69  |
| Bridge, cantilever, Queensborough              | 400 |
| Bridge, Curzon, construction of                | 201 |
| Bridge chord test (Blackwell's Island)         | 134 |
| Bridge chord, test of full-sized               | 155 |
| Bridge, Curzon, construction of                | 201 |
| Bridges, city's giant                          | 397 |
| Bridges, latticed compression members in       | 43  |
| Bridge, Manh., investig.                       | 466 |
| British Patent Act, manufacturing under        |     |

Cullinan diamond, polishing...\*262  
 Curious facts about numbers... 354  
 Cutter for shrubbery...\*340  
 Current rushes during switching...154  
 Cyclone, Nebraska, work of...\*78  
 Cyclones on the sun...\*353

**D**  
 Dam irrigation...\*3, \*293  
 Dam, Mari Kanavé, India...\*149  
 Dams at the Panama Canal, experimental... 150  
 Darning, lamp globes for...192  
 Darwinian theory, present posi... 39  
 Daylight for recreation... 70  
 Diamond, Cullinan cut... 352  
 Diamond, polishing the Cullinan...\*262  
 Dish-pan and drainer...\*228  
 Display box, puzzling...\*381  
 Dock and harbor improvements...\*408  
 Door check and closer...\*283  
 "Dreadnought," launch of first...\*334  
 "Dreadnoughts," change battle-ships to...107  
 Dredger, bucket, "Péluse"...\*165  
 Drilling holes in marbles...\*456  
 Drilling horizontal holes, guide...\*319  
 Drive system, hydraulic...\*429  
 Dry-blast system, rails by...182  
 Drydock construction, modern improvements in...\*175  
 Dry farming in semi-arid dist...\*120  
 Drainer and dish-pan...\*228  
 Driver for small drills...\*456

**E**  
 Earth, tapping for electricity...278  
 Earthquake warning service... 42  
 Eclipse of sun, December, 1908...\*372  
 Eclipses, recurrence of...\*171  
 Egg, developing into an animal...56  
 Ejector made of pipe fittings...\*359  
 Electric scrubber, for ships...\*316  
 Electric supply at Bilbao... 46  
 Electrical resistance of human body...126  
 Electrical show, Madison Square Garden...258  
 Electrical standards, accuracy and uniformity in...330  
 Electrical units, international... 118  
 Electrification of German railroads...22  
 Electricity, tapping earth for...278  
 Electro-acoustic measuring of sea distances...375  
 Electrocution of animals...123  
 Electrolysis, washing fabrics by...171  
 Engineers, monuments to...118  
 Ethics of criticism...392  
 Evolution of the blow...\*105  
 Excavation at Abydos...167  
 Exhaust steam, power generation from...154  
 Explosives, how to destroy safely...451  
 Exposition, Japanese... 87  
 Eyes of plants...\*256

**F**  
 Fakes, a few facts about...183  
 Farman, Henry, at Brighton Beach...75  
 Farman, Henry, a talk with... 86  
 Fashions, electric syst...466  
 Feeling, hearing, seeing and smelling, curiosities of...\*6  
 Ferment of egg yolk...151  
 Ferro-boron, manufacture of...298  
 Fighting tops, past and present...\*329  
 Fire-control masts...299  
 Fire service, high-pressure...\*24  
 Fire service, high-pressure test...\*332  
 Firebacks in the French navy...274  
 Fish hooks, book for...\*31  
 Flexible mirrors...\*379  
 "Flip-flap," Franco-British exposi...190  
 Flower pots, concrete...\*380  
 Flowers, etc., copper-plating...\*379  
 Fog, artificial, and air scouts...223  
 Folding tree stand...\*378  
 Foodstuffs, boric, salicylic, benzoic acids in...450  
 Foodstuffs, sulphurous acid in...426  
 Foot bridge, wire suspension...\*136  
 Foot-power compound grinder...\*264  
 Forest fire, menace of...\*333  
 Forest fires, legislation...426  
 Forest fires, loss by...238  
 Forest service...454  
 Fossil, wonders from Fayum...\*261  
 Fourth dimension, explan...355, 374  
 Fourth dimension, explanation of...454  
 Fourth dimension prize...430  
 Fountain pen...\*143  
 Freight distribution by subway...\*413  
 Freight tunnel, four-track...238  
 French and German airships, new...\*43  
 French navy of to-day...\*181  
 Fresh water from sea water...\*247  
 Frying pans, cover for...\*340  
 Fuel, government investigation...314  
 Fuel resources... 4  
 Fuel, smokeless...223  
 Fuels, relation to gas producer... 70  
 Fungus, destructive of white cedar...\*454  
 Fuse cap, waterproof...\*340

Ganges, narrowing the...\*201  
 Garden, Christmas tree...\*379  
 Gas-driven ship problem...182  
 Gas lighter, automatic...\*228  
 Gas mantle, new...\*475  
 Gas producer, relation to fuels... 70  
 Gasoline-propelled gunboats, river...140

Gatun Dam facts perverted...466  
 Gear-driven propellers for aeroplanes...431  
 German navy of to-day...\*85  
 "Germania," new German racing schooner...\*173  
 Glass sponges, uses of...\*318  
 Glidden tour, termination of... 75  
 Gliding boats, paddle wheel for...\*315  
 Glue pot, old...\*319  
 Gold, optical properties of colloidal solutions of...376  
 Grain-washing machine...\*436  
 Grand Central terminal station, new...\*410  
 Granite, quarrying, lifting proc...\*301  
 Green fruit, pre-cooling...372  
 Grinder, compound, foot-power...\*264  
 Growth and evolution, forms of memory and habit...207  
 Guide for drilling horizontal holes...\*319  
 Guiding light of our coasts...\*377  
 Gun erosion...451  
 Gyrotory stone crusher...\*309

**H**  
 Harbor and dock improvements...\*408  
 Harbor, New York, pollution of... 70  
 Hardness, testing for...136  
 Harmsworth trophy, motor boat race...111  
 Hatching snakes...\*46  
 Heavens in August...\*71  
 Heavens in September...\*151  
 Heavens in October...\*219  
 Heavens in November...\*302  
 Heavens in December...\*375  
 Hedin's, Sven, return...206  
 Helicopter, experiments with... 26  
 Helicopter, Luytids...\*21  
 Helicopters, inclined propellers...223  
 Helium gas heavier than liquid...170  
 Helium really liquefied...59  
 High-pressure fire service...\*24  
 High-pressure fire service, test...\*332  
 High-tension electric currents upon plants...\*142  
 Hiscox, Gardner D., death of...207  
 Hoe, automobile...\*376  
 Holder for brooms...\*143  
 Hook for garments...\*31  
 Hot-air-driven torpedoes... 77  
 Human ostrich...\*139  
 Hydraulic drive system...\*429  
 Hydroplane and gliding boat, difference between... 40

**I**  
 Ice-making machine, domestic...\*257  
 Ice-making machines, kitchen...155  
 Incandescent gas mantles...\*300  
 India fighting the plague, how...\*369  
 India rubber, artificial...284  
 Insects injurious to vegetation...446  
 International electrical units...118  
 Invention, question of priority...279  
 Inventors, problem to solve...314  
 Inventor, tribute to civilian...446  
 Irrigation of Egypt... 5  
 Irrigation of Yuma Valley...\*73

**J**  
 Japanese navy of to-day...\*273  
 Junior Aero Club...434  
 Jupiter's eighth satellite, theory... 74

**K**  
 Kaiser's silver flotilla... 23  
 Kettle tilter...\*340  
 Kitchen ice-making machines...155  
 Kite, motor-driven...\*43

**L**  
 Laboratory of the physiology of sensation... 8  
 Lamp extinguisher, automatic...\*340  
 Lamp globes for darning...192  
 Lamp shade, metal, home-made...\*380  
 Lancehead viper, venom from...426  
 Langley—a tribute...254  
 Lathes, fluting and beading attachment for...\*339  
 Lathes, screw-slottting attachment...\*319  
 Launch of first "Dreadnought"...\*334  
 Lemoine case, outcome of... 5  
 Letter boxes, attachment for...\*192  
 Levulose or fruit sugar...258  
 Leyden jar, unbreakable...\*264  
 Library in miniature...\*175  
 Life-saving appliance...186  
 Light, energy consumed for...206  
 Lightning, new discoveries about...430  
 Limer "Cleveland" launched...219  
 Limer, first 25-knot... 38  
 Linoleum, making inlaid...106  
 Lock for cars...\*79  
 Locomotive, a new British...\*41  
 Locomotive, express, powerful...182  
 London, models of old...\*29  
 Luminous projectiles...435  
 Lunar apulse, December, 1908...\*372  
 "Lusitania" record...139

**M**  
 Macadamized road flasco...274  
 Machine for handling coke...\*37  
 Machine for piling timber...\*88  
 Machine, Wimshurst, home-made...\*264  
 Magic, Hindu...\*226  
 Manufacturing under British Patent Act...166  
 Mari-Kanavé dam, India...\*149  
 Marine engine endurance...22  
 Marine gas engine...54  
 Match safe, convenient...\*228  
 Matches, waterproof...\*247

Mathematical prize \$25,000...246  
 Measles, cannibal...\*475  
 Mechanical joys in Coney Island...\*101  
 Medication, Ionic...211  
 Metallographs or photographs of metal specimens...\*317  
 "Microbe farm," a municipal...\*104  
 Micro-organisms, immortality of... 71  
 Micro-photography, meaning of...123  
 Mills, John Henry, death of...355  
 Military ballooning in Japan...103  
 Military dirigible balloons...135  
 Military possibilities of aeroplanes...107  
 "Minas Geraes," Brazilian "Dreadnought"...\*425  
 Mine explosions, government tests of...\*27  
 Miners' gallery and rescue training school...\*260  
 Mirrors, flexible...\*379  
 Mitts, waterproof...192  
 Models of Old London...\*29  
 Molding machine, multiple...\*41  
 Monoplane, No. 8 Bleriot's...\*44  
 Monumental blunder...350  
 Monuments to engineers...118  
 Mosquito larva, electrocuting...187  
 Moth trap, electric...138  
 Motor accidents in Great Britain...139  
 Motor boat cup, defender of...102  
 Motor boat race, Harmsworth trophy...\*111  
 Motor bus, is it profitable...134  
 Motor-car lock, wanted...219  
 Motor cycle, novel...\*474  
 Motors, light-weight, early...392  
 Multiple air propeller, possible...\*244  
 Multiple cycle for blind...\*336  
 Municipal microbe farm...\*104  
 Music stand or book rest...\*40  
 Myths exploded...243

**N**  
 Napkin ring, blacksmith's...\*264  
 Nasmyth, inventor, centenary of...238  
 Naval stores industry...245  
 Naval aeroplane...218  
 Navy Department, reorganization...446  
 Needle, rag carpet...\*319  
 Newport conference...294, 426  
 Newton, Sir Isaac, and apple...431  
 Niagara water power, restriction... 22  
 Nobel prizes for scientific awards...451  
 "North Dakota," launch of...372  
 No-segment graphite-resistance controller...\*110  
 Numbers, curiosities of...9, 43, 299  
 Numbers, curious facts...451, 471  
 Nut lock and bushing for boxes...\*283

**O**  
 Oil pipes, California, rifled... 223  
 Opera records, preserving of...\*62  
 Optical illusions...\*158  
 Optical properties of colloidal solutions of gold...376  
 Ore concentrates, elevator for...\*79  
 Ore concentrator...\*192  
 Ovipositor drill, mechanism of...\*435

**P**  
 Package tie...\*192  
 Painter's platform bracket...\*319  
 Panama Canal, progress on...\*431  
 Panama and Erie canals compared...218  
 Panama hat, cost of...258  
 Panama, work in rainy season... 70  
 Paper, consumption of...\*237  
 Paper from cornstalks, manufacturing...274  
 Paper industry related to forests and education...243  
 Patent law, important...259  
 Patent, may a manufacturer buy...102  
 Patents, report of Commissioner...284  
 "Patuxent," side launching...\*117  
 Pearls, a farm for cultivating... 78  
 Peary's polar expedition...27, 38  
 Perrine, Dr. F. A. C., death of...298  
 Petroleum, India's resources... 46  
 Photographs, stereoscope for...\*320  
 Photography, table-top...\*224  
 Photometer, a selenium...\*42  
 Picture post-card industry, Ger...318  
 Piles, wooden, electrical tere-doproof...47  
 Pipe fittings, ejector made of...\*359  
 Pipe wrench, improved...\*192  
 Pipe wrench, substitute for...\*319  
 Plants, electric currents upon...\*142  
 Plants, eyes of...256  
 Plants, faculties of...\*174  
 Plow, novel type of...\*340  
 Plow for turning surface soil...\*339  
 Pneumatic vs. solid tires...335  
 Pneumatic tire, and commercial automobile...134  
 Police academy at Rome...\*172  
 Polishing a varnished surface... 126  
 Poncho and tent...\*339  
 Postal rates to England...246  
 Postal tubes in subways...238  
 Pre-cooling green fruit...372  
 Producer gas for steam generation... 94  
 Propellers, Wright syst...471  
 Punctures, tool for repairing tire...\*359

Package tie...119, 223  
 Pupils, special for gifted... 5  
 Science and the schoolboy mind...119  
 SCIENTIFIC AMERICAN trophy, second contest...258  
 Schooners, international yacht racing...392  
 Scout cruiser "Salem," trials of...\*25  
 Screw-slottting attachment, lathe...\*319  
 Sea water, artificial...\*88  
 Seal and protector for knots...\*47  
 Seismograph, home-made...\*263  
 Selfridge, Lieut., funeral of...222  
 Sewage, electrolytic purification... 11  
 Shaft sinking by freezing proc...\*191  
 Shank drills, holder for broken...\*319  
 Shaving brushes...\*143  
 Ships' bottoms, electric scrubber...\*316  
 Shoe varnish...143  
 Shoots and roots, growth...\*126  
 Shore anchor...\*192  
 Shutter attachment, new...\*284  
 Side launching, "Patuxent"...\*117  
 Silica, melting...222  
 Siphons, starting device for...\*319  
 Sky glows...139  
 Slaughtering, humane... 23  
 Slide rule, how to use...\*455  
 Sluice box, improved...\*79  
 Smoke problem, solution of...314  
 Smokeless fuel...223  
 Snakes, hatching...\*46  
 Soap bark, detection of...434  
 Sodium, radio-activity of... 62  
 Solar eclipse, total, 1908... 55  
 Solid vs. pneumatic tires...335  
 Soundings in Niagara Falls... 77  
 South Pole trip...169  
 Speed, question of... 22  
 Spike, railroad, 20th century... 85  
 Spring, coiled, making...\*264  
 Staining wood, process for...155  
 Star and crescent, notes on... 23  
 Steam-driven and gas-driven battleship...\*58  
 Steam generation, producer gas... 94  
 Stellar streams, the two...106  
 Step-ladder, collapsible...\*339  
 Stereoscope for photographs...\*320  
 Stoking, mechanical...352  
 Stone crusher, gyrotory...\*309  
 Stope drill competition... 74  
 Storage battery without chemicals...\*359  
 Strains, models for illus...\*469  
 Street cars, prizes for essays on...278  
 Street lamps and acetylene gas...167  
 Street noise crusade and rail joint...150  
 Street noises, prevention of...187, 223  
 Structures, ornamental elevated...150  
 Submarine successes...202  
 Submarines, transportation...\*468  
 Subscribers, to our...454  
 Suburban service, N. Y. and N. J...118, 166  
 Subway cars, side doors for... 22  
 Subway, freight distribution by...\*413  
 Subway, power consumption in... 4  
 Subway, proposals for cooling...166  
 Subways and tunnels...\*404  
 Suez Canal, widening of...\*60, 107  
 Sugar, as disinfectant... 246  
 Sugar, price of, in olden times...138

Rail joint and street noise crusade...150  
 Rails by the dry-blast system...182  
 Rails, to prevent spreading of...107  
 Railroad fill, method of making...\*276  
 Railroad picks, repairing...\*155  
 Railroad spike, obsolete...107  
 Railroad spike, 20th century... 86  
 Railroad terminal station, Pennsylvania...\*409  
 Railroad tie, improved...\*436  
 Railroad ties, future of... 74  
 Railroad tree planting... 63  
 Railway accidents... 9  
 Railway to Mecca...186  
 Railway, Pan-American... 4  
 Railway progress, Northern Nigeria...155  
 Railway spike, improved...\*283  
 Rateau system, power generat...154  
 Rearing of warships... 155  
 Red Cross Christmas stamp...454  
 Reinforced concrete for boats...\*152  
 Reorganization, Navy Department...446  
 Rescue training school and miners' gallery...\*260  
 Revolving Christmas tree...\*378  
 Roads, political economy of good...451  
 Rocking chair, rubber-tired...\*228  
 Rocks and minerals, making...\*370  
 Roller mounting Christmas tree...\*378  
 Roosevelt dam...\*3  
 Roots and shoots, growth...\*126  
 Rope bracket for swing seats...\*47  
 Rotary home-made printing press...\*47  
 Royalty, how it travels...\*449  
 Rubber-tired rocking chair...\*228

Safety devices, suggestions for inventors...203  
 Safety devices, test of...38  
 Salt industry...\*465  
 Salving, British cruiser "Gladia-tor"...\*297  
 Sandpaper, holder for...\*359  
 Sanitary railroad car, wanted...254  
 Santos Dumont's aeroplane...\*433  
 Sapphires, artificial...\*452  
 Sawing building in two...\*205  
 Schoolboy mind and science, 119, 223  
 Schools, special for gifted pupils... 5  
 Science and the schoolboy mind...119  
 SCIENTIFIC AMERICAN trophy, second contest...258  
 Schooners, international yacht racing...392  
 Scout cruiser "Salem," trials of...\*25  
 Screw-slottting attachment, lathe...\*319  
 Sea water, artificial...\*88  
 Seal and protector for knots...\*47  
 Seismograph, home-made...\*263  
 Selfridge, Lieut., funeral of...222  
 Sewage, electrolytic purification... 11  
 Shaft sinking by freezing proc...\*191  
 Shank drills, holder for broken...\*319  
 Shaving brushes...\*143  
 Ships' bottoms, electric scrubber...\*316  
 Shoe varnish...143  
 Shoots and roots, growth...\*126  
 Shore anchor...\*192  
 Shutter attachment, new...\*284  
 Side launching, "Patuxent"...\*117  
 Silica, melting...222  
 Siphons, starting device for...\*319  
 Sky glows...139  
 Slaughtering, humane... 23  
 Slide rule, how to use...\*455  
 Sluice box, improved...\*79  
 Smoke problem, solution of...314  
 Smokeless fuel...223  
 Snakes, hatching...\*46  
 Soap bark, detection of...434  
 Sodium, radio-activity of... 62  
 Solar eclipse, total, 1908... 55  
 Solid vs. pneumatic tires...335  
 Soundings in Niagara Falls... 77  
 South Pole trip...169  
 Speed, question of... 22  
 Spike, railroad, 20th century... 85  
 Spring, coiled, making...\*264  
 Staining wood, process for...155  
 Star and crescent, notes on... 23  
 Steam-driven and gas-driven battleship...\*58  
 Steam generation, producer gas... 94  
 Stellar streams, the two...106  
 Step-ladder, collapsible...\*339  
 Stereoscope for photographs...\*320  
 Stoking, mechanical...352  
 Stone crusher, gyrotory...\*309  
 Stope drill competition... 74  
 Storage battery without chemicals...\*359  
 Strains, models for illus...\*469  
 Street cars, prizes for essays on...278  
 Street lamps and acetylene gas...167  
 Street noise crusade and rail joint...150  
 Street noises, prevention of...187, 223  
 Structures, ornamental elevated...150  
 Submarine successes...202  
 Submarines, transportation...\*468  
 Subscribers, to our...454  
 Suburban service, N. Y. and N. J...118, 166  
 Subway cars, side doors for... 22  
 Subway, freight distribution by...\*413  
 Subway, power consumption in... 4  
 Subway, proposals for cooling...166  
 Subways and tunnels...\*404  
 Suez Canal, widening of...\*60, 107  
 Sugar, as disinfectant... 246  
 Sugar, price of, in olden times...138

Sugar testing in U. S. customs...\*168  
 Sulphurous acid in foodstuffs...426  
 Sulphurous acid in sugar refin...139  
 Sun, cyclones on...\*353  
 Sun's radiation, its study...\*241  
 Surgery, thoracic, new method... 8  
 Suspension bridge, Manhattan...\*397  
 Suspension bridge, Williamsburg...\*397  
 "Swift," 38-knot destroyer...\*156  
 Swing seats, rope brackets for...\*47

**T**  
 Table-top photography...\*224  
 Tall buildings of New York...\*400  
 Technical heads for technical city departments...370  
 Telautograph, new form of...\*352  
 Temperature, the earth's... 46  
 Telegraph sounder, improved...\*283  
 Telegraphic cables, and fishing methods...298  
 Telephotographic process, new...190  
 Telescopes, mountains of Switzerland...\*277  
 Tetrahedral steamers...\*473  
 Theories verified, some...254  
 Thunder storms, young girl's theory of...123  
 Tie, improved railroad...\*436  
 Ties, steel... 4  
 Timber, machine for piling...\*88  
 Tire for automobile wheels...\*228  
 Torpedo craft, tactical value of...330  
 Torpedo, Davis projectile...\*159  
 Torpedo, delayed-action...150  
 Torpedoes, hot-air-driven... 77  
 Tourmaline, trick with...\*381  
 Toys and tricks, recent...\*227  
 Toys, new mechanical...\*453  
 Trains under the East River...\*191  
 Trap, moth, electric...138  
 Tree candles, Christmas, protect...\*379  
 Tree planting, railroad... 63  
 Tuberculosis Congress, Sixth, 222, 242  
 Tuberculosis exposition in New York...451  
 Tubes and sheets, Cowper-Coles process... 9  
 Tunnels and subways...\*404  
 Turbine propellers...259  
 Twin propellers for aeroplanes...279  
 Two thousand-foot building...\*53  
 Typhoid bacillus, destroyed by water storage...218

**U**  
 Ultra-violet rays, effects on eye...278  
 Umbrellas, method of christening...143  
 Universal joint, simple design...\*247

**V**  
 Vacuum cleaner, home-made...\*320  
 Valve gear, Walschaert...335  
 Valves, expansion at high temperature...314  
 Vanderbilt cup race, 1908...294, \*312  
 Varnish made with carbon tetrachloride...313  
 Veneer and waste wood...256  
 Venom from the lancehead viper...426  
 Venus, calendar of inhabitants... 87  
 Villages at great altitudes...169, 315  
 Volcanic ash as building material...335

**W**  
 Wagons, brake mechanism for...\*436  
 Wall paper, sanitary... 79  
 Walls, cement-coated enameling...106  
 Warship, the fastest...4, 59  
 Warships, rearming of...155, 279  
 Waste wood and veneer...256  
 Water current motor...\*283  
 Water famine, precaution against...310  
 Water, price of...224  
 Water sterilized at the tap...276  
 Water storage destroys typhoid bacillus...218  
 Water supply, Catskill...\*396  
 Waterproof fuse cap...\*340  
 Waterproof matches...247  
 Waterproof mitts...92  
 Waterways, useful artificial... 5  
 Weather charts, of high seas... 8  
 Weather instruments, home-made... 2  
 Welding, electric, new method... 4  
 Whaling methods, improvements... 3  
 White Mountain express, wreck...223  
 Winch, improved...\*339  
 Winding indicator for watches...436  
 Wire fastener...340  
 Wire suspension foot bridge...\*136  
 Wireless telephony, long-distance, Collins...\*185  
 Wireless typewriter, Knudsen...\*296  
 Wood, cutting with paper...\*247  
 Wood, microscopic tests of...257  
 Workshop, construction of...\*359  
 Workshop, furnishing the...\*456  
 Workshop, handy man's...350  
 Wreck of White Mountain ex... 54  
 Wrench, handy...128  
 Wright, Wilbur, at Le Man...133  
 Wright, Wilbur, in France...169  
 Wright, Wilbur, fulfills French contract...258  
 Wright, Wilbur, record for height...350

**Y**  
 Yacht racing in 1908...218  
 Yacht racing, schooners, for international...392  
 Yuma dam...\*293  
 Yuma Valley, irrigation of...\*73