

0.13
328

THE
Street Railway
Journal.

INDEX TO VOLUME XIV.

1898.

Street Railway Publishing Co.,
Havemeyer Building, 26 Cortlandt Street,
New York.

72498

INDEX TO VOLUME XIV

T.F.
701
T75

A

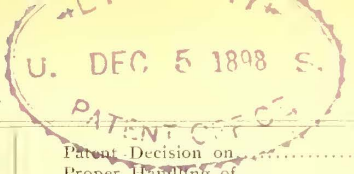
Acceleration Car: Economy in..... c 262 c 432
 Elevated Railways in Chicago..... *755
 Power Consumption in [Armstrong].... *312, *376, 539
 Tests of, at Schenectady, N. Y..... *319
 Accident: Blanks in New Orleans..... c *83
 Claim (Middletown, N. Y.)..... a 52
 Freak, in New York City..... *181
 Street Railway [Robinson]..... 86
 Accountants' Association, Street Railway:
 Benefit of..... 329
 Development of..... 700
 Editorials on..... 139, 618
 New Members for..... a 52
 Boston Convention:
 Exhibition of Blanks and Forms at.. 614
 Notes and Comments on [Kittredge]. 619
 Papers at..... 632
 Proceedings of..... 606
 Program of..... 221, 509, 538
 Standard System of Accounts, see Accounts.
 Accounts: Accident in New Orleans, Blanks for..... c *83
 Advertising..... a 448
 Development of..... 209
 Exhibition of Blanks and Forms at Boston..... 614
 Materials in Store [Kittredge] a 156, a 215, a 335
 Notes on [Kittredge]..... a 101
 Park..... a 216
 Questions on, before Committee on Standardization [Kittredge]..... a 99
 Special Forms for..... a 157, a 216
 Standard System of Street Railway.. a 336, a 388
 [Kittredge]..... a 417
 Theory of Reserve and Suspense [Kittredge]..... a 796
 Voucher System of Bookkeeping [Kittredge]..... a 731
 Accumulators, Electric Traction by [Ziffer].. 711
 Advertising: Creating Traffic by*[Kennedy] *366, 617
 Parks, Method of Keeping Accounts of.. a 216
 Printing on Transfers in Paris..... i 796
 Street Railway, and Accountants..... a 448
 Agent, Promotion of Traffic by a General Passenger [Kennedy]..... *366
 Ahearn, Thomas..... 410
 Air Brakes, see Brakes, Air.
 Air Motors, see Motors, Air.
 Air Power, see Power, Air.
 Akron, O., New Power Plant at..... *523
 Algiers, Electric Railway at..... 346, i *732
 Allen, C. Loomis..... 234, 750
 Alternating Current Transmission, see Power Transmission.
 Aluminum Gears, Manufacture of..... *192
 American Air Power Co., Formation of..... 109
 American Institute of Electrical Engineers, Paper before [Armstrong]..... *376
 American News Notes, see News of the Month.
 American Street Railway Association:
 Editorials on..... 616
 Meeting of Executive Committee..... 92
 New Officers..... 616
 Officers and Executive Committee..... *507
 Standard Rules for Employees..... 780
 Boston Convention:
 Bureau of Information at..... 688
 Convention Hall for..... *108
 Exhibits at..... *661
 Group of Visitors at..... *685
 Hotel Accommodations and Exhibition Space at..... a 394
 Papers and Committees..... 437, a 447
 Papers Read before..... 621
 Plans for..... a 220
 Proceedings of..... 591
 Program of..... a 161, 509
 Proposed Exhibits at..... 583
 Representatives of the Press at..... 656
 Representatives of Street Railway Companies at..... 653
 Social History of..... 605
 Supply Men in Attendance at..... a 657
 Veterans at..... *683
 Visiting Ladies at..... 655

Among the Manufacturers..... 63, 115, 170, 234, 299, 351, 411, 467, 587, 689, 750, 820
 Amusement Business, To What Extent Should Street Railways Engage in the [Holmes]..... 641
 Amusements: See also Parks and Pleasure Resorts.
 Anderson, Ind., Railway Between Marion and Annual Reports:
 Blackpool Corporation Electric Tramways..... i 796
 Chicago City Railway Co..... 104
 Compania de Ferrocarriles del Distrito Federal, Mexico..... \$
 Dublin United Tramways..... 578
 General Electric Co..... 295
 Melbourne Tramway & Omnibus Co.... i 803
 North Shore Traction Co., Boston..... a 52
 Arc Lamp, see Lamp, Arc.
 Argentine Republic, Electrical Orders..... 223
 Meat Cars in..... *747
 Armature Cradle, Ingenious Form of..... *137, *429
 Armatures, Shop for Repairing..... *748
 Asphalt, Handling..... 150
 Atlanta, Ga.: New Car in..... *81
 Novel Truck of..... *166
 Street Railway Situation in..... c 82
 Attractions at Parks, see Parks.
 Auckland, N. Z., Street Railway System of.. i *215
 Augusta, Ga.: Notes on Current Practice in. 195
 Austria, Dickinson Trolley in..... *564
 Condition of Several Tramways in [Ziffer]..... i 275
 Axles: Casting New Ends on..... c 117
 Pressing Wheels on..... c 190, c 320, c 431
 Tests on Wheel and..... 457

B

Babbitt Bearings, Solid (Sanford)..... *228
 Babbitting Boxes [Fells]..... c *17
 Baker, R. F..... 299
 Baker, Sir Benjamin..... i 341
 Ballantyne, C. G..... i *734
 Baltimore, Md.: Convertible Cars in (Brill). *808
 New Equipment of..... 743
 And Northern Electric Railway Co..... *175
 Third Rail System in B. & O. Tunnel... 794
 Bancroft, W. A..... 62, a *803
 Bangor, Me., Patton Motors in..... *812
 Banks, William..... 410
 Barnard, John II..... a *804
 Barre, Vt., Transmission Plant at..... *526
 Bars, Commutator, see Commutators.
 Base, Trolley, Duplex (Moyer)..... *460
 (Walker)..... *293
 Baylor, A. K..... 406
 Bearings, Solid Babbitt (Sanford)..... *228
 Belgian Engineers, Visit to England..... 533
 Belgium, Electric Railway Development in. i 46
 Small Railways in..... i 339
 Bending: Wood..... c *262
 Punching and Bending Machine (L. & A.)..... *292
 Bennett, E. H..... 411
 Bettis, Howard I..... 169
 Bicycle Holder (Graham-Woodward)..... *54
 Bishop, George W..... *503
 Blackpool; Gas Motor Traction in [Hersey]. i *799
 Tramway System of..... i *795
 Blanks, see Accounts.
 Block-Chuck Valve Reseating Machine (W. & MacDuffie)..... *290
 Blodgett, Geo. R..... 63
 Blowouts, Solenoid (Walker)..... *559
 Boilers: Contract (Stirling)..... a 802
 Patent Decision on..... 749
 Prevention of Scale in (Dearborn)..... *569
 Specifications for in Torrington, Conn... 155
 Boker, H. H..... 299
 Bolts, Manufacture of (Diamond)..... 817
 Bonds, Rail, see Rail Bonds.
 Book Inspector's Instruction..... c *15
 Bookkeeping, see Accounts.
 Booster: Connections..... c *84, c 136
 Economy of [Woodbridge]..... 130
 Recent (Westinghouse)..... *551
 Service, Feeders for [Parshall]..... *323
 See also Storage Battery.
 Boston, Mass.: Apparatus in Use in..... 585
 Broad-minded Street Railway Men in..... 505

Cars in..... *561
 Changes in..... 105
 Conventions at, see American Street Railway Association and Accountants' Street Railway Association.
 Engine Shaft for..... *576
 Engines in (Rice & Sargent)..... 688
 New 3000-kw. Generator for (Walker).... 409
 New Lighting Plant in..... 167
 North Shore Traction Co., Annual Report of..... a 52
 Proposed Elevated Railway in..... *501
 Situation in..... 268, 328
 Standard Air Brakes in..... a 660
 Street Railway Conditions, and Financial Results in..... *471
 Subway..... 76, *493
 Ventilation of (Sturtevant)..... *813
 Terminal Railway Station in, Large..... *41
 Trucks, in (Brill, 21 E)..... *558
 Bowen, M. K..... 62
 Boxes, Babbitting [Fells]..... c *17
 Sand, see Sand Boxes.
 Brackenridge, J. C..... 234
 Bradford, Eng.: Electric Construction in... *532, 730
 Bradford, H. P..... 233, 466
 Braintree, Mass.: Storage Battery at (Hatch). *579, 743
 Brakes, Air, Boston, in (Standard)..... a 660
 Changes in Company (Standard)..... 61, 108
 Manufacture of (Christensen)..... *164, *572
 New Geared (Standard)..... *349
 Brakes: Emergency Pavement (Fairchild).... *110
 Friction (Price)..... 574
 New System of Electric (Henry)..... 433
 Safety (Kilgour)..... *113
 Brake Shoes: New Principle in (A. & M.).. 575
 New Type of (Diamond S)..... 573
 With Cork Inserts (Compo)..... 61, 568
 Brazer, Gasoline (White)..... *56
 Breakers, Circuit, see Circuit Breakers.
 Bridge, Hose (Rochester)..... *55
 Brill Co., J. G.:
 Cars, Buenos Ayres, Mcat..... *747
 Baltimore, Convertible in..... *808
 Brooklyn, Convertible in..... *811
 Export for..... i *285
 Liverpool, England..... *727
 Parlour..... *457
 Monte Carlo, Monaco..... *239
 New York..... *227, *539, *794
 Exhibit at Boston..... *682
 Snow Plow, Heavy..... *109
 Truck, Boston (21 E)..... *558
 Paris, Locomotive..... *347
 Brisbane, Aus., Tramway System of [Brown]. *528
 British, see Great Britain.
 Brockton, Mass.: Power Station Tests in.... 434
 Street Railways in and Near..... *486
 Brooklyn Bridge: Electric Cars Cross... *39, 80, 138
 Electrolysis on..... 90
 Elevated Trains Operated by Electricity on..... *385
 Brooklyn, N. Y.: Electric Fountain in [Darlington]..... *128
 Brooklyn Elevated Railroad Co., Electric Equipment of..... 138, *168, *210, *385
 Motor on (Walker)..... *464
 Results of Operation Compared with Elevated Roads in Chicago..... *755
 Brooklyn Heights R. R., Convertible Cars for (Brill)..... *811
 Employment Bureau of [Kennedy].... *333
 General Passenger Department of [Kennedy]..... *366
 Instruction Book for Inspectors on... c *15
 Track Bonding of [Brown and Chapman]..... 650
 Track Construction of [Carver]..... 652
 Purchase of Sea Beach Railroad..... 342
 Coney Island & Brooklyn Railroad, Parlour Car on (Brill)..... *457
 Special Work of..... *346
 Cost of Station Operation in..... 265
 Nassau Electric R. R. Co., Shops of [Hobart]..... *182
 Special Cars of..... *704
 Brown, E. D..... 467
 Brushes: Carbon and Their Manufacture.... 748
 Self-lubricating (Partridge)..... 566



Brussels, see Belgium.

Buenos Ayres, Meat Cars in (Brill)..... *747

Electric Railway Development in [Ward-law] i *387

Buffalo, N. Y.: Buffalo & Lockport Railway. *535

Buffalo Railway Co., Storage Plant of...41, *383

Proposed Suburban Line Near..... 233

Builders, Some Suggestions to European Electric Railway..... 506

Butte, Mont.: Handling Ore in..... *227

Transmission of Power to [Tandy]..... *93

By-products of the Power House [Fenner].. 649

C

Cable: Conduit, Changing to Electric Conduit in Washington..... *37

New York..... *791

Construction in Edinburgh [Colam]..... 542

Operation in New York City, Compared with Electric and Horse..... 721

Calendars for 1898..... a 52, 108

Camden, Me., Race Between a Deer and Car at 775

Camden, N. J.: Gloucester & Woodbury Railway, Park of..... *211

Canadian Electrical Association, Meeting of.. 460

Cape Town, South Africa, Electric Railway at i *211

Carbon Brushes, see Brushes.

Carroussell, Switch-Back (Norman & Evans). 233

Car Acceleration, see Acceleration, Car.

Cars: American, in Manila (Brill)..... *461

Atlanta, Ga..... *81

Bodies, Maintenance and Repair of [Scovill] 224

Boston and Vicinity, in..... *561

Cleaning, Systematic.....196, c 708

Paper on [McAdoo]..... 363

Preparations for (Modoc)..... 559

Combination in Providence, R. I. (American) *568

Company, New English..... i 392

Comparative Earnings of Single and Double Truck [McCulloch]..... *627

Composite, on New England Railroad... *41

Construction, Points on Poor..... c *85

Convertible (Duplex)402, *809

Baltimore (Brill)..... *808

Brooklyn (Brill)..... *811

Editorials on.....380, 617, 789

New York (Brill)..... *794

Toledo, O. (Pullman)..... *569

Curtains, see Curtains, Car.

Dayton & Western Traction Co. (Kuhlman) *456

Double Deck for Mixed System, Paris... *209

Double Truck..... *401

Kinetic *557

New York City..... *227, *539

Equipments, Inspection and Testing of [Perkins] 630

Equipment and Maintenance of [Hopkins] 642

Funeral, in Mexico..... *131

Improved Interurban..... c *133

"In the White" for Export (Brill)..... i *285

Large Unit for Street [Brill]..... *401

Liverpool, England (Brill)..... *727

Meat, in Buenos Ayres (Brill)..... *747

Mileage, see Mileage, Car.

Monte Carlo, Monaco, for (Brill)..... *289

New (Jackson & Sharp)..... 819

Oscillation of.....226, c *263

Parlor (Brill)..... *457

Manchester, N. H. (Briggs)..... *559

Parade of Decorated, New Orleans..... a *279

Rochester, N. Y..... c *261

Seats, see Seat Car.

Special in Brooklyn, N. Y..... *704

Storage Battery in New York..... 210

Transporting Standard Gage, on Narrow Gage Railways..... *715, 812

Trust, New..... 409

Wheel, see Wheel, Car.

Woodwork for (Sjoberg)..... *562

Works, Large, in New England (Laconia) 564

Receivership, for Well-Known (Stephenson) 749

Carson, Howard A..... *501

Casting: End on an Axle..... c *171

Engine Cylinder c *191

Cast Welded Joints, see Rail Joints.

Catalogues..66, 118, 173, 238, 302, 354, 413, 469, 590
690, 754

Electrical Machinery (Westinghouse)..... 744

Engines (Bullock)..... 819

Installations, Electrical..... i 104

Insulating Materials (H. W. J.)..... 287

Rails297, 344

Ropes (Roebling)..... 466

Catcher, Trolley Pole (Wilson-Thomson).... *59

Cedar Falls, Ia., Street Railway System of... *72

Cement, Testing..... 132

Central Electric Co., Change of Headquarters a 394

London Underground Railway, see London, Eng.

Station, see Power Station.

Chambers Creek, Wash., New Transmission Plant at..... 36

Charleston, S. C., Notes on Current Practice in 194

Checking Employees [Walter]..... 741

Collection of Fares, and [Ferguson]..... 375

Chicago, Ill.: City Railway Co., Annual Report of..... 104

New Equipment of..... *456

Elevated Railway Problems and Results.. *755

Lake Street Elevated, New Truck on... *745

Milwaukee Electric Railway..... 358

Multiple Unit System in..... 19

South Side Elevated, Electricity on..... *331

Motor (G. E. 57 B)..... *818

Multiple Series System on..... *763

Truck, Extra Strong on (Peckham)..... *814

Pivotal for (McGuire)..... *816

Storage Battery Traction in..... 43

Street Railway Fight in..... *787

Union Elevated (Loop) Railway..... *766

Christiania, see Scandinavian Peninsula.

Cicott, Frank X..... 234

Cincinnati, O.: Street Railway Co., Chester Park Shops of..... *77

Power Station, Hunt Street [Baldwin] *239

Safety Brake on (Kilgour)..... *113

Circuit Breakers: Development of (Cutter)... *558

Magnetic Blowout (G. E.)..... *570

Circuits, Return, see Return Circuits.

Cities, Street Railways in Small [Lesseure].. 375

Clambake, Annual, of Well-Known Electrical Works 686

Clark, W. J.....750, a *805

Report on Cuba by..... 466

Clark, Henry J..... 233

Classification, Numerical, of Ry. Literature. i 104

Cleaning Car, see Car Cleaning.

Cleveland, Ohio, Impossibility of Reducing Fares in [Short]..... a 43

Clip, Trolley, see Overhead Appliances.

Coal, Steam Producing Value of..... *199

Coast Defense, Electric Railways as an Auxiliary to [Clark]..... 648

Cokeley, M..... 750

Collection of Fares, see Fares.

Columbus, Ohio, Guide to..... 461

Combination Car, see Car.

Commutators, Method of Sandpapering Generator *13

Comparative Costs and Profits of Cable, Electric and Horse Railways in New York 721

Comparison of Gross Receipts for 1896 and 1897372, 380

Compression in Engine Cylinders..... c 136

Condenser, "Injector" (Bulkley)..... *56

Conduct, G. Herbert..... 62

Conductors, see Employees.

Conduit: Electric, Changing Cable Conduit to, in Washington..... *37

New (Jenney)..... *563

New York, Cost of Operation..... 721

Laying in (McRoy)..... *774

Metropolitan St. Ry. Co.....437, 719

Systems, Present Status of [Ziffer].... 712

Third Ave. Railway in New York...371, *791

Coney Island, New Route to..... a 342

Third Railway System at (Safety)..... *809

Connecting vs. Bonding Rails [Birdsall].... *18

Conservatism, English..... 91

Consolidation of Westinghouse and Walker Companies 687

Steel Interests..... a 806

Construction, see Car Construction, Track Construction, Overhead Construction, etc.

Construction Notes..... 397

Consulting Engineer, Customer, and Electrical Manufacturer, Relations Between [Greene] 88

Contacts, Headlight c *85

Controller: New Type for Electric Cars (Henry) 433

Patent Decision on..... 350

Proper Handling of..... c 133

Series K. 2 (G. E.)..... i 284

Solenoid Blowouts, for (Walker)..... *559

Converters, Rotary: Recent (Westinghouse). *553

In Street Railway Work [Bell]..... *512

Copenhagen, Fares and Earnings of Tramways at [Madsen]..... 425

Tramways in [Faber-Madsen]..... i *217

See also Denmark.

Cork Inserts, Brake Shoes with (Compo)...61, 568

Cork, Ireland, Electric Railways in..... *6

Correspondence, School of Instruction..... 346

Cost of, Operation, Construction, Repairs, etc., see Finance.

Couplings, Automatic (Van Dorn)..... *577

Large Order for (Van Dorn)..... *816

Crafts, William A..... *503

Crank Shafts (Bchthlem)..... *248, *576

Cripple Creek, Col., Interurban Railroading at *701

Crouse-Hinds Electric Co., Change in Branch Office 233

Cuba, Electric Development in.....616, 652, 788

Remarkable Report on [Clark]..... 466

Unsanitary Conditions in..... 720

Curtains: Car (Burrowes)..... 287

Imitation Leather (Pegamoid)..... 744

New Material for Car (Moroccoline)...556, 810

Customer, Consulting Engineer and Electrical Manufacturer, Relations Between [Greene] 88

Cutters, Gear (Nuttall) *110

Cylinder: Casting an Engine..... c 191

Compression in Engines..... c 139

D

Danforth, R. E..... 62

Davenport, C. G..... a *805

Dayton, Ohio: Dayton & Western Traction Co., Cars for (Kuhlman)..... *456

Electrolysis of Cast Iron Pipes at [Brown]. 785

Street Railway System of..... *119

Decorated Cars, Parade of, in New Orleans.. a *279

Deer, Race Between a Car and..... 775

Defense, Electric Railways as an Auxiliary to Coast [Clark]..... 648

Denmark, and Scandinavian Peninsula, Tramways in [Madsen]..... i 104, i 801

See also Copenhagen.

Denver, Col.: Notes from..... c *261

Novel Gravity Road in..... *334

Depreciation as a Factor in Four-Cent Fare Litigation381, 397

De Ronde, F. S..... a *805

Designing Parks, see Parks and Pleasure Resorts.

Developing Traffic, see Traffic.

Development in Europe, Possibilities of Electric Railway i 43

Dickinson, Alfred..... i 342

Dillingham, B. F..... i *734

Dinner, Complimentary, to F. S. Pearson.... 168

Distribution of Power from a Central Station 91

Door, New Vestibule (Agard)..... *54, 577

Double Truck Cars, see Cars, Double Truck.

Dover, England, Electric Railroading in..... i *335

Draft, Mechanical, in Manufacturing Establishments *458

Drake, F. E..... 688

Draw-Bridge: Overhead Construction on, in New York City *188

Safeguard for 74

Drill: New Rail (Michigan)..... *406

Rail, Self Feeding (O. & C.)..... *228

Drilling Machine, New Rail (Buda)..... *292

Dublin, Ireland: Electric Railways in..... *4

[Boyd] i 736

New Construction in..... *203

Report of United Tramways Co..... 578

Duncan, Jr., W. B..... a *804

Duncan, Louis..... a *804

Dunkirk, N. Y., Sale of Exhaust Steam, in [Fenner] 649

Duties of the General Manager..... 201

Dynamo, see Generator.

E

Earnings, Comparative, and Economy of Operation Between Single and Double Truck Cars [McCulloch]..... *627

Fares of Copenhagen Tramways and.... 425

See also Gross Receipts.

Ear, Trolley, see Overhead Appliances.

Abbreviations: * illustrated, c correspondence, a American edition only, i international edition only.

Earth Return, see Return Circuit.
 East St. Louis, Ill., St. Louis, Bellville & Suburban Railway359, *442, *568
 Eck, Justus 61
 Economizing Electrical Power [Connett]...505, 511
 Economy: of the Booster [Woodbridge]..... 130
 Of Operation Between Single and Double Truck Cars [McCulloch]..... *627
 Edinburgh, Scotland, Cable Construction in [Colam] 542
 Electrical: Dealers, Well-Known (Anderson). 561
 Driven Pump, Triplex (Worthington).... *109
 Engineer, Institute of Correspondence... 346
 Exhibition, Exhibits at.....*60, 290, 294, a *339
 Paper at [Short]..... 343
 Program for 163
 Manufacturer, Customer, and Consulting Engineer, Relations Between [Greene]. 88
 Electric; Conduit, see Conduit, Electric.
 Fountain in Brooklyn [Darlington]..... *128
 Heaters, see Heaters, Electric.
 Light Association, see National Electric Light Association.
 Locomotive, see Locomotives.
 Electrolysis: Brooklyn Bridge, on..... 90
 Cast Iron Pipes at Dayton [Brown]..... 785
 Editorial on..... 789
 Fallacies Regarding [Herrick].....*186, *775
 Notes on [Cardew].....326
 Prevention of [Parshall] 322
 [Natalis] i *277
 [Trotter] 326
 See also Return Circuits.
 Elevated Railways: Editorial on Future of... 800
 Problems and Results..... *755
 Emergency: Pavement Brake (Fairchild).... *110
 Wagon, see Wagon, Emergency.
 Emery, Charles E.....*62, 411
 Employees: Attitude and Relation with Employers139, 200
 Checking [Walter] 741
 Collection of Fares and Checking [Ferguson] 375
 Conductors and Motormen, Questions for, in St. Louis, Mo..... 107
 Increased Pay to, in New York City.... 443
 Method of Hiring in Brooklyn [Kennedy] *333
 Profit Sharing with..... 267
 Report of Committee on Standardization, Rules for 780
 Wages Paid to, in England..... i 390
 Employment Bureau of the Brooklyn Heights Railroad [Kennedy]..... *333
 Energy, see Acceleration.
 Engineering, Poor Piece of.....c *17, c *84, c 135
 Engineers: at Boston Convention, Foreign... 615
 European i 341
 Hawaiian Islands i *734
 War Service, Brigade of.....297, 409, 455, 461
 Engines: American, from an English Standpointc *708
 (American Ball) *257
 (Armington & Sims)..... *259
 (Ball) *252
 (Ball & Wood).....*32, *576
 (Buckeye) *27
 Cylinder: Castingc *191
 Compression in..... c 136
 (Dick & Church) *255
 Electric Ry. Power Stations [Emery]...*23, *244
 (Fitchburg) *250
 Gages and Valves, for (Crosby)..... 577
 Indicators for (Crosby) 407
 (McIntosh & Seymour).....*29, i 797
 (Newburgh) *247
 (Porter-Allen) *24
 (Rice & Sargent).....248, 688
 San Antonio, Texas, Large in (Murray). *575
 Shafts for (Bethlehem).....*248, *576
 Stop and Speed Limit (Monarch)..... *291
 (Watertown) *254
 Willans for Electric Traction [Lazenby]...a *736
 (Wright) *244
 England: Electric Traction in.....534, i 804
 American Engines, from Standpoint of...c *708
 New Car Company in..... i 392
 Notes from i 802
 Visit of Belgian Engineers to..... 533
 Equipment and Maintenance of Electric Cars [Hopkins] 642
 Escott, E. R. S..... i *449
 Europe: Electric Railways in..... 265
 British Capital in Tramways of..... i 161

Electric Railway Builders in, Some Suggestions to..... 506
 Engineers in..... i *341
 Mechanical Motive Powers in [Ziffer]... 710
 Possibilities of Electric Railway Development in..... i 43
 Evian-les-Bains, Switzerland, Three-Phase Electric Railway i *731
 Excursion Traffic, Methods of Increasing [Banks] a 795
 Exhibition, Electrical, see Electrical Exhibition.
 Export, Cars for (Brill)..... i *285
 Express and Freight Interurban Line (Mahoning Valley) *81
F
 Fans, Boston Subway, Used in (Sturtevant).. *813
 Fares: Boxes for, see Registers, Fare.
 In Cleveland, Impossibility of Reducing [Short] a 43
 Collection of and Checking Employees [Ferguson] 375
 Earnings of Copenhagen Tramways and [Madsen] 425
 Reduction of, see also Municipal Control. Register, see Register, Fare.
 System of Collection of [Walter]..... 741
 Federal Steel Co., Formation of..... a 806
 Feeders: Determining Losses in Return [Trotter] 326
 Method of Arranging [Natalis]..... i *277
 Testing [Herrick].....*186
 Notes on [Cardew]..... 326
 Return Booster Service for [Parshall].... *323
 See also Return Circuits.
 Feed-Water, Cost of..... c 320, c 369
 Fender: Efficiency of a Well-Known (Providence) *743
 New Car (Hipwood-Barrett)..... *686
 New Type of (Graf)..... 807
 Wheel Guard, and New (Parmenter).... *228
 Field, B. K..... 115
 Fight, Street Railway in Chicago..... *787
 Finance, Street Railway: Companies in the Hands of Receivers..... a 735
 Comparative Costs and Profits of Cable, Electric and Horse Railways in New York 721
 Earnings and Economy of Single and Double Truck Cars [McCulloch].... *627
 Comparison of Gross Receipts of 175 Companies372, 380
 Dublin Electric Tramways, a Financial Forecast i 736
 Feed-Water, Cost of..... c 320, c 369
 Operating Expenses in Kansas City..... 71
 Operation of Various Mechanical Traction Systems, Cost of [Ziffer]..... 710
 Power, Cost of Electric [Conant]..... *621
 Cost of Hired Electric..... 373
 Cost of Motive..... c 85
 Power Station Operation in Brooklyn, N. Y., Cost of..... 265
 Records in Trenton..... c 265
 Repairs of Motors, Cutting Down Cost of [McAdoo] *11
 Results in Metropolitan, Boston..... *471
 Statistics, Their Use and Abuse [Hibbs]. 638
 Electric Tramways in Switzerland i 99
 See also Annual Reports.
 Fire from Using Old Wire..... c *85
 Fireworks as Attractions at Parks.....a *255
 First Electric Railway [Henry].....c *264
 Fitchburg, Mass., Whalom Park at.....a *276
 Flooring Machine, New Triple Cylinder (Fay) *747
 Foreign: Notes, see International News Notes.
 Tramways, British Capital in..... i 161
 Forms, see Accounts.
 Foundry at Schenectady (G. E.)..... 289
 Fountain, Electric, in Brooklyn [Darlington] *128
 Four Cent Fare, see Municipal Control.
 Fowler, Sir Benjamin..... i 341
 Framingham, Mass., Street Railways in and Near *484
 France: Condition of Mechanical Traction on the Tramways of [Boyer]..... i c 51
 Heavy Electric Railroading Proposed in.. *317
 Impulse Wheels in (American)..... *229
 Line Material in..... i 221
 Status of Electric Traction in..... i 160
 Tramways in..... 787
 Tramway Visitors from..... 223
 Franchise Conditions, see Municipal.
 Franklin Institute, Program of..... 718

Freight, Electric Locomotive (G. E.)..... *111
 And Express Interurban Line (Mahoning Valley) *81
 Hull in *355
 Lockport in..... *535
 Fredonia, N. Y., see Dunkirk, N. Y.
 Friction Brake, see Brake.
 Fuel, Furnace Adapted for Cheap (Meldrum) *286
 Funeral Cars in Mexico..... *131
 Furnace, Adapted for Cheap Fuels (Meldrum) *286, *403
 Fuyioka, I..... 298
G
 Gages and Valves (Crosby)..... 577
 Gage, Transporting Cars on Narrow.....*715, 812
 Gaining Machine, Automatic Car (Fay)..... *567
 Galvanized Iron, Paint for 810
 Gas Motor Traction [Hersey].....i *799
 Gasoline Brazier (White)..... *56
 Gaston, Wm. Alex..... *169
 Gate, Patent Car (Wood)..... *686
 Gears: Cutters (Nuttall)..... *110
 Forged Steel Split (Duquesne) *409
 Large Plant for Making (Dorner & Dutton) *112
 Life of in Pittsburgh..... 11
 Making Aluminum.....c *192
 General Electric Co.:
 Arc Lamp, Direct Current..... 807
 Annual Report of..... 295
 Belt-Driven Generator..... *55
 Changes in Stock..... a 394
 Exhibit at Boston..... *683
 Electric Locomotives.....*111, *355, *408, *535
 Foundry at Schenectady..... 289
 Lighting Plant in Boston, Contract for.. 167
 Magnetic Blowout Circuit Breakers..... *570
 Motor (No. 51 B)..... *345
 (No. 57 B)..... 818
 (No. 58)..... *459
 (No. 55)..... *578
 Late Forms of Overhead Appliances..... 574
 Patent Controversy with Walker Co..... 465
 Power Transmission Apparatus at Mechanicsville, N. Y..... *580
 Wattmeters for Storage Batteries..... *288
 General Manager, Duties of..... 201
 General Passenger Agent, see Agent, General Passenger.
 Generator: Belt Driven (G. E.)..... *55
 3000 kw. for Boston (Walker)..... 409
 Brushes, see Brushes.
 Large Railway (Walker) *566
 Patent Decision on Windings of..... 400
 Recent (Westinghouse)..... *549
 Geneva, Switzerland, Meeting of International Street Railway Association at, see International Street Railway Association.
 Georgia, Street Railway Situation in..... c 82
 Germany: Dickinson Trolley in..... *564
 Electrical Syndicates in..... i 389
 Extensive Electrical Construction in...571, i 47
 Insulating Paint in..... i *804
 Manufacturing Companies, Consolidation of, Defeated i 802
 Gibbings, Alfred..... i *734
 Glasgow, Scotland, Electric Railways in..*728, i 797
 Gloucester, Mass., Street Railways in and Near *480
 Goodwin, H. B..... *503
 Gorner-Grat, Switzerland, Three-Phase Mountain Railway in..... 36
 Gratz, Austria, Electric Railway Between Maria Trost, and..... *729
 Gravity Road in Denver, Col..... *334
 Greasing, Wire Appliance for (Dalgleish)... *232
 Great Britain: British Capital in Foreign Tramways i 161
 Electric Tramway Situation in [McCallum] i c 48
 Electric Railway Development in..... i 43
 Interurban Tramways in [McCallum].... i 657
 Methods of Placing Tramway Contracts in i 220
 Municipalism in the Tramway Field, in [McCallum] i 735
 Greene, S. Dana.....a *804
 Griffin, Col. Eugene.....298, 688, 750, a *803
 Grinnell, S..... 411
 Grinding Car Wheels: Economy of..... 381
 Machine for (Hampden)..... *57
 Gross Receipts for 1896 and 1897, Comparison of372, 380
 Ground Return, see Return Circuits.

H

Halifax, Eng.: Electric Railways in [Wilms-hurst] *144
 Engineers in i *449
 Handling: Asphalt 150
 Controllers, Properly c 133
 Hanger, Self-Locking (E. R. E. Co.) *461
 Hawaiian Islands, Engineers in i *734
 Hayward, A. H. 169
 Headlights, Electric (Neal) *563
 Contacts c *85
 (Syracuse) 165
 Headquarters, New Electrical (Central Elec-tric Co.) a 394
 Heaters, Electric: Improvements in (H. W. J.) *288
 (Gold) *463, *582, *809
 Patent Decision 410
 (Safety) *293
 Statements Concerning 690
 Heating and Ventilating Apparatus (Sturte- vant) *744
 Heat Unit: Standard, Rating Power Plants on 19, 20
 Heavy Electric Railroad: near Lockport, N. Y. *535
 Paper on [Short] 343
 Proposed in France *317
 Recent Construction on N. Y., N. H. & H. R. R. [Heft] *540
 Truck for (McGuire) 112
 Heulings, Jr., William H. 750
 Hired Electric Power, Cost of 373
 Hoboken, N. J., Thirty-ton Electric Loco- motive in (G. E.) *111
 Holder, Bicycle (Graham-Woodward) *54
 Holland, Mich., Electric Railway at *424
 Holyoke, Mass., Electric Railway System of *415
 Honolulu, Street Railways of [Cicott] *725
 Hopkinson, Dr. John 342, i 658
 Horse: Operation in New York City, Com- parison of 721
 Hose Bridge (Rochester) *55
 House, Car, Novel Construction in Spring- field, Mass. 436
 Hull, Canada, Electric Railway System of [Armstrong] *355

I

Illinois Street Railway Association: Forma- tion of 72
 Meeting of 374
 Meeting of Executive Committee *124
 Impulse Wheel, see Wheel.
 Incorporated Association of Municipal and County Engineers, Paper Before 542
 Indicator, Steam Engine (Crosby) 407
 "Injector" Condenser (Bulkeley) *56
 Inspection and Testing of Motors and Car Equipments [Perkins] 630
 Inspectors, Instruction Book for c *15
 See also Employees.
 Institution of Electrical Engineers (British), Papers Before 322
 Instruments, Street Railway Switchboard (Keystone) *746
 Insulation: Manual (Mica) 292
 Mechanical, for Electric Cars [Crane] 556
 Paint in Germany i *804
 See also Overhead Appliances.
 International News Notes, i 51, i 105, 162, 222, 283, a 344, 395, 450, i 657, i 737, i 804
 International Street Railway Association, Geneva Meeting:
 Announcement of i 450
 Editorial on 720
 Paper at [Ziffer] 710
 Proceedings at [Ziffer] *713
 Interurban Railways:
 Anderson and Marion, Ind., Connecting.. Baltimore & Northern Electric Railway Co. *175
 Carrying of United States Mail on [Dim- mock] 639
 Cripple Creek, Col., District Railway, System of *701
 Dayton to Hamilton *121
 Freight and Express (Mahoning Valley) *81
 Great Britain, in [McCallum] i 657
 Holland & Lake Michigan Railway *424
 Improvements in c *133
 St. Louis, Belleville & Suburban *359, *442
 Schuylkill Valley Traction Co., System of *361
 Torrington & Winchester Street Railway. *151

Ireland: Tramway Situation in Great Britain and [McCallum] i c 48
 Iron, Preserving, from Rust c 370
J
 Jack, Car Replacing (Pearson) *55
 Japan, Electric Railways in [Fujioka] i 340
 Jersey City, N. J., Consolidated Traction Co., Lease of 223, a 394
 Johns, Henry W. 170
 Joints, Rail, see Rail Joints.
K
 Kansas City, Mo.: Early Electric Road in... c *264
 Metropolitan Street Railway Co. *67
 Kidd, J. S. *233
 Kimball, G. W. 115
 Kincaid, Joseph i 341
 Kinetic, Motor: Car *557
 Legal Definition of 565
 Letter Concerning c 85
 Kinks: Railway Shop [Fells] *321
 Trolley Pole Rope *86
L
 Lake Michigan, Holland & Lake Michigan Railway *124
 Lamp, Arc, Well-Known (Monarch) *461
 Direct Current Enclosed (G. E.) 807
 Lap Jointed Track *407
 Launches, Electric 233
 Lawrence, Mass., Electric Switching Loco- motive at (G. E.) *408
 Leathers, Imitation (Pegamoid) 744
 Legal:
 Carriers of Passengers, Fetter on a 45
 Contribution in Collision Cases a 337
 Courts and Rapid Transit in New York.. a 41
 Courts and Street Railways a 102
 Decisions:
 Charters, Franchises, Ordinances, Powers, etc. a 45, a 103, a 159, a 218, a 281, a 391, a 449, a 732, a 800
 Liability for Negligence. a 45, 103, a 160, a 218, 388, a 389, a 450, a 800
 Use of Streets and Highways a 281
 Definition of Locomotive Steam Power... 565
 Degree of Care Demanded of Street Rail- way Companies a 449
 Negligence, Thomas on a 392
 Law, Novel Index of [Hamilton] a 800
 Patent Decision: Advertising Racks 463
 Boiler 749
 Controllers 350
 Electric Heaters a 159, 410
 Motor (Sprague) 220
 Motor Suspension 350
 Regulation of Compound Wound Dynamos 400
 Suspended Switches in Traveling Contacts 460
 Plaintiff's Negligence Is Not a Defense, When a 217
 Probable Street Railway Legislation 90
 Publications, Legal a 45, a 161, a 392
 Statutes of Limitations in Tort Cases... a 280
 Value of a Child's Life a 799
 Van Depoele Trolley Litigation a 282, 461
 Letters and Hints from Practical Men... 14, 82, 133, 190, 261, 320, 369, 431, 708
 Life of Ties [Willis] 225
 Lighting Plant in Boston 167
 "Lightning," Special Number of 230
 Lights in War Service, Portable 456
 Lisbon, Portugal, Electrical Equipment in.. 350
 Liverpool, England, New Cars for (Brill).... *727
 Lockport, N. Y., Steam Railroad Conversion Near *533
 Locomotive, Electric: Freight (G. E.)... *111, *408
 Hoboken, N. J., 30-Ton Electric 41
 Hull, Canada *355
 Lockport, N. Y. *535
 Small Lines, for (L. W. & D.) *686
 Storage Battery, for Trunk Lines i *342
 Switching (McGuire) *575
 Locomotive, Stored Steam [Ziffer] 710
 London, Eng., Central London Underground Railway System of 139, *141, i 658
 Common Council, Report on Motors to [Baker] i 803
 Electrical Orders in (Laing, W. & D.)... i 221
 Electric Railway for 408
 Engines for 461
 Tramways of [McCallum] i 389
 [M. L. C.] i c 340
 United Tramways, Electricity on i 804

Visit of Prominent Tramway Capitalist from 454
 Los Angeles, Cal., Street Railway System of. *303
 Low Fares, see Fares, also Municipal.
 Lubricants, Car Journal (Hanna) 465
M
 Mahoning Valley Railway Co. *81
 Mail, Carrying on Street Railways [Dim- mock] 639
 Maintenance: of Car Bodies [Scovill] 224
 And Equipment of Electric Cars [Hop- kins] 642
 Of Trucks [Hartson] 224
 Management, Relation of Employees to... 139
 Manchester, N. H., Parlor Cars in (Briggs). *559
 Manila, American Cars in (Brill) *461
 Mansfield, George W. 467
 Manufacturers, see Among the Manufacturers.
 Maps:
 Anderson and Marion, Ind., Railway Be- tween 772
 Baltimore, North and West Suburbs of.. 178
 Boston Elevated Railway System 478-479
 Boston Metropolitan, Street Railway Sys- tems in 471-492
 Boston Subway 494
 Central London Underground Railway... 141
 Cape Town, S. A., Showing Tramway System of i 212
 Copenhagen, Denmark, Showing Tram- way System i 219
 Europe and Portion of United States, Showing Comparative Areas i 45
 Feeder System, Dublin, Ireland 206
 Geneva and Its Railways 713
 Los Angeles, Cal., Showing System of Los Angeles Railway Co. 304
 Metropolitan Street Railway, Kansas City, Mo. 68
 Paris, France, Showing Proposed Route of Orleans Railroad 317
 Philadelphia, Pa., Showing Lines of the Union Traction Co. 694, 695
 Port Elizabeth, S. A., Showing Tramway System of i 212
 St. Anthony's Falls, Showing Location of Water-Power Plant *269
 Schuylkill Valley Traction Co., System of. 362
 Vienna, Austria i 338
 Maria Trost, Austria, Electric Railway Be- tween Gratz and *729
 Marion, Ind., Railway Between Anderson and Marseilles, France, Tramway Changes in... 534
 Massachusetts: Act Relative to Street Rail- ways in 454
 Board of Railroad Commissioners *503
 Relations Between Street Railways and Municipalities in 21
 Report of Investigating Committee in... 202
 Street Railway Association, Meeting of.. 615
 Matching and Planing Machine (Fay) *294
 Materials in Store, Accounts of [Kittredge]. a 156, a 215, a 335
 McLean, Thomas H. 62, 169, 290
 Meadville, Pa., Electric Railway System of.. *359
 Meat, Handling in Buenos Ayres (Brill).... *747
 Mechanical: Draft, see Draft, Mechanical.
 Stoker, see Stoker, Mechanical.
 Traction, Recent Improvements in, for Street Railways [Ziffer] 710
 Mechanicsville, N. Y., Power Transmission at *580
 Melbourne, Annual Report from i 803
 Memphis, Tenn., Recent Improvements in... *334
 Merry-Go-Rounds, see Carroussell.
 Metallic Packing (Duval) *55
 Metropolitan Street Railway Employees' As- sociation, Paper on Street Railway Ac- cidents [Robinson] 86
 Mexico: Electrical Equipment in 350
 Funeral Cars in *131
 Street Railroad in *8
 Mica, Manual of Insulation (M. I. Co.) 292
 Middleborough, Stockton & Thornby, Elec- tric Tramway 534
 Middletown, N. Y., Accident Claim in... a 52
 Mileage, Car: How Arrived at, and Its Use [Ford] 639
 Method of Keeping Records... a 336, 380, a 387
 Unnecessary Track and 438
 Milwaukee, Wis.: Delightful Trip to 749
 Four-Cent Fare Litigation in 381, 397
 Important New Work in a 52

Abbreviations: * illustrated, c correspondence, a American edition only, i international edition only.

| | | | | | |
|--|------------------|---|------------|--|--------------------|
| Minary, T. J..... | 351 | Manhattan Railway, Electricity on..... | 138 | Designing [Pincus]..... | a 211 |
| Minneapolis, Minn.: Accounting Forms in | | Metropolitan Street Railway Co., Acci- | | Editorial on..... | 721 |
| a 157, a 216 | | dents on [Robinson]..... | 86 | Fireworks as Attractions at..... | a 285 |
| Water-Power Plant at St. Anthony's Falls | *269 | Results of Operation Compared with | | Increasing Traffic to [Banks]..... | a 795 |
| Mixed Electric System: | | Elevated Roads in Chicago..... | *755 | Management of [Davis]..... | 741 |
| Double Deck Car, in Paris..... | *209 | Future of..... | 800 | Methods of Advertising [Kennedy]..... | *366 |
| Origin of..... | c 14 | Cars for (Brill)..... | *227, 539 | Methods of Operating [Kennedy]..... | 647 |
| Present Status of [Ziffer]..... | 712 | Results, Cable, Electric and Horse | | What Extent Should They Be Installed | |
| Montana Power Co., Description of [Tandy]. | *93 | Railway, Operation of..... | 721 | [Holmes]..... | 641 |
| Monte Carlo, Monaco, Cars for (Brill)..... | *289 | Increase of Pay to Conductors..... | 443 | Parshall, H. F..... | i 341 |
| Montevideo, Uruguay, Street Railways in... | c 320 | New Equipment for..... | 163 | Parsons, John B..... | 743 |
| Montpelier, Vt., Transmission Plant at..... | *526 | New Underground, Electric Construc- | | Patent: Controversy (Walker vs. G. E.).... | 465 |
| Mosquitoes, Methods for Exterminating..... | 267 | tion of..... | 437 | Decision, see Legal. | |
| Motive Power, see Power. | | Rapid Underground Conduit, Construc- | | List of...66, 118, 174, 238, 302, 354, 413, 469, 823 | |
| Motormen, see Employees. | | tion of..... | 719 | Paterson, N. J., Car Cleaning at [McAdoo].. | *363 |
| Motors: Compressed Air [Ziffer]..... | 710 | Snow, Effect of, on..... | 788 | Cutting Down Cost of Repairs of Motors | |
| Electric Railway [Hanchett]..*9, *74, *125, *184 | | Prospects for the Construction of an | | in [McAdoo]..... | *11 |
| Brooklyn Elevated Railroad (Walker).. | *168, *210, *464 | Underground Road in..... | 90 | Patterns, Preserving..... | c 369 |
| Brushes, see Brushes. | | Third Avenue Railway Co., Freak Acci- | | Patterson, W. S..... | *63 |
| Cutting Down Cost of Repairs of | | dent on..... | *181 | Patton Motor, Long Distance, Test of..... | *226 |
| [McAdoo]..... | *11 | Large Contracts of..... | 743 | Bangor, Me., in..... | *812 |
| Elevated Railway (G. E. 55)..... | *578 | Proposed Underground Construction | | Development of..... | *562 |
| (G. E. 57 B)..... | *818 | of..... | *371, *791 | Pay Roll Charges, see Accounts. | |
| Heavy (G. E. 51 B)..... | *345 | Storage Battery Cars in..... | 210 | Pearson, F. S., Dinner to..... | 168 |
| Inspection and Testing of [Perkins].. | 630 | New York, New Haven & Hartford Railroad | | Peckham Truck Co.: Exhibit at Boston..... | *681 |
| Maintenance of [Hopkins]..... | 644 | Co., Electric Construction on [Heft].... | *540 | Extra Strong in Chicago..... | *807, *814 |
| Narrow Gauge (G. E. 58)..... | *459 | New York State, Street Railway Association, | | Maximum Traction Truck, No. 14, D. 2.. | *555 |
| Patent Decision on (Sprague)..... | 220 | Brooklyn Meeting: | | No. 14 D..... | *232 |
| Recent (Westinghouse)..... | *549 | Delegates and Visitors at..... | *652 | Metropolitan, Special Truck..... | *167 |
| Report on Tramway [Baker]..... | i 803 | Papers at..... | 645 | Swing Bolster, Double Trucks..... | *113 |
| Shop for Repairing..... | *748 | Plans of..... | 465 | Trucks for Double Deck Cars..... | *57 |
| Suspending, Patent Decision on | | Proceedings of..... | 609 | Peekskill, N. Y., Volunteer Engineers at... | 461 |
| Methods of..... | a 104 | New Zealand, Auckland, Street Railway Sys- | | Pellissier, G..... | 233 |
| Suspension, Patent Decision on..... | 350 | tem of..... | i 215 | Pennsylvania Street Railway Association, | |
| Thirty-H.P. (Steel)..... | *59 | Non-Magnetic Watches (Becken)..... | *229 | Scranton Meeting: | |
| Gas, Traction [Hersey]..... | i *799 | Norfolk, Mass., Street Railways in and Near | *485 | Change in Time of..... | 344 |
| Kinetic, Double Truck Car..... | *557 | Norristown, Pa., Schuylkill Valley Traction | | Papers at..... | 741 |
| Mechanical Status of Various Systems of | | Co., System of..... | *361 | Printed Proceedings of..... | 109 |
| [Ziffer]..... | 710 | Norway, see Scandinavian Peninsula. | | Plans of..... | a 660, 738 |
| Paris..... | i 392 | No Seat, No Fare..... | 90, 268 | Periodicals, Special Number of "Lightning". | 230 |
| Patton, Development of..... | *562 | Nuttall Co., R. D., Early History of..... | *63 | Perry, Nelson W., Death of..... | 223 |
| Bangor, Me., in..... | *812 | Gear Cutters of..... | *110 | Personals...62, 114, 169, 233, 298, 351, 410, 466, 587, 688, | |
| Long Distance Test of..... | *226 | | | 749, 820 | |
| Moulding Machine, Extra Heavy (Fay).... | *406 | | | Philadelphia, Pa., Union Traction Co.: Edi- | |
| Mountain Railways, Construction of..... | 436 | | | torial on..... | 720 |
| Mt. Tom Railroad..... | *420 | | | New President for..... | 743 |
| Multiple Unit System in Chicago (Sprague). | 19, *331, *763 | | | Organization and Operating Methods.... | *691 |
| Municipal Control: Act Relative to Street | | | | Switchboard of..... | 819 |
| Railways in Massachusetts..... | 454 | | | Westchester Traction Co., Cars for | |
| Arguments Against..... | 21 | | | (J. & S.)..... | 819 |
| By Street Railways..... | a 220 | | | Pinions, see Gears. | |
| Four-Cent Fare Litigation, Depreciation | | | | Pipes, Mending Broken..... | c 369 |
| as a Factor in..... | 381, 397 | | | Method of Determining Value of as Re- | |
| Franchise, Tramway, in Vienna Settled | | | | turns [Herrick]..... | *778 |
| [Ziffer]..... | i 809 | | | Pittsburgh, Pa.: Changes in..... | *97 |
| Georgia, in..... | c 82 | | | Ingenious Devices in..... | 137 |
| No Seat, No Fare..... | 90 | | | Life of Gears, Pinions and Trolley | |
| Relations Between Authorities and Street | | | | Wheels in..... | 11 |
| Railways..... | 201, 202 | | | Special Work in..... | *209 |
| See also Fares and Transfers. | | | | Storage Batteries as Station Auxiliaries | |
| Municipalism in the British Tramway Field | | | | in..... | *1, 22 |
| [McCallum]..... | i 735 | | | Wheel Records in..... | 11 |
| Murray, W. L..... | 115 | | | Planing and Matching Machine (Fay).... | *294 |
| | | | | Plastic Rail Bond, see Rail Bond, Plastic. | |
| | | | | Pleasure Resorts, see Parks. | |
| | | | | Plow, Heavy Snow (Brill)..... | *109 |
| | | | | Poles: and Cars in Rochester, N. Y..... | c 261 |
| | | | | Catcher (Wilson-Thomson)..... | *59 |
| | | | | Corrugated Steel (Bibber-White)..... | *577 |
| | | | | Preserving Wooden (Fitch)..... | 568 |
| | | | | Poor Piece of Engineering..... | c 117, c 84, c 135 |
| | | | | Porcelain Insulators (Locke)..... | a 394 |
| | | | | Port Elizabeth, South Africa, Electric Rail- | |
| | | | | way at..... | i 211 |
| | | | | Portland, Me.: Fighting Snow in..... | *124 |
| | | | | Snow Plow in..... | *209 |
| | | | | Riverton Park at..... | a 275 |
| | | | | Porto Rico, Electric Development in...616, 652, 788 | |
| | | | | Power: Air, Consolidation of Air Power | |
| | | | | Companies..... | 109 |
| | | | | Consumption in Electric Railroad | |
| | | | | [Dodd]..... | *545 |
| | | | | Elevated Railways in Chicago..... | *755 |
| | | | | In Rapid Transit Service..... | c 432 |
| | | | | [Armstrong]..... | *312, 539 |
| | | | | Cost of, Hired, Electric..... | 373 |
| | | | | For Street Railways [Conant]..... | *621 |
| | | | | See also Finance, Street Railway. | |
| | | | | Distribution of, from a Central Station.. | 91 |
| | | | | Economizing Electrical [Connett]..... | 505, 511 |
| | | | | Legal Definition of Locomotive Steam.. | 565 |
| | | | | Saver, Rail Bonding as a [Chase]..... | 224 |
| | | | | Power Stations: Cost of Feed-Water in...c 320, c 369 | |
| | | | | Cost of, Operating [Conant]..... | *621 |
| | | | | Operation in Brooklyn, N. Y..... | 265 |
| | | | | See also Finance, Street Railway. | |

By-Products of the [Fenner]..... 649
 Engines for [Emery].....*23, *24
 Furnace for Burning Refuse (Meldrum).. *103
 Hunt Street, Cincinnati, Ohio [Baldwin]. *239
 New, at Akron, Ohio..... *523
 Power Distribution from a Central..... 91
 Rating, on Heat Unit Standard..... 19
 Records in Trenton..... c 265
 Safety Devices for (Monarch)..... *291
 Specifications for, in Torrington..... 152
 Steam Producing Value of Three Kinds of Coal *199
 Storage Batteries as Auxiliaries in Pittsburgh *1
 Tests in Brockton, Mass..... 434
 Power Transmission: Alternating Apparatus for (Walker)..... *53
 Barre, Vt., Plant at..... *526
 Contracts for Another Plant..... 688
 Chambers Creek, Wash., Plant at..... 36
 Cripple Creek, Col., Plant at..... *701
 Evian-les-Bains, Switzerland, Plant in... i *731
 Lockport, N. Y., Plant Near..... *535
 Mechanicsville, N. Y., Large Plant in... *580
 Montana Power Co., Plant of [Tandy]... *93
 St. Anthony's Falls Water Power Plant.. *269
 Sault Ste. Marie, Mich., Plant at..... *462
 Rotary Converter in [Bell]..... *512
 Three-Phase System in London..... 139, *141
 Westinghouse Co., Plants Installed by... 565
 Practice, Notes on Current..... *194
 Prague, Austria, New Electric Construction in i 659
 Pratt, Charles B..... 351
 Pratt, George E..... 410
 Preserving Wooden Ties and Poles (Fitch).. 568
 Press: Discussion of Municipal Ownership in the Daily 22
 Relation of Street Railways to [Kennedy] 647
 Precece, Address of W. H..... i 804
 Pressing Wheels on Axles..... c 190, c 320, c 431
 Prizes, for Employees..... *107, 139
 Profitable, How to Make, Small Street Railways 140
 Profit-Sharing Between Employees and Employers..... c 16, 267
 Progressiveness, American..... 91
 Prospects for New Business in 1898..... a 46
 Providence, R. I., Combination Car in (American) *568
 Pueblo, Col., Reorganization in..... 569
 Pugh, D. W..... 688
 Pugh, John S..... 115
 Pump, Triplex Electrically Driven (Worthington) *109
 Punching and Bending Machine (L. & A.).. *292
 Purchasing Electrical Apparatus, Facilities for i 390

Q

Questions for Conductors and Motormen, in St. Louis, Mo..... 107
 Quin, Robert C..... i *734
 Quincy, Mass., Street Railways in and Near. *490

R

Race Between a Deer and Electric Car..... 775
 Rail Bonding [Harrington]..... *42
 Vs. Connecting [Birdsall]..... *18
 As a Power Saver [Chase]..... 224
 In Brooklyn [Brown and Chapin]..... 650
 Rail Bonds: Drop in [Parshall]..... 323
 New Plastic (Brown)..... *348
 New Type of (Bryan)..... *58
 Notes on [Cardew]..... 326
 Plastic [Parshall]..... 325
 Present Types of..... *519
 Resistance of [Trotter]..... 326
 Terminal Connectors, and (McLaughlin). *745
 Welded (Payne)..... *402
 See also Return Circuits.
 Rail Drill, see Drill.
 Rail Joints c 369
 American *347
 Churchill..... *812
 Lap *407
 New Cast, and Steel..... 42
 Rapid Increase in Use of Cast Welded (Falk) 749
 Resistance of [Parshall]..... 324
 Rails, Catalogue of..... 297, 344
 Construction of, from a Scientific Standpoint [Moxham]..... 645
 Method of Determining Value of as Returns [Herrick]..... *778
 Steel, in America..... 138
 Machine for Cutting (Q. & C.)..... *813

Composition and Resistance of [Parshall] 323
 Railway Men in the Late War..... a *803
 Rapid Transit Service: Power Consumption [Armstrong]..... *312, *376, c 432, 539
 Reavis, Charles B..... 587
 Receivers, List of Street Railway Companies in the Hands of..... a 735
 Receivership for John Stephenson Co..... 749
 Recording Fares, New System of (Ohmer).. *571
 See also Registers.
 Records, Car Mileage..... a 536, 380
 [Kittredge]..... a 387
 Wheel, in Pittsburgh 11
 Life of Gears, Pinions and Trolley Wheels in Pittsburgh..... 11
 Power Station in Brooklyn, N. Y..... 265
 Power Station in Trenton, N. J..... c 265
 Storage Battery Traction in Chicago..... 43
 Refuse, Furnace for Burning (Meldrum).... *403
 Registers: Fare, Individual [Nicholl]..... 651
 New Portable (Rooke)..... *564
 New Recording (Ohmer)..... *571
 New Type (Mcaker)..... *815
 Relations Between the Customer, Consulting Engineer, and the Electrical Manufacturer [Greenc]..... 88
 Repainting Cars [Hopkins]..... 645
 Repair: of Car Bodies [Seovill]..... 224
 Of Motors, Cutting Down Cost of [McAdoo] *11
 Shops, Cincinnati Street Railway Co.'s, Chester Park *77
 Kinks [Fells]..... *321
 Modern *748
 Nassau Electric Railroad Co., Brooklyn [Hobart] *182
 Practice (Staten Island)..... *429
 Salt Lake City..... c 190
 Replacing Jack (Pearson)..... *55
 Report: Annual, see Annual Report.
 Interesting, on Motors [Baker]..... i 803
 Remarkable, on Cuba [Clark]..... 466
 Reseating Machine, Valve (W. & MacDuffie) *290
 Resistance, Frictional, see Acceleration.
 Return Circuit:
 Best Way to Arrange [Natalis]..... i *277
 Drop in the Line, Rigging for Testing.. c *16
 Making [Parshall]..... 322
 Notes on [Cardew]..... 326
 [Trotter] 326
 Sydney, in..... c 134
 Testing [Herrick] *186
 Testing Resistance of..... c 135
 See also Electrolysis.
 Rewards, see Prizes.
 Richardson, George 454
 Richmond, Va., Historic Electric Railway at. 138
 Rides, per Capita in Small Towns, Average.. 98
 Rigging, Home-Made, for Testing, for Voltage c *16
 Roadbed, New Book on Street Railway..... 579
 Robert, Louis E..... 234
 Robinson, James Clifton 587
 Rochester, N. Y., Poles and Cars in..... c *261
 Rogers, G. Tracy *615
 Rolling Stock, see Cars.
 Rope: Trolley, Kink..... *86
 Wire, Catalogue of (Roebing)..... 466
 Rossiter, MacGovern & Co., New Home for. 233
 Rules Permitting Smoking..... 91
 Standard 780
 Rusling, F. O..... 233, 351
 Russell, Frank D..... 351
 Rust, Preserving Iron from..... c 370

S

Safety Brake (Kilgour) *113
 St. Anthony's Falls, Water-Power Plant.... *269
 St. Louis, Bellville & Suburban Railway, System of..... *442, 568
 Salt Lake City, Utah: Notes on Current Practice in..... c 190, *194
 Salt, Substitute for in Removing Snow..... 820
 San Antonio, Tex., Large Engine in (Murray) *575
 Sand Boxes: Electric and Cable Cars, for (Haim) *460
 Hose in Pittsburgh..... 137
 San Diego, Cal., Early Electric Road in... c *264
 Sand-Papering, Generator Commutators, Method of *13
 Sanford, John E..... *503
 San Francisco, Cal., Notes on Current Practice in 196
 Sault Ste. Marie, Mich., Power Transmission Plant at *462

Sawing Machine, for Cutting Steel Rails (Q. & C.) *813
 Scandinavian Peninsula and Denmark.
 Tramways in [Madsen]..... i 104, i 801
 See also Copenhagen.
 Schenectady, N. Y.: Acceleration Test at... *319
 Foundry at (G. E.)..... 289
 Scale, Prevention of, in Boilers (Dearborn).. *560
 Seat-End Panel, Round Corner (Brill)..... 108
 Seats: Imitation Leather, for (Pegamoid).... 744
 New Car (H. B. & W.)..... *288
 New Material for (Morocoline)..... 556, 810
 Sellon, Stephen i 342
 Separators: New Steam (Hoppes) *347
 Test of Steam (Coebrane)..... 233
 Sergeant, Charles Spencer..... *615
 Shafts, Hollow Forged (Bethlehem)..... *576
 Shallenberger, O. B..... 115
 Shepard, C. D..... 115
 Shipperd, John J..... 411
 Shoes, Brake, see Brake Shoes.
 Shop, Repair, see Repair Shop.
 Short, S. H..... *168
 Signal System, for Single Track Roads [Cooper] 648
 (Ramsey) *567
 Single-Track Roads, Advantage of Double Track Over 267
 Truck Cars, see Cars, Single Truck.
 Sioux City, Ia.: Notes on Current Practice in. 195
 Sioux City Traction Co., Construction of [Wilson] *439
 Small Street Railways, How to Make Profitable 140
 Smoke: Furnace Adapted for Prevention of (Meldrum) *286
 Preventing Device 747
 Smoking, Rules Permitting..... 91
 Snow: Fighting, in Portland, Me..... *124
 New York, Effect of, in..... 788
 Plow, Heavy (Brill)..... *109
 Substitute for Salt in Removing..... 820
 Soap, for Cleaning Cars (Modoc)..... 559
 Solenoid, Blowouts (Walker)..... *559
 South Africa, Two Electric Railways in... i *211
 South America, see Under the Individual Countries.
 Southwestern Gas, Electric and Street Railway Association, Formation of..... 108, a 221
 Papers Before 224
 Souvenir, Tasteful (Sargent)..... 292
 Special Work: Large Piece of..... *346
 Pittsburgh, Pa., in..... *209
 Specifications for Track, etc., in Torrington, Conn. 152
 Speed: see Acceleration.
 Limit for Engines (Monarch)..... *291
 Spike, Diamond *812, 817
 Spokane, Wash., Notes on Current Practice in 195
 Springfield, Mass., Electric Railway System of *415
 Spring, Window (Sjoberg)..... *562
 Standard System of Street Railway Accounting, see Accounts.
 Staten Island: Electric Railway Co., Emergency Wagon Service of..... *364
 Repair Shop, Practice on..... *429
 Exterminating Mosquitoes in..... 267
 Steam Railroad a 806
 Statistics, Their Use and Abuse [Hibbs].... 638
 Staunton, Va., Highland Park at..... a *279
 Steam: Heating by Exhaust [Fenner]..... 649
 Producing Value of Three Kinds of Coal. *199
 Roads, to Be Equipped with Electricity.. 21
 Equipped with Electricity, Near Lockport, N. Y..... *535
 Statistics for a 806
 Separators, see Separators, Steam.
 Stored, Locomotives [Ziffer]..... 710
 Users, Decision Affecting..... 167
 Steel Motor Co., 30-H.P., Motor..... *59
 Interests, Consolidation of..... a 806
 Stockholm, see Scandinavian Peninsula.
 Stoker: Mechanical (American)..... 495
 Operation in Brooklyn..... 747
 Stephenson Co., Receivership for..... 749
 Storage Battery: Auxiliaries at Barre, Vt.... *526
 Braintree, Mass., at (Hatch)..... *579, 743
 Buffalo, N. Y., for..... 41, *383, 613
 Chicago, Traction in..... 43
 Construction of Chloride..... i *391
 Locomotive for Trunk Lines (Kummer). i *342
 New York, Cars in..... 210
 Paris i 391
 Station Auxiliaries, in Pittsburgh..... *1
 Sydney, in..... c 134

| | | | | | |
|--|------------------------|--|------------------|--|--------------------------|
| Wattmeters for (G. E.)..... | *288 | Train Order, First Electric..... | c *82 | Walls, Boring Wire Holes in..... | c *433 |
| Store, Accounts of Materials in [Kittredge]..... | a 156, a 215, a 335 | Trains, Two Handsome (B. & S.)..... | 414 | Wardwell, Fred..... | 115 |
| Straightening Wire, Tool for..... | c *432 | Transfers, see Municipal Control. | | War, Spanish-American: Brigade of Engineers, see Engineers..... | |
| Stratton, James A..... | 234 | Transmission, Power, see Power Transmission. | | Editorial on..... | 266 |
| Street Railway Accountants' Association, see Accountants' Association. | | Trenton, N. J., Power Station, Records in..... | c 265 | Railway Men in..... | a *803 |
| Suburban Railways, see Interurban Railways. | | Trip, Delightful..... | 740 | Results of..... | 504 |
| Subway, Boston, Mass., see Boston, Mass. | | Trolley Ear, see Overhead Appliances. | | Portable Lights in..... | 456 |
| Suggestions, Some, to European Electric Railway Builders..... | 506 | Trolley Poles, Wheels, Wire, etc., see Poles, Wheels, Wire, etc. | | Washington, D. C., Changing Cable to Electric in..... | *37 |
| Surfacer, Triple Cylinder (Egan)..... | *816 | Trolley: Dickinson, in Germany and Austria..... | *564 | Washington Park, Attractions at..... | a *211 |
| Surveys, Device for Making Preliminary..... | *290 | New Walker..... | *293 | Wash, White and Color Washes [Hobart]..... | 137 |
| Swain, George F..... | *503 | Truck: at Atlanta..... | *166 | Watches, Non-Magnetic (Becken)..... | *229 |
| Sweden, see Scandinavian Peninsula. | | Boston, in (Brill, 21 E)..... | *553 | Waterloo, Ia., Street Railway System of..... | *72 |
| Switchboards: Instruments for (Keystone)..... | *746 | Class H, Double (B. & S.)..... | *809 | Water Power: Cost of for Street Railways [Conant]..... | *621 |
| Philadelphia..... | 819 | Dayton & Western Traction Co. (Peckham)..... | *456 | Sault Ste. Marie, Mich., Plant at..... | *462 |
| Recent (Westinghouse)..... | *554 | Electric Locomotive (Brill)..... | *347 | Mechanicsville, N. Y., Plant at..... | *580 |
| Switches, Suspended, Patent Decision on..... | 460 | For Double Deck Cars (Peckham)..... | *57 | St. Anthony's Falls, Plant at..... | *269 |
| Switching, Electric Locomotives for (G. E.)..... | *408 | Heavy Electric Service (McGuire)..... | 112 | Wattmeters, for Storage Batteries (G. E.)..... | *283 |
| (McGuire)..... | *575 | Maintenance [Hartson]..... | 224 | Weaver, W. D..... | 466, a *804 |
| Switzerland: Mountain Electric Road in (Zermatt)..... | *166 | [Hopkins]..... | 643, 644 | Webb, Sidney..... | 351 |
| Three-Phase Mountain Railway at Gorner Grat..... | 36 | Maximum Traction, Test of (Peckham)..... | 454 | Welded Joints, see Rail Joints. | |
| Tramways of [Rochat]..... | i *99, i *156 | New 14 D 2 (Peckham)..... | *555 | Welsh, John Lowber..... | 743 |
| Sydney, New South Wales, Tramway System of..... | c 134, c 193, c 371 | 14 D (Peckham)..... | 232 | Wessels, E. J..... | 63, 234 |
| Syndicates, Great German Electrical..... | i 389 | "Metropolitan Special" (Peckham)..... | *167 | Westinghouse Electric & Manufacturing Co., Consolidation of, with Walker Co..... | 687 |
| | | New, on Chicago, Lake Street Elevated.. | *745 | Contract for a Long-Distance Power Transmission Plant..... | 688 |
| T | | New Motor (Dorner)..... | *230 | Exhibit at Boston..... | *685 |
| Tackaberry, John A..... | 688 | New Steam and Electric Passenger [McGuire]..... | *291 | Power Transmission, Plants Installed by..... | 565 |
| Taylor, W. H..... | 688 | Oscillation of [Brill]..... | 226 | Recent Electric Apparatus of..... | *549 |
| Terminal Connectors (McLaughlin)..... | *745 | [Uebelacker]..... | *263 | Special Catalogue of..... | 744 |
| Terminal Railway Station, in Boston..... | *41 | Relative Value of Single and Double [McCulloch]..... | *627 | Wheels: Car and Axle Tests..... | 457 |
| Testing: Apparatus for Drop in Circuit [Parshall]..... | 325 | Swing Bolster, Double (Peckham)..... | *113 | Regrinding..... | 381, c 431 |
| Car Wheels..... | 405 | Trust, New Car..... | 409 | Machines for (Hamden)..... | *57 |
| Cement..... | 132 | Tunnel, Third Rail System in B. & O..... | 794 | New Manufacturing, Plant (Pennsylvania)..... | 61 |
| Inspection of Motors and Car Equipments [Perkins]..... | 630 | Turnouts: Signal System for [Cooper]..... | 648 | Pressing on Axles..... | c 190, 200, c 320, c 431 |
| Motors in Paterson, N. J. [McAdoo]..... | *11 | (Ramsey)..... | *567 | Records in Pittsburgh..... | 11 |
| For Resistance of Feeders and Ground Return [Herrick]..... | *186 | | | Testing..... | 406 |
| Resistance of Feeders and Ground Return [Herrick]..... | *186 | | | Guard, Fender and (Parmenter)..... | *225 |
| Return Circuits, see also Return Circuits. | | U | | Impulse in France (American)..... | *229 |
| Rigging, Home-Made, for Testing Drop..... | c *16 | Underground: Conduit, see Conduit. | | Trolley, Life of, in Pittsburgh..... | 11 |
| Axles and Wheels..... | 457 | Railway, Central, London..... | *141 | White-Washing and Color Washes [Hobart]..... | 137 |
| Power Station, in Brockton, Mass..... | 434 | Unit: Large, for Street Cars [Brill]..... | *401 | Whittlesey, J. T..... | 233 |
| Texas, Street Railway Association in, see Southwestern Gas, Electric and Street Railway Association. | | System, see Multiple Unit System. | | Willans, Engine for Electric Traction [Lazenby]..... | a *736 |
| Third-Rail System: Safety (S. T. R. Co.)..... | *231, 298 | | | Wilmshurst, T. P..... | i *419 |
| Baltimore & Ohio Tunnel..... | 794 | V | | Winchester, Conn., & Torrington Street Railway..... | *151 |
| Coney Island (Safety)..... | *809 | Values: Reseating Machine for (W. & MacDuffie)..... | *290 | Winslow, I. E..... | i 342 |
| Equipment of Brooklyn Elevated Railroad..... | *385 | Steam Gages and (Crosby)..... | 577 | Wire: Boring Holes in Walls for..... | c *433 |
| See also Multiple Unit System. | | Van Depoele Trolley Case, Decision in..... | 461 | Catalogue of (Roebbling)..... | 466 |
| Thompson, S. P..... | i 342 | Ventilating and Heating Apparatus (Sturtevant)..... | *744 | Fire from Using Old..... | c *85 |
| Thomson, Henry M..... | 467 | Boston Subway (Sturtevant)..... | *813 | Tool for Straightening..... | c *432 |
| Three-Cent Fare, see Municipal Control. | | Vestibule Door, New (Agard)..... | *54, 577 | Trolley, Appliance for Greasing (Dalglesch)..... | *232 |
| Three-Phase Electric Railway, see Power Transmission. | | Vienna, Austria, New Electric Railways in [Ziffer]..... | i 448 | Wiseman, Alfred..... | 688 |
| Tickets, see Municipal. | | Stadtbahn [Ziffer]..... | i 337, i 390 | Wood Bending..... | c *262 |
| Ties: Preserving Wooden (Fitch)..... | 568 | Tramway Franchise in [Ziffer]..... | i 800 | Wood, Lieut., Thomas C..... | 467, a *805 |
| Their Life and Preservation [Willis]..... | 225 | Visitors, Foreign Tramway..... | 223 | Wooden Ties and Poles, Preserving (Fitch)..... | 568 |
| Tiffany, Lieut. William..... | 688, a 805 | Voucher System of Bookkeeping [Kittredge]..... | a 731 | Woodbridge, J. Lester..... | 233 |
| Torque, see Acceleration. | | Vulcabeston [Crane]..... | 556 | Woodruff, Ernest..... | *169 |
| Torrington, Conn., Winchester Street Railway..... | *151 | | | Woodwork, for Cars (Sjoberg)..... | *562 |
| Tower Wagon, see Wagon, Tower. | | W | | Woodworking Machinery: Car Gaining Machine (Fay)..... | *567 |
| Track Construction: | | Wages Paid on Tramways in England..... | i 390 | Flooring Machine, New Triple Cylinder (Fay)..... | *747 |
| Brooklyn [Carver]..... | 652 | Wagon, Emergency Service..... | *364 | Moulding Machine, Extra Heavy (Fay)..... | *406 |
| Denver, Col..... | c *261 | Wakefield, Mass., Street Railways in and Near..... | *482 | Planing and Matching Machine (Fay)..... | *294 |
| Recent, in Sioux City, Ia. [Wilson]..... | *439 | Walker Co.: Alternating Apparatus for Power Transmission..... | *53 | Saw and Dado (Egan)..... | *166 |
| Specifications for, in Torrington, Conn..... | 152 | Boston, Exhibit at..... | *676 | Surfacer, Triple Cylinder (Egan)..... | *816 |
| Track, Bad..... | c *708 | Consolidation of, with Westinghouse Co. Electrical Exhibition, New York..... | 284 | Work, Special, see Special Work. | |
| Track Joints, see Rail Joints. | | Motor for Brooklyn Elevated Railway..... | *168, *210, *464 | World's, Manufacturing Facilities for Electric Railway Apparatus..... | 329 |
| Track Mileage, see Mileage. | | New 3000-KW. Generator for Boston..... | 409 | Worswick, A. E..... | 233 |
| Trade Catalogues, see Catalogues. | | Large Generators of..... | *566 | | |
| Traffic: Methods of Developing [Kennedy]..... | *306, 647 | Patent Controversy with General Electric Co..... | 465 | Y | |
| Methods of Increasing [Banks]..... | a 795 | Sault Ste. Marie, Mich., Equipment at..... | *462 | Youngstown, Ohio, System of Mahoning Valley Railway Co..... | *81 |
| Promoting, on Small Street Railways..... | 140 | Solenoid Blowouts..... | *559 | | |
| See also Parks and Pleasure Resorts, Advertising, etc. | | Trolley..... | *293 | Z | |
| | | | | Zermatt, Switzerland, Mountain Electric Road in..... | 165 |