# Electric Railway Journal

APR 191920

## Volume 54

July to December, 1919

12642

## McGraw-Hill Company, Inc.

Tenth Avenue at Thirty-sixth Street
New York City

## Instructions for Use of Index

This index is essentially a subject index, not an index of titles, and articles treating a number of different subjects are indexed under each of them. In addition, a geographical reference is published wherever the article relates to any particular railway company, or to the state matters of any particular state. The geographical method of grouping serves to locate in the index any article descriptive of practices, conditions, events, etc., when the searcher knows the electric railway, city or state to which the article applies. Groupings are made under the name of the city in which the main office of the company is located, but an exception is made in the case of electrified sections of steam railroads, such entries being made direct under the name of the railroad. City or state affairs appear direct under the names of the city or state involved.

In the subject index, the alphabetical method is followed, and if there is a choice of two or three keywords the one most generally used has been selected, cross references being supplied. Below will be found a list of the common keywords used in the index to this volume. This list has been subdivided for convenience into thirteen general subjects, but the general subject headings, shown in capital letters, do not appear in the body of the index. As an example, if a reader wished to locate an article on powerdriven tower wagons he would obviously look in the list under the general subject "Cars and other vehicles," and under this caption, only "Service and tower wagons" could apply to the article in question. The reader would therefore refer to this keyword under "S" in the body of the index.

In addition to the groups of articles covered by these headings the papers and reports from railway associations are grouped under the names of the various organiza-Proceedings of other societies are indexed only in accordance with the subject discussed. Short descriptions of machine tools appear only under the heading "Repair Shop Equipment" and are not indexed alphabetically, because of the wide choice in most cases of the proper keyword.

## CLASSIFIED LIST OF KEYWORDS

#### ACCIDENTS AND ACCIDENT PREVENTION

Accidents (including wrecks) Accident claim department Safety-first movement

#### CARS AND OTHER VEHICLES

Car design Car design
Cars (descriptive)
Cars, one man
Motor buses
Motor cars, gasoline
Service and tower wagons
Work and wrecking cars

#### CAR EQUIPMENT

Bearings Brakes and compressors Controllers Couplers Gears and pinions Motors Trucks Wheels

#### EMPLOYEES

Employees Labor Strikes and arbitrations Wages Wage increases

#### FARES

Fare collection (including apparatus) Fares, analysis of cost Fare increases (actual increases) Fare increases, reasons for Tickets Transfers Zone fare systems

#### FINANCIAL, LEGAL AND STATISTICS

Appraisal of railway property Financial Franchises Accounting Legal Market conditions Maintenance records and costs
Maintenance records and cost
Public service and regulative
commissions

#### HEAVY ELECTRIC TRACTION

Heavy electric traction (general) High voltage d.c. railways Locomotives

#### MAINTENANCE OF EQUIPMENT

Paints and painting Repair shop equipment Repair shop practice Repair shops Tests of materials and equipment Welding special methods

#### POWER

Energy checking devices Energy consumption Feeders Overhead contact system Power distribution

Power stations and equipment Substations and equipment Third-rail contact system Transmission lines

Bridges STRUCTURES Bridges
Carhouses and storage yards
Power stations and equipment
Repair shops
Substations and equipment Waiting stations

#### TRACK

Pavement Rails
Rail joints and bonds
Special work Track construction Track Way

#### TRAFFIC AND TRANSPOR-TATION

Advertising
Freight and express
Operating practice
Publicity
Signals
Stopping of cars
Traffic promotion
Traffic surveys

## MISCELLANEOUS

Management Municipal ownership Pavement Standardization Subways

## INDEX TO VOLUME 54

	Akron, O.;	B			
PAGES BY WEEKS	—Northern Ohio Traction & Light Co.:	Baltimore, Md.:			
No. 1, July 5	Amalgamated Assn.:	Baltimore, Md.: —United Rys. & Elee. Co.: Car vestibuling, 933			
No. 3, July 19 103 to 150	—Comments on decisions, 609 —Comments of Mr. Huff on, 44	Fare increase granted, 736 Wage increase, 407 —Washington, Baltimore & Annapolis Electric			
No. 4, July 26 151 to 206	—Sixteenth convention, 527 American Association of City Representatives of Electric Railways:	R.R.: Revenues jumped 86 per cent, 138			
No. 5, Aug. 2	Constitution and by-laws, 725 American Electric Railway Accountants Assn.: Annual convention, *r85 American Electric Railway Association:	Bay State Street Ry. (see Boston, Mass.)			
No. 7. Aug. 16 309 to 368	—Annual convention, *r85 American Electric Railway Association:	—Bearing jig for locating dowel pin holes, 290 —Insuring proper fits [Dean], 759			
No. 8, Aug. 23 369 to 420 No. 9, Aug. 30 421 to 462	—Annual convention, *r2, r43 —Committee of One Hudred, organization, 33;	<ul> <li>Reclaiming worn motor axle bearings, *565</li> <li>Standard design of journals and journal bearing keys [Chance], 932</li> </ul>			
No. 10, Sept. 6 463 to 508	—Annual convention, *r2, r43  —Committee of One Hundred, organization, 33;  —Program, 54, 80; Report, r50; Work summarized, 943  —Federal Electric Railways Commission (see Federal Electric Railways Commission)	—Standardizations discussed by American Elec- tric Railway Engineering Assn., *r77			
No. 11, Sept. 13 509 to 552		Beaver Valley Traction Co. (see New Brighton, Pa.)			
No. 12, Sept. 20 553 to 606 No. 13, Sept. 27 607 to 682	—Income and expense statement, for 1918-1919, 1010 —Mail pay (see Interstate Commerce Commis-	Belgium: —Electrification proposals [McCallum], 474 Berkshire Street Ry. (see Pittsfield, Mass.) Binghamton, N. Y.:			
No. 14, Oct. 4 683 to 704	sion) —Mid-Year meeting:	-Binghamton Ry.:			
No. 15* Oct. 11, (Report Number) 1 to 130	Comments on, 1029 Program, 1050	Fare increase barred 957			
No. 15A, Oct. 11 705 to 742	-Report of committees, r43 -Report on federal legislation, r45	Birmingham, Ala.:  —Birmingham Rv., J.t. & Pr. Co.:  One man cars, 1064  Wage increase and eight-hour day sought,			
No. 16, Oct. 18	Report on federal legislation, r45  Revision of dues, Comments on, 881  Status of manufacturers, Comments on, 510  Valuation committee report, 222  American Electric Railway, Claims, Assn.	351			
No. 18, Nov. 1 813 to 848	American Electric Railway Claims Assn.:  —Annual convention, *718, r83  —Comments on efforts to reduce accidents, 705	Boston, Mass.:  —Bay State Street Ry. (see Eastern Massachusetts Street Ry.)			
No. 19, Nov. 8 849 to 880	American Electric Railway Engineering Assn.:	—Boston Elevated Ry.: Boycott and strike follow increase in fare.			
No. 20. {Nov. 8, 15, and 29 } 881 to 966	American Electric Railway Engineering Assn.:  —Annual convention, *r69  —Committee assignments, 728  —Committee on standards, Meeting, 444	198 Eight hour day and wage increase granted, 190			
No. 21, Dec. 20 967 to 1028	Equipment committee, meeting of, 33 —Standards, Status of [Cram and Brown],  *507; [Welch], 922; [Chance], 931 American Electric Railway Manufacturers	Fare situation, *547 Financial statement for June. 297			
No. 22, Dec. 271029 to 1070	*507; [Welch], 922; [Chance], 931 American Electric Railway Manufacturers				
*The publishers recommend that this Report Number be bound as an appendix	Assn.: —Annual convention, r86 —Association dissolves, r87	Investigation by special commission, 445 Plans for operation without telephones [Danal, *23 Statement for quarter ending Sept. 30, 733 Strike of car men, 134 Ten-cent fare, 45 Comparison of investments in transit facilities			
at the end of the volume, as suggested in the notice about binding on page 705 of this volume.	American Electric Railway Transportation & Traffic Assn.:				
	—Annual convention, *r53 American Gear Manufacturers Assn.: —Semi-annual meeting. *889 American Institute of Electrical Engineers:	Philadelphia and Boston, 1001  —Eastern Massachusetts Street Ry.:			
A	American Institute of Electrical Engineers: —Limitations in steam-turbine design, *923	Eastern Massachusetts Street Ry.: Commutation ticket, 677 Declares war on jitneys, 593 Fare collection register, Hearing on, 413 Face collection began register prohibited for			
Accident Claim Department:  —Claim adjuster's views on car operating econ-	—Size of turbo-generator units, 882 American Light & Traction Co. (see Muskegon,	onen cars 598			
omy [Giltner], 1045 —Discussed by Pacific Claim Agents Assn., 70	Mich.)  American Public Utility Co. (see Grand Rapids, Mich.)	Fare increase, 44 Monthly tickets, 600 Program with 100 one-man cars, 732			
-Experience with one-man cars [Dixon], 720 -Psychology of claim adjustments [Handlon], 157	American Railroad Assn.: —Adopts overhead crossing specifications, 944	Report of operation by Board of Trustees,			
Accident Prevention:	—Flat spots on wheels and worn axle collars discussed, 82 American Rys (see Philadelphia Pa.)	Resumes service in Lawrence, 948, 1056 Service to cease in Lawrence unless jitney curbed, 877			
-Comments on accident prevention campaigns [Proctor], 724 -Comments on safety-first movement, 510	American Rys. (see Philadelphia. Pa.) American Society for Testing Materials: —Annual meeting, 25	Strikes threatened, 538 Transporting shippard workers at Quincy [Conant], *61			
-Comments on safety-first movement, 510 -Co-operation of employees, *281 -Discussed by A. E. R. C. A., 718 -Discussed by National Safety Council, 790	Anderson, Ind.:  —Union Traction Co.:  Rehabilitating track joints with an are	[Conant], *61 —Former Commissioner Eastman testifies, 591 —Middlesex & Boston Street Ry.:			
—Human factor in safe operation and mainte- nance of rolling stock [Phillips], 793	welder, *82 Receiver requested, 700; Receiver denied,	Ten-cent tare 302			
Human factor in safe operation and maintenance of rolling stock [Phillips], 793     London's buses [Jackson], *820     Methods in Philadelphia discussed before the provided by the control of the provided by the provid	Appraisal of Railway Property:	—Motor bus service proposed. 456 —Policemen's strike, Comments on, 553 Brakes and Compressors:			
Federal Electric Railways Commission, r94  —Nationalization and standardization of accident prevention [Reid], 791	—Comments on, by A. E. R. A., r44 —Companies should know value of properties, Comments on, 882	—Causes of brakeshoe wear, *938 —One man car used by Brooklyn Rapid Transit Co., *786			
dent prevention [Reid], 791  —Philadelphia Rapid Transit Co., school children campaign, *399  —Safety before and after the war [Schneider],	Comments on 882  —Discussed before Federal Commission, r103  —Economics and equity in valuation [Cooke],	—Portable air compressor, *930 —Regenerative braking with single-phase com-			
791	911 —International Ry Buffalo. N. Y 90	mutator motors, *910 —Standard design of brakeshoes, heads and keys [Chance], 931			
—Safety first campaign in Rochester [McDougall], 723 —Safety organizations needed by every electric	—Inventorying materials and supplies [Yung-bluth]. *518	—Standardization of brakeshoes discussed by A. E. R. E. A., r79  —Troubles, *340			
railway [Proctor], 792 —Safety problem discussed by Pacific Claim Agents Assn., 69	—Pittsburgh Rys., 409, 436, 1017 —Principles of valuation stated by A. E. R. A., 232	Proking:			
Aceidents:	—Reproduction cost method, Discussion of, 208—Valuation and accruing depreciation [Kealy],	Transference of load in cars while braking [Burke], *750			
<ul> <li>Comments on, by A. E. R. T. &amp; T. Assn., r55</li> <li>Co-ordination of safety between transportation and equipment departments [Jeffries],</li> </ul>	—Valuation of electric railway properties [Tay-	Brazil: —Brazilian Traction, Lt. & Pr. Co.:			
694 —Discussed by A. E. R. C. A., r83	lor], 128  —Valuation to be determined by disinterested body [Sidl], r129	Income account for 1918, 596 British Traction Co. (see Great Britain) Brockton & Plymouth Street Ry. (see Plymouth.			
—Electric railway hazards—causes, effects and remedies [McDougall], 693 —Fixed schedule for injured persons other than	Argentine: —Anglo-Argentine Tramway, Ltd.:	Mass.) Brooklyn, N. Y.:			
employees [Tynan], 721	Earnings, 452 Ashes: —Hardling by steam conveyor vs. manual labor,	—Brooklyn City Ry.: Extra fare charge abandoned, 962 Problem of deficit, 951			
—Liability limitation advocated, 718 —Minimized by one man cars [Walker], 162 —Norwich, Conn., statistics 1917-1918. *281 —Relation of speed to [Bennett], 723; [Car-	30 —Losses due to combustible in refuse, *1006	Problem of deficit, 951 Stock, Condition of, 805 —Brooklyn Rapid Transit Co.:			
penter I, 722  —Telephone control system of assistance, *398	Atlanta, Ga.: —Georgia Ry. & Pr. Co.:	Certificates offered, 451 Eight cent fare recommended by Stone &			
Accounting: —Accounting for depreciation [Jirgal], 799	Considers one man cars, 961 Auburn, N. Y.:	Webster, 842 Electrically heated oven installed, *746 One-man cars, Details, *784			
—Accounting measures to meet business depression in the industry [Saliers], r37	—Auburn & Syracuse Elec. R.R.: Fare situation, 546	Receiver appointed, 138			
—Clerical work of figuring coasting percentages [Johnson]. *277  —Preparation of data in connection with rate	Auditing: —Detroit, Mich., situation, 698	Rentais in default, 576 Situation of security holders, 955 Strike unjustifiable, 267 Strike, 295 Strike settled, 352 Strike settled, 352			
cases [Bitting], r29 —Milwaukee zone fare methods *619	Aurora, III.:	Surface lines segregated, 191			
Ticket department. Great Britain, London County Council [Jackson], *274	—Aurora, Elgin & Chicago R.R.: Receivership, 409	Transfer case, 876 Two-cent transfer authorized, 199			
Accounts, Standard Classification:  —Report of Committee of A. E. R. A. A., r85	Australia:  —Brisbane, Graduated fare system [Badger],	Buffalo, N. Y.: —International Ry.:			
Advertising: —Advantages of continuity [Wright], 287	*481 —Melbourne lines prosperous, 954 —Melbourne Suburban Railways electrified, *902	Appraisal of railway property, 90 Fare increase situation, 456, 598			
—Advantages of continuity [Wright], 287 —Comments on national campaign, 608 —Comments on quality advertising, 608 Discussed by Ulinois Flow Pyrs Assay 150	—Principle of differential wages in awards [Pringle], *c943	Court of Appeals decides Public Service Commission can raise rates, 143 Public Service Commission grants fare in-			
—Discussed by Illinois Elec. Rys. Assn., 159 —Effect upon reduction of accidents [Wright], 287	—Zone fare system [Jackson], 434 Axles:	crease, 876 Publicity campaign, 36			
—For traffic [Buffe], *663 —National advertisers can help [Boyce], c696	—Reclaiming worn motor axle bearings, 565 —Repairing worn axle collars by welding, 82	Buildings and Structures:			
-\$3,600,000 notes sold over counter in Milwaukee, 734	—Standard design of [Chance], 932	—Discussed by A. E. R. E. A., r78 —Standardization of [Cram], 567			
Abbreviations: *Illustrated, c Communication, r Page in Report Number for Oct. 11.					

Camden, N. J.:
—View of the New Jersey zone plan [Bleakly],
126

Capitalization:
—Discussed before Federal Electric Railways
Commission, r102
—Recapitulation, Comments on [Becker], r125

Capital Traction Co. (see Washington, D. C.)

Capital Traction Co. (see Washington, D. C.)
Car Construction:
—Fabrication of cars in Detroit United shops,
\*863, \*920
—Light weight:
Tendencies toward, 105
—Making over open cars for prepayment fare
collection, \*113
—Standard units, Comments on, 465
—Steel pilots for all year service, \*939

Car Design:
—Car weight, Comments on, 883
—Car weight reduced 50 per cent [Dehore],

\*915
—Changes in Kansas City Safety car design, \*998
—Construction features of Detroit cars, \*863;

Carhouses and Storage Yards:

—Chemical fire protection for the car-storage yard, \*753

yard, \*753
—Protection from fire, Comments on, 815

One man

s:
ne man;
Adaptability to zonc fare system, 152
Advocated by Beeler, 538
Atlanta, Ga., Considered, 961
Birmingham, Ala., 1064
Change boards, \*342
Claim agents experience [Dixon], 720;
[Winsor], 721
Cost of maintenance, Comments on, 883
Davenport, Ia., earnings in [Roderick], 26
Details of cars used by Brooklyn Rapid
Transit Co., \*784
Devices to speed up operation, 208
Discussed by Amalgamated Assn., 762; A.
E. R. T. & T. A., r54; Beeler, r, 124; C.
E. R. A. \*63; 64; Greenland, 67, 68;
Illinois Elec. Rys. Assn., 160; Lowa Elec.
Ry. Assn., 762; Jackson, r117; Kealy,
r31; Moore, 131; Thirlwall, 233; Walker,
161, 662; Wells, r36, 983
Earnings in various localities [Wells] 983
Experiences in Virginia, \*430
Greater safety with less labor, 53
Kansas City:
Change in design, \*998
Successful [Kealy], r31
Labor, Comments on, 370
Los Angeles, Cal., Advised by commission,
959
Mirror for interior view, 348
Moving picture film to illustrate operation,

Mirror for interior view, 348
Moving picture film to illustrate operation,

6667
 Megro problem solved in Richmond, 842
 Objection answered [Wells], 983
 One hundred cars ordered by Eastern Massachusetts Street Ry., 732
 Operation discussed by A. E. R. T. & T. A., r.58

r.58
Race segregation not found difficult in Raleigh, N. C., 877
San Diego, Cal., Urged by Commission, 961
Service and jitney competition [Clifford], r35
Solution for many difficulties, 209
Standardization [Wells], r36
Standardization, Comments on 743
Stimulate summer riding, 153
Terre Haute, Results in [Walker], 161

Cars:

—British Electric Traction Co. cars, description of types [Jackson], \*156

—Car speed and equipment in Great Britain [Jackson], 432

—Melbourne (Australia) Suburban Railways, \*906

—Time of passenger interchange on double end vs. Peter Witt cars [Sullivan], \*656

—Types used in Portland, Me., \*623

—(See Work and Wrecking Cars.)

Carolina Pr. & Lt. Co. (see Raleigh, N. C.)

Central Electric Ry, Assn:

Central Electric Ry. Assn:

—Boat trip, 1

—Fall meeting, \*989, 1039

—Summer convention, 25

—Summer cruise, \*63

Central Metropolitan Railway of Madrid (see Spain).

Spain).

Charleston, W. Va.:
—Charleston Interurban R.R.:
Fare increase sought, 678, 1293

Chicago, Ill.:
—Chicago Elevated Ry.:
Coasting results [Johnson], \*277
Chemical fire protection for the car-storage yard, \*753

Communication to Federal Electric Railways
Commission, e236

Chicago, Ill. (Continued):

—Engineers report on earnings, 1016
Improved lubrication with changed motor
axle boxes, \*757
Lines tied up by strike, 249
Strike settled, \*293
Wage and fare increase situation, 134, 189,
360
—Chicago, Milwaukee and St. Paul Ry.:
Cascade electrification, Comments on, 782,
815
Locomotive tested \*887

815
Locomotive tested, \*827
Watt-hour meter, Duplex dial, \*402
-Chicago Surface Lines;
Commission orders reduced rate, 958
Commission refuses to suspend 7-cent fare,

Fare increase showing returns, 700
Lines tied up by strike, 249
Strike settled, \*293
Valuation filed, 542
Wage and fare increase situation, 134, 189, 361, 738
—Fares in Chicago, Cleveland and Philadelphia compared [Busby], 795
—Municipal ownership urged by mayor, 535, 769

-Public takes an interest in wage increase, 207

—Public takes an interest in wage increase, 207
Cincinnati, O.:
—Cincinnati & Columbus Traction Co. abandons
lines, 496
—Cincinnati, Lawrenceburg & Aurora Electric
Street Ry.:
Cutting down operating expenses [Dehore],
\*915
—Cincinnati Traction Co.:
Elements of franchise [Draper], \*r18
—Ohio Elec. Ry.:
Awarded judgment, 772
Circuit Rreakers.\*

Awarded Judgment, 772 Circuit Breakers: —Erratic setting, 749 —Open air exhaust, \*487 Cities Service Co. (see New York City)

City planning:

—Effect of fares on discussed by Dr. Whitten,
831
Claim adjustment (see Accident Claim Department).
Cleveland, O.:
Cleveland, O.:

-Cleveland and Youngstown R.R.: Inspected by Cleveland Engineering Society, 590

Inspected by Cleveland Engineering Society, 590

—Cleveland Railway Co.:
Arbitration increase dividend, 1018
Disposal of new issue of stock, 104
Operating statistics compared with Philadelphia and Milwaukee, 1918, r110
Service-at-cost plan, Operation of, 172
Wage dispute, 38, 85
Elements in a satisfactory substation building [Lloyd], \*833

—Fares in Chicago, Cleveland and Philadelphia compared [Busby], 795
—Lake Shore Electric Railway System:
Income statement and operating statistics, 1917-1918, 542

—Public Service Commission:
Comments on railway situation, \*383

—Railway situation discussed by Sect'y Baker, 329

—Rapid transit report, \*71

—Rapid transit report, \*71 —Transit plans for future traffic, 1012, 1054

Columbia S C.:

Coal:

—Arrangements made for coal supply, 768

—Consumers urged to stock coal, 204

—Conveyor at New Haven Power Station [Wood], \*312

—Economical handling of (Finn.), 1047

—Plan to combat coal famine, Comments on, 968

—Prices up, quality down [Emery], \*396

Columbia, S. C.:

—Columbia Railway, Gas & Elec. Co.:

Fare and wage increase, 142
Offers to sell to the city, 946
Columbus, O.:

—Columbus Ry., Pr. & Lt. Co.:

Fare increase defeated, 414
Strike settled, 535
Commutator Sletters

Commutator Slotter:
—Device, \*347
—Device for use with double-spindle lathe, \*578

Competition:

—Are high costs of service likely to develop permanent competition [Palmer], r9 Compressors (see Brakes and Compressors).

Concrete:
—Use of fine-grained sand, 760

Onnecticut:
Connecticut Public Utilities Commission:
Comments on railway situation, 333
Report, 592

Connecticut Co. (see New Haven, Conn.)

Constabulary:
—London buses special constabulary [Jaskson],
\*821
Contracts for Joint Use of Track:
—Obligations discussed by T. & T. Assn., r66

Controllers:
—Troubles, 341, \*577

Cost of Living: —Changes 1914-1919, 438

Counlers . -Standard design of automatic couplers [Chance], 931
-Swing of radial coupler on curves [Seelar],
\*488

Credit:
—Discussed before Federal Electric Railways
Commission, r97, r112

Cumberland County Pr. & Lt. Co. (see Portland, Me.)

D

Dallas, Tex.:

—Dallas Ry.:

First surplus under service-at-cost franchise, 1019

Municipal ownership recommended, 291

Service-at-cost plan, Operation, 173, 430, 713; deficit, 952

Davenport, Ia.:

—Clinton, Davenport & Muscatine Ry.:

Officials arrested for suspending service,

674

—Tri-City Ry.:

Earnings of safety cars [Roderick], 26

Fare increase situation, 86, 93, 413

Strike settled, 352

Tie nipper for reducing spiking difficulties,

\*891

Denver, Col.:

Denver Tramway Co.:

City to regrant temporary six-cent fare, 129
Fare collection [Doty], 40
Fare situation, 95
Mayor signs six-cent fare ordinance, 871
Traction issues at special election defeated, 730

Fare situation, Comments on, 781

730

—Fare situation, Comments on, 781

—Referendum a failure in deciding fare situation, 814

Depreciation:

—Aecounting for depreciation [Jirgal], 799

—Aecrued depreciation discussed by valuation committee, 224

—Comments by former Commissioner Eastman, 531

591
—Valuation and accruing depreciation [Kealy],

530

Des Moines, Ia.:

—Des Moines City Ry.:

Adjuster for gear-case cover springs, \*566
Fare and wage situation, 354
Open air exhaust for circuit breakers, \*487
Portable rivet heater, \*488
Reclaiming worn motor axle bearings, \*565
Strike settled, 446

—Inter-Urban Ry.:
Car maintenance records facilitate work
[McMahon], \*119

Car maintenance records facilitate work [McMahon], \*119

Detroit, Mich.:

—Bond issue urgcd, 1054
—Council upholds Mayor's opposition to service-at-cost, 1013

Council wishes to negotiate with Detroit United Ry., 951

—Detroit United Ry.;

Completing audit, 698
Construction features of new cars, \*863
Fare increase, 360

Mechanical aids in handling fares, \*217
Restrained from increasing fare, 736
Service-at-cost recommended by Board of Street Railway Commissioners, 730

Shop methods used in building cars, \*921

—Mayor disagrees with commission, 802

—Rejects Tayler plan of railway operation, 872

—Service-at-cost plan for fare arbitration, 84

—Subway situation, 248, 673, 699

District of Columbia:

—District of Columbia:

District of Columbia Public Utilities Commission:

Comments on railway situation, 331

E

Education:
—University endowment campaigns, Comments
on, 684
Eastern Massachusetts Street Ry. (see Boston
Mass.)

East St. Louis, Ill.:

-East St. Louis Ry.:

Fare case valuation, 841

-Southern Traction Co.:

Security holders seek redress, 952

Electrification (see Heavy Electric Traction) Empire State R.R. Corp. (see Syracuse, N. Y.)

Empire State R.R. Corp. (see Syracuse, N. Y.)

Employees:
—Anti-strike bill killed in Mass., 1014
—Conductors point-of-view of car operating economy [Connely1, 1042]
—Conductors to be instructed by traveling agents in Los Angeles, Cal., 807
—Contracts with, discussed at Washington hearing, r100.
—Co-operation in zone-fare system, Connecticut Co., 857
—Co-operation of employee and employer, Comments on, 684
—Co-operation of the public, company and the men, 105
—Co-operation with company, London's buses [Jackson], \*820
—Courtesy campaign started in Indianapolis, 877
—The properties of the properties o

-Courtesy campaign started in Indianapons, 877

-Dispatcher's view of car operation economies [Harris], 1044

-Effort of Twin City Rapid Transit Co. to make men citizens, \*279

-Headquarters in Chicago, \*442

-How a motorman can help in car operating economy [Sunderland], 1042

-How the master mechanic looks at car operating economy [Scullin], 1044

-Line seniority to continue in Kansas City (Mo.), 257

-London County Council Tramways shares coal saving with car operators, 214

-Operating department's training school, London's buses [Jackson], \*822

-Refuse ownership in Reading, Pa., 836

July-December, 1919] Employees (Continued):

—Representation in management discussed by Sect'y Baker, 330

—Request cancellation of union contract in Kansas City, 536

—Sentiment against union in Los Angeles, 493

—Service code in New Brighton, Pa., 503

—Street inspector [Danal, \*372

—Training of welders, Comments on, 968

—Wages extorted under threat, 207

—Welfare work, Comments on, by T. & T., Assn., r54

—Women workers on electric railways disappearing in New York City, 838

—Working hours of motormen and conductors in Philadelphia [Mitten], cr110

—(See also Labor)

Energy Checking Devices:

—Report forms, \*522

—Successful in Great Britain and Ireland, \*521

—Watt-hour meter, Duplex dial, \*402

Energy Consumption:

—Coasting results on Chicago Elevated [Johnson], \*277

—Energy saving campaign, Springfield Street Ry., 246

—Light weight cars [Greenland], 68

—London County Council Tramways shares with employees saving in coal due to more efficient car operation, \*214

—Safety cars [Roderick], 26

Energy-Saving Devices:

—Comments on, by T. & T. Assn., r54 Face Plates:

—Bending and straightening special work, \*559
Fairmont, W. Va.:

—Monongahela Valley Traction

Fare increase, 144

Heavy freight service of a single-track, high-speed passenger lin [Cole], \*866 high-speed passenger lip [Cole], \*866

Fans:

Car fan used Corp., 1009

Fare Box Vaults:

Safe for, \*758

Fare Collection:

Boston, Mass., Hearing on Roke register, 413

Change boards on one-man crs. \*342

Collection and registration o fares discussed by T. & T. Assn., r61

Collection of zone fares [Kummerlin], r68

Comments on [Nash], 651

Comments on improvements, 706

Denver, Col., Methods [Dot], r40

Discussed [Sullivan], \*653

Efficiency of fare box [Sullian], \*655

Fare registering and ticket issuing devices, \*669

Gat Britain [Jackson], 433

Weat Peritain [Jackson], 433

Weat register republished for the nair cars in -Fare registering and ticket issuing devices,

\*669
-Great Britain [Jackson], 433
-Hand register prohibited for pen air cars in
Mass., 598
-Making over open cars for repayment fare
collection, \*113
-Mechanical aids in sorting and wrapping
used by Detroit United Ry;\*217
-Methods with frequent canges in rate
[Dotyl, r40
-Milwaukee, Zone fare collection, \*616
-Newark, N. J., Zone fare, 40
-Portland, Me., methods, \*63
-Springfield, Mass, methods, \*32
-Systems compared at Washgton hearings,
\*376
-Ticket issuing machine forfare collection,
\*245
-Zone fare scheme in New Jeey, 283 -Zone fare scheme in New Jeey, 283 -Zone fare scheme in New Jeey, 283

Fare increases:
-Auburn, N. Y., situation, 5
-Baltimore, Md., granted, 736
-Binghamton, N. Y., barred, \$
-Boston, Mass., situation, 44, 5, 302, \*547
-Boycott and strike follows is increase, 148
-Brooklyn, N. Y., abandons et a fare charge, 962
-Buffalo, N. Y., situation, 14456, 598, 876
-Charleston, W. Va., sought, \$, 1065
-Chicago, Ill., situation, 189, 61, 738, 842, 958
-Columbia S. C., 142 -Chicago, Ill., situation, 189,01, 738, 842, 958

-Columbia, S. C., 142

-Columbius, O., defeated, 414

-Connecticut, Report of Publ utilities Commission, 592

-Croydon, England, Effect of ackson], \*468

-Davenport, La., situation, 863, 412

-Denver, Col., situation, 129, 80, 871

-Detroit, Mich., situation, 360/36

-St. Louis, Mo., situation, 50/599

-England, Leeds [Jackson], \*3

-Gary, Ind., granted, 875

-Great Britain, London CountCouncil, three section penny stage with affractional fare tickets [Jackson], \*270

-Holland, 80-100 per cent incese during war, 215

-Pre-war conditions versus today [Doolittle], r9
-Public utility rates discussed by National Association of Railway and Utilities Commissioners, 826
-Synchronizing revenues with wage increases in Wisconsin, 967
-Ten cent fare necessary in Pittsburgh, 257
-Federal Electric Railways Commission:
-Appointment, comments, 103
-Comments on hearings, r1, 152, 311, 369
-Communication from Chicago Elevated Railways in regard to electric railways, c236
-Communication from T. E. Mitten, cr111
-Communication from Thos. A. Edison in regard to electric railways, c229
-Correspondence on Washington Testimony, 907 -Kansas City, Kan.; Arbitras recommend, - Raisas City, Rair., Riotas Tetolinichi, 776
- Eight-cent fare, 303
- Granted by Court, 957
- Massachusetts situation [Madd], 428
- Milwaukec, Wis.:
Granted by Wisconsin Raild Commission, 891
- Seven cents, 808
- Muskegon, Mich., service sunded, 362
- Necessity discussed by Pennsania Assn., 14
- Newark, N. J.:
History of recent fare incres, 282
- Seven-cent flat rate, 1022
- New York City situation, 50546, 701, 738

Fare Increases (Continued):

-Norfolk, Va., six-cent fare sought, 301

-Omaha, Neb., 362

-Pemsylvania, Court sustains fare increase, -Omaha, Ncb., 362
-Pennsylvania, Court sustains fare increase, 197
-Philadelphia, Pa., earnings, 167
-Pittsburg, Pa., en basis of valuation, 93
-Portland, Me., earnings, 166
-Pottand, Ore., Urged to save company from bankruptey, 1021
-Providence, R. I., situation, 412, 702
-Quincy, Ill., seven-cent fare, 96
-Racine, Wis., fare decision in abeyance, 843
-Results in several localities, 15
-Rochester, N. Y., fare decision stands, 737
-Roslyn, N. Y., situation, 738
-Saginaw, Mich., voters approve fare increase, 776
-St. Joseph, Mo., 1021
-Sherbrooke, Can., People vote favorably, 677
-Sought, 776
-Syracuse, N. Y., 142
-Value of good service, 1
-Vancouver, Can., situation, 600
-Washington, D. C., situation, 142, 736
-Waverly, N. Y., seven cents granted by P. S. C., 197
-West Virginia, situation, 545
-Fare increases, Reasons for:
-Assets must be conserved [Saliers], r38
-Comments [Storrs], 175
-Credit and cost of capital [Sisson], 178
-More passengers better than too high fares [Thomas], c727
-Politicians try to befog the issue, 510
-Ten-cent fare, 302
-Fares:
-Adjustment of charges [Jackson], 435 One dollar weekly pass in Racine, 502

- One dollar weekly pass in Racine, 502

- Pennsylvania Commission says public must understand service versus revenues, 269

- Philadelphia & Milwaukee situation discussed before Federal Electric Railways Commission by Mr. Mortimer, r108

- Plans suggested before Federal Electric Railways Commission. 237

- Political issue in Massachusetts, 769

- Public pay deficits by taxation [Macleod], 429

- Public Service Railway (see November 1) -Public Service Railway (see Newark, N. J.)
-Pyschological vs. mathematical means of increasing receipts, 949
-Questionnaire of Federal Electric Railways Commission, 573
-Readiness-to-serve system [Nash], \*647
-Rush-hour vs. off-hour passenger, c349
-Sell transportation in small quantities, 289
-Views on fare question, 960
-Tickets used by British Electric Traction Co, increase travel [Jackson], \*155
-Unit fares discourage short hauls [Jackson], 392
-Wage and rate problems inter-dependent, 269 Unit fares discourage short hauls [Jackson], 392
Wage and rate problems inter-dependent, 269
Zone fares (see zone fare systems)
Fares, Analysis of Cost:
Comments on [Nash], 647
Comparisons based on insufficient data are useless, 851
Discussion before Federal Electric Railways Commission, 163, 165, 228
Eight-cent fare recommended for Brooklyn, N. Y., 842
Estimates of Wisconsin Railroad Commission, 891, 893
Fares in Chicago, Cleveland and Philadelphia compared [Busby], 795
Five-cent fare may be possible by reducing certain operating costs [Rifenberick], 66
Five cents will pay for only a five-cent ride, 783
Flat fare system summarized, 610

—racts that should be brought out [Alley], 389
—Hearings from July 15 to July 18, \*124
—Hearings, July 17-23, \*163
—Hearings, July 23-25, 228
—Hearings, Aug. 11-Aug. 19, 329
—Hearings, Aug. 13-Aug. 15, \*374
—Hearings, final \*r93
—Organization and plans, 20
—President expresses opinion on hearings before, 240
—Questionnaire, 573
—Statistics, Distribution of capital stock, 438
—Statistics on electric railway industry, \*181
—Summary of electric railways case, 284
Financial: —Summary of electric railways case, 284
Financial:
—Benefits of a consolidated system not always appreciated, 707
—Cost of financing discussed in Pittsburgh valuation report, 437
—Credit and cost of capital [Sisson], 178
—Depreciation of electric railway dollar, 868
—Effect of dead capital on fare, \*1001
—Fair return on railway properties [Bemis], r126
—Financing problems in New York discussed be-—Financing problems in New York discussed be-fore Federal Electric Railways Commission. Financing under different forms of franchise [Erickson], 242
—First cost, Central Metropolitan Railway of Madrid, Spain, 23
—Income statement of electric railways 1917-1918, 181
—Investment Bankers Association discusses railway problems, 797
—Milwaukee sells \$3,600,000 of notes at home, 734
—Need for large capital, Comments on, 180
—Organization and capitalization questiomaire of Federal Electric Railways Commission, 573
—Purchase of money, Federal Electric Railways 573

-Purchase of money, Federal Electric Railways Commission, \*164

-Purchase of one-man cars, car trust certificates for [Greenland], 69

-Railway securities situation, 171

-Simplification of corporate structures [Cooke], \*858

-Shrinkage of the nickel 1913 to 1919 [Burkel, 512

-Townspeople as stockholders, 371

-Watered stock for widows untenable [Ainey], 388

Fig. Insurance: Fire Insurance:

—Philadelphia methods described to Federal Electric Railways Commission, r94

Fire Protective Apparatus:

—Annunciators for fire sprinkler system, \*937

—Chemical engines on Chicago Elevated, \*753

—Protecting car storage yard, Comments on, 815 Fort Wayne, Ind.:
—Fort Wayne & Northern Indiana Traction Co.:
Foreclosure sale planned, 450 —Fort Wayne & Northern Indiana Traction Co.:
Foreclosure sale planned, 450
France:
—Electrification of railways, 857
—Electrification proposals [McCallum], 474
—Midl Ry.:
Progress on electric line across the Pyrenees mountains [Pahin], \*475
—Paris Tramways:
—Conditions during war, 486
Franchises:
—City and railway partnership, Different interests, 311
—City representation in electric railways [Woods], 726
—Cleveland, O., Comments on, by Secretary Baker, 329
—Compared in Chicago, Cleveland and Philadelphia [Busby], 795
—Denver, Col., situation, 781
—Franchise rates are legislative and not contractual [Chamberlain], 28
—Franchise taxe waived in Providence, R. I., 702
—Inflexible franchise bad, Testimony before Federal Electric Railways Commission, 287
—Michigan law governing, 592
—Minneapolis franchise draft, 251
—Norfolk, Va., offers new franchise, 870
—Pavement cost and maintenance, Comments on [Storrs], 176
—Service-at-cost:
Advantages [Erickson], 244 Pavement cost and maintenance, Comments on [Storrs], 176

Service-at-cost:
Advantages [Erickson], 244
Can service costs be collected from traveling public [Mortimer], r14
Cincinnati franchise [Draper], \*r18
Cleveland, O., Operation in, 172
Contracts explained, 174
Controlled by city but operated service-atcost [Sidlo], r129
Dallas, Tex. Operation in, 173
First surplus, 1019
Denver, Col., considered, 129
Detroit, Mich., situation, 84, 730, 1013
Economical operation, Comments on [Draper], 177
Federal Electric Railway Commission, 169, 171, 233
Minneapolis, 536, 590, 1013
Montreal franchise [Hutcheson], \*r24
Paducah, Ky. 447
Pittsburgh, Pa., recommended, 437
Plan [Culkins], 79
Questionnaire of Federal Electric Railways Commission, 574
Report on by A. E. R. A. r47
—Youngstown franchise [Stevens], \*r21
—Seeks new franchise, 248
—Subsidies recommended by receiver of Rhode Island Co., 426
—Toledo Rys. & Lt. Co., ousted, 801
—Toledo, O., Ouster ordinance, 446, 972
rt Number for Oct. 11. 783
—Flat fare system summarized, 610
—Flat rate vs. zone fare from city planning standpoint, 831
—Net result of the 5-cent fare [Bibbins]. \*570
—Philadelphia conditions analyzed, \*999
—Pre-war conditions versus today [Doolittle], representations of the standard conditions with the standard conditions are standard conditions.

Federal Electric Railways Commission (Cont.):

-Facts that should be brought out [Ainey],

389

Freight and Express: Freight and Express:

—Compensation for use of foreign track discussed by A. E. R. T. & T. A., r66
—Electric railway express discussed by C. E. R. A., 989
—Handling the freight business [Stanton], 982
—Heavy freight service on a single track, high-speed passenger line [Cole], \*866
—Interurban express [Nicholl], 993
—Obstacles to electric express, 996
—Possibilities of electric railway express service [Munton], 992
—Possibilities of express business [Vaughu] 997
—Possibilities of express [Vaughu] 997
—Possibilities 997
—Possibilities 997
—Possibilities 997
—Possibilities 997
—Possib

-Cost analysis discussed by American Electric Railway Engineering Assn., \*75

#### G

Garv. Ind .:

Gary, Ind.:

—Gary Street Ry.:

Double-end pay-as-you-pass cars, \*83

Fare increase granted, 875

Gasoline vs. Electric Motor for Street Railway

Service [Storer], r27

Gears and Pinions:

—Adjuster for gear-case springs, \*566
—Gear cases electrically welded, \*942
—Helical gearing discussed by A. E. R. E. A., r82

—Helical gearing for railway motors [Phillips],

Providing proper fit [Dean]. 759
Putting on motor pinions discussed by American Gear Manufacturers Assn. \*889
Reinforced suspension for sheet steel gear cases. \*1004
Troubles, 577
General Gas & Elec. Co. (see New York City) Georgia Ry. & Pr. Co. (see Atlanta, Ga.)
Girardville, Pa.:

Schuylkill Ry.: Fare increase approved by commission, 44

Fare increase approved by commission, 44
Grafton, W. Va.:

—Grafton Lt. & Pr. Co.:
May be included in merger, 772
Properties taken over by Potomac-Edison
Gas & Pr. Co., 1019.
Proposal of sale, 409
—Grafton Traction Co.:
May be included in merger, 772
Properties taken over by Potomac-Edison
Gas & Pr. Co., 1019.
Proposal of sale, 409
Crade Judicator:
Crade Judicator:

Grade Indicator:

Grand Rapids, Mich:
—American Public Utility Co.;
Earnings 1918-1919, 451
Grand Trunk Ry. (see Stratford, Can.)

Great Britain:

Great Britain:

British Electric Traction Co. zone fare systems [Jackson], \*155

British tramway conditions [Madgen], 439

Croydon, Fare Practice in, \*476

Eddinburgh Corporation Tramways:
Resourcefulness during coal strike, 1034

Energy-saving instruments, practice with, \*521

Electricity supply bill, 35

Fare practice [Jackson], 341

Glasgow Municipal Tramways: Statistics, traffic, revenues, capitalization, 1918, \*376

Leeds, Zone system in [Jackson], \*7, \*56

Sheffield Corporation Tramways and Motors:
Results of motor omnibus service, 865

West Ham Corporation Tramways:
Telephone control system, \*397

England (see Great Britain and London)

Guelph, Can.:

Guelph, Can.:

-Grand River Ry.: Citizens vote against agreement with city, 535

Heavy Electric Traction;
—Advance in Sweden, 225
—Comparison in America and Europe by French Commission, 834
—Discussed by N. Y. R.R. Club, 918
—Electrification of French railways, 857
—European proposals [McCallum], \*474
—Japan Favored, 515
—Progress on the Midi Railway across Pyrenees mountains [Pahin], \*475
—Status of Swiss electrification [Ateliers de Construction Oerlikon], c696
—Status in Switzerland, 227
—Switzerland, war time progress, 486

Heaters:

Heaters:

—Hot blast forced-ventilation heater, \*290 —One man car used by Brooklyn Rapid Transit Co., \*789 High-tension Lines (see Power Distribution and Transmission Lines)

Holland:

-Railways and Tramways. Difficulties during war. Interview with H. F. Adams. 215
Housing Conditions in Leeds, England [Jackson]. \*7
Houston Tex:
—Houston Elec. Co., Valuation situation, 1017

Illinois:

-Public Utilities Commission:
Supreme Court upholds in fare question,
1064

Illinois Electric Railways Assn.:

—Summer meeting, 159 Illinois Traction System (see Peoria, Ill.) Indiana:

Indiana:

—Assessments of all railways, 42
—Indiana Public Service Commission:
Comments on railway situation, 334
Indiana Rys, & Lt. Co. (see Kokoma, Ind.)
Indianapolis, Ind.:
—Indianapolis Street Ry.:
Courtesy campaign started, 877
Merger with Indianapolis Traction & Terminal Co. approved, 42, 91, 500
Sept. 1 dividend postponed, 497
—Indianapolis Traction & Terminal Co.:
Merger with Indianapolis Street Railway approved, 91, 500
Induction Regulator:

Induction Regulator:

Induction Regulator:

—Experiences with [Wensley], \*887
International Railway (see Buffalo, N. Y.)
Inter-professional Council:

—Conference planned, 801
Interstate Commerce Commission:

—Hearings on mail pay concluded, 286

—Mail pay hearings, 1002

Inventories:

—Inventorying materials and supplies [Yungbluth], \*518
Investment Bankers Association of America:
—Annual convention, 797

iowa:
—Regulating rates [Chamberlain], 28
Iowa Elec. Ry. Assn.:
—Committee meeting, 328
—Midyear meeting, 541, 587, 761

Italy:
—Italian car design experience, \*909

Jacks:
—For handling railway equipment, 586

Japan:

—Imperial Government Rys.;
—Electric railway transportation, Practices and tendencies [Sano], \*4
Electrification favored, 515
Joint Use of Tracks & Terminals;
—Discussed by A. E. R. T. & T. A., r64

Kansas:

—Public Utilities Commission, Permits refunding of bonded and other indebtedness, 194
Kansas City, Mo.:

—Court grants 2½ cent a mile rate, enjoining commission, 957
—Kansas City, Clay County & St. Joseph Ry,:
Employees request cancellation of union contract, 536
—Kansas City Rys.:

Abuse of transfers, 361
Arbitrators recommend fare increase, 776
Changes in safety car design, \*998
Eight-cent fare, 303
Line seniority to continue, 257
One man car successful [Kealy], r31
President gives dinner to directors and officials, 870
Prospects greatly improved, 1016
Service not fares zoned in, 362
Supreme Court upholds commission, 959
Ticket situation, 775, 875
Traffic changes suggested by J. A. Beeler, 1064
Transfers, Triplicate, \*401
Wage increase sought, 136
Kokomo, Ind.:
—Indiana Rys. & Lt. Co.:
Air-operated tower for line cars, \*794
Safe for fare box, \*758
Stockroom records and practice, \*861
—Missouri & Kansas Interurban Ry.:
Refunding permitted by Kansas Public Utilities Commission, 194

Labor:

—Comments on [Sidlo], r130
—Co-operative welfare vs. collective bargaining, Comments on [Weston], 529
—Discussed before Federal Electric Railways Commission, r98, r103, r107, r108
—Effect of shortage on maintenance during war [Phillips], 19
—Eight hour day Comments on, 510
—Labor aspect discussed before Federal Electric Railways Commission, 238
—Labor's contribution to solution of railway problem, 705
—Organized labor, what it can do, 511
—Philladelphia conditions described before Federal Electric Railways Commission, r94
—Statistics on labor and living conditions [Emery], \*394
—Superfluous labor on two man cars, 370
—Union methods discussed before Federal Electric Railways Commission, r107
(See also Employee)

Lawrence, Mass.:

Lawrence, Mass.:

-Railway service restored, 948, 1056 -Service to be suspended unless jitneys are curbed, 877

Legal:

—Bill introduced to abolish Department of Interior and substitute Department of Public Works. 38

—Federal legislation. Report on, American Elec. Ry, Assn., 746

Legal (Continued):

—Joint use of tracks and terminals discussed by A. E. R. T. & T. A., r64

—Legal notes, 458,

—Legislation slow in New York [Choate], 690

—Massachusetts provides act for investigation of electric railways, 250

—Nebraska court decides railway must have adequate temporary rate pending appraisal, 199

—Pennsylvania, Court sustains fare increase, 197

—Prospective legislation on electric railways in Massachusetts, 698

—Proposed legislation on electric railways, 838

—Referendum a failure in deciding economic questions, 814

—Toledo mayor dispossesses Toledo Rys, & Lt. Co., 133

—Transit legislation to be considered in New York, 1055

Lighting:

York, 1050
Lighting:
—Detroit cars. \*864
—Electric lights to replace oil tail lights, \*939
—Portable foot-candle meter, \*940
—Portable utility light, \*940
Locomotives:
—Midl Railway electric locomotives, characteristics [Pahin], \*476
—Modern electric locomotives discussed by N. Y. R.R. Clab. 918
—St. Paul cascade electrification, Comments on 782, 815

782, 815
London:

—London buses carry large proportion of London traffic [Beaumont], c727
—London Count, Council Zone fare systems [Jackson], \*210, \*270
—London County Council Tramways:

More passenfers better than too-high fares [Thomas], c/27
—London Electric Ry.:

Coasting records, 526
—London letter, 34, 247, 490, 697, 729
—London's tubes and buses [Jackson], \*708.

\*816
—Metropolitan listrict Ry.:

Car design, 345
—St. Paul locomotive tested, \*827
Los Angeles, Cal:

Car design, 345

—St. Paul locombrive tested, \*827

Los Angeles, Cal:

—Los Angeles R. Corp.:
Commission idvises one man cars, 959

Wage increae, 251

—Pacific Elec, ly.:
Conductors o be instructed by traveling agents, 87

Improving rounds a profiable investment [Elliott], \*517

Normal servee resumed, 493

Substations, Fireproof construction [Elliott], 48

Unusual mand for moving two 250-hp, boilers [Hiott], \*123

Wage incree, 251

Louisville & Herurban Ry.:
Reduction c suburban rates, 95

Lubrication:

Lubrication:
—Improved wit changed motor axle boxes.

\*757

Mahoning & Senango Ry. & Lt. Co. (see Youngston,O.)

Mail:

—Committee ormail pay meets, 444

—Compensation Report of American Elec. Ry. Assn., r46

—Hearings on ail pay, 286

—Mail pay heargs before Interstate Commerce Commission 1002

—Postal zone w attacked by Senator Capper, 692

Mahon], 19

Management:
—Cooperation ith merchant to develop transportation, omments on, 969
—Discussed bore Federal Electric Railways Commissio r106
—Discouraged ailway official, Comments on Johnson]c443
—Manager shed mix with car riders, 153
—Morale affeel by adverse conditions [Johnson], 289
—Officials arred in Davenport, Ia., for suspending sides, 674
—Promotting operation of directors and officials, Kaus City, Mo., 870
—Simplificatio of corporate structures [Cooke], 58

Market Conditis;

TCookel, 58

Market Conditis:
—Aluminum, 0
—Bond tester965
—Carbon brusoutlook promising, 811
—Car equipme 811
—Car equipme 811
—Car equipme 811
—Coal, 964, 126
—Coal strike uditions on Nov, 8, 811
—Copper prods advancing, 148
—Cotton and k, 306
—Cotton and k, 506
—Cross arm a pin orders, 604
—Difficulty osecuring supplies during war [Phillips19
—Door and st control market active, 741
—Effect of ren of steam roads, 879

Motor Buses (Continued):

—Comments on [Walker], 661

—Competition from motor vehicles [Stone], 979

—Competition with electric railways [Palmer],

-Cost of operation compared with electric car

974
—Truck competition discussed by C. E. R. A.,
991 Motor Cars, Gasoline:
—Automobile arranged to operate on steel tracks, \*976

Moving Picture Films:
—Illustrating one man car operation, \*668
Municipal Ownership:
—Advocated by governor of Massachusetts
before Federal Electric Railways Commission, \*232

Motors:

Market Conditions (Continued):

Fare device sales, 682
Glass, 100, 682, 965, 1026
Hand brakes, 964
Heaters, 50, 550, 741
High tension insulators, 306, 366
Insulating materials, 148, 846
Iron eulvert, 965
Jacks, Sales increasing, 704
Malleable iron delivery uncertain, 741
Metals, 51, 149, 264, 367, 507, 605, 1068
Overhead fare recorder, 506
Paints and varnishes, 417, 779
Pole market fair, 779
Pole market fair, 779
Brake shoe demand heavy, 779
Power saving devices, Sales, 682
"Price at delivery" policy, 604
Rails, 100, 366, 604
Railway accessories and supplies, 51, 149, 264, 367, 507, 605
Railway motors, 263
Rubber covered wire, 879
Sanitary hand straps, 417
Scrap iron and steel, 879, 965
Shop machinery, 460
Sleet cutter sales increase, 964
Snow plow deliveries thirty days, 846
South American, 50
Steam-turbines, 366
Steel pole and tower, 204
Steel and iron products, 263
Steel Electrical sheet, 551, 1026
Steel stuation, 704, 879, 846
Ties, 417, 1068
Tries, 417, 1068
Uniforms, insignia and equipment, 366
Unsed equipment sales, 604
Water wheels, 551
Wire and cable, 460
Wood tie reservations, 1068
Manufacturers:
—Report on, by American Elec, Ry, Assn., r47
Massachusetts:
—Anti-strike bill killed, 1014, 1030
Board of trustees report to Federal Electric Railways Commission, r96
Fares a political issue, 769
Fare situation, 311
Far estituation, 311
Far estituati r11

Cost of operation compared with electric car [Storer], r27

Effect on electric railways [Storrs], 184

Facts regarding motor-omnibus service, \*926

Jitney competition, [Eddy], 691

Lawrence, Mass., to be earless unless jitneys are curbed, 877

Leeds, England, situation [Jackson], \*11

London's tubes and buses [Jackson]—I, \*708; II, \*816

Motor trucks and electric road, [Watts], 980

Motor truck competition, [Whiteside], 981

New York City, Replace electric cars, 701

Opposed by Eastern Massachusetts Street Ry., 593

Pave the way for the tramway, British Electric Traction Co. [Jackson], 157

Promotion, Comments on, 814

Rail lines vs. buses [Jackson], 392

Results of service in Shelfield, Eng., 865

Ruled out of Portland, Me., 360

Service and jitney competition [Clifford], r35

Toledo, O., Operation during carless peroid, 974

Truck competition discussed by C. E. R. A. Prospective legislation on electric railways, 698, 838 Prospective legislation on electric railways, 698, 838
Proposed measures against strikes, 873
Public Service Commission:
Public ownership a means of restoring credit [Macleod], 427
Temporary subsidies favored, 673
Wage increase, Effect of, 354
Master Car Builders Assn.:
—Equipment standards of [Chance], 931
Metal Tickets (see Tickets)
Michigan:
—Regulative commission for all public utilities provided, 591
Middlesex & Boston Street Ry. (see Boston, Mass.)
Milwaukee, Wis.: sion, \*232

Chicago, favored by mayor and committee, 535, 769

Discussed by Public Ownership League of America, 895

Discussed before Federal Electric Railways Commission, 165, 238, 337, 796

Investment Bankers Association does not favor, 797

Is un-American [Bradley], \*r53

Japan, Tokyo's street railway system [Sano], 6 Mass.)
Milwaukee, Wis.:
—Fares increased by Wisconsin Railroad Commission, 891
—Milwaukee Elec. Ry. & Lt. Co.:
Notes sold at home, 734
Operating statistics compared with Cleveland and Philadelphia 1918, r110
Sells direct to investor, 497
Thermit-welded crossings are long lived, \*1008
Wage increase and eight-hour day sought, 351
Weekly pass in Racine, 502 — Japan, Tokyo's street railway system [Sano], 6

— Massachusetts Street Railway Commission opposed to, 871

— Means of restoring credit [Macleod], 427

— Municipal roads are not independent of economic laws. Comments on, 1031

— New York City, possible development, 967, 1012

— Ontario Hydro Electric Commission recommends for Grand Trunk Ry., 491

— Political platform, 309

— Recommended before Federal Electric Railways Commission, 285, 378

— Recommended by Dallas (Tex.) Ry., 291

— Rejected in Detroit, 872

— Report of National Association of Railway and Utilities Commissioners, 824

— Seattle municipal lines [Murphine], 897

— Seattle wash., Profit, 496

— Situation in San Francisco [O'Shaughnessy], 896

— Windsor, Can., to purchase railways, 873

Muskegon, Mich.:

— American Light and Traction Co.:

Fare situation, 362 Thermit-welded crossings are long lived, \*1008
Wage increase and eight-hour day sought, .351
Weekly pass in Racine, 502
Zone fare system, \*613, 808
—Milwaukee Light, Heat & Traction Co.:
Fare decision, 843, 891
Minneapolis, Minn.:
—Minneapolis Street Ry.:
Accepts franchise, 580
Franchise defeated, 1013
Franchise defeated, 1013
Franchise draft, 251
Service-at-cost defeated by people, 1013
—Twin City Rapid Transit Co.:
Educational publicity, \*400
Face plates for straightening and bending special work, \*559
Making American citizens, \*279
Service-at-cost franchise to be voted on, 536
Spring switches and crossovers made from standard trolley frogs, \*566
Tower trucks and cars, \*121
Missouri & Kansas Interurban Ry. (see Kansas City, Mo.)
Monetary Standard:
—Described by Prof. Fisher at Washington hearing, \*381
Monongahela Valley Traction Co. (see Fairmont, W, Va.)
Montreal, Can.:
—Montromery Light and Traction Co.:
Report of receiver, 358
Montreal, Can.:
—Montreal Tramways:
Franchise, Essential features [Hutcheson].
\*724
Statement 1918-1919, 840
Motor Buses:
—Baltimore, Results of operation [Palmer], r12
—Boston Mass Service proposed, 456

Motor Buses:

—Baltimore, Results of operation [Palmer], r12
—Boston, Mass., Service proposed, 456
—Carry large proportion of London traffic [Beaumont], c727
—Comments on, 553, 1030

National Association of Railway and Utilities
Commissioners:
—Annual convention, \$24
National Safety Council:
—Americanization, Letter on, 70
—Annual congress, Oct 1-4, 693
—Bighth annual safety congress, 790
—Organizing engineering section, 908
Newark, N. J.:
—Public Service Ry.:
—Publicity of zone fare system, \*484
—Decision of War Labor Board, 37
—Flat rates restored, 1022
—History of recent fare increases, 282
—Requests return to flat rate, 715

Newark, N. J.:

—Public Service Ry. (Continued):

Statistics, Trallic, revenues, capitalization,
1918, \*376 1918, \*376

Zone fare loss \$1,500,000, 1065

Zone fare collection, 283

Zone fare system, 268, 545, 599, \*637, 783, 843

Zone fare system approved by Board of Public Utility Commissioners, 258

Zone fare system abolished, 957

Zone fare system abolished, 957

Zone fare system, 208tacles encountered, Comments on, 744
(See also New Jersey)

New Brighton, Pa.:

—Beaver Valley Traction Co.:
Employees service code, 503

Successful traffic count, \*865

New Haven, Conn.: \*312
Observations on zone system by N. J. Board
of Public Utility Commissioners, 1035
One man cars, Change boards, \*342
Preparing the public for zone plan, 1032
Wood block, Relaying [Crandell], \*316
Zone fare system outlined, 807, \*852
Zone fare system protested, 1022
Jersey: Zone fare system protested, 1022
ew Jersey:
-Boycott zone fare plan, 678
-Board of Public Utility Commissioners:
Depreciation of electric railway dollar, 868
Observations on the Connecticut zone
system, 1035
-Refuse return to flat rate, 716
Traffic checks of non-riders, 132
(See also Newark, N. J.) New York City:

—Buses replace electric cars, 701

—Cities Service Co.;

\$100,000,000 second preferred authorized,
950 -Citizens committee act on railway problems, 837 837

Commissioner Nixon offers solution to electric railway problem, 292

Commissioner to urge merger as means to traction settlement, 946

Eighth Avenue R.R.:
Organizing, 414
Separation from New York Rys., 139

Electric railway situation [Hedges], r5

General Gas & Elec. Co.:
Changes in holding, 357

Interborough Rapid Transit Co.:
Blue lights in subway, Significance of [Porr], \*579

City and railway partnership, Comments on City and railway partnership, Comments on, 311

Deficits for 1920-1924, 497

Earnings, July-September 1919, 840

Financing problems discussed before Federal Electric Railways Commission, 234

No surplus possible until 1922 with 8-cent fare, 1058

Passenger handling records 1918-1919, 775

Report of Stone & Webster, 358

Stone & Webster report on earnings, 1016

\$8,473,098 deficit in 1918, 1059

Strike, 404

Women workers disappear, 838

\$5,000,000 deficit, 953

—Manhattan & Queens Traction Co.:

Fare increases blocked by state supreme court, 701

Fare situation, 546, 738

Increased fares sought, 503

—Municipal ownership suggested, 1012

New York Municipal Ry, Corp.:

4000 fans ordered for subway cars, 1009

—New York New Haven & Hartford R.R.:

Income statements for 1918, 195

—New York Rys.:

Abandonments authorized, 596

Abolishes transfers pending rehearing, 257

Receiver recommends transfers be abolished, 46

Receivership troubles, 3

Separation of the Eighth Avenue R.R., 139

Stone & Webster report on earnings, 1016

Transfer case, 876

Transfer case, 876

Transfer order enforced, 301

Two-cent transfer charge granted, 55, 94, 199

Wage increase, 403

\$106,000,000 security shrinkage, 952 City and railway partnership, Comments on, 199
Wage increase, 403
\$106,000,000 security shrinkage, 952
—Politicians oppose fare increase, Comments on, 510
—Public Service Commission:
Comments on railway situation, \*379
—Railway representatives and public service commissioner confer, 731
—Third Avenue Ry.:
Amalgamated Assn., Statement regarding, 447
Transit legislation to be considered, 1055 Transit legislation to be considered, 1055
—Tunnel to Staten Island proposed 803
—Zone fare system politically barred \*381
—Zone fare vs. multi-fares, Comments on, c868
—104,403,015 more passengers, 960
New York Elec. Ry. Assn.:
—Conference of electric railway executives, 688
—Dinner, 978
—Fall meeting 977 —Fall meeting, 977

—Meeting of electric railway executives, 609, 674

New York State:
—Consistant state policy is necessary [Choate]. 690 -Mayors confer on fares, 545 -Mayors confer on fares, 545

Norfolk, Va.:
-Virginia Ry. & Pr. Co.
Negro problem in relation to one-man cars solved, 842
New franchise offered, 870
Net revenue declines, 954
Requests fare increase, 301
Safety cars experience [Callard], \*430
Northern Ohio Traction & Ltg. Co. (see Akron. O.) Akron. O.)

Norwich, Conn.:
—Shore Line Elec. Ry.:
Abandonment before superior court, 955
Accident reduction campaigns, \*281
Making over open cars for prepayment fare collection, \*113
Receivership, 804
Resume service, 292
Strike, 135
Zone fare system described, \*685

## O

Oakland, Cal.: Oakland, Cal.:

Oakland & Antioch Ry.:

Affairs taken over by San Francisco & Sacramento R.R., 1019

—San Francisco-Oakland Terminal Rys.:

Ten day strike, 731

Reorganization planned, 595

Omo:
—Promotion operation and dismantling of an electric and steam line [Finger], \*1036
Ohio Electric Ry. (see Springfield, O.)

Saving in the shop, \*582. (see also Lubrication)

Olean, N. Y.:
—Western New York & Pennsylvania Traction Co.: Strike and rioting, 448

Strike and Flotting, 446
Omaha, Neb.:

-Omaha & Council Bluffs Street Ry.:
Fare situation, 362
Nebraska Court grants adequate temporary
rate pending appraisal, 199
Skip stops continue, 701
One-man cars (see Cars, One-Man)

One-man cars (see Cars, One-Man)
Ontario, Can.:

—Associated Municipalities of Northwestern Ontario:
Organization, 81
Ontario Hydro-Electric Ry. Assn.:
—Annual meeting, 593
Operating Practice;
—Advantages of higher schedule speeds [Beeler],
•657
—British Electric Traction Co., characteristic features [Jackson], 156
—Claim adjuster's views on car operating economy [Giltner], 1045
—Dispatcher's view of car operation economies [Harris], 1044
—Economies in car operation [Phillips], 1039
—How the master mechanic looks at car operating economy [Scullin], 1044
—Human factor in safe operation and maintenance of rolling stock [Phillips], 793
—Increasing schedule speed of cars [Dehore],
•917
—London County Council Tramways [Jackson], -London County Council Tramways [Jackson],

-London County Council Tramways [Jackson], \*816
-London tubes and buses—II [Jackson], \*816
-Questionnaire of Federal Electric Railways
Commission, 573, 574
-Schedules, layouts and routing [Beeler], r122
-Superintendent's viewpoint on car-operating
conomics [Snell], 1045
-Questing records and costs:
-Cutting down operating expenses on a small
interurban road [Dehore], \*915
-Discussed by A. E. R. E. A., \*774
-Economics in car operation discussed by A. E.
R. A., 991
-Economics in Philadelphia discussed before
Federal Electric Railways Commission, r94
-Estimates of Wisconsin Railroad Commission,
892

-Estimates of Wisconsin Railroad Commission, 892
Great Britain, London County Council [Jackson], \*272
Operating engineer frowns upon theoretical calculations, [Castig Lioni], e350
-Pre-war conditions vs. today [Doolittle], r9
-Statistics of Philadelphia Rapid Transit Co., \*1000
-Tower trucks, 123
Overhead contact system:
-Double trolley favored in Japan [Sano], \*5
-Line materials, 417
-Statistics on cost [Emery], \*395
Overload release for power driven machines, 346

Pacific Claim Agents Assn.:

—Annual convention, 69
Pacific Electric Ry. (see Los Angeles, Cal.)
Paducah, Ky.:

—Paducah Traction Co.:

Franchise, 477
Paints and Painting:

—Development in japanning, 443
—Insulating varnish solvent chart, 348
—Paint Mixer driven by remodelled air drill,

\*1007

Shop methods used in paint above \*\*\*\* -Shop methods used in paint shop, \*921

Passenger Handling Records:

—Leeds, England [Jackson], \*12

—New York City, 960

—Time of passenger interchange on double end vs. Peter Witt cars [Sullivan], \*656

vs. Peter Witt cars [Sullivan], \*656
Pavement:

—Hints on paving [Findley], 764

—Kreolite paving blocks and sectional paving for railway tracks, \*30

—Pneumatic tools for breaking up pavement, \*584

\*584

\*584

\*584

\*584

\*586

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*588

\*584

-Pneumatic tools for breaking up pavement [Burn], \*583

-Public authorities should assume this burden [Tinnon], 221

-Repairs to wood-block paving [Swartz], c588

-Results with wood-block paving [Buehler],

c767 -Wood-block paving [Rasmussen], c767 -Wood-block, relaying [Crandell], \*316 Pennsylvania:

Public Service Commission —Public Service Commission:
Comments on railway situation, 269, \*382
—Receivership [Ainey], 391
Pennsylvania Street Railway Assn.:
—Annual meeting, 13
—Traffic studies of the non-riders discussed, 55

Peoria, Ill.:
—Illinois Traction System:
Operating costs and revenues, 89

Operating costs and revenues, 89
Philadelphia, Pa.:

—American Rys. Co.:
Fare increase earnings, 167
—Comparison of invesments in transit facilities,
Philadelphia and Boston, 1001
—Fares in Chicago, Cleveland and Philadelphia
compared [Busbyl, 795
Philadelphia Rapid Transit Co.:
Comparison of fare situation with other
municipalities, 851
Co-operative plan [Mitten], r114
Co-operative Welfare Association annual
picnic, 537
Correspondence on hearings before Federal
Electric Railways Commission, 907
Earnings increased, 537
Gross revenue and increase 1903 to 1919,
999
"L" nearing completion, 403
Operating statistics compared with Cleveland and Milwaukee, 1918, r110
President's transit plan attacked, 950
Proposal to lease Frankford Elevated, 732
Safety-first movement, \*399
Service and fare conditions analyzed, \*999
Traffic court [Horton], \*75
Wages readjustment, 36, 291
—Practice described by Mr. Joyce before Federal
Electric Railways Commission, r94, [Mortimer], r108
Pittsburgh, Kan.:
—Joplin & Pittsburgh Ry.:

Pittsburgh, Kan.: —Joplin & Pittsburgh Ry.: Court grants 2½ cent a mile rate, 957

Court grants 2½ cent a mile rate, 957

Pittsburgh, Pa.:

—Pittsburgh Rys.:

Appraisals, 409

Arbitration before War Labor Board, 38

Court sustains fare increase, 197

Fare increase earnings, 165

Fare increase helpful, 735

Requests taxes remitted, 297

Strike situation, 405, 445, 491

Ten-cent fare necessary, 257, 302

Valuation, 357, 436, 1017

Valuation of property as basis for fare increase, 93

Wage increase sought, 136

—Street railway situation

—Subway planned, 85

—Voters recommend loop plan be abandoned, 950

Pittsfield, Mass.:

Pittsfield, Mass.:

—Berkshire Street Ry.:
Receiver appointed, 496

Plymouth, Mass.:

—Brockton & Plymouth Street Ry.:

Building special work with an oxyacetylene cutting and welding outfit [Smith], \*317

Oles. —Pole-pulling jack, \*941
—Pole-pulling jack, \*941
—Spacing for transmission line
—Steel gain, \*346
—(See also, Transmission Lines)

Portland, Me.:

—Cumberland County Power & Light Co.:
Car mile and car hour earnings, \*624
Fare increase earnings, 166
Zone system, \*621

—Motor buses ruled out, 360

—Motor buses rined out, 560

Portland, Ore.;

—Portland Ry., Lt. & Pr. Co.;

Fare increase sought, 776

Higher fare urged to save from bankruptcy, 1021

Mr. Strandborg discusses the dollar, 596

Wage situation, 403, 949

Power Development;

Power Development: Power Development:
—Stimulus given to water power development
in Sweden, 148
—Water power development hastened in
Sweden, 225
—Discussed by American Electric Railway Engineering Assn., r71
—Keeping up the trolley voltage [Placel, 27
Power Distribution:
—Maintenance of high tension lines [Drabelle],
325

-McIbourne (Australia) Suburban Railway, \*904
-Street and interurban railways [Drabelle], 765 765 -Voltage surveys give information for varying station voltage, 976

Power, Purchase of:

—Discussed by American Electric Railway Engineering Ass'n, \*r74

Power Stations and Equipment:

—Air blast transformers, Maintenance of, \*424

—Automatic devices, Progress of, 370

—Coal handling equipment layout at New Haven [Wood], \*312

—Dead gas pockets for protecting soot-cleaner elements, \*935

—Discussed by American Electric Railway Engineering Ass'n, r72, 74, 76

—Economies in Steam generating stations [Finn], 1047

—Evaporating water in steam boilers, chart showing cost of, \*586

—Feed water regulator, \*936

—High efficiency of modern steam-turbine plants, 922

—Limitations in steam-turbine design discussed by A. I. E. E., \*923

—Measuring boiler draft conditions, 1008

—Mechanical overload release for power driven machines, \*346

—Melbourne (Australia) Suburban Railways electrified, \*902

—Neglect of power plant fatal, 209

—Steam condenser construction, 578

—Underfeed stoker, automatic cleaning feature, \*585

—Unusual method for moving two 250-hp. boil-

\*585
—Unusual method for moving two 250-hp. boilers [Elliott], 123

Power Transmission:
—Conditions in Sweden, 226
Providence, R. I.:
—Rhode Island Co.:

Earnings and operating expenses Jan.-June 1919, 412

1919, 412
Fare increase hearing, 412
Public pay subsides, comments on, 426
Results of higher fare, Washington testimony, 339
Service suspended by strike, 191
Six-cent fare, 702

Six-cent fare, 702
Publicity:

—Accident prevention campaigns advocated, 719
Educational publicity of Twin City Rapid
Transit Co., \*400
Effect of cartoons upon public sentiment, 850
—Inform people through representatives, comments on, 849
—International Railway, 36
—Men with the nerve to tell the people the facts needed [Hedges], \*r5
—National campaign needed, 464
—Newspaper most influential [Mullaney], 216
—Preparing public for zone system in Connecticut, \*852
—Preparing the public for zone plan, 1032
—Public education of railway facts urged [Pardee], \*r3
—Public Service Railway for zone fares, \*484, \*638
—Railway utility a good source [Mullaney], 216
—Selling transportation, comments on, 6534
—Speak the speech of the records of the records.

216
Selling transportation, comments on, c534
Speak the speech of the people, comments on, 849
State facts to public [Ainey], 387
Straight-forward publicity bring results [Fredericks], 928
Value and necessity of [Burroughs], r90
When and where successful, 267
Zone fare system in New Jersey, \*484, \*638

—Dublicity Agents:

—Organize as committee of American Asso., r89
Public Ownership (see Municipal Ownership)
Public Ownership League of America:

—Conference Nov. 15-17, 895

leel, 240
-Commission regulation at fault. Discussion before Federal Electric Railways Commission, 234, 235
-Consistent state policy is needed [Choate], 689

Constructive attitude, 798

Co-operation of commissions and municipalities, 688

Detroit mayor disagrees with commission, 802

Federal Electric Railways Commission (see Federal Electric Railways Commission)

Industrial conference should include electric railway industry, 509

Local versus state commissions [Erickson], 243

National Association of Railway and Utility

243

—National Association of Railway and Utility Commissioners, Meeting, 824

—New York Court of Appeals decides commission can raise rates, 143

—Regulation not a primary obstacle [Ainey], 389

—Regulation should be simplified [Rifenberick], 66

—Supervisory force comments on by T. & T.

Supervisory force, comments on by T. & T. Ass'n, r54

Public Service Ry. (see Newark, N. J.)

Purchasing:
—Problems of Purchasing agents [Whiteford],

т88

Purchasing Agents and Storekeepers:
—Organize as branch of Engineering Ass'n, r87

Q

Quincy, Ill.: —Quincy Ry.: Seven-cent fare, 96 R

Rail Joints and Bonds:

Bonds for temporary and permanent track construction [McKelway], \*114

Bond troubles, 577

Button-head on terminal type [McKelway], \*116

Expanded type [McKelway], \*115

Joint without bolts, \*348

Soldered bonds for track bonding [McKelway], 899

Rails:

Rails:

Age and its relation to tracks and cars, comments on, 745

Brinell hardness test for girder rails, comments on, 422

—Chemical analysis [Cram], 112

—Composite [Cram], \*110

—Composition of [Cram], \*111

—Cutting rails with a power sawing machine, \*1049,

—Curved rails, use of, Manganese steel in, 54

—Girder rails recommended designs [Cram], \*558

Girder rail specifications revised (A. S. T. M.

-Girder rails, recommended designs [Cram], \*558

-Girder rail' specifications revised (A. S. T. M. annual meeting), 24
-History and early types [Cram], \*106
-Length increases [Cram], \*112
-Making accurate measurements of railwear [Ferguson], \*1006.
-Rehabilitating track joints with an are welder, \*82
-Selection of [Cram], \*556
-Sorbitic method of hardening, \*29
-Standardization of [Cram], \*395
-Third rail: Standardization drive, 3
-Uses of oxyacetylene cutting and welding outfit [Smith], \*317
-Raleigh, N. C.:
-Carolina Pr. & Lt. Co.:
-Race Segregation with safety cars, 877
-Racine, Wis.:

Racine, Wis.:

—One dollar a week pass started, 502

—Wisconsin commission withholds fare increase, 843

Reading, Pa.:

—Reading Transit & Lt. Co.:

Employees refuse ownership, 836

Receiverships:

—Aurora, Elgin & Chicago, R.R., 409

—Brooklyn Rapid Transit Co., 138

—Pennsylvania [Ainey], 391

—United Rys., St Louis, Mo., 139; Court orders liquidation of indebtedness to War Finance Corp., 194

Rehabilitation:
—How the railways can be rehabilitated [Cooke], r127

Repair Shops:

--Commutator slotting device for use with double-spindle lathe, \*578

--Saving oil, \*582

--Stockroom records and practice, \*861

—Stockroom records and practice, \*861
Repair Shop, Material and Equipment:
—Choice of, comments on, 554
—Commutator slotter, \*347
—Electrically heated oven, \*746
—Self-centering chuck, \*347
Repair Shop Practice:
—Discussion on slack adjusters, mèters, wheel grinding, etc., by Iowa Elec. Ry. Ass'n, 761
—Handy shop carriage for fenders, \*925
—Maintenance kinks [Dean], 759
—Maintenance of equipment [Sutherland], 766
—Portable rivet heater, \*488
—Removing armatures from box frame motors, \*532

\*Bode Island:

Rhode Island:

—Rhode Island Public Service Commission, comments on railway situation, 338

ments on railway situation, 338
Rhode Island Co. (see Providence, R. I.)
Rivet Heater:
—Portable for shop use, \*488
Rochester, N. Y.:
—New York State Rys.:
Fare decision stands, 737
Roslyn, N. Y.:
—New York & North Shore Traction Co.:
Fare situation, 738
Zone fare system established, 501

S

Safety car (see Cars, one man)
Safety-first Movement (see Accident Preventions)
Saginaw, Mich.;
—Saginaw Bay City Ry.;
Voters approve fare increase, 776
San Diego, Cal.;
—San Diego Elec Ry.;
Commission orders zone system and commends one man cars, 961
Zone fare system recommended, 501
St. Louis, Mo.;
—United Rys.;
Court orders liquidation of indebtedness to War Finance Corp., 194
Drag line car for handling track materials.

\*\*531
Fare increase situation, 502, 599

\*5.21
Fare increase situation, 502, 599
Maintenance of air-blast transformers, \*425
Metal tokens popular, 961
Notice of default served, 139
Power contract upheld, 836
Receiver's report, 955
Vice-President reviews finances, 254
Wage award changed, 769
Wage increase, 404
Where the six-cent fare goes, 357

Abbreviations:

St. Joseph, Mo.:
—St. Joseph Ry., Lt., Heat & Pr. Co., Fares Increased, 1021
Sandwich, Windsor & Amhurstburg Ry. (see Windsor, Can.)
San Francisco, Cal.:
—Municipal Ry.:
Depreciation fund situation, 450
San Francisco & Sacremento R. R.:
—Affairs of Oakland & Antioch Ry. taken over, 1019
—Street railway situation, 10 Shaughnessyl 896

— 1019
—Street railway situation [O'Shaughnessy], 896
—United R. R.:
Readjustment plan modified, 734
San Francisco-Oakland Terminal Rys. (see Oakland, Cal.)
Schenectady, N. Y.:
—Schenectady, Ry.:
Fare situation, 689
Schuylkill Ry. (see Girardville, Pa.)
Scotland:

Fare situation, cost
Schulykill Ry. (see Girardville, Pa.)
Scotland:
—Glasgow Corporation Tramways;
Income account, 1918 and 1919, 595
Seattle, Wash.;
—Municipal ownership successful, 496
—Municipal Ry.;
Financial report, April-June, 1919, 386
Improvements planned, 1054
Profits for May, 89
—Puget Sound Traction, Lt. & Pr. Co.;
Purchased by city, 897
—Seattle municipal lines [Murphine], 897
—Traction situation [Hanson], 386
Service and Tower Wagons;
—Air-operated tower for line cars, \*794
—Tower trucks and cars at Minneapolis, \*121
Service-at-cost (see Franchises)
Sherbrook, Can.;
—People vote to increase fares, 677
Shore Line Electric Ry. (see Norwich, Conn.)
Signals;

-reopie voice to increase lares, 577
Shore Line Electric Ry. (see Norwich, Conn.)
Signals:

—Annunciators for fire sprinkler system. \*937
—Blue lights and their significance in New York subways [Porr], \*579
—Combined signal and telephone box [Restofski], \*901
—Effect of electrification, 280
—England, West Ham Corporation Tramways telephone control system, \*397
—Equipment of York (Pa.) Railways increased, \*120
—Maintenance, observations on [Nachod], 442
—Operating without telephones, Boston elevated Railway [Danal, \*23]
Skip Stops (see Stopping of Cars)
Southern Traction Co. (see East St. Louis, Ind.)
Spain:

Southern Flaction of the Spain:

—Central Metropolitan Railway of Madrid, subway nears completion, \*21

Special Work:

—Construction by oxyacetylene process [Smith], \*318

—Centinguous rail crossing, \*936

-Continuous rail crossing, \*936 -Face plates for bending and straightening, \*559

Face plates for bending and straightening,
\*559

Home made high speed trolley frogs, \*942

Labor saving tools useful [Findley], 763

Screw spike vs. cut spike, Comments on, 969

Spring switches and crossovers made from standard trolley frogs, 566

Switch construction [Smith], \*318

Tests on holding power of railroad spikes, \*975

Thermit-welded crossings are long lived, \*1008
Spokane, Wash.:

Spokane & Inland Empire R. R.:
Court grants wage increase, 539
Foreclosure, 840
Springfield, Mass.:

Springfield, Mass.:
—Springfield Street Ry.:
—Springfield Street Ry.:
Encrys saving campaign, \*246
Zone fare system described, \*628

Springfield, O.:
—Ohio Electric Ry.:
Observations and queries on safety ear operation [Moore], 131

ation [Moore], 131
Standardization:
—Applying salesmanship to the engineering standards, 465
—Buildings and structures [Cram], 567
—Cars, one man [Wells], r36
—Classification of accidents, A.E.R.C.A., r83
—Classification of accounts, A.E.R.A.C., r85
—Danger of laxness, comments on, 743
—Engineering standards discussed by A.E.R.E.A., r81

Engineering standards, Report of A.E.R.A., r47
Equipment standards of A.E.R.E.A. [Chance],
931

-Equipment standards of A.E.R.E.A. [Chance], 931

-Equipment standards of Master Car Builders' Assn., 931

-One man cars considered [Kealy], r31

Wells, r36

-One man car discussed by Central Electric Railway Assn., 64

-One-man cars, Comments on, 743

-Present status of engineering association standards [Welsh], 922

-Rails [Cram], \*109

-Report of A. E. R. E. A., r70

-Use of standards by railways, 3

-Use of standards may be stimulated [Schreiber], 34

-Way matters [Cram], 568

-Wheels, 568

-Wheels, rails, bearing, motors and brake shoes discussed by A. E. R. E. A., \*r77

Standards of Service:
—Prewar versus today [Doolittle], r10
Staten Island, N. Y.:
—Tunnel to New York City proposed, 803 Statistics:

-Accidents, Shore Line Elec. Co., 1917-1919, -281
—Automatic substation operation data on, [Cadle], 986
—British tramway expenses, 1913-1914 [Madgen], 440

Statistics (Continued):

—Car equipment increase, 1914-1919, 169
—Census ligures for 1917 show distress, 195
—Census Report for 1917-1917, 91
—Comparison of Philadelphia, Milwaukee and Cleveland discussed by Federal Electric Railways Commission, r110
—Coasting records in Great Britain, 526
—Cost of capital, 1909-1919 [Sisson], 179
—Distribution of capital stock, 438
—Electrical equipment and supply parts increase, 1914-1918, 167
—Expenses and earnings, 1913 and 1919, compared [Burkel, 512
—Fare revision and passengers carried, Croydon, England [Jackson], \*469
—Income statement of electric railways, 1917-1918, 181
—Monthly statement of electric railways, 40, 256, 298, 411, 498, 544, 597
—Preparation of data in connection with rate cases [Bitting], r29
—Presented to Federal Electric Railways Commission, \*181
—Promotion operation and dismantling on Ohio line [Finger], \*1036
—Raw material increase, 1912-1919, 168
—Records show railways plight [Emery], \*394
—Shrinkage of the nickel, 1913 to 1919
—[Burkel, 512
—Traffic returns, Croydon, England [Jackson], \*473
—Traffic returns, Croydon, England [Jackson], \*1917 [Jackson], \*155
—U. S. and German export to Sweden, 1909-1913, 148

Steam Turbines;
—Limitations in design discussed by A. I. E. E.,

Steam Turbines:
—Limitations in design discussed by A. I. E. E.,

\*923

Stokers:
—Underfeed stoker, Automatic cleaning feature,
\*585

Stockrooms:
—Records and practice, \*851

--Records and practice, \*851
Stopping of Cars:
--Comments on by A. E. R. T. & T. A., r54
--Effect upon economics in car operation [Phillips] 1039
--Omaha, Nebraska, Continue, 701
Stratford, Can.:
--Grand Trunk Ry.:
Government ownership proposed, 491

Government ownership proposed, 192
Strikes and Arbitrations:
—Akron, O., 133
—Boston, Mass.:
Boycott and strike follow fare increase, 198
Eight-hour day with increase wage granted.
\*190

Eight-hour day with increase wage granted.

\*190
Situation, 134
Strike threatened, 538

—Brooklyn, N. Y.:
Settled, 352
Union recognition, 295
Unjustifiable, 267
—Chicago, Ill., 249, 293
—Columbus, O., settled, 535
—Davenport, Ia., settled, 352
—Denver, Col., 129
—Des Moines, Ia., settled, 447
—Discussed before Federal Electric Railways
Commission, r106
Discussed by Amalgamated Assn., 528
—Facing a strike [Hedges], r7
—New Area, N. J., 37
—New York City, settled, 404
—Norwich, Conn., 135, 292
—Oakland, Cal., Ten day strike, 731
—Olean, N. Y., Rioting, 448
—Pittsburgh, Pa., situation, 405, 445, 491
—Proposed measures in Massachusetts, 873
—Providence, R. I., Service suspended by strike, 191
—Public opinion, Effect of, 268

-- Frovidence, R. I., Service suspended 1919

-- Public opinion, Effect of, 268
-- Toronto, Can., Strike settlement, 191

-- Urbana, Ill., 87
-- Windsor, Can., 86, 294

Subsidies:
-- Comments on State Subside, 607

outsidies:

—Comments on State Subsidy, 607

—Massachusetts Street Railway Commission approves, 871

—Massachusetts, Temporary subsidies favored, 673

Mässachusetts, Temporary subsidies favored. 673
Municipalities lessen assessments, Comments on, 849
State subsidies for electric railways [Perkins], \*645
Substations and Equipment:

Air-blast Transformers, Maintenance of, \*424
Automatic substations on New York state railways [Cadle], \*985
Automatic substations, permit salvaging of copper [Dehorel, \*916
Discussed by A. E. R. E. A., r73
Experience data of automatic substation operation, Comments on, 967
Experiences in development of automatic substations [Wensley], \*886
Fireproof construction [Elliott], 487
Melbourne (Australia) Suburban Electric Railways, \*904
Selection of [Drabelle], 765
Some elements in a satisfactory substation building [Lloyd], \*833

Subways:
Cleveland O.

Subways: Cleveland, O.: —Plans outlined, 1012 —Detroit, Mich., Engineers' report, 248 —Proposed, 673, 699 —Proposed in Cleveland, \*71

Friposed in Cleveland, 71
 Sweden:
 Electrification work and waterpower development to be hastened, 225
 Railway development, 227
 Stimulus given to waterpower development.

tions: \*Illustrated. c Communication. r Page in Report Number for Oct. 11.
READ THE INSTRUCTIONS AT THE BEGINNING OF THE INDEX

Switzerland:

—Regenerative braking with single phase commutator motors, \*910
—Status of Swiss electrification, 227
—Status of Swiss electrification [Ateliers de Construction Oerlikon], c696
—War time progress in railroad electrification, 487

Veraguse N. V. Syracuse, N. Y.:

—Empire State R. R. Corp.:

Fare increase, 142 Т Taxation:
—Comments on [Bullock], 186
—Comments on [Jackson], r122
—Relief from taxation [Rifenberick], 66
—Problems before Federal Electric Railway
Commission, 173 Taxes:
—Questionnaire of Federal Electric Railways
Commission, 574
Templates:
—Shop methods used in building cars, 921 Tennessee:

-Regulative commission for all public utilities provided, 591
Terminology:
-Valuation terms defined by American Elec.
Ry. Ass'n. 223
Terre Haute, Ind.:
-Terre Haute, Indianapolis & Eastern Traction
Co.. Terre Haute, Ind.:

—Terre Haute, Indianapolis & Eastern Traction Co..

Co..

One man cars, results of operation, 161

Tests of Equipment and Material:

—Brinell hardness test for girder rails, comments on, 422

—Manufacturers tests of materials for railway motors [Dean], \*321; comments, 309.

Third-rail (see Rails, Third-rails) Tickets:

—Automatic ticket selling machine, \*941
—Eastern Massachusetts Street Rys., Monthly tickets, 600
—Hentification checks at Youngstown, \*32\*
—Increase traffic [Buffel, 665
—Kansas City, Mo., to be used, 875
—London's buses [Jackson], \*818
—Metal tickets:

Denver, Col. [Doty], r40
Popular in St. Louis, 96
Substitute for multiple coins [McLaughlin], r42
Stimulate sale of a480 Substitute for multiple coins [McLaughlin], r422
Stimulate sale of, c489

-Zone fare ticket forms:
Brisbane, Australia [Badger], \*483
Connecticut Co., \*855
Croydon, England [Jackson], \*469, \*470
Foreign countries [Cusani], \*478
Milwaukee, \*616
Newark, N. J., \*484, \*642
New London, Conn., \*687
Portland, Me., \*625
Springfield, Mass., \*630

-Zone fare metal tickets in New London, Conn., \*686
lies: Tres:
—Selection of [Findley], 763
—Statistics on selling price [Emery], \*395
—Tie nipper for reducing spiking difficulties,
890 Coledo, O.:

Statements by company and city, 837

Toledo Rys. & Lt. Co.:
Cease operation, situation, 801, 837

Mayor dispossesses company, 133
Ouster order overruled, 248
Ouster ordinance suspended, service-at-cost plan, 447

Paving blocks and sectional paving for railway tracks, \*30

Plan suggested for temporary resumption of service, 947

Resumption of service, situation, 870, \*970

Review of railway situation causing suspension and finally resumption of service, \*972

-Toledo Traction Lt. & Pr. Co. Toledo, O. -Toledo Traction Lt. & Pr. Co.: Bonds called for payment, 1019 Bonds called for payment, 1019

Toronto, Can.:
—Strike settlement, 191

Track Construction:
—Bonds for temporary and permanent track construction [McKelway], \*114
—Clearance in special track work layout, comments on, 464
—Cost of recent construction [Storrs], 176
—Lessen first cost and increase maintenance cost, comments on, 555
—Selection of rails [Cram], \*556
—Solid manganese for heavy traction [Findley], 764
—Standard track sub-construction, comments on, "704"
—Standard track sub-construction, comments on, 310
—Using lever throw-type track switches for safety, "987
—Way matters discussed by A. E. R. E. A., r80
Track Maintenance:
—Discussed by Iowa Elec. Rv. Ass'n. 761
—How to maintain track [Findley], 763
—Lessen first cost and increase maintenance cost, comments on, 555
—Long track life, comments on [Cooper], c533
—Monolithic construction discussed by Illinois Electric Railways Ass'n, 159
—Removing track with a small force of laborers [Druy], 906
—War time progress [Tinnon], 220
Track Regulation:
—Joint use of discussed by A. E. R. T. & T. A. r64, r66, r67
—Terms and gaging points discussed by A. E. R. E. A., \*177
Tractor for freight haulage, \*347 -Standard track sub-construction, comments on,

Traffic:

Code of principles discussed by A. E. R. T. & T. A., r55

Conditions in Cleveland, O., \*72

Croydon, England [Jackson], \*467

Effect of density and regulation upon economies in car operation [Phillips], 1039

Regulation, comments on by A. E. R. T. & T. A., r54

Rush hour vs. off hour passengers, c349

Transporting shipyard workers at Quincy by "Split shift" plan [Conant], \*62

Traffic Promotion:

Advertising for traffic [Buffel, \*663

Business follows service [Walker], \*660

Comments on, 607

Co-operation by the public [Beeler], r123

Great Britain [Jackson], 432

Higher schedule speeds [Beeler], 658

Merchandizing, 391

Methods of overcoming jitney competition [Eddy], 691

Railways must sell their transportation [Jackson], c587

Tickets increase rides [Sullivan], \*654

Tricket selling campaign in Kansas City, Mo., 775

Traffic Surveys:

Comments on, 511

Comments on by A. E. R. T. & T. A., r54

Effect of carless period in Toledo upon business houses and theatres, 974

Methods used by Philadelphia Rapid Transit System [Horton], \*75

Motor buses in London, England [Jackson], \*709

Successful count on the Beaver Valley Traction Co., \*865

Traffic checks of non-riders [Eddy], c132

Traffic studies of the non-riders discussed by Pennsylvania Street Railways Ass'n., 55

Transmission Lines:

Cap for mounting apparatus on the insulators, 584

Laying out a complete line [Harte], \*561 Jor -Laying out a complete line [Harte], \*561 -Maintenance of high tension lines [Drabelle], Timning test for copper wire (A. S. T. M. annual meeting), 25 annual meeting), 25
Transfers:

—Abuse of the transfers in Kansas City, 361
—Comments on [Sullivan], \*655
—Cost of giving [Storrs], 176
—Croydon, England, Tickets [Jackson], \*469
—Discussed by Wisconsin Railroad Commission, 894 — Discussed by Wisconsin Railroad Commission, 894

— Great Britain, London County Council, Granted only with higher fares [Jackson], \*273

— Kansas City triplicate transfer, \*401

— New York City:

Abolishes transfers pending rehearing, 257

Two-cent order enforced, 301

New York State Supreme Court to hear case for abolishing transfers, 876

— Portland, Me., Practice, \*624

— Springfield, Mass., \*631

Transportation Department:

— London County Council Tramways staff, \*213

Trenton, N. J.:

— Pennsylvania-New Jersey Ry.:

Commutator slotting device for use with double spindle lathe, \*579

Trespassing:

— Grade crossings and trespassing discussed by National Association of Railway and Utilities Commissioners, 824

Tri-City Ry.: (see Davenport, Ia.)

Trolley Wires (see Overhead Contact Systems)

Tunnels:

— New York City to Staten Island proposed, 803

Turbo-Generators:

— Sizes possible to build, discussed by A. I.

E. E., 882 U

United R.R. (see San Francisco, Cal.)
United Rys. (see St. Louis, Mo.)
United Rys. & Elec. Co. (see Baltimore, Md.)
Union Traction Co. of Indiana (see Anderson, Ind.)
Urbana. III.:

—Urbana & Champaign Ry., Gas & Elec. Co.:
Strike, 87

Vancouver, Can.:
—British Columbia Elec, Ry.:
Fare situation, 600
Valuation (see Appraisal)
Varnish (see Paints and Painting)
Virginia Ry. & Pr. Co. (see Norfolk, Va. and Richmond, Va.)

#### W

Wages:

—Budget basis discussed before Federal Electric railways Commission, 1100

—Compared in Chicago, Cleveland and Philadelphia [Busby], 796

—Compensation for efficient management, 14
—Depend on rate of production, comments on, 781

781

Discussed by Amalgamated Assn., 527

Japan [Sano], 6

Lower for high schedule speeds [Beeler], 658

One man car operators [Greenland], 68

Principle of differential wages in awards [Pringle], c943

Wages (Continued):

-Public takes an interest in wage increases, 207
-Questionnaire of Federal Electric Railways
Commission, 574

-Wage and rate problem inter-dependent, 269
-Wage scales must be on reasonable basis [Pardeel, 2]
-Will wages continue to increase? 152
-Wage Increases;
-Baltimore, Md., 407
-Birmingham, Ala., situation, 351
-Boston, Mass., 134, x-190
-Chicago, Ill., 134, 189
-Cleveland, O., 85
-Columbia, S. C., 142
-Kansas City, Mo., 136
-Los Angeles, Cal., 251
-Massachusetts: Effect of, 354
-Milwaukee, Wis., situation, 351
-New York City, 403
-Philadelphia, Pa., 136
-Portland, Ore., situation, 403
-Granted, 949
-St. Louis, Mo., 404, 769
-Spokane, Wash., court grants increase, 539
War Labor Board:
-Award in case of New Jersey Public Service
Railway vs. employees, 37
-Cases settled, 353
-Dissolved, 353
-Dissolved, 353
-Dissolved, 353
-Dissolved, 353
-Dissolved, 353
-Dissolved, 353
-Pittsburgh, Pa., decision in, 39
Warsaw, Ind.:
-Winona Interurban Ry.:
-Stee pilots for all year service, \*939
Washington, D. C.:
-Capital Traction Co.:
-Fare increase granted, 736
-Washington Ry. & Elec Co.:
-Collateral ordered sold, 254
-Fare increase sought, 142
-Fare increase granted, 736
-Washington, Baltimore and Annapolis Electric
-R. R. (See Baltimore, Md.)
-Water Power (see Power)
Wausau, Wis.:
-Wisconsin Valley Elec. Co.:
-Wood block paving [Rasmussen], c767
-Waverly, N.-Y.:
-Waverly, Sayre & Athens Traction Co.:
-Fare increase granted by P. S. C., 197
-Way':
-Welbourne (Australia) Suburban Railways,
-\*905
-Mowing weeds on interurban right-of-way Way:

Melbourne (Australia) Suburban Railways.

\*905

Mowing weeds on interurban right-of-way [Man], \*569

Standardization of way matters [Cram], 568 Welding, Special Methods:

Arc welding set. \*585

Building special work [Smith], \*317

Electric arc [Unland], \*343

Experiences with thermit insert welding [Robeson], \*987

Recent progress in arc welding discussed by N. Y. R. R. Club, 919

Shop thermit welded crossings are long lived. \*1008

Use and misuse of arc welding apparatus [Unland], \*756

Welding wrought iron and steel [Unland], 581 Western New York & Pennsylvania Traction Co. (See Olean, N. Y.), 448

Western Society of Engineers:

Meeting Sept. &, 529

West Virginia Tr. & Elec. Co. (See Wheeling, W. Va.)

Wheeling, W. Va.:

West Virginia Traction & Elec. Co.:

Receiver appointed, 358

Wheels:

Building up flat spots. 82

Standardization of [Brown], 568

Limiting features in life and performance of chilled iron wheels, \*755

Terms and gazing points discussed by American Electric Railway Engineering Assn., \*577

Window Sash Brake Device, \*246

Windsor, Can.:

Sandwich, Windsor & Amherstburg Ry.:

Purchase by municipalities approved, 873

Strikes, 86, 299

Winnippe, Can.:

Workers sympathetic strike, 36

Winconsin:

Railroad Commission recommends synchronizing revenues with wage increases. 967 Way:
—Melbourne (Australia) Suburban Railways,
\*905

## Y

Wisconsin:

—Railroad Commission recommends synchronizing revenues with wage increases, 967
Wisconsin Valley Elec. Co. (see Wausau, Wis.)
Work and Wrecking Cars:

—Drag line car for handling track materials,

\*531

York. Pa.:

—York Rys.:

Signal equipment increased, \*120

Youngstown, O.:

—Mahoning & Shenango Ry, & Lt. Co.:

Franchise, essential features [Stevens], r21

Zone fare collection, \*327

Zone fare systems:

—Adaptability of one man cars, 152

—America [Jackson], r120

—Australia [Jackson], r120

—Australia [Jackson], 484

—Advertise zone boundries. 371

—Brisbane, Australia [Badger], \*481

—British Electric Traction Co. [Jackson], \*154

Zone Fare Systems (Continued):

—Camden's view of the New Jersey zone plan [Bleakly], r126

—Collection at Youngston, \*327
—Collection of zone fares [Kuemmerlein], r68
—Congestion reduced [Jackson], 393
—Comments on operation, 813
—Croydon, England [Jackson], \*466
—Discussed by Dr. Whitten, 831
—Discussed by A. E. R. T. & T. A., r62
—Discussion of less than five-cent first zone fare, P. S. R. A. annual meeting, 166
—Effect upon distributing population [Madgen], 441
—Future fare system for small cities [Emery], \*695
—Great Britain [Madgen], 440 Great Britain [Madgen], 440
Great Britain [Jackson], 431
—Increase postage [Jackson], 1119
—Kansas City, Mo., service not fares zoned in, 362
—Leeds, England, operation in [Jackson], \*7, 56
—London County Council [Jackson], \*210, \*270
—Milwaukee, satisfactory, \*615
System upheld, 808—Necessity for [Jackson], 393

Zone Fare Systems (Continued); —Newark, N. J., 545, \*637, 843 Abolished, 957 Losses, \$1,500,000, 1065 New Haven, Conn.:
Comments on, 707
Observations on by N. J. Board of Public Utilities Commissioners, 1035
Opposed by people, 1023
System outlined, 807, \*852
New Jersey (see Public Service Railway below) -Obstacles encountered: Comments on, 744 Operation in, 599, 715 Plan approved, 258 Situation, 715, 783 Transfer-less zone fare system, 268 -Objections [Jackson], 435
-Politically barred in New York, \*380
-Pointland, Me., described, \*621
-Practice in British cities, 34
-Preparing the public for, 1032
-Publicity, \*484

Zone Fare Systems (Continued):

—Public Service Railway of New Jersey:

Comparison of zone fare rate with flat rate,
283 283

History, 545, \*637, 678, 808, 843, 1022

—Reports on by A. E. R. A., r47

—Results in Rhode Island, testimony at Washington hearing, 339

—Roslyn, N. Y., 501

—San Diego, Cal.;

Ordered by Commission, 961

Recommended, 501

—Shore Line Electric Railway system described, \*685

—\*8685

—Side lights on the zone force system. \*685\*
Side lights on the zone fare—congestion or diffusion? [Jackson], \*276\*
-Springfield, Mass., described, \*628\*
-System outlined and practice discussed, 610\*
-Ticket forms, foreign [Cusani], \*478\*
-Zone fare system vs. horizontal fare unit increase [Spring], 18\*
-Zone fare system vs. multi-fares in New York, c868\*
-Zone fares for small cities [Jackson], c 1051\*
-Zone markings on Shore Line Electric Railway, \*686\* -Side

### **AUTHOR INDEX**

Ainey, William D. B.:

—State the facts to the public, 387

—What the Federal Commission should bring out, 389

Ateliers de Construction Oerlikon. Status of Swiss electrification, c696

## B

Babcock, E. V. Street railway situation in Pittsburgh, r116
Badger, J. S. The graduated fare at Brisbane,
Australia, \*481
Beaumont, W. Worby. Buses carry large proportion of London traffic, c727
Beeler, John A.:
—Advantages of higher schedule speeds, \*657
—What ails the street cars, r122
Bemis, Edward W. Fair return on railway properties, r125
Bennett, H. K. Written discussion on Mr. Carpenter's paper, Speed and its relation to accidents, 722
Bibbins, James R. The net result of the 5-cent fare, \*570
Bitting, Clarence R. The preparations of data vs. connection with rate cases, r29
Bleakley, E. G. C. Camden's view of the New Jersey zone plan, r126
Boyce, W. H. National advertisers can help, c696
Brown, H. L. The wheel situation, standardi-Jersey zone plan, F120
Jersey zone plan, F120
Boyce, W. H. National advertisers can nearc696
Brown, H. L. The wheel situation, standardization of, 568
Buehler, Walter, Results with wood block
paving, c767
Buffe, F. G. Advertising for traffic, \*663
Bullock, Charles J. The taxation of electric
railways, 186
Burke, T. F. Transference of load in cars when
braking, \*750
Burke, W. H. The nickel in 1913 and 1919,
513
Pneumatic tools for breaking braking, \*700
Burke, W.H. The nickel in 1913 and \*51, 513
Burr, Walter P. Pneumatic tools for breaking up pavement, \*583
Burroughs, W. Dwight. The value and necessity of publicity, r90
Busby, L. A. Fares in Chicago, Cleveland and Philadelphia compared, 795

### C

Cadle, C. L. "Automatics" on the New York State Railways, \*985
Callard, H. N., Jr. Safety car experience in Virginia, \*430
Carraway, Leake. All electric railway publicity agents should be in Atlantic City, c588
Carpenter, E. C. Speed and its relation to accidents, 722
Castiglioni, F. Why does the operating engineer frown upon theoretical calculations, c350
Chamberlain Wm. Regulating rates in Iowa 28 c350
Chamberlain, Wm. Regulating rates in Iowa, 28
Chance, T. A. Equipment standards of the A. E.
R. E. A., 931
Choate, Joseph K. A consistant state policy is
needed, 689
Clifford, C. H. Service and jitney competition,
r35
Cole A. R. Hogger for the control of the competition. r35
Cole, A. B. Heavy freight service on a single-track. high-speed passenger line, \*866
Conant, W. B. Transporting shipyard workers at Quincy, \*61
Connely, Charles. A conductor's point of view on car-operating economy, 1042
Cooke, Charles B. Jr.
—Economies and equity in valuation, 911
—Simplification of corporate structures, \*858
Cooke, Morris Llewellyn. How the railways can be rehabilitated, r127
Cooper, H. S. Long track life, c533

Cram. R. C.:

—buildings and structures, standardization of, 567

—Way matters, standardization of, 568

—Notes on the history and development of electric railway rails, \*106

—Selection of rails for electric railway service \*556

Crandell, J. S. Relaying wood block in Bridgeport, Conn., \*316

Culkins, W. C. Incentive to efficiency is needed, 79

Cusani, Ferdinando C. Typical zone tickets from abroad, \*479 D Dana, Edward:
—Operating without telephones, \*23
—The street inspector as he was and is to be,
\*372 \*372

Dean, J. S.:

—Manufacturers' tests of materials for railway motors [Dean], \*321

—Railway shop, maintenance kinks, 759

Dehore, C. T. Cutting down operating expenses on a small interurban road, \*915

Dixon, Alves. A claim agent's experience with one-man cars, 720

Doolittle, F. W. Relationship of items of cost under pre-war conditions and today, r9

Doty, W. A. Fare collection with frequent changes in rates, r40

Draper, Walter A.:

—A need for incentive for economical operation under service-at-cost franchise, 1777

—Some elements of the Cincinnati franchise, \*r18

Drabelle, John M.:

Drabelle Power distribution for street and interurban

—Power distribution for street and interuroan railways, 765 Drury, A. C. Removing track with a small force of laborers. 906

## E

Eddy, H. C.:

—The street railway outlook, 691

—Traffic checks of non-riders, c132
Edison, Thos. A. Communication to Federal
Electric Railways Commission in regard to
electric railways, c229
Elliott, Clifford A.:

—Fireproof construction for substations, 487

—Pacific electric has complete parking program,
\*517

—Using lever throw-type track switches for
safety, \*987

—Unusual method for moving two 250-hp. "Using lever throw-type track switches for safety, \*987

"Unusual method for moving two 250-hp. boilers, \*123

Emery, J. A.:
"Statistics show railway's plight, 394

"The future fare system for small cities, \*695

Erickson, Halford, Financing, state vs. local regulations and service-at-cost plan, 242 F

Fearnley, A. R. Facts regarding motor-omnibus service, \*926
Ferguson, Alexander D. Making accurate measurement of railwear, \*1006
Findley, R. H. How to maintain track, 763
Finger, Charles J. History hath its lessons, \*1036
Finn, S. M. Economies in steam-generating stations, 1047
Fredericks, Ernest B. Straightforward publicity does bring results, 928

G

Giltner, T. W. A claim adjuster's views on ear operating economy, 1045 Greenland, Sam W. One man car operation, 67

Handlon, J. H. The psychology of claim adjustment, 157
Hanson, Ole. Traction situation in Seattle, 386
Harris, R. E. A dispatcher's view of car operation economies, 1044
Harte, Charles R.:
—An effective home made grade indicator, \*933
—Laying out a power transmission line, \*561
Hedges, Job E. Men with the nerve to tell the people the facts needed, \*r5
Horton, R. H. Methods of observing and analyzing passenger traffic, \*75
Hutcheson, J. E. Montreal cost-of-service plan.
\*r24

Insull, Samuel. Communication to Federal Electric Railways Commission in regard to electric railways, c236

Jackson, A. A. Railways must sell their transportation, c587
Jackson, Dugald C. Status of the electric railway, 391
Jackson, Walter:
—Foreign fare practice, 431
—London's tubes and buses, \*708, \*816
—Possible operating economies and sales methods, r117
—Side lights on the zone fare—congestion or diffusion? \*276
—The zone fare in practice, \*56
—The zone fare in practice, Leeds—Part 1, \*7;
—The zone fare in practice, Leeds—Part 1, \*7;

\*466

The zone fare in practice, Croydon, England,
\*466

The zone fare in practice, Leeds—Part I, \*7;
Part II, \*56

The zone fare in practice, London County
Council—Part I, \*210—Part II, \*270

The zone fare in practice, the British Electric Traction Co. \*154

Zone fares for small cities, c1051

Jefferies, Guy K. Co-ordination of safety between transportation and equipment departments, 694

Jirgal, John. Accounting for depreciation, 799

Johnson Geo, H.:

—Morale of executive staff is affected by adverse conditions, c289

—The discouraged railway official, c443

Johnson, H. A. Coasting results on the Chicago Elevated, \*277

Valuation and accruing depreciation, 530 Kuemmerlein. George, Jr. Collection of z fares, r68

## L

Laney, Charles J. Obstacles to electric express, 996 1916 Lloyd, C. F. Some elements in a satisfactory substation building, \*833

Abbreviations: \*Illustrated. c Communication. r Page in Report Number for Oct. 11. READ THE INSTRUCTIONS AT THE BEGINNING OF THE INDEX

### M

Madgen, William L. Some light on British tramway conditions, 439
Main, Edwin, Mowing weeds on interurban right-of-way, \*569
McCallum, Alexander. European electrification proposals, 474
McDougall, R. E.:
—Electric railway hazards—causes, effects and remedies, 693
—Organization for public accident prevention campaigns, 723
McLaughlin, J. F.: Metal tickets as a substitute for multiple coins, r42
McKelway, G. H.'
—Bonds for temporary and permanent track construction, \*114
—Soldered bonds for track bonding, \*899
McMahon, C. B. Car maintenance records facilitate work, \*119
Macleod, Frederick J. Public ownership may be only means of restoring credit. 427
Moore, F. J. Some observations and queries on safety car operation, 131
Mitten, T. E.:
—Philadelphia's answer to the traction question, r114
—Working hours of motormen and conductors, continuance of the 5-cent fare, cr111
Mortimer, J. D. Can service costs be collected from traveling public, \*r14
Mullany, Bernard J. Getting the right kind of publicity, 216
Munton, C. J. Possibilities of electric railway express service, 992
Murphine, Thomas F. Seattle municipal lines, 897

## N

Nachod, Carl P. Some observations on signal maintenance, 442 Nash, L. R. The possibilities in readiness-to-serve fare schedules, 647 Nicholl, H. A. Interurban Express, 993

O'Shaughnessy, M. M. Street railway situation in San Francisco, 896

Pahin, Lucien A. Progress on the Midi railway pyrenean electrification. \*475
Palmer, L. H. Are high costs of service likely to develop permanent competition, \*r11
Pardee, J. H. Wage scales must be on reasonable basis, \*r2
Perkins, R. W. State subsidies for the street railway companies, \*645
Phillips, Frank R.:

—Economies in ear operation, 1039
—The human factor in safe operation and maintenance of rolling stock, 793
—The maintenance man's experiences during the war, 19
Phillips, W. H. Helical gearing for railway motors, \*934

Place, C. W. Keeping up the trolley voltage, 27

Porr, Edward A. Blue lights and their significance in the New York subways, \*579

Pringle, P. J. The principle of differential wages in awards, \*c943

Proctor, C. B.:

—Why does not every electric railway have a safety organization? 792

—Written discussion on Mr. McDougall's paper, Organization for public accident prevention campaign, 724

## R

Rasmussen, W. C. Wood block paving, c767
Reid, Harry, Nationalization and standardization of accident prevention, 791
Rostofski, Harry:

--Combined signal and telephone box, \*901

--Voltage surveys give information for varying station voltage, \*976
Rifenberick, Robert B. Burdens from which we should be relieved. 66
Robson, W. Tuke, Experiences with Thermit insert welding, \*1649
Roderick, T. C. Earnings of the safety car, 26

## S

Saliers, Earl A. Accounting measures to meet business depression in the industry, r37 Sano, Shiro. Practices and tendencies in Japanese electric railway transportation. \*4
Schaddelee, Richard. Commissions have failed properly to administer the intent of the law, 240
Schneider, E. F. Safety before and after the war, 791
Schreiber Martin. Use of standards, c34
Scullin Terance. How the Master Mechanic looks at car operating economy, 1044
Scelar, L. F. Swing of radial coupler on curves. \*489
Sidlo. Thomas L. Relief for the present traction conditions, r129
Sisson, F. H. Street railway credit and cost of capital, 178
Smith. Montelle C. Building special work with an oxygen-acetylene cutting and welding outfit, \*317
Snell. O. C. Superintendent's viewpoint on car-operating economies, 1045
Spring, Edward C. Electric railways from an operating standpoint, 17
Stanton, H. C. Handling the freight business, 982
Starkey, J. F., Possibilities of electric express service, 995
Stevens, R. P. The Youngstown service-atcost franchise, r21
Stigall, E. E. Purchasing agents and store-keeper urged to attend the Atlantic City convention, c589
Stone, C. I. Competition from motor vehicles, 979
Storer, Norman W. Gasoline vs. electric motor for street railway service, r27
Storrs, L. S.:
—Competition of motor vehicles, 185
—Reasons for railways' present condition, 175
Strated, C Communication, r Page in Repo

Sullivan, R. T. The collection of odd street railway fares, \*653
Sunderland, John A. How a motorman can help in car operating economy, 1042
Sutherland, John, Maintenance of equipment, 766
Swartz A. Popolice 45 Swartz, A. Repairs to wood block paving, c588

## T

Taylor, A. Merritt. The valuation of electric railway properties, 128
Thirlwall, J. C. General observations on Birney cars, r33
Thomas, Theodore E. More passengers better than too-high fares, c727
Tinnon, John B. War-time progress in maintenance of way, 220
Tynan, L. J. A fixed schedule for injured persons other than employees, 721

## U

Unland, H. L.:

—Electric arc welding methods, \*343

—Use and misuse of arc welding apparatus, 757 -Welding wrought iron and steel, 581

Vaughn, S. L. Possibilities of express business,

## W

Walker, E. M.:

—Business follows service, \*660
—Safety cars and the results of their operation, 161
Watts, F. W. Motor trucks and electric road, 980
Welsh, J. W. Present status of engineering association standards, 922
Wensley, R. J. Some experiences in the development of automatic sub-stations, \*886
Weston, George, Electric railway policy, 529
Whiteford, William, Problems of the purchasing agents, r88
Wells, Gardner:
—Standardization of Birney safety car, r36
—Some safety car objections answered, 983
Whiteside, W. J. Motor truck competition, 981
Winsor, H. G. Written discussion on Mr.
Dixon's paper, A claim agent's experience with one man cars, 721
Wood, George E. Insuring adequate coal supnly with the least expenditure, \*312
Woods, Robert P. City representation in electric railways, 726
Wright, T. T. Advertising publicity, 287

Yungbluth. B. J. Inventorying materials and supplies, \*519

Abbreviations: \*Illustrated. c Communication. r Page in Report Number for Oct. 11. READ THE INSTRUCTIONS AT THE BEGINNING OF THE INDEX

## PERSONAL INDEX

(with biographical notes)

Anderson, Walter E. 261 D Bailey, R. W. '703 E Bauer, John '1025 E Beach, H. L. 262 E Bicknell, M. O. 49 E Blair, Col. E. J. 740 F Blanks, D. H. 1067 F Boardman, A. Jay 203 F Bolt, Walter C. 203 F Bramlette, John M. 778 G Brown, Harry L. 48 G Buffe, F. G. '99 G Burr, George L. 549 H Butler, Henry O. '703 H Callaghan, W. C. 416 H Cameron, Bruce '98 H Campbell, Gordon '48, 261 H Chamberlain, F. C. 365 H Cram, R. C. '147 In	Dempsey J. J. *305 Dillon. Col. T. H. 963 Eagan. J. F. *505 Edstrom. Sigfried J. 845 Fnimons. C. D. 203 Estill. G. C. *459 Fitch. Howard F. 202 Flowers. Herbert B. 810 Ford. A. H. 778 Grauenthal. B. W. 878 Jaboury. Arthur *1067 Gillette. Maj. Geogre 878 Gordon. Leroy O. 739 Hardy. Frank I. 203 Harr. Augustus E. 365 Harrsen. H. P. 549 Hell, Otis R. 549 Hull, Otis R. 549 Hull, Edward J. 49 Ingle, J. P. *488	Johnson, Eugene C. 98 Knox R. R. 1067 Larrabee, Harold D. 146, 203 Leussler, R. A. 810 Libbey, Joseph H. 202 Lyons, William L. 416 Merrill, E. D. 146 Milliken, E. L. 878 Moyer, C. C. 963 McCormick, Maurice E. 146, 845 Neal, J. Henry 810 Perkins, Col. A. T. 146 Pierce, Daniel T. 963 Porter, H. Hobart 778 Ray, William D. 262 Renshaw, Clarence 203 Rolston, William E. 963 Root, Oren 680 Seeley, Garrett T. 740	Stearns, Robert B.       202         Stocks, Carl W.       262         Stovel, Russell W.       963         Stratton, M. G.       740         Sullivan, Patrick F.       203         Sullivan, Richard T.       739         Faurman, A.       778         Trazzare, J. F.       1067         Yon Phul, William       49         Waldo, Ralph       416         Ward, Frank D.       202         Warner, Robert L.       146, 365         Warnock, A. W.       49         Walker, Frank B.       202         Wayne, Joseph E.       262         Wellman, Louis W.       202         Wharton, J. S. M.       261         Whitlo, Louis C.       48         Whitlock, W. L.       505
Cram, R. C	Ingle, J. P *48 Jackson, Caleb S 202		

(\*Indicates Portrait)