References to Articles Descriptive of Railway Shops


Delaware, Lackawanna & Western Railroad. Locomotive Shops at Scranton, Pa. Ry. Age, Oct. 28, 1904; April 12, 1907.


Hamill & St. Joseph Railroad, Hamill, Mo. See Chicago, Burlington & Quincy.


REFERENCES TO GENERAL ARTICLES CONCERNING RAILWAY SHOPS.


RAILWAY SHOP UP TO DATE

237

Location of Tanks in Oil Houses. By L. T. Johnson. Central Railway Club, March, 1904.


Some Notes on Steel Car Repairing. (Describing several railroad shops for repairing steel cars). R. R. Gaz., June 6, 1903.

Shop Practice and Maintenance of All Steel Cars. Central Railway Club, January, 1903.


Electricity in Railroad Shops. R. R. Gaz., May 29, 1903.


The Organization of the Central Railway Shop Forces. By H. T. Bentley. Western Railway Club, September, 1905.


RAILWAY SHOP UP TO DATE


<table>
<thead>
<tr>
<th>Name of Periodical</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering News</td>
<td>Eng. News</td>
</tr>
<tr>
<td>Engineering Record</td>
<td>Eng. Rec.</td>
</tr>
<tr>
<td>Railroad Gazette</td>
<td>R. R. Gaz.</td>
</tr>
<tr>
<td>Railway Age</td>
<td>Ry. Age</td>
</tr>
<tr>
<td>Railway Engineering and Maintenance of Way</td>
<td>Ry. Eng.</td>
</tr>
<tr>
<td>Railway Master Mechanic</td>
<td>Ry. M. M.</td>
</tr>
<tr>
<td>Railway and Engineering Review</td>
<td>Ry. Rev.</td>
</tr>
</tbody>
</table>
INDEX

Atchison, Topeka & Santa Fe Ry. at La Junta.
  blacksmith shop ............................................ 80
  oil house .................................................... 184
  roundhouse .................................................. 213
  storehouse .................................................. 178

Atchison, Topeka & Santa Fe Ry. at Shopton.
  oil house .................................................... 183
  storehouse .................................................. 183

Atchison, Topeka & Santa Fe Ry. at Topeka.
  blacksmith shop ............................................ 81, 91
  layout ........................................................ 14, 27, 56
  power plant ................................................ 150, 151, 158

Atlantic Coast Line Ry. at Waycross.
  cross section of roundhouse ................................ 216

Baltimore & Ohio R. R.
  ash pits ..................................................... 206
  inspection pits ............................................ 206
  layout of locomotive terminal at Baltimore ............. 206
  layout of locomotive terminal at Holloway .............. 206
  layout of locomotive terminal at Washington .......... 206

Big Four Ry. at Indianapolis.
  layout ........................................................ 16, 22
  locomotive shop ............................................ 63

Bibliography
  233-238

Blacksmith shop ............................................. 74-91
  arrangement of equipment .................................. 77
  blast ........................................................ 77
  construction ................................................. 75
  crane service .............................................. 75
  doors for distribution of material ....................... 75
  equipment lists ............................................ 78-79
  floor ........................................................ 75
  fuel for furnaces ......................................... 76
  furnace equipment ......................................... 77
  hand forges ............................................... 76
  height from floor to roof truss .......................... 75
  layout ........................................................ 74
  location ..................................................... 11, 74
  methods of operation ..................................... 77
  size .......................................................... 74
  ventilation and light ..................................... 76

Atchison, Topeka & Santa Fe Ry. at La Junta ............. 90

Atchison, Topeka & Santa Fe Ry. at Topeka ............... 81, 91

Buffalo, Rochester & Pittsburgh Ry. at Du Bois ......... 91

Canadian Pacific Ry. at Angus ................................ 83, 86

Chicago & Eastern Illinois Ry. at Danville .............. 86

Chicago & Western Indiana Ry. at Oelwein ............... 87

Chicago, Milwaukee & St. Paul Ry. at Milwaukee ....... 89

Chicago, Rock Island & Pacific Ry. at Silvis ........... 82, 87

Delaware, Lackawanna & Western R. R. at Scranton .... 85, 89

Delaware, Lackawanna & Western R. R. at Scranton (car)
  blacksmith shop ............................................ 85, 90
  freight car shop ......................................... 94, 102, 103
  layout ........................................................ 94, 33
  oil house .................................................... 76
  planing mill ............................................... 122, 155

Denver & Rio Grande W. R. at Pueblo ...................... 50
  cross section of roundhouse ................................ 515
  plan of roundhouse ....................................... 217
  roundhouse pits .......................................... 222

Delaware, Lackawanna & Western R. R. at Scranton (loco-
motive).
  layout ........................................................ 33
  locomotive shop ............................................ 32

Dover & Hudson R. R. at Oneonta.
  cross section of roundhouse ................................ 211
  drop pits .................................................... 202, 203
  layout of locomotive terminal ............................ 210

Eastern R. R. of New Jersey at Elizabethport.
  layout ........................................................ 18, 26

Erie Lackawanna & Atlantic R. R. at Scranton ........... 87

Electrical distribution, systems ................................ 45
  alternating current ....................................... 45
  double commutator motors ................................ 47

Freight car shop ............................................ 15, 29

Central R. R. of New Jersey at Elizabethport.
  layout ........................................................ 18, 26

Bibliography

Chicago & Eastern Illinois Ry. at Danville .............. 86
  blacksmith shop ............................................ 86
  layout ........................................................ 18, 26
  locomotive shop ............................................ 55, 67

Chicago & Northwestern Ry. at Chicago ................. 14
  roundhouse at Clinton ..................................... 200

Chicago & Western Indiana Ry. at Oelwein ............... 87
  layout ........................................................ 54, 56
  planing mill ............................................... 124

Chicago, Burlington & Quincy Ry. at Hannibal .......... 24

Chicago Great Western Ry. at Oelwein ................. 83, 86

Chicago & Northwestern Ry. at Chicago ................. 14
  roundhouse at Clinton ..................................... 200

Chicago & Western Indiana Ry. at Oelwein ............... 87
  blacksmith shop ............................................ 54, 56
  layout ........................................................ 54, 56
  planing mill ............................................... 124

Chicago, Hamilton & Dayton R. R.
  cross section of engine house ............................ 216

Chicago, Milwaukee & St. Paul Ry. at Milwaukee ....... 89
  blacksmith shop ............................................ 89
  foundry (wheel) ............................................ 132, 133
  planing mill ............................................... 155, 163

Colorado & Southern Ry. at Denver ........................ 12

Contents.................................................................. 3

Delaware, Lackawanna & Western R. R. at Scranton .... 85, 89

Delaware, Lackawanna & Western R. R. at Scranton (car)
  blacksmith shop ............................................ 85, 90
  freight car shop ......................................... 94, 102, 103
  layout ........................................................ 94, 33

Delaware, Lackawanna & Western R. R. at Scranton (loco-
motive).
  layout ........................................................ 33
  locomotive shop ............................................ 32

Denver & Rio Grande W. R. at Pueblo ...................... 50
  cross section of roundhouse ................................ 515
  plan of roundhouse ....................................... 217
  roundhouse pits .......................................... 222

Delaware, Lackawanna & Western R. R. at Scranton (car)
  blacksmith shop ............................................ 85, 90
  freight car shop ......................................... 94, 102, 103
  layout ........................................................ 94, 33
  oil house .................................................... 76
  planing mill ............................................... 122, 155

Delaware, Lackawanna & Western R. R. at Scranton (loco-
motive).
  layout ........................................................ 33
  locomotive shop ............................................ 32

239
multi-voltage .............................................. 46
speed variation by field control. ....................... 48

Electrical Equipment.
fitting electrical equipment in general layout ........... 10
El Paso & Southwestern Ry. at El Paso. ................. 227
cinder pits ............................................ 237
Erecting pits, number ................................... 38
Erecting shop (see Locomotive shop) .................... 38

Erie R. R.
layout of locomotive terminal at Hammond ... 210
standard roundhouse cross section ................. 211
roundhouse plan ......................................... 218

Foundry
building, gray iron .................................... 126
charging floor .......................................... 126
crane service ........................................... 126
cupolas ..................................................... 128
disposition of work .................................... 128
industrial tracks ......................................... 128
list of foundries at railway shops .................... 128
location ...................................................... 129
pattern shop ............................................. 129
systems on Canadian Pacific Ry. at Angus .......... 131
wheel ......................................................... 132
wheel, Canadian Pacific Ry. at Angus ................. 129
wheel, Chicago, Milwaukee & St. Paul Ry. at Milwaukee. 129
wheel, Pennsylvania R. R. at South Altona ......... 130
Canadian Pacific Ry. at Angus ... 133
Chicago, Milwaukee & St. Paul Ry. at Milwaukee ... 132, 133
Louisville & Nashville R. R. at South Louisville ... 134
Philadelphia & Reading Ry. at Reading ... 135
Pennsylvania R. R. at South Altona ... 136, 137, 138, 139

Freight car shop ........................................ 92-106
building ................................................... 92
industrial tracks ...................................... 93
location .................................................... 10, 92
repair yards ............................................. 98
track arrangement ..................................... 92

Big Four Ry. at Indianapolis ...........................................
Canadian Pacific Ry. at Angus ................. 94, 101
Cleveland, Cincinnati, Chicago & St Louis Ry. at Indianapolis ... 97
Delaware, Lackawanna & Western R. R. at Scranton .. 94, 102, 103
Illinois Central R. R. at Burnside ..................... 100, 102
Louisville & Nashville R. R. at South Louisville ... 100, 103, 104

New York, New Haven & Hartford R. R. at Readville ..... 96
Pittsburg & Lake Erie R. R. at McKees Rocks .......... 97
St. Louis, Iron Mountain & Southern Ry. at Baring Cross ... 101
Wabash R. R. at East Decatur ......................... 97
Wisconsin Central Ry. at Fond du Lac ... 100, 102

Grand Trunk Ry. at Battle Creek.
layout ...................................................... 83
locomotive shop ...................................... 69

Great Northern Ry. scrap platform at St. Paul ........ 181

Illinois Central R. R. at Burnside.
freight car shop ...................................... 100, 102
layout ...................................................... 13
paint shop .............................................. 113
planning mill .......................................... 193
storehouse .............................................. 180

Introductory ............................................. 7

Lake Shore & Michigan Southern Ry. at Collinwood.
blacksmith shop ...................................... 84, 88
layout ...................................................... 88

Great Northern Ry. scrap platform at St. Paul ........ 289

locomotive shop ...................................... 57
oil house ............................................... 184

paint shop .............................................. 114
passenger car shop ................................... 114
power plant ............................................ 152, 153, 161
scrap platform ...................................... 181
storehouse ............................................. 190-194
Lake Shore & Michigan Southern Ry. at Elkhart.
boiler washing system ................................ 223
cross section of roundhouse ......................... 214
layout at locomotive terminal ....................... 208
section of engine pit ................................. 233

Layout
access to shops ....................................... 9
blacksmith shop ...................................... 11
classification of railway shops ...................... 12
compactness provided by single transfer table ........ 9
distribution of material .............................. 12
electrical power in providing flexibility ............ 10
evolution of old shops ................................ 9
flexibility provided by electrical power .......... 10
foundry ..................................................... 11
freight car shop ...................................... 11
governing conditions ................................ 9

 grouping of buildings ................................ 9
locomotive shop ...................................... 10
lumber yard ............................................ 11
passenger car shops .................................. 10
plating mill ............................................. 11
roundhouse .............................................. 11
scrap department ...................................... 12
storehouse .............................................. 10

Atchison, Topeka & Santa Fe Ry. at Topeka ... 14, 27, 56
Big Four Railway at Indianapolis .................... 16, 22
Buffalo, Rochester & Pittsburg Ry. at Du Bois ....... 26, 55
Canadian Pacific Ry. at Angus .................... 29, 52
Central R. R. of New Jersey at Elizabethport ....... 26, 55
Chicago & Eastern Illinois Ry. at Danville .......... 26, 56
Chicago & Northwestern Ry. at Chicago ............ 14
Chicago, Burlington & Quincy Ry. at Hannibal ...... 13
Chicago Great Western Ry., at Oelwein .......... 24, 26
Chicago, Rock Island & Pacific Ry. at Silvis ....... 18, 30
Cleveland, Cincinnati, Chicago & St Louis Ry. at Indianapolis ... 16, 32
Colorado & Southern Ry. at Denver ................. 24

Delaware, Lackawanna & Western R. R. at Scranton (car) ... 20, 35

Delaware, Lackawanna & Western R. R. at Scranton (locomotive) .......... 33
Grand Trunk Ry. at East Decatur ................. 20, 35
Illinois Central R. R. at Burnside ................. 33, 35

North Shore & Michigan Southern Ry. at Collinwood .... 23
Louisville & Nashville R. R. at South Louisville ........ 17, 31
Missouri, Kansas & Texas Ry. at Sedalia ......... 34

New York, New Haven & Hartford R. R. at Readville 19, 34
Philadelphia, Baltimore & Wilmington R. R. at Wil-
mingston .................................................. 29

Pittsburg & Lake Erie R. R. at McKees Rocks ....... 15, 25
St. Louis, Iron Mt. & Southern Ry. at Baring Cross .... 23
Wabash R. R. at East Decatur ....................... 23, 35

Lehigh Valley R. R. locomotive shop at Sayre ........ 59, 69
Louisville & Nashville R. R. at South Louisville 
blacksmith shop ...................................... 82, 90
foundry ..................................................... 134
freight car shop ...................................... 92, 102, 103
layout ...................................................... 17, 31

locomotive shop ...................................... 61, 69
passenger car shop ................................... 112
plating mill ............................................. 121, 122

power plant ............................................ 156

Locomotive shop ...................................... 58-72
aisle space .............................................. 45
alternating current system ......................... 49
INDEX

shapers .................................. 51-53
slotters .................................. 51-53
Missouri, Kansas & Texas Ry. roundhouse heating system at Parsons .................................. 219
layout at Sedalia .................................. 34
Missouri Pacific Ry. at Sedalia.
passerger car and paint shop .................................. 111
planing mill .................................. 122
New York Central & Hudson River R. R. at West Albany.
scrap platform .................................. 196
storehouse .................................. 195
New York Central & Hudson River R. R. at De Witt.
layout of locomotive terminal .................................. 205
New York, New Haven & Hartford R. R. layout at Readville .................................. 219, 24
New York, Ontario & Western R. R. at Middletown.
heating system in roundhouse .................................. 218
paint shop .................................. 110, 116
Oil house .................................. 175
building .................................. 176
delivery .................................. 176
location .................................. 175
Atchison, Topeka & Santa Fe Ry. at La Junta .................................. 184
Atchison, Topeka & Santa Fe Ry. at Shopton .................................. 183
Delaware, Lackawanna & Western R. R. at Scranton .................................. 163
Lake Shore & Michigan Southern Ry. at Collinwood .................................. 184
Paint manufacture .................................. 109
Passenger car shops .................................. 107-116
Passenger coach and paint shops .................................. 107-116
building .................................. 107
fire protection .................................. 109
floor .................................. 109
location .................................. 10, 107
natural lighting .................................. 107
scaffolds .................................. 109
track arrangement .................................. 107
transfer table operation .................................. 108
truck repairs .................................. 109
Canadian Pacific Ry. at Angus .................................. 116
Delaware, Lackawanna & Western R. R. at Kingsland .................................. 111
Illinois Central R. R. at Burnside .................................. 113
Lake Shore & Michigan Southern Ry. at Collinwood .................................. 114
Louisville & Nashville R. R. at South Louisville .................................. 112
Missouri Pacific Ry. at Sedalia .................................. 111
New York, Ontario & Western R. R. at Middletown .................................. 110, 116
Pittsburgh & Lake Erie R. R. at McKees Rocks .................................. 109, 115
Seaboard Air Line Ry. at Portsmouth .................................. 140
Wabash R. R. at East Decatur .................................. 112
Pattern shop .................................. 128, 135
Pennsylvania R. R. at East Altoona.
coaling station .................................. 230
cross section of roundhouse .................................. 214
details of engine pits and roundhouse floor .................................. 200
drop pits .................................. 221, 222
inspection pits .................................. 225
layout at locomotive terminal .................................. 205
pneumatic coal chute gate .................................. 231
pneumatic lifting door in roundhouse .................................. 222
sand drying and storage plant .................................. 231
track stop .................................. 222
Pennsylvania R. R. at Olean.
blacksmith shop .................................. 89, 96
Pennsylvania R. R. at South Altoona.
foundries .................................. 136, 139
Pennsylvania R. R. at Trenton.
blacksmith shop .................................. 91
Pere Marquette R. R. at Grand Rapids.
coaling station .................................. 233, 234
cross section of engine house .................................. 216

arrangement of erecting pits .................................. 38
area of erecting floor .................................. 42
area of machine floor .................................. 42
boiler department .................................. 37
double commutator motors .................................. 47
electrical distribution .................................. 45
electrical distribution at Angus, C. P. Ry. .................................. 49
erecting bay, width .................................. 40
erecting floor, area .................................. 42
erecting floor, proportion of area to machine floor .................................. 42
erecting pits arrangement .................................. 48
erecting pits, number .................................. 38
equipment lists .................................. 65, 66, 68, 70, 71, 72, 73
floor space per machine .................................. 48
grouping of machines .................................. 43
location in general layout .................................. 10
location of boiler department .................................. 37
machine bay .................................. 41
machine floor, area .................................. 48
machine floor, proportion of area to erecting floor .................................. 42
machine floor space .................................. 48
machine grouping .................................. 49
machine tool equipment .................................. 51
machine too's, number .................................. 50
multi-voltage system .................................. 46
number of erecting pits .................................. 38
number of machine tools .................................. 50
proportion of departments .................................. 37
relative areas of erecting and machine floors .................................. 42
sanitary requirements .................................. 45
size .................................. 49
speed variation obtain by field control .................................. 48
storage of dismantled parts .................................. 44
storage of locomotive skeletons .................................. 38
systems of electrical distribution .................................. 45
width of erecting bay .................................. 49
Atchison, Topeka & Santa Fe Ry. at Topeka .................................. 56
Big Four Ry. at Indianapolis .................................. 63
Buffalo, Rochester & Pittsburg Ry. at Du Bois .................................. 54
Canadian Pacific Ry. at Angus .................................. 58, 70, 71
Chicago & Eastern Illinois R. R. at Davenport .................................. 55, 67
Chicago Great Western Ry. at Oelwein .................................. 54, 66
Chicago, Rock Island & Pacific Ry. at Silver City .................................. 60, 72, 73
Cleveland, Cincinnati, Chicago & St. Louis Ry. at Indianapolis .................................. 63
Delaware, Lackawanna & Western R. R. at Scranton .................................. 62
Grand Trunk Ry. at Battle Creek .................................. 62
Lake Shore & Michigan Southern Ry. at Collinwood .................................. 57
Lehigh Valley R. R. at Sayre .................................. 59, 69
Louisville & Nashville R. R. at South Louisville .................................. 61, 69
Pere Marquette R. R. at Grand Rapids .................................. 57, 65
Pittsburg & Lake Erie R. R. at McKees Rocks .................................. 55, 68
St. Louis, Iron Mountain & Southern Ry. at Baring .................................. 48
Cross .................................. 54, 64
Terminal R. R. Asn. of St. Louis, at E. St. Louis .................................. 56, 65
Union Pacific R. R. at Omaha .................................. 55

Lumber yard.
location in general layout .................................. 11
Machine shop (see Locomotive shop) .................................. 41
Machine tool equipment for the locomotive shop.
machine tools for 1, 13, 15, 24, 48 erecting pits .................................. 51-53
boring mills .................................. 51-53
drills .................................. 51-53
grinders .................................. 51-53
lathes .................................. 51-53
mills .................................. 51-53
miscellaneous .................................. 51-53
planers .................................. 51-53
railway shop up to date

Preface .............................................. 5

References to articles descriptive of railway shops .......... 246-258

Roundhouse ........................................ 197-244
ash pits ........................................... 225, 226, 227
boiler washing systems .............................. 203, 204, 224
cinder pit ........................................... 199, 225, 226, 227
coaling station ..................................... 198, 227-234
crane service ....................................... 202
cross section ....................................... 200, 210, 216
cross section, A. T. & S. F. Ry. at La Junta ............... 213
cross section, A. C. L. R. R. at Waycross ................. 216
cross section, B. & O. R. R. at Cumberland ............... 211
cross section, C. H. & D. R. R. ...................... 216
cross section, D. & H. R. R. at Oneonta ................ 211
cross section, D. & R. G. R. R. at Pueblo ................. 215
cross section, Erie R. R., Standard ..................... 211
cross section, L. S. & M. S. Ry. at Elkhart ............... 214
cross section, P. R. R. at East Altamaha .................. 214
cross section, Pere Marquette R. R. at Grand Rapids .... 216
cross section, P. & L. E. R. R. at McKees Rocks ........... 212
cross section, Southern Ry. at Inman Yard ................ 212
cross section, Terminal R. R. Assn. of St. Louis at East St. Louis ........................................ 213
cross section, Wabash R. R. at Landers .................... 212
diagram .............................................. 201, 222
drop pits ............................................. 201, 222, 223
diesel engine, rectangular ................................ 200, 226
diesel engine ....................................... 200
diesel engine ..................................... 200, 215, 216
electric heating .................................... 201
heating system, M. K. & T. Ry. at Parsons ................. 219
heating system, N. Y. C. & W. Ry. at Middletown ....... 218
heating system, P. R. R. at East Altamaha ................. 211
inspection pit ...................................... 196, 225, 226
layout .............................................. 197, 205, 210
layout, B. & O. R. R. at Baltimore ........................ 206
layout, B. & O. R. R. at Holloway ........................ 206
layout, B. & O. R. R. at Washington ........................ 206
layout, C. & W. N. Ry. at Clinton ........................ 209
layout, C. & W. N. R. at Chicago ........................ 207
layout, D. & H. R. R. at Oneonta ........................ 210
layout, Erie R. R. at Hammond .......................... 210
layout, L. S. & M. S. Ry. at Collingwood .................. 209
layout, L. S. & M. S. Ry. at Elkhart ........................ 208
layout, N. Y. C. & H. R. R. at DeWitt .................... 205
layout, P. R. R. at East Altamaha ........................ 205
layout, Southern Ry. at Inman Yard ........................ 207
layout, Terminal R. R. Assn. of St. Louis at St. Louis .... 209
lighting ............................................. 200
location ............................................. 11
piping .............................................. 203
pits .................................................. 201, 202, 222, 223
plan .................................................. 217
plan, D. & R. G. R. R. at Pueblo ........................ 217
plan, Erie R. R. ..................................... 218
plan, Southern Ry. at Atlanta ........................... 217
sand house ......................................... 198
sand plant .......................................... 230, 231, 233, 234
smoke jacks ......................................... 203
stand pipe .......................................... 199
storage tracks ...................................... 199
track stop .......................................... 206, 222
turntable .......................................... 199
ventilation ........................................ 201

St. Louis, Iron Mountain & Southern Ry. at Baring Cross

freight car shop .................................. 191
locomotive shop .................................. 144, 154
power plant ...................................... 149, 158

Scrap .............................................. 173, 181, 185, 196

locomotive shop .................................. 57, 65
Philadelphia & Reading R. at Reading........................ 88
blacksmith shop ................................... 227
coaling station ................................... 135
foundry ............................................. 152, 162
power plant ....................................... 29
Pittsburg & Lake Erie R. at McKees Rocks
blacksmith shop ................................... 84, 90
boiler washing system ................................ 224
coaling station ................................... 226, 229
cross section of roundhouse ................................ 97, 100, 105, 106
layout .............................................. 25, 25
locomotive shop ................................... 65, 68
paint shop ......................................... 109, 115
power plant ....................................... 149, 159, 165
sand handling station ................................ 230

Plaining mill ...................................... 117-125
arrangement of machines ................................ 118
building ............................................ 117
distribution of material ................................ 118
equipment lists ..................................... 119-121
floors .............................................. 118
location ............................................ 117
machine arrangement ................................ 118
natural lighting ..................................... 117
shavings exhaust systems ................................ 118
Canadian Pacific Ry. at Anguas .......................... 125
Chicago Great Western Ry. at Oelwein ..................... 124
Delaware, Lackawanna & Western R. R. at Kingsland .. 124
Delaware, Lackawanna & Western R. R. at Scranton .122, 125
Illinois Central R. R. at Barnside ....................... 126
Louisville & Nashville R. R. at South Louisville ....... 121, 122
Missouri Pacific Ry. at Sedalia .......................... 122
Wabash R. R. at East Decatur .......................... 123, 124

Power plant ........................................ 140-169
boilers ............................................. 144
boiler pressure ..................................... 144
building ............................................ 140
chimneys .......................................... 144
cable and ash handling equipment ......................... 141-144
data .................................................. 148
diagrams of power distribution ............................ 155-160
distribution of electric power ............................. 147
draft systems ...................................... 145, 146
economizers ........................................ 146
electric current ..................................... 147
engine equipment ................................... 146

gas engines ....................................... 147
location ............................................ 140
mechanical draft .................................... 140
piping .............................................. 146
steam turbines ..................................... 144
tubing .............................................. 146

Atchison, Topeka & Santa Fe Ry. at Topeka ................ 150, 154, 158
Canadian Pacific Ry. at Anguas .......................... 154, 160, 167
Chicago, Milwaukee & St. Paul Ry. at Milwaukee .. 156, 163
Chicago, Rock Island & Pacific Ry. at Silvis ................ 150, 152
Lake Shore & Michigan Southern Ry. at Colingwood .... 152, 153, 161
Louisville & Nashville R. R. at South Louisville ....... 156
Pennsylvania R. R. at Olean .......................... 157, 164
Pere Marquette R. R. at Grand Rapids ................... 157, 164, 169
Philadelphia & Reading Ry. at Reading .................. 150, 162
Pittsburg & Lake Erie R. R. at McKees Rocks ...... 149, 159, 165
St. Louis, Iron Mountain & Southern Ry. at Baring Cross 149, 158
INDEX

Scrap department.
  location in general layout .................................. 11
Scrap platform.
  Canadian Pacific Ry. at Angus .................................. 189
  Great Northern Ry. at St. Paul .................................. 181
  Lake Shore & Michigan Southern Ry. at Collinwood ........ 181
  New York Central & Hudson River R. R. at W. Albany ...... 196
Seaboard Air Line Ry. at Portsmouth.
  passenger car shop .............................................. 109
Southern Ry.
  cinder pits ...................................................... 227
  coaling plant at Inman Yard .................................. 228
  cross section of roundhouse at Inman Yard ................. 212
  engine pits ..................................................... 220
  layout at Inman Yard .......................................... 207
Storehouse
  bolster storage .................................................. 189
  bolt storage .................................................... 186
  bolt transportation ............................................. 192
  brass room ....................................................... 185
  building ........................................................ 171
  car casting bins ............................................... 187
  crane service .................................................. 173, 185, 189, 196
  interior arrangement .......................................... 172
  iron storage ................................................... 186, 189
  location ........................................................ 10, 171
  lumber storage .................................................. 188
  paint stock ..................................................... 193
  platform served by crane ...................................... 185
  rack for storing tubes ........................................ 185
  rod storage ...................................................... 186
  scrap ............................................................ 173
  shelves, unit system .......................................... 190, 191
  transportation of material .................................... 185, 187, 192
  wheel storage ................................................... 188
  turn table for distribution tracks ............................ 185

Atchison, Topeka & Santa Fe Ry. at LaJunta .................. 178
Atchison, Topeka & Santa Fe Ry. at Shoapton .................. 153
Canadian Pacific Ry. at Angus .................................. 179
Chicago, Rock Island & Pacific Ry. at Silvis ................. 179
Illinois Central R. R. at Burnsida ........................... 230
Lake Shore & Michigan Southern Ry. at Collinwood .......... 190-194
New York Central & Hudson River R. R. at West Albany ... 195
St. Louis, Iron Mountain & Southern Ry. at Baring Cross ... 177
Terminal R. R. Assn. of St. Louis, at East St. Louis ........ 179
Union Pacific Ry. at Omaha ..................................... 180
Wabash R. R. at East Decatur .................................. 177

Terminal R. R. Assn. of St. Louis at East St. Louis
  blacksmith shop ................................................. 87
  cross section of roundhouse .................................. 213
  locomotive shop ............................................... 56, 65
  storehouse ..................................................... 179

Terminal R. R. Assn. of St. Louis at St. Louis
  coaling station ................................................ 232
  layout of locomotive terminal ................................ 209

Transfer table
  access to shops ............................................... 9
  compactness provided ........................................ 9
  effect on layout ............................................... 9

Union Pacific R. R. at Omaha
  locomotive shop ............................................... 55
  storehouse ..................................................... 180

Wabash R. R. at East Decatur
  freight car shop ............................................... 97
  layout .......................................................... 21, 35
  passenger car shop ............................................ 112
  planing mill ................................................... 128, 124

Wabash R. R. at Landers
  cross section of roundhouse .................................. 212

Wisconsin Central Ry. at Fond du Lac
  freight car shop ............................................... 100, 102
# Index to Advertisers

<table>
<thead>
<tr>
<th>Advertiser</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acme Machinery Co., The</td>
<td>48</td>
</tr>
<tr>
<td>Ajax Mfg. Co., The</td>
<td>38</td>
</tr>
<tr>
<td>American Balance Valve Co.</td>
<td>21</td>
</tr>
<tr>
<td>American Valve &amp; Meter Co.</td>
<td>32</td>
</tr>
<tr>
<td>Armstrong Bros. Tool Co.</td>
<td>7</td>
</tr>
<tr>
<td>Armstrong Mfg. Co., The</td>
<td>48</td>
</tr>
<tr>
<td>Baldwin Steel Co.</td>
<td>70</td>
</tr>
<tr>
<td>Baeder, Adamson &amp; Co.</td>
<td>29</td>
</tr>
<tr>
<td>Becker-Brainard Milling Machine Company</td>
<td>74</td>
</tr>
<tr>
<td>Beckwith-Chandler Co.</td>
<td>29</td>
</tr>
<tr>
<td>Bentel &amp; Margedant Co.</td>
<td>29</td>
</tr>
<tr>
<td>Best American Caloric Company, W. N.</td>
<td>71</td>
</tr>
<tr>
<td>Bettendorf Axle Co.</td>
<td>61</td>
</tr>
<tr>
<td>Bowser, S. F. &amp; Co., Inc.</td>
<td>65</td>
</tr>
<tr>
<td>Buffalo Brake Beam Co.</td>
<td>18</td>
</tr>
<tr>
<td>Bullard Machine Tool Co., The</td>
<td>80</td>
</tr>
<tr>
<td>Case Mfg. Co., The</td>
<td>48</td>
</tr>
<tr>
<td>Chambersburg Engineering Co.</td>
<td>48</td>
</tr>
<tr>
<td>Chester Steel Castings Co.</td>
<td>63</td>
</tr>
<tr>
<td>Cincinnati Punch &amp; Shear Co., The</td>
<td>45</td>
</tr>
<tr>
<td>Cleanola Co., The</td>
<td>11</td>
</tr>
<tr>
<td>Cleveland City Forge &amp; Iron Co.</td>
<td>39</td>
</tr>
<tr>
<td>Cleveland Punch &amp; Shear Works Co., The</td>
<td>69</td>
</tr>
<tr>
<td>Coates Clipper Mfg. Company</td>
<td>78</td>
</tr>
<tr>
<td>Coes Wrench Co.</td>
<td>47</td>
</tr>
<tr>
<td>Columbia Nut &amp; Bolt Co., Inc.</td>
<td>63</td>
</tr>
<tr>
<td>Cooper Hewitt Electric Co.</td>
<td>64</td>
</tr>
<tr>
<td>Crandall Publishing Co.</td>
<td>79</td>
</tr>
<tr>
<td>Crockett Co., The David B.</td>
<td>19</td>
</tr>
<tr>
<td>Detroit Graphite Mfg. Co.</td>
<td>23</td>
</tr>
<tr>
<td>Diamond Saw &amp; Stamping Works</td>
<td>66</td>
</tr>
<tr>
<td>Drake &amp; Wiers Co.</td>
<td>63</td>
</tr>
<tr>
<td>Duff Manufacturing Co.</td>
<td>16</td>
</tr>
<tr>
<td>Ellis-Chalmers Co.</td>
<td>29</td>
</tr>
<tr>
<td>Faessler Mfg. Co., J</td>
<td>61</td>
</tr>
<tr>
<td>Farlow Draft Gear Co.</td>
<td>11</td>
</tr>
<tr>
<td>Flannery Bolt Co.</td>
<td>59</td>
</tr>
<tr>
<td>Foote-Burt Co., The</td>
<td>34-35-36-37</td>
</tr>
<tr>
<td>Franklin Manufacturing Co.</td>
<td>56</td>
</tr>
<tr>
<td>Galena-Signal Oil Co.</td>
<td>64</td>
</tr>
<tr>
<td>Garvin Machine Co., The</td>
<td>40</td>
</tr>
<tr>
<td>Geometric Tool Co., The</td>
<td>43</td>
</tr>
<tr>
<td>Globe Ventilator Co.</td>
<td>33</td>
</tr>
<tr>
<td>Gould Coupler Co.</td>
<td>52</td>
</tr>
<tr>
<td>Gould Storage Battery Co.</td>
<td>53</td>
</tr>
<tr>
<td>Greenlee Bros. &amp; Co.</td>
<td>50</td>
</tr>
<tr>
<td>Hanna Mfg. Co., The</td>
<td>19</td>
</tr>
<tr>
<td>Heath &amp; Milligan Mfg. Co.</td>
<td>13</td>
</tr>
<tr>
<td>Henderer's Sons, A. L.</td>
<td>17</td>
</tr>
<tr>
<td>Holmes Metallic Packing Co.</td>
<td>29</td>
</tr>
<tr>
<td>Homestead Valve Mfg. Co.</td>
<td>63</td>
</tr>
<tr>
<td>Indianapolis Switch &amp; Frog Co., The</td>
<td>64</td>
</tr>
<tr>
<td>Jefferson Union Co.</td>
<td>62</td>
</tr>
<tr>
<td>Kolesch &amp; Co.</td>
<td>11</td>
</tr>
<tr>
<td>Landis Machine Co.</td>
<td>22</td>
</tr>
<tr>
<td>Landis Tool Co.</td>
<td>48</td>
</tr>
<tr>
<td>Lucas &amp; Co., John</td>
<td>24</td>
</tr>
<tr>
<td>Macleod &amp; Co., Walter</td>
<td>9</td>
</tr>
<tr>
<td>Marston Co., J. M.</td>
<td>64</td>
</tr>
<tr>
<td>McConway &amp; Torley Co., The</td>
<td>58</td>
</tr>
<tr>
<td>McCord &amp; Co.</td>
<td>60</td>
</tr>
<tr>
<td>McCroskey Mfg. Co., The F. B.</td>
<td>49</td>
</tr>
<tr>
<td>McNees Steel Co., Ltd.</td>
<td>25</td>
</tr>
<tr>
<td>McKim &amp; Co., John</td>
<td>28</td>
</tr>
<tr>
<td>Merrell Mfg. Co., The</td>
<td>49</td>
</tr>
<tr>
<td>Metal Plated Car &amp; Lumber Co.</td>
<td>20</td>
</tr>
<tr>
<td>Milton Manufacturing Co.</td>
<td>20</td>
</tr>
<tr>
<td>Nathan Manufacturing Co.</td>
<td>18</td>
</tr>
<tr>
<td>National Machinery Co., The</td>
<td>46</td>
</tr>
<tr>
<td>National Malleable Castings Co.</td>
<td>11</td>
</tr>
<tr>
<td>National Oil Pump &amp; Tank Co.</td>
<td>78</td>
</tr>
<tr>
<td>New Jersey Zinc Co., The</td>
<td>15</td>
</tr>
<tr>
<td>Nicholson File Co.</td>
<td>13</td>
</tr>
<tr>
<td>Nichols, Geo. F., &amp; Bro.</td>
<td>17</td>
</tr>
<tr>
<td>Parrott Varnish Co.</td>
<td>12</td>
</tr>
<tr>
<td>Parkhurst &amp; Wilkinson Co.</td>
<td>55</td>
</tr>
<tr>
<td>Pittsburg Crushed Steel Co.</td>
<td>6</td>
</tr>
<tr>
<td>Pittsburg Spring &amp; Steel Co.</td>
<td>49</td>
</tr>
<tr>
<td>Prentiss Tool &amp; Supply Co.</td>
<td>76</td>
</tr>
<tr>
<td>Purchasing Agents' Buying List</td>
<td>72</td>
</tr>
<tr>
<td>Queen City Machine Tool Co.</td>
<td>12</td>
</tr>
<tr>
<td>Railway Master Mechanic</td>
<td>75</td>
</tr>
<tr>
<td>Railway Materials Co. The</td>
<td>9-11-12-17-18-28-68-78</td>
</tr>
<tr>
<td>Ralston Steel Car Co., The</td>
<td>59</td>
</tr>
<tr>
<td>Rockwell Engineering Co.</td>
<td>77</td>
</tr>
<tr>
<td>Ronceray, E.</td>
<td>20</td>
</tr>
<tr>
<td>St. Louis Surfacier &amp; Paint Co.</td>
<td>67</td>
</tr>
<tr>
<td>Safety Car Heating &amp; Lighting Co., The</td>
<td>57</td>
</tr>
<tr>
<td>Sellers, William &amp; Co., Inc.</td>
<td>41</td>
</tr>
<tr>
<td>Sight Feed Oil Pump Co.</td>
<td>18</td>
</tr>
<tr>
<td>Slocomb &amp; Co., F. F., Inc.</td>
<td>17</td>
</tr>
<tr>
<td>Smith Machine Co., H. B.</td>
<td>61</td>
</tr>
<tr>
<td>Smith Foundry Supply Co., J. D.</td>
<td>9</td>
</tr>
<tr>
<td>Standard Tool Co., The</td>
<td>20-24-26-28</td>
</tr>
<tr>
<td>Starrett Co., L. S.</td>
<td>44</td>
</tr>
<tr>
<td>Stockbridge Machine Co.</td>
<td>42</td>
</tr>
<tr>
<td>Stoever Foundry &amp; Mfg. Co.</td>
<td>8</td>
</tr>
<tr>
<td>Stowell Mfg. Co.</td>
<td>54</td>
</tr>
<tr>
<td>Underwood &amp; Co., H. B.</td>
<td>49</td>
</tr>
<tr>
<td>Vanduzen Co., The E. W.</td>
<td>73</td>
</tr>
<tr>
<td>Van Nostrand Co., D.</td>
<td>27</td>
</tr>
<tr>
<td>Vulcan Iron Works</td>
<td>60</td>
</tr>
<tr>
<td>Warner &amp; Swasey Co., The</td>
<td>30-31-32-33</td>
</tr>
<tr>
<td>Watson-Stillman Co., The</td>
<td>19</td>
</tr>
<tr>
<td>Wells Light Mfg. Co.</td>
<td>11</td>
</tr>
<tr>
<td>Western Tool &amp; Mfg. Co.</td>
<td>17</td>
</tr>
<tr>
<td>Whiting Foundry Equipment Co.</td>
<td>68</td>
</tr>
<tr>
<td>Williams Tool Co.</td>
<td>12</td>
</tr>
<tr>
<td>Wolfe Brush Co.</td>
<td>13</td>
</tr>
</tbody>
</table>
WE PUBLISH

Railway Master Mechanic

Railway Shop Up To Date

Modern Machinery

Railway Engineering

Purchasing Agents Buying List

Crandall Publishing Co.

CHICAGO: 510 Security Bldg.

NEW YORK: 132 Nassau St.

Subscription and Advertising Rates on Request.

DIAMOND STEEL EMERY

A RAILROAD SHOP NECESSITY

PITTSBURGH CRUSHED STEEL CO., Pittsburgh, Pa.
ARMSTRONG TOOL HOLDERS

will do more work and cause less trouble than any other tools you can put on your lathes and planers. Experience counts in making tool holders just as it does in any other line, yours for instance. It's easy for us to make better tool holders than anybody else; that's been our specialty for years, and it don't cost us (or you) one cent extra.

WE MAKE A COMPLETE LINE—A Tool Holder for Every Operation on the Lathe and Planer

Cutter is Extra Large and is supported directly under strain of cut. Our Patented Relieved Seat prevents chattering and breaking of cutter.

Patented February 28, 1893, and patent pending

Armstrong Universal Ratchet Drill

Sectional View of Head and Spindle

Two inches of motion at end of handle, IN ANY DIRECTION, will drive the Drill.

No lost motion—cuts faster than common ratchet. Write for special circular.

A Few of These Ratchets

in your erecting and repair department will repay their cost many times in the course of a year. They have a special field of their own in which neither air or electric drills nor the common ratchet can compete.

Drop Forged Of Steel

The Armstrong Improved Tool Post

FOUR SIZES

OUR Improved Tool Post combines in itself the strength and holding power of the Strap and Stub Tool Clamp with the convenience of the "open side" and ordinary Set Screw Tool Post. Write for special circular.

Armstrong Bros. Tool Co.
129 N. Francisco Ave., Chicago, U. S. A.

IMITATIONS ARE UNSATISFACTORY—INFRINGEMENTS ARE UNLAWFUL
PIECE THREADING MACHINES

This cut shows the No. 6 machine which threads and cuts off from 1¼ in. to 6 in. It has ten speeds, two gripping chucks, sliding head, steel clad die head and other improvements.

We have a complete line of machines for threading all sizes of pipe from ¼ to 12 inches. Each machine was designed with the idea of getting the work out rapidly, with as little wear as possible. Hence we use hardened steel instead of cast iron in many places. To get the work out we give a large number of speeds.

Our booklet explains matters clearly. Send for it.

The Stoever Foundry & Mfg. Co.
MYERSTOWN, PA.
OUR 500 X PLUMBAGO

Is refined and ground at our Cleveland Facing mill, from the best grade of Ceylon Graphite.

It is ground very fine and has a brilliant silver polish. Can be applied with a brush or shake bag and slicked with the hand or tool. Gives a nice blue color to the castings, and peels them perfectly clean.

We will send a pound sample for trial free of all charges.

Send for No. 37 Catalogue.

The J. D. SMITH FOUNDRY SUPPLY CO.
CLEVELAND, OHIO.

WE DESIGN AND BUILD COMPLETE FOUNDRY PLANTS

P. H. CHAMBERLIN, Pres.-Mgr.
J. S. SMITH, Sec'y-Treas.
F. A. COLEMAN, Engineer.

We also build PORTABLE ELECTRIC DRILLS and GRINDERS.
LOCOMOTIVE WEIGHING APPARATUS FOR ASCERTAINING WEIGHT ON EACH AXLE.

WALTER MACLEOD & CO.
MANUFACTURERS OF
THE BUCKEYE LIGHT AND HEATER
OIL BURNER SPECIALTIES AND FORGES, SAND BLASTS, PAINTING AND WHITENING MACHINES, ETC.

213 East Pearl Street, CINCINNATI, OHIO.
BUYERS' GUIDE—Continued.

Car Springs.
Fitzhugh Spring & Steel Co., Pittsburgh, Pa.

Car Trucks.
Bettendorf Axle Co., Davenport, Iowa.

Car Ventilation.

Car Wheels.
Victor Axle Works, Wilkes Barre, Pa.
Car Wheel and Crank Pin Presses.

Cars.
Bettendorf Axle Co., Davenport, Iowa.
Bailton Steel Car Co., Columbus, Ohio.

Cars, Dump, Ballast, etc.
Bailton Steel Car Co., Columbus, Ohio.

Cars, Steel.
Bettendorf Axle Co., Davenport, Iowa.

Cars, Tank.
Bettendorf Axle Co., Davenport, Iowa.

Car Wheel Plants.
Whiting Foundry Equipment Co., Harvey, Ill.

Car Window Strips, Metal.
Metal Plate Car & Lumber Co., New York.

Castings, Brass.

Castings, Railway.
Goold Coupler Co., New York.

Castings, Malleable Iron.
Goold Coupler Co., New York.
National Malleable Castings Co., Cleveland, Ohio.

Castings, Machine Tools.
Goold Coupler Co., New York.

Chuck, Drill.
Standard Tool Co., Cleveland, Ohio.

Clamping Machines.

Clutch, Brake.
Smith, H. B. Mach Co., Smithville, N. J.

Circlips and Polishing Compound.

Clevis Nuts.
Cleveland City Forge & Iron Co., Cleveland, Ohio.

Coal Grinders.
Warner & Swasey Co., Cleveland, Ohio.

Cold Water Calciners.

Cold Water Paints.

Combination Tap and Drill.
Standard Tool Co., Cleveland, Ohio.

Continuous Platform and Buffers.
Goold Coupler Co., New York.

Contractors' Equipment and Supplies.
Vulcan Iron Works, Wilkes Barre, Pa.

Contractors' Locomotives.
Vulcan Iron Works, Wilkes Barre, Pa.

Core Ovens.
Smith, J. D., Foundry Supply Co., Cleveland, Ohio.

Couplers, Car.
Goold Coupler Co., New York.

Crane, Hand, Steam, Electric.
Whiting Foundry Equipment Co., Harvey, Ill.

Crate Mfg. Co., Columbus, Ohio.

Crane Pin Presses.

Crane Pin Turk.

Cruclisles.
Smith, J. D., Foundry Supply Co., Cleveland, Ohio.

Cruicible Tool Steel.
McIntosh Steel Co., Corry, Pa.

Cutting-Off Saws.
Bentel & Margedant Co., Hamilton, Ohio.

Cutting-Off Machine for Self-Hardening Steel.

Cutting-Off Tools.

Daggers, Sleeping Heads.

Bentel & Margedant Co., Hamilton, Ohio.

Dip and Stationary Paints—See Paints.
Die Heads, Adjustable, Self-Opening.

Diorama Co., New Haven, Conn.

Die Steel.
McInnes Steel Co., Corry, Pa.

Disc Grinders.
Armstrong Bros. Tool Co., Chicago.

Draft Gears and Draft Rigging.
Farlow Draft Gear Co., Baltimore, Md.

Drafting Machines.

Draftsmen's and Engineers' Supplies.

Draughtsmen's Tools.
Starrett Co., Athol, Mass.

Draughting Room Supplies.

Drew Bar Attachments.
Farlow Draft Gear Co., Baltimore, Md.

Draw Bridge Machinery.
Nicolich, Geo. B. & Bro., Chicago.

Drelichmacher.
Standard Tool Co., Cleveland, Ohio.

Drill Holders.
Armstrong Bros. Tool Co., Chicago.

Drelichmacher.
Foot-Hurt Co., Cleveland, Ohio.

Drill Presses.

Drills, Rammers, Etc.
McInnes Steel Co., Corry, Pa.

Drill Sockets.
Standard Tool Co., Cleveland, Ohio.

Drilling Machines.
Foot-Hurt Co., Cleveland, Ohio.

Dross Finishers.
Smith, J. D., Foundry Supply Co., Cleveland, Ohio.

Built Heidelberg.

Genuine Railroad Finishes
CROCKETT'S RAILWAY VARNISHES

Railway Body.
A varnish, very durable and brilliant, and specially adapted to finishing passenger cars and trolley cars. It has a good body, works freely and dries dust-free in ten or twelve hours.

Railway Rubbing.
A varnish, made expressly for undercoats on passenger cars and trolley cars. It works easily, and can be rubbed in forty-eight hours.

Inside Car.
A varnish, drying with a fine and durable luster in eight hours. It works easily and is more elastic than ordinary inside varnishes.

Open Car.
For one coat on electric open cars for the entire surface, including seats, dries hard and with durable luster.

Engine Finishing.
A medium drying, finishing varnish, made from the hardest gums, designed to withstand the rough usage on a locomotive.

Engine Rubbing.
A varnish for undercoats on locomotives and similar purposes. It works easily, dries quickly, and can be rubbed in from twenty-four to thirty-six hours.

Locomotive Black Finish.
A medium drying and durable black finish or enamel, made from the best materials, and designed to withstand the rough usage on a locomotive.

Smoke Stack.
A slow drying black varnish for locomotive iron work and similar purposes, designed to resist the action of heat and exposure.

Coat Japan.
This japan has been a standard article with railroad painters for many years, and has an unrivaled reputation. It is a very powerful dryer, absolutely reliable and uniform.

Brown Japan.
For freight paints.

Floor Finish.
Where a varnish is required that can be frequently washed with hot or cold water. Can be rubbed or left with a gloss.

Spar Composition.
Composed of the best materials procurable, is the most durable, the best known and has the largest sale of any Marine Varnish manufactured. Positively salt and fresh water-proof, is invaluable for Exterior Marine Work of any kind, and as its name indicates particularly adapted for Spar, Steamboats, Yachts and Canoes. Also a finish for Decks, Outside Doors, Piazza Floors, Store Fronts, etc. It will not crack, turn white or blister.

Primelac.
After making many experiments we have produced this article, which we consider indispensable for the pores of this wood and kills all resinous matter and prevents sweating. It dries hard in a few hours, with smooth surface, and is a firm foundation for the after coat.
TOWER AND CLIMAX COUPLERS
In Malleable Iron or Cast Steel
Malleable Castings for Railroad Purposes
The National Malleable Castings Co.
CLEVELAND INDIANAPOLIS CHICAGO
TOLEDO SHARON

Drawing Material
Complete Outfits for the Drafting Room.
Triangles, Squares, Drawing Boards,
Inks, Drawing and Tracing Papers,
etc.
SLIDE RULES.
KOLESC & CO.
Established 1869
138 Fulton St., New York
Write for catalogue.

The Modern Draft Gear
FARLOW

It is giving universal satisfaction and being extensively used.
It does not cause cars to go to the repair track, because it does not fail.

FARLOW DRAFT GEAR CO.
BALTIMORE, MD.
CHICAGO OFFICE, FISHER BLDG.

For Use on
Railroad Wrecking Cars,
Switching,
Track Laying and Repairs Generally.

No. 5—4,000 C.P.
Over 25,000 Wells Lights now in use. Every light tested before it leaves factory. Made in three sizes—800, 2,000 and 4,000 candle power. Send for catalogue and prices.

Ask about our Tire Expansion System.

Wells Light Manufacturing Co.
44 and 46 Washington St., NEW YORK

The Perfect Car and Locomotive Cleaner
AND VARNISH PRESERVATIVE
CLEANOLA GLASS CLEANER
CLEANOLA SIGNAL CLEANER
CHICAGO OFFICE—53 West Van Buren Street
A Rare Opportunity

24-inch B. G. Crank Shaper

WE will place a B. G. Crank Shaper in your shop, without order from Pur. Agent, freight prepaid, as a test machine.

If not as represented, return at our expense. If the best of its type, pass a requisition for it. We know our shaper is best adapted to R. R. Shop requirements. We want to prove it to you.

Queen City Machine Tool Co.
Cincinnati, Ohio

A PIPE CUTTING EQUIPMENT

of Williams Machines will meet all requirements of modern work

COMPLETE LINE OF PIPE CUTTING MACHINES

For up-to-date Shops

Mostly designed, strong construction, 7-9-0-5 and convenient to operate. Several sizes and adjustable dies. Six speed changes without shifting a gear.

7 sizes, capacities 1-4 in. to 12 in.

WILLIAMS TOOL CO.
ERIE, PA.

Best Paint Remover

PARROTT

PARROTT MANUFACTURERS
OF the
Highest Grade
Car and
Locomotive
Varnishes

PARROTT VARNISH CO.
Bridgeport, Conn.

FERGUSON OIL FURNACES

Chicago

The Railway Materials Company

New York
Nicholson Files
THE CHOICE OF ALL CRITICAL MECHANICS
Unequaled in
CUTTING POWER — DURABILITY — UNIFORMITY
NICHOLSON FILE CO.
PROVIDENCE, R. I., U. S. A.

WOLFE BRUSH COMPANY
Successors to WOLFE, WALKER & CO., Ltd.
General Offices and Factory:
South 15th and Bingham Sts.
Retail Store, 305 Liberty St.
PITTSBURG, PA.
Manufacturers of Superior
Brushes
Especially Designed for
Rail Roads

THE "GLOBE" VENTILATOR
For ventilating cars and railroad buildings of every character
The "Globe" Ventilator is absolutely storm and cinder proof
The "Globe" Ventilator is manufactured by
The Globe Ventilator Company
TROY, N. Y.

Write for Sample Card
FERRICO PAINT
Paste, Semi-Paste and Liquid
Buy It
For Cars, Bridges, Train-sheds, Structural Work and other Wooden and Metallic Surfaces
In preparing Ferrico Paint the most careful attention has been given to the requirements of the surfaces upon which it is to be applied, also to the character of each pigment used.
In grinding, the drying properties of the pigments used in the various colors have been carefully studied and a vehicle used which exactly meets the requirements of each pigment, so that in making reductions the same quality and quantity of thinners can be used in all shades.
MADE IN ELEVEN SHADES AND ELASTIC RED LEAD

Heath & Milligan Mfg Co
Use It
PAINT AND COLOR MAKERS
CHICAGO
U.S.A
You’ll Like It
Railway Master Mechanic

($1.00 per Year)

Is the leading mechanical journal of railroading, because it is read by more motive power and car shop officials than any other paper. It also carries more advertising in these departments than any other paper. Just as a bank's growth is the measure of confidence in it by its patrons so is a newspaper's growth. The Railway Master Mechanic has shown a greater growth in the past two years (400 per cent.) than any railway journal. It brings many times one dollar's worth of news to its subscribers, and therefore results to its advertisers.

Crandall Publishing Co.
Security Building 130 Nassau St.
CHICAGO NEW YORK
The Only White
That Remains White
In the Vicinity of a Railroad

IS

Oxide of Zinc

Paints based on Oxide of Zinc will not
discolor in the presence of sulphur
gases.

Such paints are the only ones that will
give satisfactory service on station build-
ings, shops, etc.

The New Jersey Zinc Co.
71 Broadway, New York

FREE, OUR PRACTICAL PAMPHLETS:
The Paint Question
Paints in Architecture
Specifications for Architects
French Government Decrees
BARRETT and DUFF CAR JACKS

are THE acknowledged lifting jacks of the world

The No. 19 Barrett Jack

is especially designed for car repairing. Easily carried and easily operated. Designed also to grapple low set loads. Lifts and lowers on down stroke of lever only. Capacity, 15 tons.

No. 130 Barrett Geared Ratchet Lever Jack

has a capacity of 35 tons and is particularly designed for the rapid handling of loaded freight cars and heavy loads in general. Single acting, raising the load on the downward movement of the lever only. This Jack permits of great ease of operation and is quick acting.

No. 58 Cone Bearing Journal Jack

weighs 39 pounds and has a raise of 5 inches. One man can easily replace the brasses in a truck with one of these Jacks.

The Duff Ball-Bearing Screw Jacks

are made to interchange with Duff Roller Bearing Screw Jacks, so that any shop having our Jacks equipped with roller bearing can easily change them to ball-bearing Jacks if desired. We shall be pleased to send full information regarding our complete line of Jacks, which are made in capacities of from 1 to 75 tons.

BUYERS' GUIDE—Continued.

Headlights, Acetylene. Macleod & Co., Walter, Cincinnati, O.
Simpson, W. M., Chicago.
McBride Steel Co., Corry, Pa.
Housing Machinery. Case Mfg. Co., Columbus, O.
Smith, J. D., Foundry Supply Co., Cleveland, O.
Whiting Foundry Equipment Co., Harvey, Ill.
Rental & Margetson Co., Hamilton, O.
Greenlaw Bros. & Co., Chicago.
Hot Pressed Nut Machines. Ajax Mfg. Co., Cleveland, O.
Index Center. National Machinery Co., Tiffin, O.
Instruments, Engineering and Surveying. Hanna & Co., Troy, N. Y.
Iron for Staybolts. Cleveland City Forge & Iron Co., Cleveland, O.
Hendeker's, A. L. Sons, Wilmington, Del.
Jib Cranes. Whiting Foundry Equipment Co., Harvey, Ill.
McDermott & Co., Chicago.
Benten & Margetson Co., Hamilton, O.
Lamp Jacks. Globe Ventilator Co., Troy, N. Y.

The Duff Manufacturing Company

PITTSBURG, PA.