

THE MICHIGAN CENTRAL
RAILROAD COMPANY

RULES OF THE
MAINTENANCE OF WAY
DEPARTMENT

C. S. DIVISION

No. 93

THIS BOOK
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The Michigan Central
Railroad Company

AND IS
LOANED TO

Name	Employed as
<i>Wm Duncan</i>	

I hereby agree to return it to the proper
officer when called for, or upon
leaving the service.

**THE MICHIGAN CENTRAL
RAILROAD COMPANY**



**RULES OF THE
MAINTENANCE OF WAY
DEPARTMENT**

C. S. DIVISION



To Take Effect
SEPTEMBER 1, 1927

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THE MICHIGAN CENTRAL RAILROAD COMPANY

General Office

Detroit, Michigan

This Book of Rules is issued for the information and guidance of the employes of the Maintenance of Way, Bridge, Building and Signal Departments, and must be studied and strictly obeyed.

All previous instructions not conforming to these rules are hereby cancelled.

Special instructions will be issued when required.

Geo. H. Harris,
Assistant Chief Engineer

Approved:

J. F. Deimling,
Chief Engineer

Approved:

Henry Shearer,
Assistant Vice President and General Manager

GENERAL NOTICE

The safety of Passengers and Trains is of the first importance, and all operations, repairs, or construction on this road must be subservient thereto. To this, with the regularity and punctuality of the Trains and the comfort and convenience of Patrons, all work must be entirely subordinate.

It is of the utmost importance that proper rules for the government of the employes of a railroad should be enforced. If they cannot or ought not to be enforced, they should not exist. Officials or employes whose duty it may be to make or enforce rules, however temporary or unimportant they may seem, should keep this clearly in mind. If, in the judgment of any one whose duty it is to enforce a rule, such rule cannot or ought not to be enforced, he should at once bring it to the attention of those in authority.

The public judges a railroad very largely by the treatment of it by the employe representing the Railroad, in whatever capacity employed.

A reputation for fair dealing, with courteous and absolutely equal treatment of all patrons, is as essential to the success of the railroad as it is to the success of any other business.

The interest of the farmer, the manufacturer, the mine owner, the merchant and the railroad is mutual, and efficient transportation facilities are necessary to the success of all.

The good will and friendship of the communities served by this Railroad are its most valuable assets; and the strongest recommendation for promotion an employe in any department can possibly have is the fact that by uniform courtesies and kindly accommodation of patrons he has secured for himself and for the railroad the good will and friendship of the community in which he is located.

DEFINITIONS

Engine.—A locomotive propelled by any form of energy.

Motor.—A car propelled by any form of energy.

NOTE—When a motor is used instead of an engine, requirement of the rule will be the same for a motor as for an engine.

Train.—An engine, or motor, or more than one engine, or motor, coupled, with or without cars, displaying markers.

Regular Train.—A train authorized by a time-table schedule.

Section.—One of two or more trains running on the same time-table schedule, displaying green signals or for which green signals are displayed.

Extra Train.—A train not authorized by a time-table schedule. It may be designated as:

“Work extra”—for a work train.

“Passenger extra”—for an extra passenger train.

“Extra”—any other extra train.

Superior Train.—A train having precedence over another train.

Train of Superior Right—A train given precedence by train order.

Train of Superior Class.—A train given precedence by time-table.

Train of Superior Direction.—A train in the direction in which regular trains are superior to trains of the same class in the opposite direction, as specified in the time-table.

NOTE—Superiority by direction is limited to single track.

Time-Table.—The authority for the movement of regular trains subject to the rules. It contains the classified schedules of trains with special instructions relating thereto.

Time-Table Schedule.—That part of a time-table which prescribes class, direction, number and movement for a regular train.

Division.—That portion of a railway assigned to the supervision of a Superintendent.

Subdivision.—A part of a division designated by time-table.

Main Track.—A track extending through yards and between stations, upon which trains are operated by time-table or train order, or the use of which is governed by block signals.

Single Track.—A main track upon which trains are operated in both directions.

Double Track.—Two main tracks, upon one of which the current of traffic is in a specified direction, and upon the other in the opposite direction.

Three (or more) Tracks.—Three (or more) main tracks, upon any of which the current of traffic may be in either specified direction.

Current of Traffic.—The movement of trains on a main track, in one direction, specified by the rules.

Station.—A place designated on the time-table or by a sign board by name, at which a train may stop for traffic; or to enter or leave the main track; or from which fixed signals are operated.

Initial Station.—A station at which a regular train is first timed on any sub-division, is an initial station for that train.

Passing Track.—A track, auxiliary to the main track for meeting or passing trains, limited to the distance between two adjoining telegraph stations.

Side Track.—A track auxiliary to the main track, used for purposes other than for meeting and passing trains.

Fixed Signal.—A signal of fixed location indicating a condition affecting the movement of a train.

NOTE TO DEFINITION OF FIXED SIGNAL—The definition of a "Fixed Signal" covers such signals as slow boards, stop boards, yard limits, switch, train order, block, interlocking, semaphore, disc, ball or other means for displaying indications that govern the movement of a train.

Yard.—A system of tracks within limits defined by yard limit boards, or indicated by time-table, provided for the making up of trains, storing of cars, and other purposes, over

which movements not authorized by time-table or by train order, may be made, subject to prescribed signals and rules.

Yard Engine.—An engine assigned to yard service and working within yard limits.

Pilot.—An employe assigned to a train when the engineer or conductor, or both, are not fully acquainted with the physical characteristics, or running rules of the road, or portion of the road, over which the train is to be moved.

Train Register.—A book or form which may be used at designated stations for registering signals displayed, the time of arrival and departure of trains and such other information as may be prescribed.

Signal Station.—A place from which fixed signals are operated.

Signalman.—An employe whose duties require him to operate fixed signals, or the levers of an interlocking plant.

GENERAL RULES

1. Safety is the first rule to be observed, and in cases requiring urgent attention, take quick measures to avoid accidents. In case of doubt, take the safe course.

2. Division Engineers, Bridge Engineers, Superintendent of Buildings, Road Masters and Assistant Road Masters must see that all employes of Track, Bridge, Building, Water Service and Engineering Work whose duties are prescribed by these Rules, are provided with a copy and require a strict observance thereof; giving particular attention to flagging rules for the protection of trains, also rules for the operation of hand and motor cars, flagman's signals and manner of using.

3. The head of each sub-department and each foreman who directs employes must enforce discipline and see that efficient service is rendered. Before employment or promotion, foremen must be examined and instructed by their superior officials, and thereafter at least once a year to insure their knowledge of the rules pertaining to their work, and a permanent record kept of such examination, and they should be prepared to pass a satisfactory re-examination at any time.

4. Foremen must be conversant with standard plans and specifications, rules and special instructions which apply to their work. They shall be responsible for the proper use of material furnished them and account for the quantities of same.

5. Employes whose duties of employment are affected by Federal or Provincial laws must familiarize themselves with requirements and avoid violations.

6. All employes whose duties are in any way affected by the time-tables, must always keep the standard time and have a copy of the current time-table with them when on duty, and will be governed by the special instructions therein. They will carefully read all bulletins pertaining to their duties.

SIGNALS

7. Employes whose duties may require them to give signals, must provide themselves with the proper appliances, keep them in good order and ready for immediate use.

8. Flags of the prescribed color must be used by day, and lights of the prescribed color by night.

9. Night signals are to be displayed from sunset to sunrise. When weather or other conditions obscure day signals, night signals must be used in addition.

10. COLOR SIGNAL INDICATIONS

COLOR	MEANS	USED ON
RED	1—STOP.	SIGNALS AND SIGNS.
	2—SWITCH SET FOR TURNOUT.	MAIN TRACK SWITCHES.
	3—STOP TO PUBLIC.	CROSSING GATES.
	4—REAR OF TRAIN ON MAIN TRACK.	MARKER LAMPS ON REAR OF TRAIN.
	5—STOP TO PUBLIC.	PROTECTED CROSSINGS
YELLOW	1—CAUTION.	AUTOMATIC AND INTER-LOCKING SIGNALS.
	2—SWITCH SET FOR TURNOUT.	YARD SWITCHES.
	3—REDUCE SPEED.	SLOW SPEED SIGNS.
	4—"19" ORDERS, TRAIN MESSAGES OR CLEARANCE CARD.	TRAIN ORDER SIGNALS.
	5—TAKE SIDING.	TAKE SIDING INDICATORS
GREEN	1—PROCEED.	SIGNALS.
	2—SWITCH SET FOR MAIN TRACK, STRAIGHT TRACK OR LEAD.	MAIN TRACK AND YARD SWITCHES.
	3—NON-DERAILING POSITION.	PASSING TRACK AND SIDE TRACK DERAILS.
	4—RESUME SPEED.	RESUME SPEED SIGNS.
	5—FOLLOWING SECTION.	FRONT OF ENGINES.
GREEN AND WHITE	6—TRAIN CLEAR OF MAIN TRACK.	MARKER LAMPS ON REAR OF TRAIN.
	1—STOP FOR PASSENGERS.	FLAG STATIONS. (Rule 28)
BLUE	1—REPAIRING CARS.	AT ONE OR BOTH ENDS OF AN ENGINE, CAR OR TRAIN. (Rule 26)
PURPLE	1—DERAILING POSITION.	PASSING TRACK AND SIDING DERAILS.
LUNAR WHITE	1—ENDS OF TRACK PAN.	TRACK PANS.

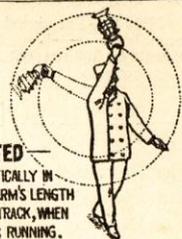
10a. Main track switch banners and lights will show green when switch is set for main track and red when set for diverging route. All other switch banners except on derails will show green when set for straight track or lead and yellow when set for diverging route. Banners on siding derails will show red and lights will show purple when derail is in derailing position. The banners and lights will show green when derail is in non-derailing position.

11. On track protected by automatic block signals, a train finding a fusee burning, on or near its track, must stop before any part of the train has passed it and extinguish the fusee, and then proceed with caution prepared to stop short of train or obstruction.

On track not protected by automatic block signals, a train finding a fusee burning on or near its track must stop before any part of the train has passed it and not proceed until the fusee is burned out.

A lighted fusee dropped from the engine when the train has parted, is a warning to the rear portion.

12. **HAND, FLAG AND LAMP SIGNALS**
MANNER OF USING

<p>(a) STOP — SWUNG ACROSS THE TRACK.</p> 	<p>(e) TRAIN HAS PARTED — SWUNG VERTICALLY IN A CIRCLE AT ARM'S LENGTH ACROSS THE TRACK, WHEN THE TRAIN IS RUNNING.</p> 
<p>(b) REDUCE SPEED — HELD HORIZONTALLY AT ARM'S LENGTH, WHEN THE TRAIN IS MOVING.</p> 	<p>(f) APPLY AIR BRAKES — SWUNG HORIZONTALLY ABOVE THE HEAD, WHEN THE TRAIN IS STANDING.</p> 
<p>(c) PROCEED — RAISED AND LOWERED VERTICALLY.</p> 	<p>(g) RELEASE AIR BRAKES — HELD AT ARM'S LENGTH ABOVE THE HEAD WHEN THE TRAIN IS STANDING.</p> 
<p>(d) BACK — SWUNG VERTICALLY IN A CIRCLE AT HALF ARM'S LEN- GTH ACROSS THE TRACK, WHEN THE TRAIN IS STANDING.</p> 	

NOTE—Hand signalling includes the use of lamp, flag, torpedo and fusee signals.

13. Any object waved violently by any one on or near the track is a signal to stop.

AUDIBLE SIGNALS

14. Engine and Motor Whistle Signals

NOTE—The signals prescribed are illustrated by "o" for short sounds "—" for longer sounds. The sound of the whistle should be distinct, with intensity and duration proportionate to the distance signal is to be conveyed.

SOUND	INDICATION
(a) o	Stop. Apply brakes.
(b) —	Release brakes, or ready to proceed.
(c) — o o o	Flagman go out to protect rear of train.
(d) — — — —	Flagman return from west or south.
(e) — — — — —	Flagman return from east or north.
(f) — — —	When running, train parted; to be repeated until answered by the signal prescribed by Rule 12 (e). Answer to 12 (e).
(g) o o	Answer to any signal not otherwise provided for.
(h) o o o	When train is standing, back. Answer to 12 (d) and 16 (c). When running, answer to 16 (d).
(j) o o o o	Call for signals.
(k) — o o	To call the attention of yard engines, extra trains or trains of the same, or inferior class or inferior right to green signals displayed for a following section.
(l) — — o o	Approaching public road crossings at grade and at whistle posts.
(m) — — —	Approaching stations and as prescribed by Rule 31.
(n) o —	When double heading, air brakes have failed on leading engine and second engine is to take control of them. Answer to 14 (n); to be given by second engine as soon as it has control of air brakes.
(o) o o —	Answer to 14 (k).

14p. Succession of short sounds is an alarm for persons or animals on track.

14q. When trains are required to reduce speed where repairs to track and bridges are being made, the signal 14 (l) must be sounded not less than 1500 feet before reaching such point.

14r. Enginemen of all trains shall sound signal 14 (l) when approaching curves where view of track ahead is obscured to warn section men and bridge men. The same signal must be sounded at intervals in fogs and storms.

14s. Trains carrying mail cars on which catcher service is performed must sound signal 14 (m) for the guidance of mail clerks.

14t. Eight long blasts of the whistle is "distress signal" and is a call for assistance. Section men and other employes hearing the signal must go at once to the train making the call.

15. The explosion of one torpedo is a signal to stop; the explosion of two not more than 200 and not less than 100 feet apart is a signal to reduce speed, and look out for a stop signal.

15a. Torpedoes must not be placed near stations or public crossings, nor where persons are liable to be injured by them.

16. Torpedoes exploded by hand cars, velocipede or gasoline cars must be at once replaced.

TRAIN SIGNALS

17. A headlight will be displayed to the front of every train by night, but must be concealed when the train turns out to meet another and has stopped clear of main track, with switches closed, or is standing to meet trains at the end of double track, or at junctions, and switches properly set for the approaching train.

When a train enters a passing track to clear the main track for an opposing train and finds the passing track occupied by another train or by cars which will obscure the headlight, a flagman must be sent ahead a safe distance to stop an opposing train until main track is clear.

18. Yard engines will display a headlight to the front and rear by night. When not provided with a rear headlight, two white lights must be displayed, one on either corner of the rear of the tender. Yard engines will not display markers.

18a. Under conditions not requiring display of markers, road engines without cars will display a white light on the rear of tender by night.

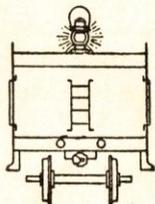


FIG. 66

ENGINE RUNNING BACKWARD BY NIGHT,
WITHOUT CARS OR AT THE FRONT OF A TRAIN
PULLING CARS.

18b. A white light must be displayed by night on velocipede, motor or hand cars when on main track.

19. The following signals will be displayed, one on each side of the rear of every train, as markers to indicate the rear of the train.

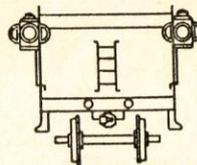


FIG. 67

ENGINE RUNNING FORWARD BY DAY,
WITHOUT CARS OR AT THE REAR OF A
TRAIN PUSHING CARS.

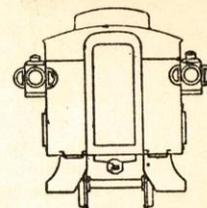


FIG. 68

REAR OF TRAIN BY DAY.

Marker lamps not lighted.

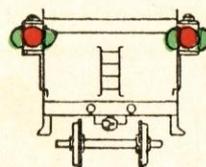


FIG. 69

ENGINE RUNNING FORWARD BY NIGHT,
WITHOUT CARS OR AT THE REAR OF
A TRAIN PUSHING CARS ON SINGLE
TRACK, AND WITH THE CURRENT OF
TRAFFIC ON DOUBLE TRACK.

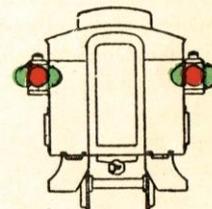


FIG. 70

REAR OF TRAIN BY NIGHT WHILE RUN-
NING ON SINGLE TRACK, AND WITH
THE CURRENT OF TRAFFIC ON
DOUBLE TRACK.

Lights showing green to the front and side and red to the rear.

NOTE—For markers on engines running backward, see Figures 77, 78, 81 and 82.

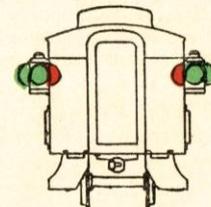


FIG. 71

REAR OF TRAIN BY NIGHT WHEN PASSING TRACK
TO BE PASSED BY ANOTHER TRAIN.

Light showing green toward engine, side and to rear.

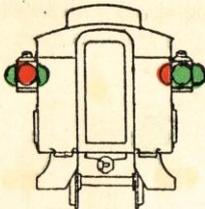


FIG. 72

REAR OF PASSENGER TRAIN BY NIGHT RUNNING AGAINST THE CURRENT OF TRAFFIC ON DOUBLE TRACK.

Lights showing green to front and side and green to the rear on the side next to the main track on which the current of traffic is in the direction the train is moving and red to the rear on the opposite side.

19a. By night, in addition to the markers, freight trains, while on the main track, will display from the top of the caboose a green light to the front and a red light to the rear.

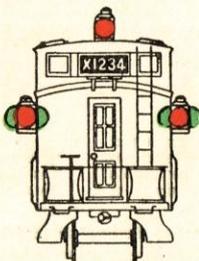


FIG. 73

BY NIGHT, FREIGHT TRAIN WHILE ON MAIN TRACK.

Freight train by night, when running against the current of traffic.

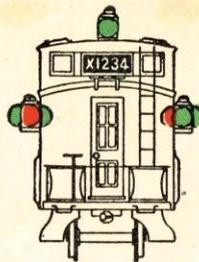


FIG. 74

REAR OF FREIGHT TRAIN BY NIGHT RUNNING AGAINST THE CURRENT OF TRAFFIC ON DOUBLE TRACK.

Lights showing green to front and side and green to the rear from the cupola also on the side next to the main track on which the current of traffic is in the direction the train is moving and red to the rear on the opposite side.

19b. When the cupola of a caboose is provided with indicators for designating the train, the proper indication must be shown as above and must be removed as soon as the run is completed.

Extra trains with two or more engines coupled, will show the number of the leading engine only in the cupola.

19c. By night, when a train is to pass from a passing track to the main track, the marker lights must show red to the rear before any part of the train fouls the main track. Engineers finding a train on any passing track with markers showing red, it will indicate that such train is fouling the main track, and will proceed with such caution as will prevent accident until it is seen or known that the main track is clear.

20. All sections except the last will display two green flags, and in addition, two green lights by night, in the places provided for that purpose on the front of the engine.

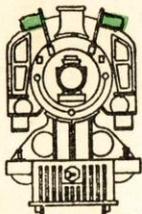


FIG. 75



FIG. 76

ENGINE RUNNING FORWARD BY DAY DISPLAYING SIGNALS FOR A FOLLOWING SECTION.

ENGINE RUNNING FORWARD BY NIGHT DISPLAYING SIGNALS FOR A FOLLOWING SECTION.

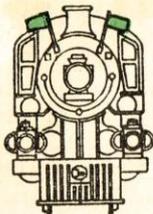


FIG. 77

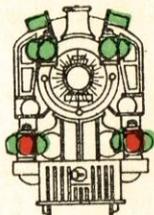


FIG. 78

ENGINE RUNNING BACKWARD BY DAY, WITHOUT CARS OR AT THE REAR OF A TRAIN PUSHING CARS, AND DISPLAYING SIGNALS FOR A FOLLOWING SECTION.

ENGINE RUNNING BACKWARD BY NIGHT WITHOUT CARS OR AT THE REAR OF A TRAIN PUSHING CARS, AND DISPLAYING SIGNALS FOR A FOLLOWING SECTION.

21. Extra trains will display two white flags, and in addition, two white lights by night, in the places provided for that purpose on the front of the engine.

21a. Extra trains will omit the display of white signals when so specified on the time-table.

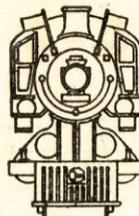


FIG. 79



FIG. 80

ENGINE RUNNING FORWARD BY DAY AS AN EXTRA TRAIN.

ENGINE RUNNING FORWARD BY NIGHT AS AN EXTRA TRAIN.

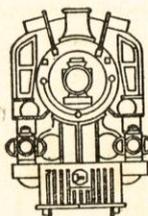


FIG. 81

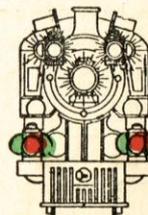


FIG. 82

ENGINE RUNNING BACKWARD BY DAY AS AN EXTRA TRAIN, WITHOUT CARS OR AT THE REAR OF A TRAIN PUSHING CARS.

ENGINE RUNNING BACKWARD BY NIGHT AS AN EXTRA TRAIN, WITHOUT CARS OR AT THE REAR OF A TRAIN PUSHING CARS.

22. When two or more engines are coupled, the leading engine only shall, unless otherwise directed, announce the signals as prescribed by Rule 14, and display the signals as prescribed by Rules 20 and 21.

23. One flag or light displayed where in Rules 19, 20 and 21 two are prescribed will indicate the same as two; but the proper display of all train signals is required.

24. When cars are pushed by an engine (except when shifting or making up trains in yards) a white light must be displayed on the front of the leading car by night.

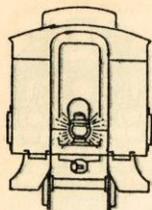


FIG. 83

PASSENGER CARS BEING PUSHED BY AN ENGINE BY NIGHT.

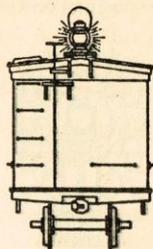


FIG. 84

FREIGHT CARS BEING PUSHED BY AN ENGINE BY NIGHT.

25. Each car on a passenger train must be connected with the engine by a communicating signal appliance.

26. A blue flag by day and a blue light by night, displayed at one or both ends of an engine, car or train, indicates that workmen are under or about it; when thus protected, it must not be coupled to or moved, and other cars must not be placed on the same track, so as to intercept the view of the blue signals, without first notifying the workmen.

Workmen will display the blue signals and the same workmen are alone authorized to remove them.

USE OF SIGNALS

27. A signal imperfectly displayed, or the absence of a signal at a place where a signal is usually shown, must be regarded as a stop signal, and the fact reported to the Superintendent.

28. A combined green and white signal is to be used to stop a train only at the flag stations indicated on its schedule. When it is necessary to stop a train at a point that is not a flag station on its schedule, a red signal must be used.

29. When a signal (except a fixed signal) is given to stop a train, it must, unless otherwise provided, be acknowledged as prescribed by Rule 14 (g) or (h).

30. The engine bell must be rung when an engine is about to move, and while moving about stations.

When engines are equipped with automatic bell ringers, the bell must be kept in operation while moving, except where it is prohibited by law or local ordinance.

31. Signal 14 (c) must be sounded when necessary to protect rear end of train.

Signal 14 (l) must be sounded at least 80 rods ($\frac{1}{4}$ mile) from every public road crossing at grade, and the engine bell be kept ringing until the crossing is passed.

Signal 14 (l) must be sounded at every whistle post.

Signal 14 (m) must be sounded one mile from stations, watering and fueling points, junctions, the end of double track, drawbridges and railway crossings at grade.

Signal 14 (k) must be sounded by a train displaying green signals for a following section, to call attention of yard engines, extra trains or trains of the same or inferior class or inferior right to green signals displayed, and must hear the answer 14 (o) or stop and notify them of green signals displayed.

32. The unnecessary use of either the whistle or the bell is prohibited. They will be used only as prescribed by rule or law, or to prevent accident.

The whistle must not be sounded while passing a passenger train, except to prevent accident.

33. Watchmen stationed at public road crossings must, by day, display a metal disc (16 inches in diameter, white background, with the word "Stop" in large black letters, and a black border); and by night, a red light hooded to warn pedestrians and persons in vehicles that a train is approaching; where gates are provided, a red light hooded, so as to show to the highway only, must be displayed by night.

MAINTENANCE OF WAY FLAGGING RULES

34. In emergency cases when track is suddenly found defective, any employe shall by the use of flags, lights, torpedoes, fuses or other signals, use every effort possible to stop trains in both directions.

35. Where reduced speed over track is required, (if section or bridge foreman, as the case may be, have been advised by the Superintendent that trains are being notified by train order or bulletin order to reduce speed), the point may be marked and the speed designated by signs or yellow flags as follows:

(a) Indication—REDUCE SPEED TO INDICATED LIMIT.

Name—Reduce-Speed-Sign.

Location—Upon the right of and adjoining the track to which it refers, approximately 3,000 feet from the point to be protected.

If a yellow flag is substituted for the sign or the sign does not designate the speed limit, speed must be reduced to 6 miles per hour.

(b) Indication—SLOW SPEED.

Name—Slow-Speed-Sign.

Location—At the point to be protected, upon the right of and adjoining the track to which it refers.

(c) Indication—RESUME NORMAL SPEED WHEN REAR OF TRAIN HAS PASSED.

Name—Resume-Speed-Sign.

Location—Upon the right of and adjoining the track to which it refers, and 50 feet in advance of the point protected.

NOTE—In addition to signs or flags, lights of prescribed color must be used by night.

36. Before undertaking any work which will render the track impassable or if rendered impassable from any cause or defect, trackmen, bridgemen, or other employes of the Company shall protect the same as follows:



Part 1.

(a) On double track.

(b) On three or more tracks.

(c) In Mountain territory.

(d) On all lines with frequent or fast train service.

Send out a flagman in each direction with stop signals at least:

1,500 feet in day time, if there is no down grade towards the obstruction within one mile, and there is a clear view of 6,000 feet from an approaching train.

3,600 feet at other times and places if there is no down grade towards the obstruction within one mile.

5,400 feet if there is a down grade towards the obstruction within one mile.

The flagman must, after going the required distance from the obstruction, to insure full protection, take up a position where there will be an unobstructed view of him from an approaching train, of, if possible, 1,500 feet, first placing two torpedoes on the rail (not more than 200 or less than 100 feet apart), on the same side as the Engineer of an approaching train, 300 feet beyond such position. The flagman must display a red flag by day and a red light by night and remain in such position until recalled or relieved.

Part 1 is applicable only to the main track, Windsor to Bridgeburg and to East end of the Arch bridge.

Part 2. On other lines.

(a) By day place a red flag, and in addition, by night a red light on the same side of the track as the engineer of an approaching train at a point 600 feet from the defective or working point, with two torpedoes placed on the rail opposite each other so as to cause but one explosion, 150 feet in advance of the red signal and provide further protection as follows:

(b) By day place a red flag and, in addition, by night a red light, on the same side of the track as the engineer of an

approaching train so that it will be clearly in his view, at least:—

3,600 feet from the defective or working point, if there is no down grade towards the obstruction.

5,400 feet if there is a down grade within one mile of the obstruction, or as much farther as may be necessary to insure full protection.

(c) Place two torpedoes (not more than 200 or less than 100 feet apart) on the rail on the same side as the engineer of an approaching train, 300 feet in advance of the red signal.

Part 2. (a), (b) and (c), is applicable only to the Amherstburg, Leamington, St. Clair and Niagara Branches.

Part 3. Trains stopped by flagman as per Part 1 shall be governed by his instructions and proceed to the working point and there be governed by signal or instructions of the foreman in charge.

Part 4. Trains stopped by red signal, as per Part 2, shall replace the torpedoes exploded and proceed to the working point signal, and there be governed by signal or instructions of the foreman in charge, unless in the meantime stop signal had been removed.

Part 5. In the event of train order protection being provided the defective or working point must be marked by signals placed in both directions as follows:

Yellow flags by day and in addition yellow lights by night 3,600 feet from the defective or working point; red flags by day and in addition red lights by night 600 feet from the defective or working point on the same side of the track as the Engineer of an approaching train, except on double tracks, where trains run to the left, in which case, signals shall be placed to the left hand side as seen by an engineer of an approaching train and there is a clear view of at least 1,200 feet.

Part 6. Trackmen and bridgemen before undertaking any work that may render the track impassable or unsafe for trains at the usual rate of speed, will, when advised that notice of such work has been given to trainmen by Bulletin Order, protect the defective or working point as follows:

"A flagman with yellow flag by day and yellow light by night and torpedoes, must be stationed 3,600 feet in each direction from the defective or working point, flagman first placing two torpedoes on the rail, not more than 200 nor less than 100 feet apart, on the same side of the track as the engineer of an approaching train, 300 feet in advance of the point he is stationed. Further protection to be given by a red flag by day and, in addition, a red light by night placed on the engineer's side of the track 600 feet in advance of the defective or working point.

"When trains are flagged as herein prescribed, they must at once reduce speed and be prepared to stop before passing the red signal, unless a proceed hand signal is received from the foreman in charge with a green flag by day or a green light by night."

Part 7. When weather or other conditions obscure day signals, night signals must be used in addition.

37. The following signals will be used by flagmen:

Day Signals—A red flag.
A yellow flag
Torpedoes and fuses.

Night Signals—A red light,
A yellow light
Torpedoes and fuses.

38. The speed specified by train order, bulletin or timetable, or as prescribed by Rule 35 must not be exceeded.

39. When reduced speed is required the entire train must pass over the designated territory at the reduced speed.

40. Track and bridgemen will report by engine numbers, time and direction, any train which disregards speed prescribed by slow orders, or disregards slow signals.

SPECIAL RULES

41. Foremen must know that all men used as flagmen thoroughly understand the duties required of them and are competent in every respect to perform same.

42. All work affecting the condition of track will be subject to rules governing maintenance of way.

43. Employees must be conversant with and obey the rules and special instructions, must render every assistance in their power in fulfilling them, and must report any violation of them to their superior. If in doubt as to their meaning, they must apply for an explanation to their immediate superior, whose duty it shall be to explain to them the rule, by reference to the book, and know that his interpretation and the explanation is correctly understood.

44. Foremen shall give such careful attention to their men from the time they enter upon the right of way until they leave it as is necessary to see that the work is done with safety and efficiency.

45. Roadmasters and Foremen should see that materials or obstructions of any nature are not allowed to remain close to the track where the public, employes, or patrons are liable to be injured thereby. Material needed for repairs at such points must be distributed only in sufficient quantities for immediate use, and the old material released must be promptly removed.

46. Excavations shall be carefully made to avoid slides or disturbing adjacent structures and tracks, using shoring or sheet piling if necessary. All openings must be protected to avoid injury to patrons or employes.

47. Whenever a track, switch, derail, signal, interlocking, water tank, building or anything which affects the running of trains or operation of the road is to be taken out of use, or put into service either temporarily or permanently, permission shall be obtained from the Superintendent and report made to the proper official.

48. No unauthorized obstruction or structure shall be constructed or maintained closer than eight feet to the nearest rail of the nearest main track, or six feet to the nearest rail of any side track. No rope, wire, guy or any movable obstruction shall be allowed to remain or be strung or placed over any track lower than twenty-five feet, and no fixed obstruction less

than twenty-two feet six inches above the base of rail. All overhead structures having less than twenty-two feet six inches clearance above the base of rail must be protected by standard warning guards. In any case where the clearance is less than provided by law standard warning guards must be provided.

49. Private tracks or structures, not owned or maintained by the Railroad, over which it operates, must be regularly inspected to see that they are in safe condition. If found unsafe, immediate report shall be made. If repairs are required, the owner's attention shall be called to the same, and if not remedied the matter shall be reported promptly.

50. Officials, foremen and others, who are liable to be summoned by telegraph, must leave their addresses with the operators at their headquarters. They shall keep a record of the addresses, telephone and telegraph calls, of all the men under their charge, so that they can be promptly called in case of emergency. Foremen must inquire at stations for mail each morning and evening, and at noon when convenient.

51. Roadmasters and foremen employed upon track or structures affecting the safe operation of trains must use reliable watches and compare them daily, or as often as possible, with Standard Clocks, or the certified watches of other employes.

52. The observance of rules for prevention of fire is required, and all employes must be familiar with them.

53. Persons whose hearing, sight or color perception is defective must not be employed where such defects may endanger life or property. (See instructions of the examination of employes for vision, color sense and hearing.)

54. Employes must comply with the rules governing the operation of the pension department and with the special safety instructions.

55. When a person is discharged from the Railroad's service he will not be re-employed without the consent of the official who dismissed him, or that of the head of the department from which he was discharged.

56. Persons formerly employed in other Departments or on other railroads must not be allowed to enter the service unless evidence is obtained of a satisfactory record.

57. From April 1st to November 1st, Section Foremen and their men shall carry their lunches with them; during the balance of the year, they may go home for the mid-day meal, providing they can do so and not be absent from their work longer than time allowed for such meal.

X 58. Minors must not be employed except as permitted by law, and then only upon written consent of their parents or guardians.

59. No employe shall wear red clothing for outer garments where they may be mistaken for danger signals.

60. The use of intoxicants by employes while on duty is prohibited. Their habitual use, or the frequenting of places where they are sold, is sufficient cause for dismissal. The use of tobacco when on duty in or about passenger stations is prohibited.

61. The assignment of pay by employes is prohibited. Garnishee proceedings against an employe's wages will be considered sufficient cause for dismissal, unless a satisfactory explanation is given.

62. No employe shall engage in any other occupation without authority.

63. No employe will be allowed to absent himself from his duty or to engage a substitute to perform his duties without permission.

64. Foremen when suddenly called away must leave a competent man in charge, promptly notifying his superior.

65. If an employe should be disabled by sickness or other cause, the right to claim compensation will not be recognized. An allowance, if made, will be a gratuity, justified by the circumstances of the case and the employe's record.

66. No employe is allowed to contract any bill or other obligations on account of the Railroad, or to use the Railroad's credit, or sell any Railroad material unless authorized.

67. Neither time nor wages are to be returned upon the payroll except for work actually performed by the person whose name appears on the roll.

68. No employe shall solicit, contribute or accept money, or other consideration, for presentation directly or indirectly

to a superior official or for personal use. No employe shall ask or receive money or any valuable consideration for, or on account of employment or place given.

69. All employes in an official capacity should have a general knowledge of laws governing railroads in their territory. Roadmasters will, when necessary, provide Foremen with copy of Provincial laws governing Forest Fires.

70. An employe served with a subpoena to report to any court or officer must at once notify his superior official and communicate with or report in person to the railroad attorney and act under his direction.

71. Employes are required to exercise great care to avoid injury to themselves and to others. Employes before using any tools, scaffold, car or other appliance, must be sure it is in safe condition for their use.

72. All scaffolding or staging must be constructed in accordance with the law.

73. Foremen must caution their men to look out for their own safety, and must instruct their men to move away to a safe distance from passing trains, and must be watchful at all times, especially in fogs or storms, to protect the men against injury. Where two or more main tracks parallel each other and are less than twenty feet from center to center, whether such tracks are for double or single track operations, employes in every instance when stepping out of the way of approaching trains must move to the right of way and not to another track.

74. In congested yards, at terminals and in obscure places, and particularly where gangs of foreign laborers are employed, or when required by law or regulations, foremen will detail one or more men as watchmen, with suitable appliances to give warning of approaching danger.

75. When the foreman is absent from his gang, or any part of it, he will detail some competent person to keep a lookout for approaching trains.

76. Employes when going upon or across tracks should look in both directions for approaching trains.

77. Employes are warned that trains may run at any time, on any track, in either direction, without notice.

78. In case of danger to the Railroad's property employes must unite to protect it. Any employe observing an obstruc-

tion upon or damage to the road or structures will take the necessary steps to insure the safety of traffic, and immediately thereafter report the circumstances by telegraph, telephone or mail to the proper official.

79. A watchman shall be detailed, when necessary, to watch bridges, patrol endangered or imperfect track, or to perform other duties concerning the safety of track and structures. His work must be frequently inspected by his superiors.

80. Telegraph should be used only when delay would involve loss to the Railroad.

81. Messages or orders relative to the condition of track, roadbed or structures must be in writing.

82. Employes must, at all times, be ready to aid the passage of trains, and in case of accident or delay, will render all assistance possible.

83. The Roadmaster at wrecks, washouts, or other emergencies, must see that the men are properly fed and are worked in relays so that they will have proper rest.

84. Employes of the Maintenance of Way Department shall not open or close switches at the request of Trainmen or for trains. Switches must be left in proper position after having been used. Conductors are responsible for the position of the switches used by them and their trainmen, except where switch tenders are stationed. A switch must not be left open for a following train unless in charge of a trainman of such train.

85. Employes must not unlock or stand within 20 feet of main track switches while a train is approaching or passing. Every main track switch, when in proper position, must be locked.

86. No attempt should be made to close the switch until the last wheels are off the switch rails and clear of the derail.

87. The person who locks the switch must grasp the chain and pull the lock to see that it is securely fastened, and, after having done so, must look at the switchpoints and know that they are in their proper position.

88. Both switches of a main track crossover must be locked for the main track while a train is passing, and must not be unlocked or opened except when the crossover is to be immediately used.

89. If any main track switch is found to be defective, or to have a defective lock, the switch must be secured and the fact reported at once by wire to the Superintendent and Roadmaster by the person who discovered it.

90. Switch keys will be furnished to employes as authorized by the proper official. Employes entrusted with such keys will receipt for them and will be held responsible for their proper use.

91. Foremen in charge of work on track or structures, affecting the maintenance or operation of signals, must secure the co-operation of the authorized signalmen in the work.

92. Maintenance of Way employes who are not authorized to do so, must not touch or handle in any way electric wires, whether insulated or not. If it is necessary, when work is being done on bridges, buildings, etc., to have wires removed or changed, such work must be done by the owner of the wires or the department in charge of them.

93. Employes whose duty requires them to handle wires are cautioned to avoid contact with high voltage wires and other lines which may be crossed with such wires. They must take every precaution possible to avoid being shocked by forming contact with dangerous wires. When working with wires they must be sure that the men assisting them are properly instructed, and must be careful not to subject themselves to injury, through green hands or unauthorized persons.

94. The indication of the switch indicator at switches in Automatic Block Signal territory should be observed before the switch is opened. When indicator indicates red or blade is horizontal, indicates train approaching and switch should not be opened.

95. Employes will observe passing trains for defects in equipment liable to cause a derailment, and make every effort to have the train stopped. Locomotives or cars that have flat wheels shall be reported immediately by wire to the Superintendent.

96. All articles furnished for use of employes must be returned to the proper official when leaving the service. The right is reserved to withhold from wages due the value of such articles lost or not surrendered.

97. No appliance suitable for service intended shall be discarded or disposed of without authority.

98. Special appliances must not be installed without authority. Communications from manufacturers and dealers concerning appliances installed must be handled through the Chief Engineer.

99. The Railroad's business affairs must not be divulged except to the proper officials.

100. Employes must keep themselves informed of proposed public improvements and report same to the proper official.

101. Employes are required to keep the premises in their charge in a neat and orderly condition.

HAND, MOTOR, PUSH AND VELOCIPEDA CARS

102. Only employes of the Railroad, in the discharge of their duties, will be permitted on the tracks of the Railroad on velocipedes, motor cars, hand cars or push cars unless special permits are given in writing by the proper authority.

Under no circumstances shall women or children be allowed on them.

103. Uninsulated cars must not be used on bonded tracks.

104. Cars must be inspected daily by the employe in charge. Defective cars must not be run.

105. Hand, motor and velocipede cars are to be used for transporting men and tools only. Push cars must be used for transporting heavy material.

106. Cars must be accompanied by a foreman or competent employe designated by him. Cars, except velocipede and light motor cars, must not be run with less than two men and, before starting, there must be a thorough understanding as to what part each employe is to take in handling the car should an emergency arise necessitating its prompt removal from the track. If, from any cause, a car cannot be removed from the track to clear an approaching train, such train must at once be signalled to stop.

The employe in charge of a car will designate one or more employes to keep a sharp lookout, in both directions. In places where view may be obscured precaution must be taken for protection. Cars which cannot be quickly removed from track to clear approaching trains must be protected at all times.

Cars must be stopped and employes using car step off tracks when a train is passing on adjacent main track.

107. In stormy weather or during heavy fog, when view is obscured, motor, hand or push cars must not be used except in cases of emergency, and they must be properly protected.

Whenever view of track is obstructed, cars must be run with extreme caution and every effort made to prevent accidents.

108. Cars must not be operated on passenger tracks where there are other tracks available.

109. Employes must not mount a moving car from the front or side.

110. Cars must not be run at night, Sundays or Holidays, except in cases of necessity, and never on any other than Company business. When run at night, the car must carry a white light on the front end and a red light on the rear end so as to be plainly visible. Care must be taken to cover colored lights when cars are removed from track.

111. The speed of cars is restricted as follows:

Hand Cars.....	10 miles per hour
Motor Cars.....	15 miles per hour

All cars 6 miles per hour over switches, railroad crossings, street and farm crossings.

112. Cars must not be run over crossings protected by gates except when the gates are down, and over crossings protected by flagmen only on signal from flagman, and must stop and be flagged over all railroad crossings at grade.

113. All cars must come to a full stop before crossing any highway or street where a full, clear and unobstructed view, of at least (500) feet in either direction from the track is not afforded; further, all such cars must come to a stop before crossing a highway or street in the event of a vehicle approaching the crossing within (500) feet.

114. Cars must not be run less than six hundred feet behind moving trains or attached to an engine or car or between standing passenger train and station.

115. Two or more hand cars may be run not less than three hundred feet apart, and two or more motor cars or a hand car and a motor car not less than six hundred feet. The car in advance must not be stopped until the following car has been signalled.

116. Cars must not be left on tracks unprotected. When not in use they should be set off the track, clear of trains, and locked when unattended. They should never be left on street or highway crossings.

117. Push cars must not be left out overnight within one quarter of a mile of a highway crossing; when left out overnight, they must be placed parallel to the track and securely locked.

118. On each motor, hand, or push car which is being operated on any main track, lanterns, flags, fuses and torpedoes must be carried which are to be used in an emergency.

119. Torpedoes exploded by cars must be replaced.

ROADMASTER

120. The Roadmaster shall report to and receive instructions from the Division Engineer.

121. The Roadmaster shall have charge of and be responsible for the right of way, roadbed, track, tunnels, riprap, slopes, sea-walls and fences.

122. The Roadmaster, immediately he becomes aware of any condition that renders any track unsafe, shall take such means as are possible to protect it and to restore it to normal conditions.

123. The Roadmaster shall employ such assistants, general foremen, section foremen, extra gang foremen, worktrain foremen, laborers, and other forces as are authorized.

124. The Roadmaster shall make frequent examination of all roadway, tunnels, bridges, culverts, trestles, retaining walls, tracks and other structures on his sub-division, and report to the Division Engineer any conditions requiring attention.

125. The Roadmaster shall select as Foremen experienced, sober and trustworthy men. He shall assign the duties to each Foreman, and must see that such duties are promptly and properly performed in accordance with the standard practices and rules.

126. The Roadmaster shall see that each Foreman has a proper supply of tools in good condition.

ASSISTANT ROADMASTERS, GENERAL AND EXTRA FOREMEN

127. Assistant Roadmasters, General and Extra Foremen shall report to and receive instructions from the Roadmaster. They shall perform such duties as are assigned them and comply with rules herein.

SECTION FOREMAN

128. The Section Foreman shall report to and receive instructions from the Roadmaster.

129. The Section Foreman shall have immediate charge of such section of the road as the Roadmaster may direct, and shall be responsible for its safety and for the economical use of labor and material in its maintenance. On bridges and structures he shall be responsible for the proper spiking, jointing, lining, surfacing, elevation and gauge of track.

130. Section Foremen shall inspect their sections daily, unless otherwise ordered, and see that the track, roadbed, fences, culverts, pipes, bridges and all property within the limits of the right of way are in safe condition. This inspection shall be made the first thing in the morning, unless some emergency requires immediate attention. When practicable, it shall be made on the section car, and the ordinary track repair tools, light repair material and danger signals shall be carried on the car. When it is not practicable to run the section cars, Foremen and sufficient men must walk over their sections, taking with them necessary tools, supplies and signals.

131. For the Sunday and Holiday inspection trips, a force not exceeding Foreman and three men shall be used, unless otherwise ordered, and such inspection trip shall be started at the same time as on a working day.

132. The Section Foreman shall know that all watchmen and flagmen understand their duties and are capable of acting quickly in emergency. They should be provided with flags, lamps, torpedoes and fuses, and should be instructed how to use them, as well as to give the hand signals.

133. The Section Foreman shall keep a close lookout at all times for any defects in track, roadbed, bridges or other structures that might endanger the safety of trains, and his first duty shall be to protect trains and notify The Division Engineer, Superintendent and Roadmaster, and take such action as is possible to remedy the defect. He shall see that his section is patrolled in case of severe storms or unusual weather conditions, and shall keep the Roadmaster fully informed by wire as to the conditions on his section in such cases.

134. The Section Foreman shall make frequent inspections of work being done on his section by extra gangs, or by contractors, and in case it is not being done properly, he will report it to the Roadmaster.

135. The Section Foreman shall make an immediate report to the Roadmaster of all wrecks and derailments that occur on his section, stating the facts briefly and giving the amount of damage and material needed.

136. The Section Foreman will respond promptly when called upon by the Superintendent, and without further orders will assist to the best of his ability in protecting trains, clearing wrecks, and in restoring normal conditions, but he will report promptly all such work to the Roadmaster. When off duty or during the night, calls may be made by the Agent, Operator or Signalman, which must be immediately responded to with as many men as he can get quickly.

When in his judgment more men are needed, he may call any available foremen or men without orders from the Roadmaster.

137. The Section Foreman must keep all bridge warnings in the best possible condition. If he is unable to make necessary repairs he must immediately report the matter to the Roadmaster.

138. The Section Foreman shall observe the general condition of the poles and wire lines along and across the right of way, and in case of breaks or interruptions of the service in

Company telegraph or telephone lines, he will make temporary repairs, if possible, advising Superintendent, Division Engineer and Roadmaster.

139. The Section Foreman shall be responsible for the condition of the rails, ties, switches, and frogs, connected to and operated by an interlocking machine. He shall be responsible for the position and proper fastening of all rail braces at switches, except those put in on switch tie plates by the Signal Department. Any defects in Signal Department work must be promptly reported.

140. The Section Foreman must keep all switch points and stock rails in position so switches will operate properly and so the rods and connections will not rub against the ties.

141. The Section Foreman shall, on request of the Signal Maintainer, make such corrections in the track conditions as may be necessary to insure proper working of signals or interlockings.

142. The Section Foreman shall be familiar with the right of way lines and Railroad's outlying property, and must not permit anyone to place wires or guys over the tracks, or make any encroachments without authority. He shall see that no advertising is placed on the Railroad's buildings, structures or lands. He shall see that all structures, materials or wires have the standard overhead and side clearance.

WORK TRAINS

143. The Roadmasters shall have charge of all the work trains in their Department, and must see that all such trains are properly equipped for economical work.

144. Conductors of work trains will obey the directions of the Roadmaster for whom they are working as to the work to be done.

145. Conductors shall make such reports as the Roadmaster may require, upon the prescribed forms.

146. When a work train is delayed the Foreman shall employ the time of the men in ditching, ballasting, cleaning station grounds, etc.

147. The work for the work train shall be arranged in advance, so as to require the least mileage and time.

148. Work trains shall not be used for distributing material that can be handled to advantage by regular or other train service.

149. An accurate account of worktrain service used jointly with other roads must be kept, so that proper charges can be made for the service.

150. When transporting men over the road on work or other trains, they must not ride on work or freight cars, but must ride in cars provided for them.

151. Roadmaster shall make frequent inspection of all equipment in use in his Department. He shall see that all snow equipment, steam shovels, rapid unloaders, roadbed and ballast spreaders, flat, dump and ballast cars, derricks, boarding and sleeping equipment, etc., are properly maintained.

GENERAL METHOD OF WORK. ROADBED

152. During early spring the roadbed, sides of cuts and fills, station grounds and yards shall be thoroughly cleaned of all rubbish.

153. Trees, rocks, etc., obstructing the view or in danger of falling on the track must be removed. It not on the Railroad's property, the adjoining owner shall be consulted. If he objects to the removal, the facts must be immediately reported. Frequent examinations must be made of the sides of rock cuts and neighboring lands to discover any loose rock, dams or other conditions threatening the safety of the track.

154. Roadbed shall comply with standard plans, unless modified by special instructions.

155. To insure uniformity, standard templates should be used in grading and ballasting.

156. Vegetation should be cultivated on embankments and cuts to insure permanency of slopes.

DRAINAGE

157. Good drainage is most essential, and the farther water is removed from the track and the sooner it can be diverted from the roadbed the more stable the track will become.

During the fall, especial attention shall be given to ditching. New ditches should be dug and all old ditches cleaned before the winter sets in.

158. Ditches shall be in good condition at all times, and they must be in accordance with standard plans. They shall be parallel with the track, except at inlets and outlets, where they should divert from the roadbed so as not to injure the embankments. They must be of the necessary size to pass all water freely during the heaviest freshets.

159. Where necessary, surface ditches shall be made on the tops of cuts, to prevent surface water from washing the sides. These ditches shall be a sufficient distance from the edge of the cut to insure permanency. Care should be taken to prevent material from washing down on the track.

160. Earth from ditches or elsewhere should be used for strengthening adjacent embankments, properly leveled off, and should not be thrown on slopes of cuts where it is possible to avoid it.

161. Standard cross drains must be used where necessary to obtain proper drainage.

162. Ditches, drain boxes, culverts and streams must be kept free from brush and other obstructions, and free of snow and ice, providing a free waterway, so as not to endanger the roadbed.

163. Where efficient open ditches cannot be economically maintained, underdrainage should be provided by means of tile or other approved methods as may be directed by the proper official.

BALLAST

164. Ballast shall be either stone, gravel, slag or cinders, and shall be placed as shown on standard plans.

165. Clean stone ballast is essential to proper maintenance, and every opportunity should be taken when handling stone in track to work with this in view. Forks should be used for cleaning it and filling track.

166. Gravel ballast should be free from loam and stone which will disintegrate. Ballast pits should be carefully stripped so as to secure clean ballast.

167. Before ballasting tracks, line and grade stakes shall be set by an Engineer. All unsuitable material shall be removed to the bottom of the ties and used to widen narrow embankments or otherwise. Before distributing ballast the sub-grade must be properly prepared and the banks widened so that the ballast will not be wasted or washed away. Cuts will also have the edges carefully shaped to the proper section, and always below the bottom of the old ballast so as to give proper drainage.

168. Where heaving or wet spots develop, the bad material must be removed to such depth and in such a manner as to insure drainage and the space filled with good porous material.

169. When ballasting, open track shall be reduced to a minimum, and such track carefully watched, loosening bolts temporarily, if necessary, to avoid rail buckling and throwing track out of line.

170. When resurfacing or ballasting track through tunnels, under or along structures which require certain clearances, the general surface of the track must not be raised without instructions from the proper official.

171. When ballasting is completed, track must be put to gauge, surface and line, and to the stakes furnished by the Engineer, and ballast must be neatly trimmed to standard section.

172. Where rails are bonded, any ballast, mud or dirt that may touch the rails should be removed to allow a clear space of at least one inch below the base of rail. At road crossings, platforms, etc., where it is not possible to keep the rails clear, the mud or dirt shall be removed and clean ballast substituted.

CROSS AND SWITCH TIES

173. Ties shall be laid heart side down and at right angles to the rail. On single main tracks ties shall be lined preferably on the south or west side; for multiple main tracks they shall be lined on the outside. The line for 8'-0" ties shall be 4'-0" and for 8'-6" ties 4'-3" from center line of track.

174. Outside spikes shall be on the same side of the center line of the tie and inside spikes on the side opposite to the outside spikes. At joints, the spikes shall be driven in the

splice bar slots, except on open floor bridges. Where location of spikes is not fixed by the tie plate punching or splice bar slots, the spikes shall be staggered as much as possible but driven not closer than two inches from edge of tie.

175. Each tie shall be marked with a dating nail, indicating year placed. Dating nails shall be driven between rails, fourteen inches from the base of south or west rail.

176. Ties in the track shall be inspected by the Roadmaster or his inspector prior to October 1st, each year, and the annual statement of quantities required for the ensuing season prepared. Care shall be taken not to injure ties when testing for renewal.

177. Care shall be taken to avoid renewing ties out of face, and ordinarily ties that will last one year shall not be renewed. The maximum should be about three ties per 33-foot rail, and the average number of ties renewed each year should not exceed two per rail length, but this limit shall not prevent the renewal of such ties as are necessary for proper maintenance.

178. When renewing ties, two methods may be followed: By raising the track, or by spotting them in without raising. They should be handled with tie tongs. Picks, shovels or any other tools that injure the tie must not be used.

179. When renewing ties by raising the track, new ties shall be distributed, the ballast removed to half the depth of the tie to be taken out. When track is raised, all good ties should be tamped first, the old ties pulled out and the new ones put in without disturbing the bed. New ties should be tamped as solid as the ties left in track.

180. When renewing ties by spotting them in, the bed should not be disturbed if it can be avoided. The ballast should be removed from around the old ties, and when conditions permit, the rail raised sufficiently to remove it; when conditions do not permit, the ballast may be removed from one side of the tie, but only to a sufficient depth to allow the tie to be pulled out and the bed of the old tie levelled to suit the new one. When the new ties are in, they should be tamped as solid as the ties immediately adjoining.

181. The tie must provide a true and uniform bearing for the base of the rail, and when necessary, must be adzed to obtain it.

182. Tie plugs must be kept on hand, and whenever a spike is drawn the hole must be plugged. Wherever possible, the spike should be redriven in the plugged hole.

183. New ties must not be left scattered along the road, and if not needed for immediate use shall be piled according to standard plan.

184. All ties removed from the track must be gathered up at the close of each day and placed in a safe place for burning or loading on cars. Old ties will be separated into two classes: Those fit for use in sidings, and those unfit for one year's additional service. The latter to be sold by the Railroad or burned. No ties shall be condemned as unfit for use until they have been examined by the Roadmaster or his Assistant.

185. In burning old ties care must be used to avoid damage to adjacent property, trains and wire lines; also avoid burning at night or where smoke will obscure signals.

TIE PLATES

186. Tie plates shall be used as shown on standard plans and where directed by the Division Engineer.

187. In applying tie plates to ties in track all spike holes must be plugged and the tie adzed so the plate will have a full bearing on the tie and the base of rail a full and uniform bearing on the plate. The rail should be raised and the plate placed under the rail, so that the flange of the rail will have a full bearing against the shoulder of the plate. As tie plates are seated, spikes must be kept driven down.

188. When rail is replaced by rail of different width of base, tie plates with the proper punching must be used.

RAIL

189. Rails and fastenings shall be so unloaded and distributed as to prevent their injury. Rail must be distributed uniformly but must not be placed on station platforms nor on crossings. When rails are distributed through yards or crossing grounds, the Superintendent must be notified.

190. All joints shall be full bolted, the bolts made tight and the rail full spiked. Before allowing trains to pass over track on tangents, every other tie, and on curves every tie, must be full spiked.

191. Rails adjoining others of a different section must be connected with compromise splices or step joints to bring the heads of the rails to the same level and gauge line.

192. Rail must be laid in accordance with the standard plan; the joints must be "alternate," care being taken to have them not more than six inches from the center of the opposite rail. Second quality rail to be laid where directed.

193. Special length rails will be furnished for curves so as to bring the joints in their proper position. Short lengths of rails, twenty-four feet to thirty feet inclusive, should be laid in main tracks through station layout, and in slow-speed tracks and switch leads, laying the various lengths together.

Rails under twenty feet in length will not be used in any track except for making closures at street crossings, turnouts, etc.

194. Tie renewals, spacing, surfacing, gauging and lining must follow rail-laying closely, and care must be used to take out all kinks. Ties shall be adzed to give a full and uniform bearing for the rail on the tie and the wheels on the rail.

195. Metal expansion shims must be used to provide for the proper openings between the rails.

A thermometer shall be placed against the rail for sufficient time to determine temperature.

The proper opening for different temperatures is given in the following table:

TEMPERATURE (Fahrenheit)	AMOUNT OF OPENING (Rails 33 feet long)
-20 degrees to 0	$\frac{5}{16}$ inch
0 degrees to 25	$\frac{1}{4}$ inch
25 degrees to 50	$\frac{3}{16}$ inch
50 degrees to 75	$\frac{1}{8}$ inch
75 degrees to 100	$\frac{1}{16}$ inch

Over 100 degrees, to be laid close without bumping.

196. A split switch point with clamps may be used for a temporary connection; such connection, however, must never be left over night, but an old rail shall be cut and fastened to the new rail with compromise splice, full bolted.

197. Where rails are bonded and used for a track circuit, no bond wires are to be broken or rails removed from track unless a Signal Maintainer is present to re-bond the rails. In case of emergency, any rail or frog may be renewed without waiting for the Signal Maintainer, but in these cases the joints should be well tightened to make a good contact, and the Signal Maintainer notified.

198. When relayer rail for main track use is loaded, the rail for each side shall be loaded separately. Curve-worn rail must be loaded separately from tangent rail, and cars and invoice marked "Curve" or "Tangent."

199. All rails in main tracks must be closely inspected frequently. Rails damaged by engines slipping, having battered spots, black streaks, pipes or split heads, half-moon breaks in the flange, or any other defects, should be promptly replaced. Broken rails should be replaced as soon as found, but may be spliced to make track safe until rail is available.

BOLTS AND JOINTS

200. All joints in main track must be full-bolted, and joints in other tracks must have at least four bolts.

201. To prevent undue stresses in rails due to contraction and expansion during sudden and wide changes of temperature, sufficient bolts and splices shall be loosened to permit the rail to adjust itself and then the bolts retightened. At all other times the bolts must be kept tight.

RAIL ANCHORS

202. Rail anchors in sufficient numbers shall be used wherever necessary to prevent rail-creeping.

203. Rail anchors shall be applied immediately after the rail is laid or ties have been spaced.

204. Rail anchors should be applied against solid ties, and should not be applied when there is ice on the rail base.

205. Rail anchors are made for special rail sections, and care must be taken that anchors are applied to the rail section for which they are made, and they should be applied according to directions.

206. When rail anchors are drawn away from the tie, by expansion and contraction of the rail, they should not be adjusted, as a change of temperature will bring the anchors against the ties.

207. Rail anchors must be clear of the ballast when applied, and must be kept clear. To insure this, they should be gone over in the fall before freezing, and in the spring after the frost is out, and cleared of ballast and all loose anchors tightened.

208. Rail anchors shall be removed with the same care as when they are applied.

FROGS, SWITCHES AND DERAILS

209. Frogs, switches and derails must be placed in accordance with standard plans. They must be kept in proper gauge, line, surface and adjustment.

210. When necessary, lead rails in turnouts must be curved before laid. The spaces between the rails at frogs, guard rails and switches in which the foot of any person is liable to be caught must be filled with standard blocks. Section Foremen must see that these blocks are kept in good order.

211. Careful daily attention must be given to switches to see that they work properly and with no lost motion; that all bolts and nuts are tight with cotters, and that they are otherwise in safe condition. In emergencies, where cotters are not used, bolts must be nicked with a chisel to prevent nuts turning off. Targets must be properly adjusted and painted.

212. Derails on side tracks should be located so that a car will not foul the main track when derailed. Their normal position shall be to derail.

GUARD RAILS

213. Guard rails must be placed at all frogs and at other locations as directed. They must be placed in accordance with standard plans.

214. Guard rails at frogs should be frequently inspected by Roadmaster and Section Foreman. The distance from the

gauge line of the frog to the wearing side of the guard rail must always be 4 feet $6\frac{3}{4}$ inches, regardless of the gauge of the track.

215. Guard rails on bridges must be placed as shown in standard plans. They should be full-bolted and spiked. At curves in tunnels and elsewhere they will be placed as directed.

SPIKING

216. All tracks must be full-spiked, including tracks on bridges.

217. Spikes shall be driven on the inside and outside of the rail on each tie, care being taken to drive the spikes perpendicular. Spikes must be set one-half of their width from the edge of rail and driven to a full bearing against the base of the rail, and must be kept in this position. Spikes must not be driven sloping or bent against the rail, or over-driven. When re-tightening spikes, avoid over-driving. All spike holes must be plugged, and wherever possible the spikes should be re-driven in the plugged hole.

218. Spikes must be driven not less than two inches from the edge of the tie, and staggered as much as possible. The inside spikes shall be on the same side of the tie and lead in the direction of the traffic, and the outside spike shall be on the opposite side of the tie, except at joints, where the spikes shall be driven according to the slots. On single track, the outside spikes shall be driven on the south or west side of the tie.

219. Spikes should be driven in angle bar slots, except in open floor bridges. Where tie plates are used, spikes must be driven in the holes in the tie plates.

220. When spiking, the track gauge must always be used.

221. Spikes in passenger or high speed tracks rail-cut $\frac{1}{8}$ inch, and spikes which have rusted or corroded to such an extent as to weaken them, shall be promptly replaced by new ones. Serviceable spikes must be pulled carefully so they can be used again.

222. All curves in main tracks, not tie plated, shall be double spiked on the outside of both rails.

GAUGING

223. Standard gauge is 4 feet $8\frac{1}{2}$ inches. Uniform gauge is one of the principal features of good track and must be maintained. Gauge kinks are detrimental and must be corrected.

224. Wide gauge on account of curvature should be given as follows:

On curves of 8 to 12 degrees.....	$\frac{1}{4}$ inch
On curves of 12 to 16 degrees.....	$\frac{1}{2}$ inch
On curves of 16 to 20 degrees.....	$\frac{3}{4}$ inch

No other deviation from standard gauge will be permitted, except by permission of the proper official.

225. The extra width of gauge shall be given in placing the inside rail. Where a third rail is used, the rail adjacent to it shall be used as the line rail.

226. Use care to gauge correctly at joints, especially where the angle bar projection is liable to catch the lug of the gauge.

227. During the winter months special attention should be given to the gauge of all tracks and corrections made where necessary.

228. Track gauges must be compared with the Division Standard at least once a year. All which have been compared with the standard and adjusted will be painted a new color each year to indicate that they have been inspected and tested.

TAMPING

229. Ties must be thoroughly tamped under the rail and to the outer end of the tie, and inside the rail as directed. The tamping outside of the rail should be done first, and inside of the rail last, and, where possible, after the passage of a train. Joint ties shall be well and uniformly tamped.

230. Where track is being rebalasted, the new ballast must be put under the ties uniformly. In resurfacing use the tamping bar or pick. Tamping machines may be used by special authority.

TRACK

231. Track changes affecting the movement or safety of trains must be made under the supervision of the Roadmaster.

232. During winter and spring, points where there is excessive heaving should be located and improved. The necessity of shimming is an indication of poor drainage or ballast.

233. As the frost comes out, thicker shims should be replaced by thinner ones to maintain the surface, and as soon as the ground becomes sufficiently dry, shims should be removed and the ties tamped to solid bearing. All rough places due to poor ties, poor surface, or poor line, shall receive prompt attention in order to put the track in proper condition before commencing the work of regular track repairs.

234. As soon as the season will permit, the work of renewing ties, surfacing and removing any remaining shims shall commence. Foremen on adjacent sections shall begin at the designated end of their respective territory, working in opposite directions, and continuously, until renewals and surfacing are completed. Work shall progress on each track separately, except in special locations. The renewing of ties, surfacing, gauging and lining shall all proceed in a complete manner, and at the end of the week all minor details of gauge, surface and line, in the work gone over, shall be corrected before proceeding. The forces should then devote their time until the end of the season to the improvement of line, surface, neatness and drainage.

235. During the spring and fall, attention shall be given to the freight and side tracks.

236. Private Side Tracks should not be constructed until necessary agreement has been executed, unless the work is specifically authorized. Repairs to private side tracks shall not be made until authorized.

237. Repairs to tracks which affect the safe passage of trains may be made until within ten minutes of the time of scheduled trains, but always under the proper flag protection.

238. The line or surface of track on bridges or approaches must not be changed, except under the direction of the track forces. During the erection of bridges, if the track cannot be maintained for usual speed, the speed of trains must be restricted by slow orders and signs. Track on bridges and approaches must always be kept in good line and surface.

239. Tracks through tunnels and under or along structures which require certain clearances must not be changed, nor shall bridges be raised by blocking up under them without instructions from the proper authority.

240. Jacks must not be placed on the inside of the rail, except under the protection of stop signals. When raised, they should immediately be placed in tripping position. They must always be in charge of experienced men.

241. During hot weather, tracks shall be carefully watched to detect any tendency of the rails to expand enough to throw the track out of line. During cold weather, tracks shall be carefully watched and necessary precautions taken to prevent the contraction being great enough to break the rail and joints.

242. Straight track must be level transversely except on the approaches of curves. On curves special care must be taken to maintain the prescribed elevation uniformly.

243. Track levels must always be used in surfacing track. They shall be tested frequently by Foremen before using.

244. Care must be taken to avoid breaking bond wires or injuring the trunking protecting wires. Care must be used not to break the wires in concealed locations.

245. Insulated joints shall be installed and maintained by the track forces. The installation and repairs shall be made under the inspection of the Signal Maintainer. When the Signal Maintainer calls attention to any defective part of the insulation, repairs shall be made as soon as practicable. Not more than two standard end posts must be placed in any joint.

CURVES

246. The grade line on curves must be maintained along the inner rail and the elevation obtained by raising the outer rail.

247. The track level shall always be used in surfacing curves. Uniformity of elevation is far more important than the exact amount of elevation.

248. The amount of elevation on each main track curve shall be established by the proper official.

SHIMMING

249. Wooden shims placed under the rails shall be used to maintain the proper surface of the track when the surface is disturbed by the action of frost or when other conditions make tamping impracticable.

250. When shimming, the track level and track gauge must always be used.

251. Shimming should be done on the top of the tie. No shimming shall be done under the tie, except in emergency, and shims so placed should be removed as soon as possible.

252. Shims of a thickness of less than one inch should be one piece, at least as wide as the base of rail and as long as the width of the tie. They may be used on top of the tie plate and the rail properly braced. Shims of over one inch in thickness shall not be less than six inches wide and not less than fifteen inches long, and placed lengthwise of the tie, and the tie plate must be put on top of the shim or the rail braced. Shims fifteen inches or longer shall be securely fastened to the tie, independent of spikes holding the rail.

253. Standard track spike may be used with shims less than one inch thick. Spikes eight inches long shall be used with shims one inch thick or more. Where necessary to spike through a shim, three-quarter-inch holes shall be bored in the shim in the proper location.

254. Where shims are used, care must be taken to have a full, even bearing on the tie, adzing where necessary. Where shimming is not advisable, because of clearance, or where the irregularity in surface is short, the ties may be adzed.

255. Shimmed track must be watched carefully to see that the shims are in place and tight, frequently testing with track gauge and level. Extra spikes or nails may be used if necessary to hold the shims in place.

TRACK INSPECTION

256. Division Engineers must inspect all track on their divisions as frequently as possible.

257. Roadmasters must be continually vigilant in the inspection of their sub-division, going over it either by walking, hand car, velocipede, or motor car at short intervals. They must pay frequent visits to all points where new or important work or repairs are in progress.

258. Section Foremen must make a careful examination of their sections at least twice a week, and as much oftener as necessary, and shall see that a thorough daily inspection is made.

259. During heavy wind and rain storms, abrupt changes in temperature, or when some unusual operating service is to be performed, great precaution must be taken day and night to prevent accidents and Section Foremen must be out with a sufficient force of men, supplied with the proper signals, tools and instructions, to insure the safety of trains.

260. All employees, whether on ordinary or special inspection, patrolling or watching, must carry the necessary signals for flagging trains.

261. During heavy rain storms, all waterways must be watched and all obstructions must be removed. Record must be made of high water, the direction of heavy currents, tendencies to scour or deposit, and all information affecting structures.

262. Work done by contractors or others must be watched closely to see that their operations do not endanger track, bridges, structures, or trains, and if necessary, immediate precaution for safety taken.

POLICING (Care of Right of Way)

263. Foremen shall make themselves familiar with the lines of the right of way, and any outlying property on their section.

264. New fences should be built according to stakes. Authority must be obtained for setting line fences elsewhere than on the correct line.

265. Foremen must not allow any person to erect telegraph or telephone poles, place signs or advertisements on fences, buildings or land, string wires or ropes or anything else over or across the tracks or buildings, or otherwise occupy the Railroad's property without proper authority. Any encroachment must be reported at once to the Roadmaster, giving the name and address of the party, with full particulars as to the locality and nature of the encroachment.

266. Station platforms, fences, tool houses, overhead foot bridges, subways and grounds at stations and yards, and stock yards, must be kept clean and in good order. Defective platforms which might cause injury to persons must be repaired or reported to the Roadmaster. Open culverts, ditches or drains near stations or where switching is done must be protected to prevent patrons or others from falling into them. Trench openings or piles of material for construction work, in the vicinity of station platforms or points where patrons or employes pass, must not be left overnight by the Foreman in charge until they have been properly guarded so that injury to persons may be avoided.

267. All noxious weeds, etc., must be cut before they grow to seed.

268. In June, the weeds on the right of way must be mowed, also a single swath of grass just outside each sod line, and as fast as any portion of the right of way becomes sufficiently dry it must be burned. Especial care must be taken in the vicinity of buildings, muck land and where adjoining land is in grass or grain.

269. In August or September all weeds must be cut and the single swath along the sod line mowed again so that the right of way will present a uniform appearance. Briars and undergrowth on the right of way must be kept cut close to the ground.

270. An effort should be made to destroy all weeds and to get a good stand of grass everywhere on the right of way.

271. During the winter months an effort must be made to smooth off rough places; brush should be grubbed, logs, pieces of ties, etc., burned; stones removed and the right of way thoroughly cleaned and cleared.

272. All material, such as old ties, old rails, splices, car material, etc., must be gathered up at least once a week and neatly piled at proper points, to be disposed of as ordered by the Roadmaster. New material stored on the right of way or station grounds must be neatly piled.

273. Bond wires that are released from track must be picked up at once and disposed of as directed by the Roadmaster.

274. All grass and weeds, whether dry or not, and all brush, wood and other inflammable material must be kept cleared away from all wooden bridges and trestles, culverts and buildings, and from all piles of cross ties, around telegraph poles and other material liable to burn, and from stock pens. No material must be piled near a road crossing in such a way as to obstruct the view of approaching trains by parties using the road.

275. Loose stones on the right of way and boulders rejected from ballast must be gathered up and disposed of where they will not be unsightly.

276. Trespass by live stock, teams or persons must be prevented by employes. Trespass notices shall be erected by the Roadmaster where necessary.

HIGHWAY, PRIVATE ROAD AND FARM CROSSINGS

277. Crossings must be constructed according to standard plans.

278. Crossings must be kept in the best possible repair, free from all obstructions to vision or travel. Defective or loose plank must be renewed or fastened. Care must be taken that crossing planks do not project above the top of rails.

279. Gates at farm or private crossings should be in good condition and closed when not in use. Where gates are habitually left open by parties using them it should be reported to the proper official, who must take action.

INTERLOCKING AND SIGNAL APPARATUS

280. Trackmen shall avoid disturbing any of the apparatus connected with automatic signals. But if, for any reason, any part is disarranged, they shall report the fact at once, by telegraph, to the Roadmaster, Division Engineer, Signal Maintainer, Signal Supervisor and Superintendent, giving full particulars of damage.

281. If a Foreman sees an automatic signal giving a false indication, he shall immediately make inspection to see if such indication is due to defects in the track.

282. If a rail must be changed out, a switch adjusted or any work done which would interfere with the proper working of the signals or crossing bells, the Signal Maintainer shall first be notified, when possible, to care for track connections. In emergency cases, when a rail must be changed out, or other work done which will disturb the track circuit, and the Signal Maintainer is not present, Section Foreman shall wire around the affected portion of the track and notify the Maintainer as soon as possible.

283. Section Foreman shall see that all insulated joints are kept in good condition. When a joint is reported to him by the Signal Maintainer as in need of attention, he shall examine such joint at once and make the necessary repairs, conferring with the Roadmaster in case of doubt.

284. Tie plates must not be used under insulated joints.

Two one-eighth inch fibre end posts must always be used between rails. The lower part of end posts must not be cut off, and end posts must not be driven into position. Spikes must not be driven so they can come in contact with the end of an insulated joint and the base of the rail at the same time.

285. The Section Foreman shall keep the rail flow chipped off from over detector bars and from the ends of rails at insulated joints.

286. Metal parts of cattle guards or bridges must not touch rails or fastenings on bonded track.

287. When it is necessary to lift track or change its alignment within the limits of an interlocking plant, or track circuit,

or to do any work which would interfere with the perfect working of the plant or circuit, the Signal Department is to be notified and work must not be started before signalmen are on hand to look after any adjustment or changes which may be necessary. In no case shall a Section Foreman make any extensive or general changes to surface or alignment through and around any interlocking plant or track circuit without first getting instructions from the Roadmaster.

288. Salt should not be used on any part of an interlocking plant nor on derails or their connections, except in case of emergency.

289. Section Foremen shall see that the working parts of interlocking plants are kept free of snow, ice and weeds.

290. Section Foremen shall see that snow and ice are removed and kept clear from the connections of train order signals and isolated signals, and that the necessary drainage is provided to prevent these connections from freezing.

291. Section Foremen shall frequently examine interlocked switches and derails, to see whether expansion or contraction of rails has caused the switch points or derails to shift from standard locations. If they have shifted they should immediately be restored to proper position.

RULES GOVERNING SIGNAL FOREMEN

292. Signal foremen shall report to and receive instructions from the Signal Supervisor.

293. They shall be responsible for the safe condition of signals and interlocking plants under their charge, and shall do no work thereon that will interfere with the safe passage of trains, except under proper protection.

294. They must make such inspections of the signals and interlocking plants in their districts as the Signal Supervisor may direct, and report all defects found on prescribed form.

295. They must know that the men under their charge are competent, obedient to the rules and see that they properly perform their duty. They must treat their men with consideration and see that they are supplied with the required copies of the rules, current time tables and special instructions and that they are familiar with the regulations therein.

296. They must each have a copy of the current time table, and be thoroughly familiar with the rules and regulations therein, and with the time of trains over their districts. They must carefully observe signals displayed by all trains, and assure themselves, before obstructing track, that all trains and sections due have passed. No notice will be given of extra trains, and employees must protect themselves as prescribed by the rules. Foremen must provide themselves with standard watches, and, when possible, verify time daily with a standard clock or with the watches of other employees who are required to have the standard time.

297. They must, in case of damage to signals or interlocking apparatus in their district, promptly proceed to the place with the men, tools and material at their command, and do all in their power to make necessary repairs.

298. They shall investigate and report on accidents which may be attributable to defects in, or resulting in damage to, the signal apparatus.

299. They shall conform to the prescribed standards and plans in the execution of work under their charge.

300. They shall be responsible for the proper care and use of tools and materials necessary for the efficient performance of their duties, and shall make requisition to the Signal Supervisor from time to time as additional supply becomes necessary.

301. They must not, except by proper authority, permit experimental trials of appliances or devices nor give out information of the results of any trial.

302. They must not make nor permit any permanent re-arrangement or change in the signals or inter-locking plants without proper authority.

FOREMEN OF BRIDGES

303. They shall report to and receive instructions from the Bridge Engineer.

304. They shall be responsible for the safe condition of bridges, trestles and culverts in their districts.

305. When notified of damage to any structure under their supervision, they shall use all possible efforts to get to the structure with necessary force and equipment for making re-

pairs: Whenever traffic is obstructed on any structure, their first effort must be to restore traffic as quickly as possible, making temporary repairs, and report condition of such structure to the Chief Engineer and Bridge Engineer by telegraph, specifying at what speed trains can be operated over damaged structure.

A written report of the condition and material needed for permanent repairs to the damaged structure must be sent in the first mail.

Permanent repairs to a damaged structure should be made as soon as material can be obtained.

306. In case of wrecks, obstructions or damage to track and roadbed, they shall assist in restoring traffic, when requested to do so by the Division Engineer.

307. The Bridge Engineer must be advised as to the location of all bridge gangs. The Division Engineer, and Superintendent must be kept advised regarding the location of all gangs in their district.

When changing from one location to another, the Foreman must make arrangements for the prompt forwarding of mail and messages to his new location.

308. Foremen must see that all the men in their gangs are familiar with the rules in regard to train signals and flagging, and they fully understand and comply with same.

309. Their work shall in all cases conform to the prescribed standards and plans, except where special instructions have been issued. Foremen must obtain written permission from the Bridge Engineer before any deviation is made from prescribed standards and plans.

Structures must be built according to lines and stakes which will be furnished when necessary.

310. No alterations shall be made in structures which will affect existing track levels, waterway or bridge clearance until same has been referred to the Bridge Engineer.

311. Bridgemen must not change the surface or line of the track on bridge approaches, except under the supervision of the track forces. While erecting or repairing bridges, if the track cannot be kept in condition for full speed, slow orders must be provided for according to rules.

312. Ties and guard timbers on all bridges shall be maintained in safe condition, and any missing bolts shall be replaced.

313. The Division Engineer will provide necessary barrels, with floating lids and buckets, for each end of all short wooden bridges, and trestles, and at suitable intervals on long ones. The bridge foreman will call attention to a failure of the track forces to keep these barrels filled.

314. The Foreman of Bridges will call attention to any neglect of Section Foremen to keep bridge warnings in proper repair.

315. They shall have immediate supervision of all work train service for maintenance of bridges, trestles and culverts, and employ such service only when authorized by the Bridge Engineer.

316. They shall see that the Assistant Foremen and men are supplied with tools and material necessary for the efficient performance of their duties. All M. C. R. R. tools must be kept in serviceable condition and plainly marked "M. C. R. R." All unserviceable tools and equipment must be returned to the Storekeeper and not be allowed to accumulate around camp cars.

317. Foremen must not leave their work without giving due notice to the Bridge Engineer, and before leaving must place the work in charge of a competent assistant. The Notice shall give the name of the Assistant in charge of the gang,

318. Foremen must see that the necessary current timetables, rules, circulars and special instructions are provided for the Assistant Foreman and men whose duties require them.

319. They shall employ competent men to do the work. The number of such men employed shall be regulated by the Bridge Engineer.

320. In dismantling old superstructures to be used at another location, care must be exercised to avoid injury to the parts, particular attention being given to avoid bending eye-bars, rods, connection plates and the flange angles of girders. Old bridges will be marked for re-erection, before dismantling,

unless otherwise ordered. Pilot and driving nuts will be used in erection and dismantling of pin-connected bridges. Unpainted surfaces of old bridge material, which is not to be immediately scrapped, shall be painted.

321. Bridge material, both wood and steel, will be handled so as to avoid injury, and will be placed on skids above the ground to keep it clean; girders and floor members placed upright to prevent the collection of water; heavier members placed below and the material arranged so it can be readily inspected and loaded.

322. No falsework shall be constructed except on approved plans, and no structure shall be supported on the completed falsework until same is approved by the Engineer in charge of the work.

INSPECTION OF BRIDGES

323. District Bridge Foremen or a competent Inspector must make a regular inspection of all structures under their supervision about May 1st and such other inspection as may be found necessary. A report of the regular inspection shall be sent to the Bridge Engineer not later than May 20th.

A General inspection will be made about Sept. 1st by the Bridge Engineer and Bridge Foremen.

324. Private structures over which the rolling stock of the Railroad is operated shall be constructed in accordance with standard or approved plans, maintained in safe condition, and shall be inspected in the same manner as Railroad structures.

325. Spans of a bridge shall be designated by numbering them in the direction of the bridge numbers, and the bents or piers in the same manner, commencing with abutment, bank bent, or sill as number one. The bents and spans of overhead bridges shall be numbered from left to right, facing in direction of bridge numbers commencing with bank bent as number 1.

Trusses shall be designated as right or left, locating points on it by numbering the panels in the direction of bridge numbers.

326. Particular attention shall be given to the action of the structure, or parts thereof, under passing trains. Excessive deflection, swaying, twisting or rattling of parts is evidence that attention is needed. Unusual deflections shall be accurately measured.

327. Examination shall be made of each retaining wall, culvert, pier and abutment or other masonry structure to discover undermining, scouring, bulging, cracking, settlement or other indications of failure.

328. Wooden members in bridges will be inspected by sounding, and if necessary by boring, especially at points where they bear against each other; all such holes should be not larger than $\frac{1}{8}$ of an inch in diameter, to be bored in such places that the members will not be weakened.

Bents of trestles should be plumb and be free from settlement or lateral motion under traffic. Sills should be free from dirt.

329. Overhead structures exposed to locomotive gases shall be frequently examined. Planking must be removed or other means taken to determine the condition at inaccessible places. All parts deteriorated shall be immediately reported.

330. Waterways that require straightening, cleaning out or enlarging above or below structures, shall be reported.

Insufficiency of waterway or need of rip-rap to maintain channel or protect roadway shall be reported.

331. Examination shall be made of line and surface, condition of rail, joints and fastenings on bridges and approaches, and any defects reported.

Bridge decks shall be examined for loose or missing bolts, decayed or misplaced timber.

Piles must be examined for displacement, decay or crushing, especially at the ground or water line.

332. The Foremen of Bridges or Inspector should make a record of high-water marks at the time of floods or extraordinary freshets at all bridges, culverts and openings, and report it to the Bridge Engineer.

333. When the Bridge Foreman or Inspector finds conditions which he considers dangerous or demanding immediate attention, he shall immediately report it to the Bridge Engineer by letter, telephone or telegraph, as he may deem advisable, and he may call on any employe of the Maintenance of Way Department who may be on hand for assistance.

334. Examination shall be made to see that bridge seats are level, well-bedded and free from cracks or evidence of crushing, also that bridge-seats and roller nests are clean and free from rubbish and cinders.

Bed plates and rollers should be level and in proper position, and have uniform bearing.

Rollers should move freely and with the axis at right angles to the line of the bridge.

Sole plates and pedestals should be free from flaws and cracks and shall be firmly attached. Pedestals must be anchored. The fit of end stiffener angles shall be examined and reported.

Condition of drain pipes and gutters shall be noted.

335. Attachments to bridges, such as telegraph poles or brackets and other structures shall be properly secured and afford proper clearance. Electrical attachments shall be properly insulated.

Condition of paint on all structures shall be noted.

336. Posts of viaducts and those supporting girders or trusses should be free from bends or bulges, and all points should bear firmly and closely against each other. The cap plates on top of columns shall be examined for bends or cracks and reported.

337. Examination and report shall be made of the condition of adjustable members.

338. Shelf angles supporting ties shall be closely examined for loose, missing or defective rivets, and special examination should be made for cracks in the root of the shelf angles and in the web along the line of rivets.

339. Floor beams and stringers shall be closely examined for any cracking of connection and flange angles and for loose, defective or missing rivets, shearing and crushing of webs and flanges at their connection.

Pins shall be inspected for evidence of loose nuts, bending or wear.

340. Rivets in floor beams and stringer connections and in splices shall be examined at least once a year. Other riveted connections shall be examined for loose or missing rivets and shall be marked with paint for replacement.

341. Hangers supporting floor-beams require careful inspection. Where they consist of round or square sections their bearing around the pins should always be equal and uniform over half the circumference and they shall be inspected at the semi-circle for flaws or cracks. The nuts on the ends of hangers should be tight and should have jamb-nuts to prevent their movement. Plate hangers shall be examined for loose rivets and for any indication of cracking or shearing.

342. Castings on bridges shall be examined for cracks, breaks or flaws.

FOREMEN OF BUILDINGS

343. Division Foremen of Buildings report to and receive their instructions from the Superintendent of Buildings.

344. They shall be responsible for the safe condition and proper maintenance of the buildings, water supply stations and such other structures as are in their charge on their districts. They must inform themselves of the condition of such structures, make temporary repairs of such defects as may endanger or delay the movement of trains, and promptly report defective condition to the Chief Engineer and Superintendent of Buildings.

345. They shall employ, in the discharge of their work, such men as are necessary, by authority, for carrying out the duties for which they are responsible.

346. They must know that all Foremen are provided with all rules, circulars, forms and special instructions pertaining to their duties and that they fully understand and comply with same.

347. They must see that all Foremen are familiar with the rules in regard to train signals and flagging, and that they fully understand and comply with the same.

348. They must know that all Foremen are supplied with tools and material necessary for the efficient performance of their duties, and must see that those belonging to the Railroad Company are properly cared for and used.

349. They shall conform to the prescribed standards and plans in the execution of the work under their charge.

350. They shall go promptly to the spot with the force, tools and materials necessary to effect clearance and repairs in cases of obstructions or damage to buildings and water supply stations.

351. They must make frequent inspections of all buildings and water supply stations on their districts and have necessary repairs made as promptly as conditions will permit.

352. They shall not attempt any repairs, changes or alterations of electrical apparatus used for lighting or power, but shall make reports of any apparent defects or repairs needed.

353. They shall not permit Electric Light Companies, outside electricians or any unauthorized persons to make repairs, changes or alterations in the electrical apparatus used for lighting or power, and should any such unauthorized work come to their knowledge, the facts must be reported at once.

354. They shall see that each interlocking tower is provided with a ladder permanently attached to the building, reaching from the ground to the roof.

355. They shall see that approved fire extinguishers are provided for every interlocking tower. They shall know that the heating stoves and stove pipes in all buildings are absolutely safe from fire. They shall report at once any instances coming to their knowledge where oil lamps are filled or cleaned in the interlocking towers or where combustible material of any kind is kept in the towers.

SNOW AND ICE

356. The Roadmaster shall be fully prepared for handling snow and will assign men to operate snow equipment.

357. The Roadmaster shall keep in touch with the Division Engineer and the Superintendent, and inform himself as to the conditions on his sub-division and be prepared to prevent snow obstructions. In case of doubt as to which part of the road shall be cleared first, consult with the Division Engineer and Superintendent.

358. Arrangements will be made through the Division Engineer or by the Roadmaster direct in emergency, with the

Superintendent, for prompt service for flangers and plows, and it is expected that the best class of locomotives will be provided for this purpose.

359. Every man in the employ of the Maintenance of Way Department is subject to call for duty in fighting snow, and must perform the duty assigned to him. In severe storms the forces of the Building Foreman and Bridge Foreman and the Engineering Corps will be called upon.

360. The Roadmaster shall see that all equipment is in first-class condition, and after each storm see that every appliance is carefully examined to discover necessity for repairs, and in case of long continued disuse make frequent examinations to see that parts are not lost or stolen. Running gears must be carefully examined periodically by the Maintenance of Way men in charge and by the Car Inspectors.

361. Sufficient men must be detailed during the night and day to properly care for switches and interlocking during snowstorms.

362. During long continued storms men will be worked in relays, so that one gang may be resting while the other is working.

363. Ample arrangements shall be made for feeding the men during bad storms so that they can work to their full efficiency.

364. The Roadmaster may, when necessary, increase his force to handle snow. Such action must be reported promptly to the Division Engineer. Such increased force must be dispensed with as soon as conditions permit.

365. Ice and snow must be removed from frogs, switches, water pans, flange-ways at crossings and track scales. Ice must be removed from the roof, sides and bottoms of tunnels. Unusually heavy falls of snow must be removed from turntable and ash pits when necessary.

366. Platforms and walks about stations are to be kept clear of snow by the Operating Department, but the Section Foremen shall furnish such help as is possible without interference with the proper fulfillment of their other duties.

367. Where necessary, ice shall be cut from around abutments, piers, piles, etc., where movement might cause damage.

368. Culverts and ditches obstructed with snow must be opened before thaws. Culverts liable to be hidden must be marked.

369. Section Foremen must see that all portable snow fence is in place before the winter begins and taken down in the spring and piled.

370. Section Foremen shall erect snow plow markers on October 15, at points designated by the Roadmaster. These markers shall be set on the engineman's side of the track in clear view and shall be at least six (6) feet from the rail and twenty-five (25) feet in advance of the obstruction to be protected. Markers shall be taken down on April 15, and racked at car houses.

371. During the winter season locate points where trouble with snow might be avoided by the use of snow fences or other means.

EXPLOSIVES

372. Roadmasters must know the Provincial and Federal laws and Municipal regulations governing the storage and transportation of explosives and inflammable material, and must see that they are obeyed and a printed abstract of the law is posted at every point where explosives are stored.

373. Danger signs shall be conspicuously placed on all buildings and magazines in which explosives are stored.

374. Dynamite and other explosives must be thawed only with the greatest care—preferably in a room heated with steam pipes in which the temperature does not exceed 50 degrees Fahrenheit, and ample time must be given. Small quantities may be thawed by burying it in fresh manure, taking care to avoid contact with it. Small quantities may also be thawed by placing in a tightly covered water vessel placed inside another vessel and surrounded by hot water. The water should be heated over a distant fire and should not be allowed to come in contact with the explosives. When dynamite cartridges become wet they are dangerous and should be re-

moved to a safe place, and the vessel containing them should be carefully cleaned before continuing its use.

375. On sections where small quantities of explosives are kept for local use they must be stored where they will not endanger life or property if they explode, and where they are not liable to be disturbed by unauthorized persons.

376. Fuses and caps shall be kept in a place separate from explosives.

377. Explosives must not be handled by any but experienced men.

REPORTS

378. Reports shall be rendered promptly upon the prescribed form.

379. Foremen must enter their time daily on the prescribed form and return it as directed.

380. Foremen must keep an accurate daily record of all material received and used.

TOOLS, MATERIAL AND EQUIPMENT

381. The Roadmaster shall make frequent inspection of all the equipment in use in his Department. He shall see that all snow equipment, steam shovels, rapid unloaders, road-bed and ballast spreaders, flat, dump and ballast cars, derricks, pile drivers, compressors, boarding and sleeping equipment, etc., are properly maintained.

382. Foremen will be provided with necessary tools, which they shall keep in first-class condition and ready for service. Tools and small track supplies, when not in use, must be securely kept in tool houses.

383. Roadmasters must make frequent personal examination of the condition of tools and supplies in charge of Foremen, and will see that surplus, damaged and worn out articles are promptly returned to headquarters.

384. All materials and supplies shall be checked carefully when received, and no invoice shall be approved until the

quantities and the quality have been checked. Their efficiency in service must be watched and a record kept as to wear and efficiency.

385. Requisitions for tools, materials and supplies must be in writing, sufficiently in advance of the time needed to insure delivery.

386. Ties and lumber must be piled above high water mark and clear of the ground.

387. Materials shall be checked before monthly reports are made.

388. Foremen and others in charge shall chalk the number of pieces in each pile of ties, plank and other material, to detect theft.

389. Tools, hand-cars, etc., requiring repairs which cannot be made locally must be properly tagged and billed and sent to the repair shop. Each article so shipped must be plainly marked with name and address of the party making shipment.

390. Old material, scrap, rails, ties, etc., must be kept picked up and proper disposition made of them.

SPECIAL RULES ON ELECTRIFIED TERRITORY

391. Avoid stepping, sitting or walking upon or brushing against the Third Rail. While the energized rail is protected by sheathing, there is always chance of shocks because of the presence of water, brake-shoe dust, derangement or imperfection of the sheathing. Employees should caution passengers and the public in accordance with the above rule.

392. Obstacles which cannot be easily removed after a train appears shall not be placed upon the tracks without permission from the Superintendent. In addition to obtaining such permission, protection must be made as prescribed in "Rules for the Protection of Trains."

393. Ballast, ties, tools, ladders, refuse or construction material of any sort shall not be allowed to lie within the clearance lines of any track in service. Loose tools or other objects, wholly or partially of metal, shall not be left between the running rails of any track where trains are likely to pass over them.

394. Proper distance must be maintained between the third rail and track. This must be frequently tested with template. Templates should be compared frequently with the Division Standard.

395. Where work is to be done close to third rail, Foremen must provide themselves with a special form, to be placed or held so there will be no possibility of contact with third rail. All employes must know that metal tools or wooden tools that are wet coming in contact with the third rail may cause a short circuit and injure them or others or interrupt train service. Foremen shall request and put on metal tools such insulating tape as is necessary to prevent men from getting in contact with the third rail through such tools. All electric conductors must be considered as alive at all times unless it is definitely known that current has been turned off for a definite period.

396. Third rail must not be heavily loaded or used as a support for bars or pry sticks.

397. Bracket ties shall be thoroughly tamped under and for 16" each side of each running rail. The remainder of the tie must have a uniform bearing and be lightly tamped.

398. Except in emergency the removal or renewal of rails, frogs or switches that are in tracks which are bonded, must be only after the co-operation of the signal forces and third rail forces has been secured. The Foreman in charge shall notify third rail and signal Maintainer in advance of beginning work.

399. The track and road-bed shall be kept clear of scrap, loose bond or telegraph wires, and all material which would, in any way, cause a short circuit.

400. Special care must be taken to keep divergent track rails in the same plane for a sufficient distance to prevent the third rail shoe coming in contact with the track rails and thus causing a short circuit.

401. In no case shall any planking, ballast or other obstructions come above the plane of the tops of the running rails for a distance of three feet out from the gauge line. Care must be used in keeping this clearance where the tracks have a super-elevation.

402. Employes shall report any defects in the third rail,

including insulators, sheathing, connections, track bonds and jumpers.

403. Bracket ties shall be placed and maintained at right angles to the track.

ACCIDENTS, WRECKS AND PERSONAL INJURY

404. In case of accident, wreck or other emergency the nearest foreman shall at once take his force and tools to the place, even if it is not on his territory, and do all in his power to restore normal conditions. When, in his judgment, more men are needed, he may call any available foremen or men without waiting for orders.

405. When assisting a train delayed by accident Foreman will act under the direction of the Conductor until the arrival of the Roadmaster, Wrecking Master or Train Master.

406. In case of a wreck the Section Foreman must, when necessary, appoint watchmen to prevent theft or damage, and such watchmen must remain on duty until relieved or the goods are removed.

407. The territory along each division shall be canvassed to locate available men for quick service in case of an emergency, and each Roadmaster should have a list of the names and addresses of such men so that he can promptly organize a large force. When such means fail he shall communicate promptly with the Division Engineer.

408. In case of personal injury, loss of life, damage to property or condition involving safety of traffic, immediately make a report by wire to all concerned, giving all information possible, and following this as soon as possible with a written report on prescribed form.

409. Employes who are injured and desire treatment without expense to themselves should go to or be attended by the Railroad Surgeon. In cases of serious injury, where the service of the Railroad Surgeon cannot be secured at once, the nearest surgeon may be called to take charge of the case until relieved by the Railroad Surgeon. The Railroad will not pay for the services for other than Railroad Surgeons, except for first aid when called by a representative of the Railroad.

410: All concerned must be familiar with local laws governing the removal of body after death.

INFORMATION FOR EMPLOYEES IN CASE OF INJURY

Bystanders shall not be permitted to crowd about an injured person.

A written dispatch, telegram or messenger should be sent at once to the nearest surgeon, giving such particulars as will enable him to bring the necessary remedies and appliances.

The injured person shall not be moved until it is known what part is injured and anything pressing upon or holding it is removed.

In moving the injured person a stretcher shall be used if obtainable; but in any event, the body should be very gently raised and moved, any injured limb being carefully supported.

In all cases the use of stimulants should be avoided, except under medical advice.

Remove the injured person to the nearest convenient clean place. Put the patient in as comfortable a position as possible with the least amount of handling.

If there is a hemorrhage, use no stimulants.

If the patient is weak from severe shock, a teaspoonful of aromatic spirits of ammonia or a little brandy and water may be given and warmth should be applied to the extremities by means of hot water pads, but care should be taken to avoid burns.

BLEEDING WOUNDS

If the blood is of dark color, showing injury of a vein, the bleeding can almost always be stopped by applying a piece of gauze directly over the wound and binding it tightly with a bandage.

If the blood is bright red and the flow is intermittent, showing an injured artery, apply a tight bandage above the wound. A handkerchief loosely tied around the limb and tightened by twisting with a stick will always stop the hemorrhage. Care should be taken not to use greater constriction than sufficient to stop the bleeding, and the pressure should be occasionally lessened in order not to produce gangrene of the limb below.

All wounds, with or without hemorrhage, should be covered at once with sterile gauze from one of the emergency packages. The gauze can be held in place by means of a bandage, and should not be disturbed until the arrival of the surgeon. Under no circumstances should a wound be washed with water or any other solution.

INJURIES TO THE HEAD

In scalp wounds the bleeding can almost always be stopped by applying a pad of gauze held in place by a tight bandage.

In concussion of the brain or cases of possible fracture of the skull no stimulants should be given. The head should be elevated slightly and cold applications should be made to the same, e.g., ice bag, if at hand, and heat to the lower extremities.

In cases of severe injury to the head the patient should be kept as nearly at rest as possible.

FRACTURES—BROKEN OR INJURED EXTREMITIES

(Arm, Leg, Hand or Foot)

In case of a broken arm or leg in which there is no open wound, the limb should be gently placed as nearly as possible in the normal or straight position, and kept in this position by means of tying the bandage to some temporary splint. For this purpose may be used pieces of a cigar box, pasteboard, umbrella ribs or many other things that may be at hand.

In case of a fracture in which the bone has pushed its way through the skin, forming an open wound, an attempt should be made to gently draw the bones as nearly as possible into their correct position; then apply a pad of sterile gauze over the wound, keeping it in place by means of a bandage. The bone should then be kept in position in the same way as just described.

BROKEN RIBS OR BRUISED CHEST

A broad bandage should be applied around the entire body on a level with the injured ribs. If there is an open wound, a pad of sterile gauze should be first applied.

BROKEN BACK

The usual signs of a broken spine are paralysis and loss of sensation in the limbs below the injury. The injured person should be kept flat upon his back and moved as little as possible until he can be taken to a hospital.

BROKEN COLLARBONE

The arm should be put in a sling, or, better, should be bound against the chest by means of a bandage, putting fingers of broken arm as near as possible to the other shoulder.

BURNS OR SCALDS

If possible, a warm solution of bicarbonate of soda (baking soda) should be poured upon the clothes over the burnt area, and clothing should not be removed before the arrival of doctor unless delay is over one hour. The clothing should then be carefully cut off and some preparation of oil, e.g., sweet oil, linseed oil, vaseline, may be applied to the burnt area, which should then be covered with gauze or cotton to keep out the air.

FROST BITES

The frozen parts should on no account be rubbed, but should be kept in cold water until the frost is out of them. The temperature of the water should then be gradually raised to 99°.