

Reporting System of the Illinois Central Signal Department

The value of statistics is recognized more or less in all the departments of a railroad, although it is seldom considered to any great extent in the operation and maintenance of signals. It is true that a number of roads, whose signal engineers are alive to the value of compiling a record of the actual operation of the different mechanisms, have devised means of knowing just what service the different installations are rendering, to such an extent that it is almost impossible for a single failure of an apparatus to escape their notice.

A very complete system of reporting signal failures, both for the immediate notification of the maintainer and for the purpose of compiling statistics to be used in making comparison as to the different methods of signaling, has recently been installed on the Illinois Central Railroad, and lines operated by that company. This system was put into effect on the Chicago Division on April 1st of this year, and after having proved a success, was installed throughout the entire line the following month.

The basis on which the reporting system was designed was to insure notice of a failure of any signal

on the card it is then mailed by the operator to the Division Signal Foreman having charge of the territory in which the failure occurred, the card being so addressed on the reverse side.

FORM NO. 2.

It will be noted that the form of this card is similar to that on Form 1, its purpose being to report the failure of manual block signals. The transmission of a

Illinois Central Railroad Company.

REPORT OF FAILURE OF MANUAL BLOCK SIGNALS.

Station _____ Date _____ 190__

DIVISION SIGNAL FOREMAN:—

Train No. (a) _____ Time delayed (b) _____

Remarks (c) _____

NOTE:—This card to be filled in by Block Operator and returned to Dispatcher's office by wire. Operator will transmit only such information as is indicated by small letters "a" "b" "c" "d" etc. in parenthesis. Operator will mail this card to Division Signal Foreman.

Block Operator.

Form No. 2—5½"x3½".

Illinois Central Railroad Company.

REPORT OF FAILURE OF AUTOMATIC OR INTERLOCKING SIGNALS.

DIVISION SIGNAL FOREMAN:—

Station _____ Date _____ 190__

Train No. (a) _____ Time delayed (b) _____

By Automatic Interlocking } Signal No. (c) _____ Location (d) _____

Remarks (e) _____

NOTE:—This card to be filled in by Conductor and filed at first telegraph office at which train stops, for transmission by wire to Dispatcher's office. Operator will transmit only such information as indicated by the small letters "a" "b" "c" "d" etc. in parenthesis. Operators will mail this card to Division Signal Foreman. A lamp not burning on any signal constitutes a failure, and this form is intended to cover same.

Conductor.

Form No. 1—5½"x3½".

apparatus being given to the maintainer immediately, that the maintainer might make the necessary repairs to restore the apparatus to service on receipt of the notice, and that a written record might be obtained of the failure, its cause, etc. In addition to the reports covering signal failures, several other forms were adopted covering failures of crossing bells, inspection of interlocking plants, etc., the use of which are as follows:

FORM NO. 1.

Form No. 1 is made of light pasteboard, similar to that used in postal cards and is carried by all conductors while on duty. Upon the failure of an automatic or an interlocking signal the blank spaces shown on this card are filled in by the conductor, giving the station where filed, date, train delayed, time, number of signal having caused delay and its location. He then presents the card to the nearest telegraph station at which the train stops, where the operator transmits the information shown on same as noted by the small letters, "a," "b," "c," "d" and "e" to the chief dispatcher, who is constantly informed as to the whereabouts of the maintainer. After wiring the informa-

notice to the maintainer in this case is handled in the same manner as in the case of Form No. 1, with the exception that the block operator fills out the card, instead of the conductor.

FORM NO. 3.

When the maintainer has made repairs to a signal, failure of which is reported to him by the Dispatcher, he fills out this form noting thereon a full record of the failure as covered by the form. It is then delivered to the nearest telegraph station, where the information indicated by the letters in parenthesis is wired to the dispatcher and the card mailed to the Division Signal Foreman, in whose office it is kept on file, together

Illinois Central Railroad Company.

Report of repairs to interlocking Automatic or Manual Block Signals.

Station _____ Date _____ 190__

DIVISION SIGNAL FOREMAN:—

Referring to delay to train No. (a) _____ at (b) _____

Interlocking Signal Automatic Signal Manual Block Station } No. (c) _____ on date of (d) _____

Cause of failure _____

Time failure report received _____

Time arrived on ground _____

Time repaired (e) _____

Time reported repaired to Dispatcher by wire _____

NOTE:—This card to be filled in by Repairman immediately on completion of repairs and filed at nearest telegraph office for immediate transmission by wire to Dispatcher's office. Operator will transmit by wire only such information as is indicated by small letters "a" "b" "c" "d" etc. in parenthesis. Operator will mail this card to Division Signal Foreman.

Maintainer.

Form No. 3—5½"x3½".

with the original notice on Form No. 1 or No. 2 (as the case may be) of the failure. It will be noted that this card is intended for use in both automatic and manual block territory.

FORM NO. 6.

As the notice of a signal failure is received over the wire, the dispatcher immediately records it on form

No. 6 and notifies the maintainer, over the telephone or as otherwise provided. The record of the failure, number of train delays, signal number, etc., is then retained by the dispatcher until he has received advice

day that notice of failure is received are carried over to the report of the following day, it being required of the dispatcher to mail a report daily to the signal engineer.

Illinois Central Railroad Company.

REPORT OF SIGNALS OUT OF ORDER.

..... District. Division.

Date.....

| Signals No. or Name | Reported by Train No. or Block Operator at | Time Reported | Repairman Notified | Time Repaired | CAUSE |
|---|--|---------------|--------------------|---------------|-------|
| | | | | | |
| | | | | | |
| Train movements in all directions. District No. 1. | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

NOTE:—This report to be filled in at Dispatcher's office as delay reports are received; and report closed at 7pm and mailed to Signal Engineer. Any failures for which Repairman's repair notice has not been received should be transferred to this form for the day following close of report.

.....
Chief Dispatcher.

Form No. 6—8½"x10¾".

Illinois Central Railroad Company.

AUTOMATIC BLOCK SIGNAL REPORT.

..... DIVISION. MONTH OF..... 190.....

| SIGNAL No. | TRAIN No. | DAY | TIME | | Legitimate Stops | Defective Maintenance | Defective System | Uncontrollable Causes | Negligence of Trainmen | Negligence of Other Employees | Unknown Causes | CAUSE OF DELAY |
|----------------|-----------|-----|-------|-------|------------------|-----------------------|------------------|-----------------------|------------------------|-------------------------------|--------------------|----------------|
| | | | A. M. | P. M. | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| SUMMARY | | | | | | | | | | | TOTAL STOPS | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

NOTE:—This report to be made monthly by Division Signal Foreman compiled from Card Reports. Original copy to Signal Engineer, copy to Superintendent.

.....
DIVISION SIGNAL FOREMAN.

(OVER)

Form No. 10—8½"x10¾".

from the maintainer that the signal has been repaired, whereupon a notation is made in the proper column, giving the exact time the signal was restored to service. Signals that are not reported repaired the same

FORM NO. 10.

At the close of the month the division foreman makes a summary of all the signal failure reports received during that particular month, each failure be-

Illinois Central Railroad Company.

DAILY REPORT OF INTERLOCKING PLANT.

..... Division.

Name of Plant..... Time..... Date..... 190.....

| | Write Answers in full. |
|--|------------------------|
| 1. Is there any looseness or evidence of failure in the machine or locking? | |
| 2. Is there any looseness or evidence of failure in the ground connections or lead out? | |
| 3. Is there any looseness or evidence of failure in the switch or, signal connections? | |
| 4. Is there any movement in bell crank, compensator or other foundations? | |
| 5. Is there any trouble with signal lamps? | |
| 6. Have any trainmen failed to obey the signals? | |
| 7. Has there been any disregard of rules by trainmen or others? | |
| 8. When did signal repairman last inspect the plant? | |
| 9. Train delays—Cause | |
| <p>NOTE:—This report to be made in duplicate by leverman and forwarded by trainmail. Original copy to Division Signal Foreman, and copy to Repairman. Foreman to sign this report if correct at end of their respective tricks, report being mailed by last trick leverman.</p> | First Trick Leverman. |
| | Second Trick Leverman. |
| | Third Trick Leverman. |

Form No. 11—8½"x10¾".

ing noted and classified on form No. 10. The opposite side of the report shows in detail under what classification a failure would come, which enables the foreman to show the failure under the proper caption on the face of the report.

FORM NO. 11.

A monthly recapitulation of all automatic signal failures on the entire line is compiled by the signal

engineer and rendered on Form No. 11. The figures, of course, are taken from the division foreman's report Form No. 10, with the exception of the number of signal operations, which can be obtained from the dispatcher's daily report, Form No. 6. It will be noted that there is also provided a space in which to show the percentage of failures in relation to the number of operators.

The six forms described include all the reports used in connection with block signal failures, and in this reporting system it will be noted that not a single failure can be lost sight of until it is lodged in the proper column on the signal engineer's report at the close of the month. The information shown on Form No. 11, which is a summary of all of the above described re-

FORM NO. 8.

At the close of each day a report is required from the levermen employed at interlocking towers on Form No. 8, which covers questions of failure of interlocking apparatus, also other information which is desirable regarding the condition of the plant.

The original of the form is mailed to the division

Illinois Central Railroad Company.

DIVISION SIGNAL FOREMAN'S REPORT.

To.....190.....
SIGNAL ENGINEER.

| | WRITE FULL ANSWERS IN THIS COLUMN |
|---|-----------------------------------|
| 1. Name and location of plant? | |
| 2. Date of inspection? | |
| 3. Are all switch and lock movements adjusted to make full locking travel requiring lever in machine to spring connections slightly, before it can be latched? | |
| 4. Do facing point lock plungers, clear the lock bar 1-inch when unlocked and have a locking travel of at least 7 inches? Are the holes in lock bar more than 7-16-in. larger than the plunger? | |
| 5. Are switch and derail points adjusted to come up tight against the stock rail? | |
| 6. Are lock rods adjusted to prevent plungers entering the hole when a 3-16-inch rod or rod wire nail is placed between point and stock rail, 6 inches from the end of point? | |
| 7. Are all bolt locks properly connected, and are the slots in both lock bar and signal bar of proper length? | |
| 8. Are all defect bars adjusted to use at least 3/4-in. above the top of rail when placed on centers? | |
| 9. Is the interlocking properly cleaned and oiled and when last oiled? | |
| 10. Are all side plates under switch points properly cleaned and oiled? | |
| 11. Have all signals been adjusted to come to their proper positions? | |
| 12. Are the glasses in spectacle cases kept clean? | |
| 13. Is the lamp house kept in proper condition? | |
| 14. Are the lamps in good order and well cleaned? | |
| 15. Are the electric locks kept in good order? | |
| 16. Are the tools kept in order and on hand? Check list. | |
| 17. Is the plant properly drained? | |
| 18. Are there any repairs needed? | |
| 19. Is the tower kept clean? What is the general condition of the building? | |
| 20. Is the machine kept clean and oiled? | |
| 21. Does the machine lock all the combinations properly? | |
| 22. What material is required to put the plant in first class condition? | |

REMARKS:—

Division Signal Foreman will make an inspection at least once a month of each interlocking plant he has charge of and will make a full report by train mail of the condition of the plant at the time of leaving it. Original copy to Signal Engineer, copy to Superintendent.

Form No. 9—8 1/2" x 10 3/4".

DIVISION SIGNAL FOREMAN.

ports, is most valuable to the official who takes an interest in knowing positively how the block signals are operating, as it gives a true record of the failures, their cause, and whatever information is necessary for a correct comparison.

signal foreman, with a copy to the repairman. This report is signed by each towerman at the end of their respective tricks, the report being mailed by the last man on duty. While it is understood that towermen are not supposed to detect any intricate defects, this

report is only to cover such defects as would be apparent to any ordinary towerman handling the levers. These reports are filed when received by the division signal foreman, making a permanent record as to the interlocking plants and is filled out by the maintainer and mailed to the division signal foreman, copy being sent to the signal engineer and to the superintendent. This report covers everything in the way of informa-

PROBABLE CAUSE OF BLOCK SIGNAL INTERRUPTION.

NOTE: In making up request see other side of sheet. Cause of interruption must be classified as outlined below.

LEGITIMATE STOPS

Rail..... Broken rail.
Train..... Train in block.

DEFECTIVE MAINTENANCE

Battery..... Discharged cell or cells or bad solution.
Battery..... Elements in bad condition, over discharged.
Battery..... Jars broken, open or short circuit in cells.
Bond Wires..... Broken or rusted in two.
Bootleg..... Wires broken, rusted in two or bad condition.
Brushes..... Dirty or out of adjustment.
Commutator..... Dirty
Clutches..... Coils open, damaged, or out of adjustment.
Circuit Controllers..... Out of adjustment.
Lamps..... Not burning, broken lens, improper care or poor grade of oil.
Lightning Arresters..... Short circuits, poor connections or damaged.
Motor..... Fields open, short circuit, poor connections or damaged.
Other Causes..... Electric Gas, Mechanical or other signal mechanism not performing its functions properly and which indicates poor maintenance.
Relay..... Out of adjustment, poor connection in contacts, defective insulation or short circuit. (Providing relay is not sealed.)
Roundels..... Broken, cracked or dirty.
Switch..... Out of adjustment.
Insulated Joints..... Worn out or defective installation.
Rail..... Rails run together, account of defective end posts.
Shafts..... Broken or binding in bearing.
Slots..... Out of adjustment, broken or worn parts.
Spectacles..... Broken or damaged.
Wire..... Broken or worn in two, bad connection, crossed, grounded or torn out.

DEFECTIVE SYSTEM

Current..... A system troubled with foreign current is defective.
Fuses..... Blown by foreign current.
Gas or Air..... Freezing.
Lamps..... Blown out by high winds.
Track Circuit..... Long or wet track circuit.
Ties..... Treated ties.
Commutator..... Dampness or frosted.
Shafts..... Broken.
Relay..... Out of adjustment, etc. (Relay sealed.)
Gauges..... Gauges leaking, including connections.
Expansion Chamber..... Expansion chamber exploding.
Grounds..... Defective grounds.

UNCONTROLLABLE CAUSES

Damage..... Damage to apparatus by trespassers or others.
Dragging..... Damage caused by something dragging from train or engine.
Derailments..... Damage caused by derailments.
Sleet..... Sleet storms are beyond control.
Fire..... Fire which destroys apparatus.
Lightning..... Fuses blown by lightning or other damage to apparatus caused by lightning, including battery
Wind..... High winds are beyond control.
Washout..... Washouts are uncontrollable.
Shot..... Persons shooting into cables, wire or other apparatus causing failure of signal.

NEGLIGENCE OF TRAINMEN

Cars..... Fouling main track.
Derails..... Sidetrack derails left closed.
Switch..... Misplaced by trainmen.
Switch..... Switches trailed through.
Trains..... Fouling main track.

NEGLIGENCE OF OTHER EMPLOYEES

Switch..... Misplaced by signal, men or other employes.
Hand Cars..... Non-insulated hand, push and velocipede cars.
Other Causes..... Negligence on part of other employes which cannot here be anticipated.

UNKNOWN CAUSES

Causes..... Signal failures, the cause for which cannot be located after diligent search and inquiry has been made.
Reverse Side of Fig. No. 10—Intended as a guide in classifying failures.

working condition of the interlocking plants under his supervision.

FORM NO. 7.

This report covers derailments and damage done at

tion regarding the damage done to the plant and will serve as an office record of the accident. It also enables the different offices to take such prompt action as they see fit, either in getting the material on the

way for the necessary repairs or issuing such instructions to avoid further accidents of similar nature as may be considered necessary.

FORM NO. 9.

Each division foreman is required to make a personal inspection of every plant in his territory at least once a month, his report on the condition of the apparatus being submitted on Form No. 9, the original of which is forwarded to the signal engineer and copy to the superintendent. This report covers the condition of the important functions of the plant, and also a space is provided for such remarks as may be necessary to more clearly explain the situation. It is required that this report be mailed on the same day the

Illinois Central Railroad Company.

REPORT OF CROSSING BELL OUT OF ORDER

Station _____ Date _____ 190__

DIVISION SIGNAL FOREMAN:—

The crossing bell located at (a) _____
is out of order.

Remarks:—(b) _____

NOTE.—This card to be filled in and filed at nearest telegraph office for immediate transmission to Superintendent by wire, copy of message to Signal Engineer. Superintendent will notify Repairman. Operator will transmit by wire only such information as is indicated by small letters "a" "b" "c" etc. in parentheses and will mail this card to Division Signal Foreman.

(Signature)

Form No. 4—5/2"x3/2".

inspection is made, and when received by the signal engineer and superintendent it is filed in monthly order, constituting a permanent record from month to month.

FORM NO. 4.

This form is used for reporting crossing bells out of order and a supply of them is placed in the hands of agents and section foremen in the neighborhood of the bells. Information shown on this card is wired to the division superintendent with a copy of the message to the signal engineer, and the card then mailed to the division foreman, it being already addressed on the re-

Illinois Central Railroad Company.

REPORT OF REPAIRS TO CROSSING BELL

Station _____ Date _____ 190__

DIVISION SIGNAL FOREMAN:—

Referring to crossing bell at (a) _____
reported out of order.

Time failure report received _____

Time arrived on ground _____

Time repaired (b) _____

Cause of failure _____

NOTE.—This card to be filled in by Maintainer immediately on completion of repairs and filed at nearest telegraph office for immediate transmission by wire to Superintendent, copy of message to Signal Engineer. Operator will transmit only such information as is indicated by the small letters "a" "b" "c" etc. in parentheses and will mail this card to Division Signal Foreman.

Maintainer.

Form No. 5—5/2"x3/2".

verse side. The superintendent immediately upon receipt of the notice gets in touch with the repairman, who, on making the necessary repairs to the bell, fills out Form No. 5, stating that the necessary repairs have been made, and files it at the nearest telegraph station, where the report is wired to the superintendent and signal engineer, and the card mailed to the division signal foreman, thus completing the record of all concerned.

FORM NO. 12.

Every man traveling out of the signal engineer's

office is provided with a book, or pad, of Form No. 12. The purpose of this form is to aid in determining the frequency and thoroughness of inspection of apparatus by the maintenance forces. Whenever, in the opinion of the possessor of one of these books, it would appear advisable to do so, one of these cards is dropped in a relay box, or any receptacle, a notation being made on the stub showing when and where the card was placed. Upon finding the card the maintainer fills in the exact time found and mails the card immediately to the signal engineer. The card bears complete instructions, and the maintainer is fully advised as to how the card should be handled.

While these forms entail considerable clerical work, it is so divided as to not make it arduous upon any one person, with the exception of the signal engineer, who has one of his clerks devote about 10 per cent of his time in handling and compiling them. The most trouble experienced has been caused by conductors failing to report the failure of signals that have stopped their trains, but this is now being overcome by taking the matter up with them in each instance where they have neglected to make their report and requiring an explanation. In this way the conductors are aware that their reports are being checked up, and after being taken to task a few times for their neg-

No. 130

AN 5-28-08

Form 9 0. 11

Date used _____
Hour _____
Left at _____

Is _____
Left by _____
Returned by _____
Date _____

Illinois Central Railroad Company.

No. 130

When maintainer finds this card he will date and sign name and mail to the Signal Engineer.

Date found _____ Hour _____

Maintainer.

Form No. 12—2 7/8" wide—6 3/4" long—Including stub.

lect, become more careful in carrying out the instructions.

The most benefits come from the close supervision it is possible to keep over the maintainers by the division foreman and over the division foremen by the signal engineer. Each man is checked up monthly and the performance of the signals in his territory carefully recorded, and his superior can see at a glance whether or not his section is being kept up to the standard. The satisfactory effect that a reporting system of this kind has on the maintenance force is very noticeable.

Rock Island—Frisco Contract

The Union Switch & Signal Company has been awarded a contract for five hundred miles of automatic block signaling on the Chicago, Rock Island & Pacific Railroad. A short time ago the Union Switch & Signal Company was also given a contract for seven hundred and fifty miles of automatic block signaling on the St. Louis & San Francisco, which road is a part of the Rock Island system. Therefore the two orders are essentially one and together they make the biggest automatic block signaling contract ever placed at one time except the contracts for signaling of the Harriman lines which the Union Switch & Signal Company received something like two years ago.

It is expected that all of this work (1,250 miles) will be completed within twelve months, or fifteen months, at the furthest. This the Union Switch & Signal Company can easily do with its very great facilities.