braces but which were properly maintained and caused no failures and gave good service and adjustment from an interlocking standpoint. In other cases I have known of a standard of excellence in track work which did not keep the switch "up to snuff" with the result that the adjustable rail braces came in handy to take up wear before it ruined the plating which held the stock rails and plates and points to the proper precision adjustment required for an interlocking switch.

Adjustable Improves Operation and Maintenance

R. A. SHEETS
Signal Engineer, Chicago & North Western, Chicago

The operation and maintenance of any interlocking switch is greatly improved where adjustable rail braces are used. There may be exceptions where switches are used infrequently or where traffic is light, but where switches are used frequently or where traffic is heavy, and particularly where turnouts are sharp, adjustable rail braces will not only save greatly in the maintenance expense but will prevent many needless delays because of improperly adjusted switches. With the present weight of equipment, no matter how well a switch is plated and braced, there is bound to be a certain small amount of give or spring in the stock rails of any turnout, and after repeated movements it will be found that, with non-adjustable braces, a certain amount of this results in a permanent set which is constantly increasing. With the small limits set for proper switch locking, the limit is soon exceeded and it is continually essential that non-adjustable rail braces be tightened to prevent failure and to insure tight fitting switches.

Switch locking failures as a rule occur because of two elements: (1) Either the lock rod was improperly drilled to correspond to the throw or movement of the switch point; or (2) the stock rail has moved to a position between 1/16 in. and ⅛ in. beyond its original location.

Adjustable lock rods are very important to insure that the switch, as installed, may have the lock rod exactly set to correspond to the throw or movement of the switch points, which will eliminate failures due to mistakes in (1). It is equally important that adjustable rail braces be installed on stock rails to insure against constant maintenance expense or failures from cause (2). Our experience in busy terminal interlockings where there are many No. 10 and No. 7 turnouts, over which our heaviest equipment moves, indicates that the adjustable rail brace is well worth the small additional cost, both because of the decrease in maintenance expense and because of a lack of switch failures. Customarily, each stock rail is equipped with two, and occasionally with three, adjustable rail braces located on the headlocks where the point adjustment is most sensitive. We find that the signal maintainer can quickly and easily compensate for the movement of a stock rail due to slip, wear or strain. It is our recommendation that adjustable rail braces, where used, be of the type in which the adjustment can be made quickly by means of driving a pin or wedge and securing the adjustment with a nut in just the degree it is desired, rather than to make these adjustments at infrequent intervals, where it is necessary to take up 1/16 in. or ⅛ in. to correspond to some fixed amount provided in the adjustable brace.

Inspection of Signal Facilities

"What kind of a schedule for daily or weekly inspections of equipment have you found to be most effective in maintaining (1) power interlocking, (2) automatic block signaling?"

Places Definite Responsibility

E. T. GARRISON
Supervisor of Signals, C. & O.
Clifton Forge, Va.

Schedules were prepared for the Clifton Forge division early in the year 1929, and with the addition of C.T.C. at Ronceverte, W. Va., in 1933, it was revised to take care of this addition, and has been found very workable for the past eight years with a definite responsibility placed on each man involved on a given territory. Following is the schedule we use for both interlocking and automatic territory maintainers. When two or three tricks are worked on a given territory, the responsibility is subdivided between each trick:

Daily Inspections: Switches, derails, S&L movements, switch boxes and bonding, fouling through crossovers and turnouts, compressors and batteries, machine spring combination and signal lights.

(Continued on page 418)

Schedule of Inspections

Apparatus	*Frequency*	*Month*	*Inspector*
Biennial field test of relays	50% annually	May through Sept.	Road mechanic
Megger test of wires & cables	Annually	Feb. & March	Maintenance foremen & road mechanic
Resistance of all grounds	Annually	April	Maintenance foremen & road mechanic
Highway crossing protection and automatic signals	Annually	November	Maintenance foremen
General inspection of code units	Annually	August	Maintenance foremen
Switch indication circuits	Semi-annually	April & Oct.	Maintenance foremen
E. P. restoring circuits	Semi-annually	April & Oct.	Maintenance foremen
Switch obstruction tests	Semi-annually	April & Oct.	Maintenance foremen
Approach locking	Quarterly	Jan.-April-July-Oct.	Maintenance foremen & road mechanic
Detector locking	Quarterly	Jan.-April-July-Oct.	Maintenance foremen & road mechanic
Signal indication	Quarterly	Jan.-April-July-Oct.	Maintenance foremen & road mechanic
Testing of switch boxes	Quarterly	Jan.-April-July-Oct.	Maintenance foremen
Integrity of inductor circuits	Quarterly	Jan.-April-July-Oct.	Maintenance foremen
Actual check of inductors in service riding car in train equipped for this purpose	Monthly		Road mechanic accompanies an inspector
Cycle check and visual inspection of code units	Quarterly	Jan.-April-July-Oct.	Maintenance foremen

Weekly Inspections: Leadouts, pipe lines and fittings, air lines, relay cases and contents, bonding within interlocking limits, track circuits and connections, insulated joints, model board, circuit controllers, electric locks and indicators.

Semi-Monthly Inspections: Pole line, wires and cables, power line apparatus and fittings, and cleaning windows and floors of interlocking apparatus rooms.

Tests Made by Maintainers: (a) Daily—Flasher signals at highway crossings, ground test at G.R.S. plants; (b) Weekly — Emergency whistles, lamp of color-light signals, cross protection of G.R.S. electric switches; (c) Semi-monthly—Switch obstruction (all switches), E. P. restoring circuit, traffic locking, power off buzzer; (d) Monthly—Indication of power switches, fouling circuits, electric switch lever locking, mechanical locking; (e) Quarterly—Main air line pressure drop, voltage at color light signal lamps; (f) Annually—Lightning arresters, torque test of semaphore signals, foreign current test of d.-c. track circuits. The above general routine of maintainers is followed up by a schedule of periodical tests and inspections of apparatus conducted by the maintenance foremen and road mechanics only, and since 1929 has proved very valuable. These are shown in the accompanying table. After these checks are made, the foremen furnish me with a detailed list of all irregularities noted, which are recorded and sent out to the various maintainers for correction.

Knocking Stones off the Rail

"What kind of an arrangement is most practicable to mount on a track motor car ahead of the wheels for the purpose of knocking stones and other obstructions off the rail?"

Flexible Air Hose

K. RHINEHART
Signal Maintainer, St. L.-S. F.,
Lamar, Mo.

An arrangement that is practicable and proved to be a success, for mounting on track motor cars ahead of the wheels for the purpose of knocking stones and other obstruction off the rail, is a common piece of air hose used for air coupling on cars in trains. This is flexible and does not interfere when taking the car off and on the track. It is strong enough to keep the rail clear of any ordinary obstruction such as stones, nuts, bolts, spikes and torpedoes. When mounted on the motor car the hose should clear the rail 3/16 in. On some makes of motor cars a clamp or extension has to be made. A cross arm brace serves the purpose. It can be easily bent in a vise to any angle, to extend from the car frame over the rail in front of the wheels.

Describes Assembly

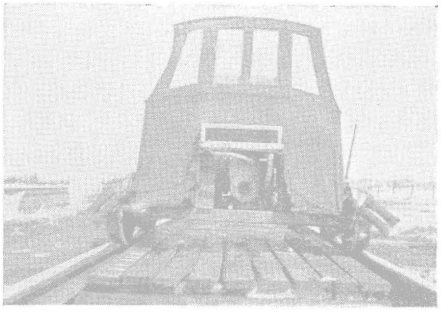
A. W. FEHRENBACH
Chicago, Ill.

Use four old air hoses, one for each wheel. Slit each air hose from the end, four inches up. Then bolt eight pieces of strap iron ⅛ in. by 1 in. by 4 in., one on each side of each air hose. This will take eight bolts and nuts and eight wood screws for mounting on the motor car frame ahead of each wheel.

Winter and Summer Sweepers

B. O. BROWN
Signal Maintainer, Canadian Pacific,
Berthierville, Que.

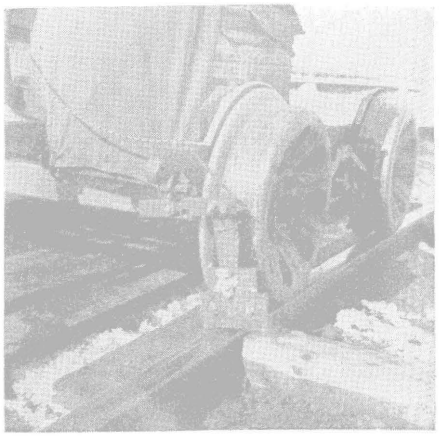
The accompanying illustrations show two types of sweepers mounted on a motor car for knocking stones, etc., off the rail. The design using sections of rubber hose is for summer



Sections of rubber hose for summer

use, while the steel design is for winter use. The winter sweeper will permit the operation of a car in 3 in. to 4 in. of light snow.

This equipment is on a Sylvester Model M-19 car. Of course, with a few changes it could be made to fit



Steel design for winter

any type of car. The lift chains for the sweepers are attached to the engine lever. When the car is in motion, the rail sweepers are in the down position, while when the lever is in the non-running position, the sweepers are in raised position so as not to be damaged when placing the car off or on the rails. The chain is of the type ordinarily used in connecting train order signals. All bolts are check nutted, with lock washers and cotter keys.

Uses Rubber Hose

E. E. SPENSLEY
Signal Maintainer, Chicago Great Western,
Dubuque, Iowa

Of the different appliances tried on the Chicago Great Western, we find that the most practical is a piece of a discarded air hose, of the desired length, from the train line of a railroad car. Insert in one end a wood crossarm pin with the wood threads sawed off to make the hose solid on the upper end. This can be fastened to the frame or sill of the motor car by a clamp made from a metal strap the dimensions of a crossarm brace; if this hose is to be secured to the car in one place, bend the brace in an L shape. If it is to be secured in two places, bend the brace in a U shape and use a short piece of the same material bent in a semi-circle with a flange on each end, and bolt it to the first shape made, to make a clamp around the hose. The lower end of the hose should be above the rail far enough to clear torpedoes, as stones of this dimension would not derail a track motor car.

(Continued on page 420)