

switches, skates and compressors. They also take care of the communicating system, and with the assistance of an acetylene welder and his helper these men are also overhauling on an average of five retarders per month.

There is one maintainer at each hump on the second trick. These men clean and lubricate the retarder mechanisms, switch mechanisms, skate mechanisms, motor-generator sets and compressors. They also take care of the control machines and the man at the northbound hump checks and adjusts the air pressure on the retarder regulators.

The repair and adjustment of skate machines and skates is a much larger item than that of switches and switch machines.

Our apparatus is of the earliest type built commercially and our maintenance is, therefore, probably somewhat greater than on the most modern installations.

### Three Men, Two Shifts

By C. F. STOLTZ

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WE have a 32-track hump yard equipped with about 900 ft. of retardation, 29 interlocked switches and 35 signals. The maintenance force consists of one day maintainer, one night maintainer, and a helper. The helper does the greasing and oiling. This yard has been in service about a year and unless business is unusually heavy, is operated two 8-hr. shifts each day, the maintainers covering these shifts, which generally are between 8:00 a. m. and 4:00 p. m. and between 8:00 p. m. and 4:00 a. m. The oiling and greasing is all done during daylight hours. This force has proved to be adequate, and sufficient to maintain the system, and we do not anticipate that it will be necessary to increase it in the future.

The switches and retarders are the electro-pneumatic type, equipped with the Zerk-Alemite system of lubrication. The greasing and oiling is all done by compressed air, which we consider a great labor saver in keeping the movable parts well lubricated, thus avoiding undue wear.

### Pitcairn Yard on the Pennsylvania

By E. B. PRY

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AN electro-pneumatic car retarder installation has been in service at the eastbound classification yard, Pitcairn, Pa., approximately 15 mi. east of Pittsburgh, since November, 1929. The switches at this yard had previously been operated from a push-button machine and there had been a complement of car riders on three tricks daily. The grade of the yard was changed to accommodate the car retarders.

At the time the retarders were installed the existing switch operating mechanisms were continued, but their control was changed from the push-button machine to the separate car retarder and switch control machines installed at the same time as the retarders. There are 34 classification tracks in the yard, 25 double-rail retarders, 33 switches and 34 skates operated from three control towers. A loud-speaker system and teletype service is provided between the assistant yardmaster's office near the apex of the hump and the three control towers.

Since the retarders have been installed it has been possible to classify in two tricks a number of cars

that previously required three tricks. As practically all of our freight trains are on a definite schedule, it was desirable to establish the two tricks from 7:00 a. m. to 3:00 p. m. and 7:00 p. m. to 3:00 a. m. About 90 per cent of the cars handled in this classification yard are loaded, the lading consisting principally of merchandise and manufactured articles.

To handle the maintenance at this point we believe it is necessary to provide a maintainer on each trick who will handle general maintenance work, renewal of worn parts, etc. In addition to this it is necessary to employ a helper on one trick, his chief duties being to clean and lubricate the retarders as well as to assist the maintainer with any work requiring the services of two men. Due to the continuous movement of cars through the retarders during the time the yard is in operation, we considered it desirable to establish the helper's hours from 11:00 a. m. to 7:00 p. m., which permits uninterrupted work of cleaning and lubricating for approximately the four hours from 3:00 p. m. to 7:00 p. m.

### Depends Upon Traffic

By W. H. ELLIOTT

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THE maintenance organization for a car retarder installation should be based on the amount of apparatus to be maintained and the quantity and quality of traffic being handled. If the car retarders are being worked to capacity with important traffic which cannot be delayed without material loss, it is desirable that a maintainer be on duty continuously and the necessary night and relief men provided. If traffic is light and occasional delays are not objectionable a smaller organization will be sufficient.

An installation with 30 retarders, 30 power-operated switches and 30 skates with hump and trimmer signals should be properly taken care of with one leading maintainer, one maintainer, one assistant maintainer and one helper; relief maintainer and night maintainer may be provided in addition if required.

If it is planned to have the maintenance work done periodically by an extra gang and the maintainers cover only emergency trouble, a smaller organization can be used, although as a rule the greatest economy is obtained by having a leading maintainer in charge and keeping up with running renewals and repairs.

## Light-out Protection

*"In light signaling what are the advantages and disadvantages of the various methods of preventing signal failures that are caused by lamp failures?"*

### Auxiliary Light-Signal Unit Controlled by Light-Out Relay

By J. A. JOHNSON

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THE May issue of *Railway Signaling* describes the method we used in our recent installation of color-light signals. An auxiliary light-signal unit, with a yellow lens, is mounted on the signal mast 2.5 ft. on centers below the lower unit of the main signal. An ANL-2 relay, connected as shown in the sketch, performs the following function: If the lamp filament in the green or yellow unit of the main signal should burn out when the clear or caution circuit, respectively, is set up, the auxiliary unit will be lighted through a back contact of the light-out relay, since

