snowfalls, we have considerable maintenance problems, among which is that of combatting the moose. The following incident actually occurred at Mile 176:

Our maintenance lineman, H. D. Benston, stationed at Willow, was notified of a break in the Commercial south of Willow, approximately eight miles. Mr. Benston started on his gas car for the scene of trouble, running ahead of train No. 25 at approximately 4:30 to 5:00 p.m., which is heavy dusk. He located the scene of the trouble and, as a marker, placed his snow shoes alongside the track, continuing on to Houston to clear No. 25. This was due to the fact that there was no opportunity to set his gas car off, because of a four to five-foot bank of snow along the track. He then returned in darkness, located his snowshoes, and walked out toward the line. He found the break, spliced in a piece of wire and started for the pole to complete the splice, as was the customary procedure, but the wire pulled back. Mr. Benston thought the wire was caught on a bush and pulled again, but the wire pulled back again. So, he walked back toward the source of apparent trouble and found a big moose tangled in the wire. He had his dog, a MacKenzie River Husky named Mike, with him, so he "sicced" the dog on the moose. The moose chased the dog, the dog ran for Mr. Benston, and he had to run up the pole. Moose and dog were both tangled in the wire, but the moose finally became disentangled and wandered off. Mr. Benston completed his work but, in the meantime, from the top of the pole, he called me at home and reported the incident, stating that the moose refused to cooperate.

We have had considerable trouble with moose, and it finally reached a point where we had to authorize our linemen to carry rifles to protect themselves, for moose have been known to charge gas cars and even locomotives.

CODED TRACK CIRCUITS

"What are the reasons why coded track circuits can be much longer than conventional d.c. track circuits, and what are their practicable limits?"

Can Use Higher Voltage

By S. M. Day
Principal Assistant Engineer
General Railway Signal Company
Rochester, N. Y.

To clear a signal, the armature of a code-responsive track relay must continuously make and break its contacts in response to the "on" and "off" periods of the current fed to the rails through the code transmitter. If the armature stops (with contacts either open or closed), the signal goes to Stop. The train shunt resistance need only hold the current to a point just below the relay's *pick-up* value.

In a steady-energy track circuit, the shunt resistance must lower the current to the *drop-away* value of the track relay. Thus, a code-responsive track relay stops operating as soon as the current through it falls below its picked-up value, even though such a current is well above the *drop-away* current of a steady-energy track relay.

Since the *pick-up* current of any relay is considerably higher than its *drop-away* current, it follows that (given the same track circuit conditions for each) we can use higher voltage at the feed end of a coded circuit and still get proper shunting sensitivity. Higher feed voltage makes possible extension of the track circuit, still maintaining shunting sensitivity equal to or better than with steady-energy circuits. It is usually safe to assume that when coded circuits are replacing steady-energy circuits which have operated satisfactorily, lengths of coded circuits can be twice that of the steady-energy circuits.

TESTING LIGHTNING ARRESTERS

"What procedures do you use in the field or in the shop to test lightning arresters to determine whether they are defective?"

Further Explanation

By N. L. Altland
Communications Engineer
Atlantic Coast Line
Savannah, Ga.

Following is a more detailed discussion, regarding the testing of lightning arresters, in connection with my remarks on the subject published on page 321 of the May issue, in which was stated, "Neon-type lightning arresters are tested with a spark coil and the color of the gas observed. Observation and comparison checks are made on ordinary arrester blocks."

When applying the voltage from a spark coil across a neon arrester that has been in service, the color of the gas in the tube should be compared with the color of the gas in the tube of a new or unused similar type neon arrester tested with the same spark coil and in a like manner. Two different spark coils will vary considerably in output voltage and this voltage will, to a certain degree, vary the color of the glow in the neon tube. Thus, in making the comparison, if the color of the glow in the used arrester is different from that of the new or unused one, the break-down voltage of the used arrester has changed and should be replaced.

If you have an idea you think would be of interest and help to others in the field, please write to the editor.

BATTERY BOX MOISTURE

"How do you keep moisture out of signal battery boxes on the ground in bringing underground cables into the boxes?"

Mounted Above Ground

By J. E. Hackman
Supervisor Telephones & Signals
Lehigh & New England,
Bethlehem, Pa.

Battery boxes in the main are of treated-wood construction, Celotex lined, pier mounted 1 ft. above ground level, with two screened openings 6 in. from the top to provide cross ventilation, and the cable entrance through a plugged circular hole. Battery boxes as a whole are of simple construction.

The main reason for above-ground level mounting of battery boxes is largely due to poor surface drainage, rather than moisture elimination. However, we do find moisture, but believe our method of mounting above ground level has been a contributing factor toward moisture reduction.

Sand and Sealing Compound

By C. E. Pinkston
Signal Supervisor
Louisville & Nashville
Nashville, Tenn.

Moisture is kept out of battery boxes by filling the cable entrance with sand after the cable is in place, up to about 2 in. of the surface, then covering the sand with about one inch of Victolac. For the past five or six months, we have been sealing cable entrances in battery boxes and foundations with Dux-Seal, furnished by Johns-Manville Company, and the latter method is proving very satisfactory. It is doing a good job of sealing and is easy to apply or remove.