

Heavy snowfalls, drift-forming winds, and snowslides make winter railroading near the Arctic Circle difficult and expensive. In this article the author discusses some of the snow removal problems on the Alaska Railroad and their solutions.



This half-mile long slide was cleared in 48 hr. of round-the-clock work by . . .

Big Machines Defeat

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Left—Map of the Alaska Railroad. The northern terminus of this road at Fairbanks is only 100 mi. from the Arctic Circle. Below—Cleaning up a yard with one of the Alaska Railroad's four Jordan spreaders. These utilitarian units, useful in summer as well as in winter, economically handle the greater part of the snow removal work on this road

• For the past several years, nine cents out of every dollar expended by the Alaska Railroad on maintenance of way has gone for snow removal. This 470-mile long government-owned line operates a total of 539.2 miles of track. Its northern terminus at Fairbanks is only 100 miles from the Arctic Circle. From December to April, the road must combat snow and its ally—winds which whip up heavy drifts and set snowslides in motion.

Snow-removal equipment on the road consists of the following units: Four Jordan spreaders, two rotary snow plows, two Russell plows, 4 bulldozers, two Tournapulls, and four Snow-Gos. A Barber-Greene snow loader-melter, with a 12,000-gal. melting tank, was put into operation recently. It will be used in yard operations when snow is falling and before it becomes packed. All locomotives, the two rotaries, the Jordan spreaders and the Russell plows





... bulldozers, which scraped a trail along the top, and a 125-ton rotary plow pushed by two 2-8-0 steam locomotives

Big Snow Troubles

On the Alaska Railroad

are equipped with flangers. In addition, locomotives are equipped with pilot snow plows.

Particularly troublesome is the Broad Pass area, halfway between Anchorage and Fairbanks. This section crosses the Alaska Range on a summit 2,363 ft. high. On the south slope of the range, way-stations are buried under the heaviest snowfalls in Railbelt Alaska. For example, on February 10, 1949 Honolulu, 24 miles south of the summit, had 80 in. Hurricane, six miles south of Honolulu, recorded a total of 75 in. Cantwell, however, only seven miles north of the summit, on the inland slope, had a snowfall of only 27 in.

Another area of considerable snowfall and wind is the Tunnel-Grandview section between Anchorage and Seward in the Kenai Peninsula. On February 10, 1949 Grandview had a total snowfall of 80 in. and Tunnel, 39 in. These stations are only six miles apart.

Snowslides can bury the right of way in a number of different

places on the Alaska Railroad. The chief trouble spot, however, is the Turnagain Arm route where the track skirts the base of steep mountains for 30 mi. The track occupies a narrow man-made ledge or grade bench between the mountains and the Arm, a narrow body of water that pokes a finger eastward from Cooks Inlet.

On one occasion six slides sealed off the Portage section for two days. One of these slides, possibly the record single slide on the Alaska Railroad, covered nearly a half mile of track, extending from Mile Post 78 almost to Mile Post 78.5. In places the snow was 60 ft. deep over the track. The slide snapped off telephone poles, uprooted trees, and bowled over rocks.

Experience with this slide emphasized the value of bulldozers. With hard-packed deep snow, the bulldozers can knock the top of a slide down to rotary size. The Alaska's bulldozers are Caterpillar D-4s, D-6s, D-7s, D-8s, and HD-14s.

The procedure followed at the giant slide at Mile Post 78 was typical of this type of job. First, three bulldozers, working all night, scraped a rough trail across the top of the slide. The snow was extremely hard packed. Snow plummeting down a mountain is compressed to an almost unbelievable hardness. Actually, when it arrives at the base of the mountain after traveling a mile or more, it is a mass of rough white ice. The "cat-skinners" skillfully rolled up a carpet of snow and pushed it toward the edge of the water. After they had cut the trail, they returned and hollowed out the snow banks.

Ahead of them one of the road's two rotary plows was in action headed south. (This particular rotary had cleared a slide at Mile Post 79 and had moved through the area at Mile Post 78 a few hours before the big slide hurtled down.)

A slide at Mile Post 76 proved how useful bulldozers can be when used in conjunction with a rotary. The rotary tackled this slide from the north end. Two bulldozers worked on the same slide from the south end. They soon approached the rotary and helped smooth the way by cutting down the banks, by keeping snow from falling in on the rotary, and by rolling snow-carpets out of the way. This combination—a ro-



A rotary snow plow in action in the Curry yards. This type of unit is used in the yard-cleaning work when the snowfall is extremely heavy and snow is hard-packed

tary and bulldozers—apparently makes the best mechanical team for leveling big snowslides. The dozers are particularly useful when the slide is "dirty"; that is, when the snow contains dirt, rocks and trees.

After clearing the slide at Mile Post 76, the rotary went to Portage, eight miles away, turned around and returned to work on the slide at Mile Post 78. With six bulldozers and the rotary as team-mates, the slide was speedily cleaned up.

Years of experience with snowslides on the Alaska has enabled Anton Anderson, assistant chief engineer, to classify slides in the following ways:

1. **Guleh slide.** In autumn, wet sloppy snow picks up dirt and rocks which have not yet frozen tight on the mountain slopes, and topples them down into the gulches which act as chutes for the downward plunge of the mass.

2. **Slick slide.** On top of a heavy fall of snow, a slick crust or glaze may form. Newly falling snow may shoot off the slick crust in a sheet as it might off a smooth tin roof.

3. **Comber slide.** Enormous combers are formed by the wind depositing damp snow on the lee side of mountain crests. Sometime these overhanging combs extend 150 ft. over the edge of the mountain, and they can be thousands of feet long. When broken by excessive weight, these combers shoot down the mountain side with tremendous speed. Their enormous weight makes this type of slide the most dangerous. The slide often occurs after a sudden thaw.

4. **Sun slide.** The sun thawing the snow in the spring can cause a slide.

On a warm day, usually from noon until about 4 p. m., the danger of this type of slide is at the maximum. The Alaska changes train-operating schedules when necessary, so that trains will not be subjected to this danger.

For snowdrifts, the rotary, ordinarily, is the most useful piece of equipment. The Alaska's second rotary is an American Locomotive Company, 212-ton unit, built in 1930. This rotary is normally stationed at Broad Pass. The other rotary is stationed at Portage. U-shaped cuts made by rotary plows fill with snow later and must be cleaned out again with a rotary. Plow or spreader types of equipment would pack the snow more solidly against the sides of such cuts, whereas the rotary can "fire-hose" the snow out of such slots. However, there is this problem with the rotary: Chunks of hard snow, shooting out with force from the rotary, often endanger nearby telephone pole lines.

The bulk of our snow-removal work is done by the four Jordan spreaders. They are all Type-A, each weighing 57.5 tons. Economical to operate they are useful in both winter and summer. Two of the spreaders have the high extension front and two have attachments for ditching. The ice pick attachment on the nose or middle section is useful to gouge out ice.

In fighting snow from Curry to Windy, the following procedure is normal: Early in winter when the first snow falls, the Russell

plows are most useful. One of these is a 42-ton unit, built in 1944. The other was more recently acquired. As the depth of the snow increases, the railroad generally uses the rotaries for snowstorms, and the Jordan spreaders for clean-up work. The Jordan spreaders, the maintenance of way department has found, save money.

A typical operation for cleaning up heavy snowfalls in the Curry yards, a division point, is as follows:

1. Use the Jordan spreader to clear some space and make some "elbow" room.
2. Plow out a path with the spreader to the first cut of cars and then set them clear.
3. Go to the second track and pull the cut of cars in clear.
4. With the spreader, plow snow on the main line to Track 1.
5. Go to Track 1 and push the snow to Track 2.
6. Pick up the cars and send them to Track 1.

In the Curry yards, a rotary works in conjunction with the Jordan spreader. The rotary takes over the job when the snow is heavy and hard-packed.

The two 6.5-ton LeTourneau Tournapulls are helpful, particularly in yard-clearing work, to carry off the snow. The Tournapulls have been used recently to help remove heavy snow from the area around the passenger depot in Anchorage.

The four Snow-Gos, powered with six-cylinder gas engines, are truck-mounted snow plows. They are used in the yards. One is stationed at Curry, one at Anchorage and two at Whittier, one of the two ports of entry to the railbelt. A Snow-Go and bulldozers clean the unloading wharf at Whittier, which is Alaska's most modern dock installation. The Snow-Go also cleans the yard from the docks to a tunnel portal about two miles away.

In wind-swept Whittier, drifts 8 ft. to 10 ft. high are not uncommon. In both the Broad Pass and Grandview areas the fall of snow can be so heavy in 20 or 30 min. that it will halt a train. In the old days, with infrequent schedules, the Alaska kept a rotary ahead of each train. Now with the schedule stepped up considerably, this is impossible.