Ski Tows

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PROBABLY the most important problem in the construction of a ski-tow is that of maintaining the tension on the rope between the person gripping the rope and the engine. Immediately a person grips the rope, the rope goes slack between him or her and the rope drum on the engine itself. This causes the drum to spin impotently without transmitting any power to the rope, and thus the tow cannot hoist its load of skiers. There are various ways of overcoming this. The first is by means of a jockey pulley. A weight is attached to the jockey pulley so that immediately there is any slackening of the rope the jockey pulley immediately takes up the slack and thus maintains the tension on the rope. This method is employed on the large Hamilton ski-tows in New Zealand. The second method used on the smaller portable Hamiltons is a pulley mounted on a kind of metal "wish bone," the legs of which are attached to the metal sledge on which the tow engine is mounted. Two coil metal springs keep a tension on the "wishbone" and through the pulley on to the rope and rope drum.

The third method (which I noticed on the very small portable tow in use at Mt. Robert by the Nelson Ski Club) is to have the whole engine mounted on a tubular steel frame. This frame, controlled by coil springs, is free to move inside another frame attached to the sledge. Thus, when the rope goes slack, the whole engine and rope drum slides back and thus maintains the tension on the tow-rope. The whole engine and tubular frames are mounted on a small toboggan. Another useful adjunct is a small block and tackle inserted between the toboggan and the anchoring device. The block and tackle is used to take up slackening due to the stretching of the rope.

A fourth method of maintaining the all-important tension has been reported to me from the Mt. Egmont snowfields in the province of Taranaki (North Island). I understand that with this tow, the sledge is not anchored and thus any slack is automatically taken up by the sledge with its engine sliding bodily downhill.

The next important question is that of some form of reduction gear to reduce the high rate of travel of the engine down to a speed that will run the rope fast enough to hoist the skiers and yet not too fast for the skiers to grab. This is best done by means of a reduction gear box incorporated in the structure of the engine, although an external reduction gear can be made out of pulleys; wheels from an old motor car gear box; or, possibly, if the metal was sufficiently hard, of cream-separator parts.

Another important point is, that with small tows, it is best to site the tow on a concave and not a convex slope so that the possibility of any dragging of the rope in the snow is reduced to the absolute minimum. Even the slightest drag in the snow seems to cause considerable loss of effective horse-power. Also, a rope dragging in the snow picks up snow crystals that cut the rope when rubbed against its fibres by the various pulleys.

A ski-tow must also have a safety device so that in the event of any skier not being able to get free from the rope, the engine will be stopped before the skier is carried up to the top pulley. At Queenstown this was accomplished in two ways. On one tow a cord was stretched across the tow-track. Any skier who might be carried on would hit the rope which was tied to a knife-switch and thus stop the engine by breaking the circuit. The other tow's safety device was worked somewhat on the same lines, but the trip-rope was connected to the clutch of the engine.

I have already discussed the question of the skier gripping the rope by means of a kind of "nut cracker' 'handpiece in my article on New Zealand. This handpiece, connected to a broad canvas belt, means that instead of the skier having to depend on the strength of his arms to hold the rope, is effortlessly taken up the hill by a steady pressure on the small of his back. The essential of any handpiece must be that if the skier either voluntarily or involuntarily lets go of the handpiece, it must fly open easily and readily let the skier drop clear of the rope.

The beginners in New Zealand did not have, as far as I could see, any difficulty in handling the tows over there, but I think that any ski centre should have at least one ski-tow on some easy country suited to the beginners' limited supply of technique.

The cooling of the tow engine is of some importance. I noticed that the Hamilton tows at Queenstown showed a tendency to over-heat. One was a big 26h.p. Bedford truck engine, and the other a Ford 10 engine. I feel that both these engines, being intended for mobile vehicles, missed the cooling effect of the air rushing through the radiator, and therefore, I think that where such an engine is used for a static task such as a ski-tow, an additional water tank should be coupled into the normal cooling system.

One final point is that while it is optional to place the ski-tow engine either at the top or the bottom of the chosen slope, it is more desirable to have the engine at the bottom, because it is easier to ski down to re-start an engine than to ski uphill and do the same thing.

The cost of ski-tows varies from £800 (the big Hamilton tow) to £500 (the small Hamilton) and then down to the £80 Briggs and Stratton engined home-made tow of the Nelson Ski Club. Possibly they could be made more cheaply still. They are not always easy to make work—there were three ghastly failures littering the snows of Ruapehu last season—but every ski club in Australia should tackle this problem by setting to work to construct its own tow.

Mr. G. W. A. Day, of the Canterbury Winter Sports Club (which functions in the Craigieburn Mountains outside Christchurch) has sent me some details of a tow they have just installed and with which they are delighted. It was designed and constructed by Richard Simmers, an enthusiastic club member. It is known as the "Simtow" in honour of its creator.

The power unit is a 6.5h.p. Briggs and Stratton air-cooled motor which has a built-in governor, and a 5 to 1 reduction on the output shaft to which an old T-model Ford clutch will fit without any alteration. From the clutch the drive goes through an old Hudson differential built into a square box to contain oil. This gives a further reduction of 6 to 1, an over-all reduction of 30 to 1. The differential is connected to the main triple groove drive pulley by means of a Reynolds link coupler. The rope feeds over an idler into the main drive and then over the double groove tow idler and out over another idler pulley. The rope is 5-8in. diameter manila. The tension take-up at the back is over a set of block and tackle on to a sack of rocks. The motor and ancillary gear is bolted on to a wooden sledge. The gear is designed to take up to 25h.p. and the pulley grooves are V-shaped, so that at any time the present motor can be replaced by a heavier one with heavier and longer rope. The present tow lift is 220 vertical feet in 250 yards with two intermediate pulleys mounted on 2in. piping. The total cost was £150. The capacity of this tow is 5 or 6 skiers on the rope simultaneously and the time taken is 1½ minutes from the bottom to top. The tow runs from 5½ to 6 hours on a gallon of petrol. Mr. Day concludes his letter by saying that if any Australian clubs are in-

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terested, he feels sure that Richard Simmers would be only too glad to supply specifications.

I called in specially at Kiandra to get information about the ski-tow there, but beyond the fact that it was driven by a jeep, Mr. Reid could not give me any particulars.

In conclusion, I now append some notes kindly sent me by Mr. A. W. Keown, the Superintendent of the Refreshment Services of the Victorian Railways. Victoria is at least doing something to catch up on the long lead that New Zealand has gained on us in the matter of ski-tows.

The Tow at Mt. Buffalo, Victoria.

In 1937 the first ski-tow in Australia was operated at the Cresta Run, Mt. Buffalo National Park. It was a rope tow, designed and erected by Messrs. Affleck and Berger, of The Chalet staff. It operated spasmodically for two seasons but, for various reasons, was not entirely successful, and only strong and comparatively skilled skiers could master the technique. Subsequently, a more elaborate ski lift was built at Charlotte's Pass, Mt. Kosciusko.

The Committee of Management of Mt. Buffalo National Park—as mentioned in another article in this issue—is erecting another rope-tow at Dingo Dell. The tow has been designed by Mesrs. Hall and Heikkila, two Canadian ski instructors brought out by the Victorian Railways Department during the 1948 snow season, and they are supervising its erection.

It is an 800ft. tow of about 170ft. rise, powered by a V8 Cadillac engine with alterations to the differential to provide optimum running speed. The poles are disused railway rails. Accidental operation of a safety device, fitted by means of a gate at the top, breaks an electrical circuit and switches off the engine ignition. Manila hemp rope is the most desirable medium, but the dollar shortage reared its head and forced the Committee to employ sisal which, being specially water-proofed, may be as effective, if not as long-lasting, as manila. Both daily and weekly tickets will be available and the tow will run, snow conditions permitting, every day, Fridays excepted.