a 1 7in. diameter by 24 in. stroke 2 cylinder engine. Steam was supplied by a locomotive type boiler, having 1,259 sq. ft. of heating surface and carrying 180 lb. pressure. The cutting wheel was supported by an 8½ in. diameter shaft geared to the engines. The shaft was supported in a main bearing 34 in. long. These snow ploughs, as well as many other early rotaries, were equipped with a wheel of the fan type, illustrated in fig. 25. The back of this wheel consisted of steel plate, to which the fan blades, or partitions, were secured. The fronts of the partitions were supported to heavy inner and outer rings. The reversible cutters were supported by trunnions riveted to these rings. When the plough was in operation the revolving knives cut the snow and delivered it into the space between the partitions. The snow was then carried around the casing until the top opening was reached, through which it was thrown in a straight line by centrifugal force. Fig. 28 shows how these cutting knives were supported and how they assumed a cutting position, no matter in which direction the wheel revolved. In light and dry snow these wheels were satisfactory, but in heavy work their construction proved inadequate. In wet and heavy snow the partition and cutting plates buckled and the supporting rings became distorted. This caused the knives to fail and the wheel to jam in the casing. These troubles were overcome by heavier construction.

This fan type wheel is still in service on very many railways. It is the opinion of most users, an opinion endorsed by J. S. Leslie, that a well constructed, heavily built, fan type wheel is the most efficient snow remover that has yet been devised. On these ploughs the boiler, the engines, the main shaft and gears were supported on an underframe the sides of which were steel channels. At the front these side members were tied together by a very large casting which formed the bed for the main wheel shaft and the engine shaft bearings. Back of this casting two sills extended to the rear end sill. A wooden cab protected the engines and boiler. The plough, without the tender, weighed 125,000 lb.

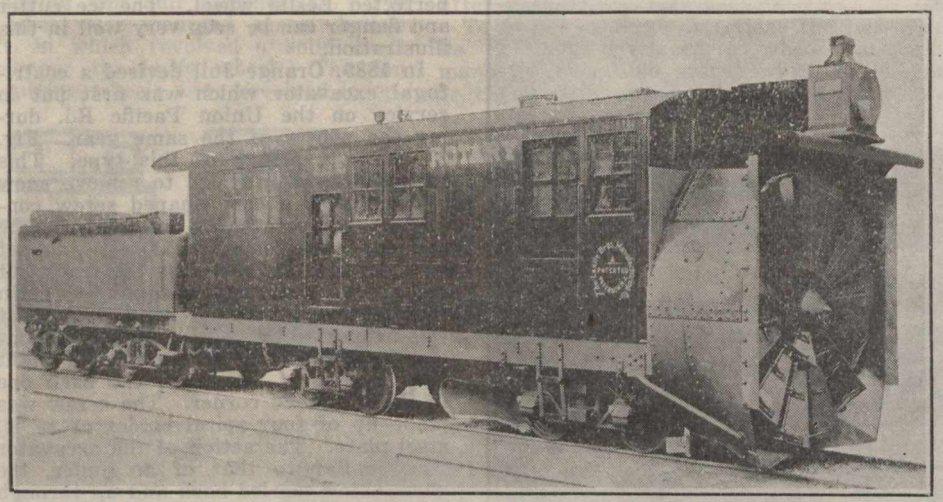

Fig. 26. Leslie Bros. Rotary Snow Plough, with Ice Cutters and Flangers.

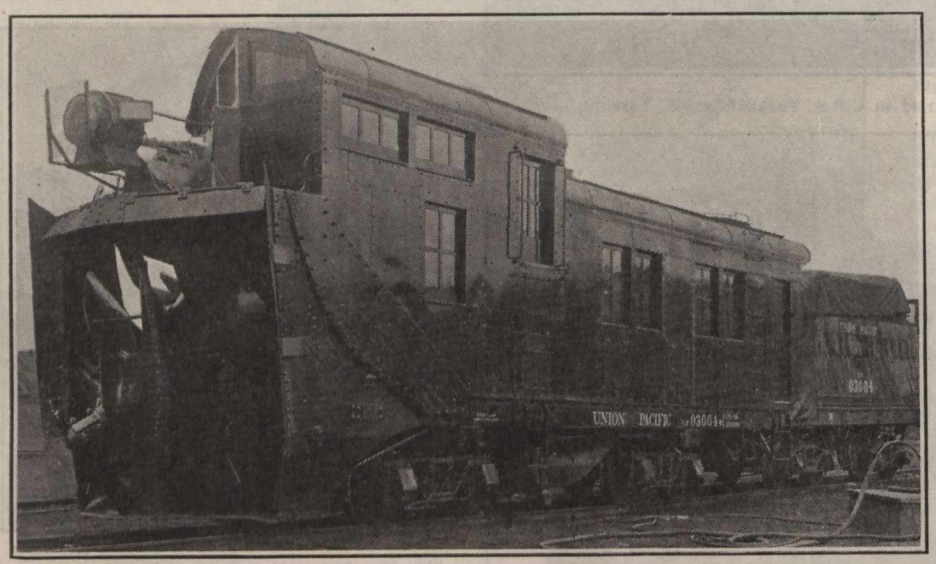

Fig. 27. Jull Centrifugal Snow Excavator.

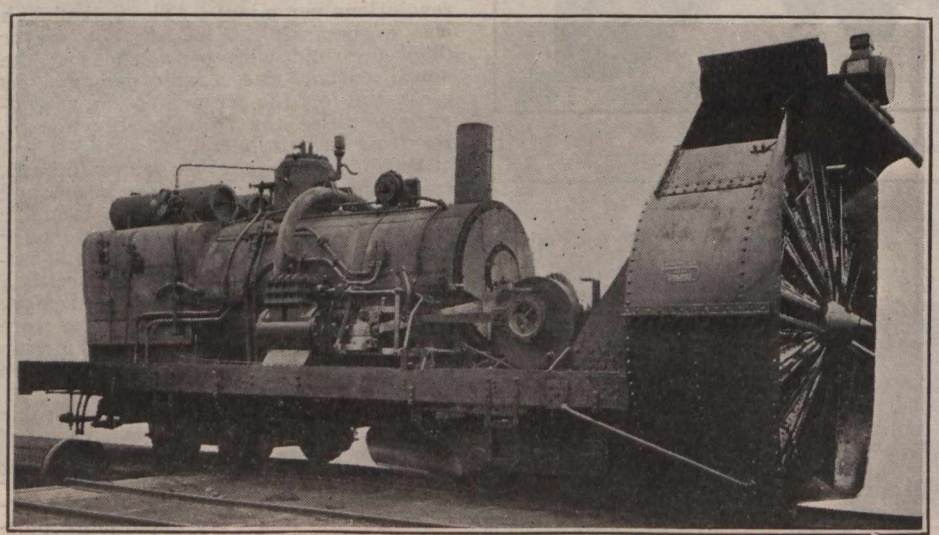

Fig. 30. Boiler and Machine Arrangement of Rotary Snow Plough, built by American Locomotive Company.

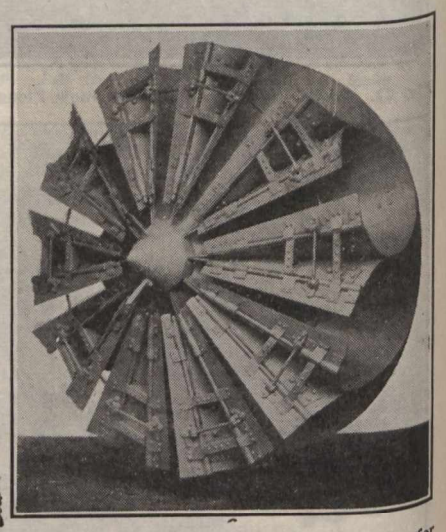

Fig. 29. Leslie Bros.' Scoop Type Wheel, for Rotary Snow Plough.

The Leslie Brothers also developed the scoop type of wheel shown in fig. 29. Mr. J. S. Leslie states that this wheel was developed to handle the soft, fluffy, wet snow found on the Pacific slope near the citrus belt. Such snow had a tendency to adhere to and clog the partitions of the fan type wheel. Reference to the figure shows that the wheel is composed of 10 cone shaped radially placed scoops, the backs of which are fastened to a steel plate. The surface of these scoops is smooth to prevent snow from adhering. Each scoop is open its entire length on the front side. A cutting knife is hinged on each side of the opening. These knives adjust themselves automatically into cutting position. The knives on the adjacent edges of each scoop are connected by links so that when one knife is cutting snow the other knife is depressed to afford the necessary clearance.

With the exception of special ploughs, the general construction of the modern