

must insure him a reduction in his annual power bills sufficient to pay the annual fixed charges and expenses incident to the battery, plus a fair return on the battery investment; or, in other words, the yearly fixed charges and operating expenses per kilowatt of the battery (meaning the total annual cost of the battery divided by the maximum number of kilowatts cut off the peak), must be less than the fixed charges and fixed expenses per kilowatt per year of the power company.

The power company's method of determining the peak has a distinct bearing. For instance, if the peak load of a railway is assumed to be the maximum one hour average load in one case, and the maximum five minute average load in another, the same size of battery might meet both conditions, and, therefore, cost the same, but it could reduce the peak more in the latter than in the former case, thereby effecting a larger return on the investment.

The power company's method of determining its fixed charges per kw. is also pertinent to the battery situation. In the case of a steam plant these charges can often be based on the overload rating of the generating units, while with a hydro-electric plant they can figure on very little, if any, overload capacity, as the generator would probably be installed with a continuous rating nearly equal to the water wheel capacity. If the charges are based on overload ratings, the reduction of a certain amount in the peak would result in less reduction in the consumer's bills than if based on continuous ratings.

In conclusion, I would say that I have only attempted to point out in a necessarily brief way a just basis or form of power rate, and the discussion of such kindred subjects as off-peak loads, wholesale rates to large users, etc., are hardly within the scope of this paper. Local conditions may arise, and do arise, in specific cases necessitating some departure from this general form, but the fact remains that the nearer rates in force approach this basis the more equitable they become.

RAILWAY ACCIDENTS FOR SEPTEMBER.

Record for Month Shows Improvement in One Direction.

So far as passengers are concerned, signs of a welcome improvement are noticeable from a glance at a record of the accidents which occurred on Canadian steam railways during September. It is worthy of note that not a single passenger was killed, while only five were injured. This is gratifying. But the figures which relate to employees do not compare with the record for August nearly so favorably. The totals for the two months are as follows:—

	Passengers		Employees		Others.		Total.	
	K.	I.	K.	I.	K.	I.	K.	I.
1909								
September	0	5	18	15	15	7	33	27
August	4	5	6	8	22	2	32	15
Difference	-4	0	+12	+7	-7	+5	+1	+12

It should be possible to prevent many of the accidents to employees. Five brakemen lost their lives by falling from freight cars, two deaths were caused by defective equipment, and four men were killed while shunting operations were in progress. There is much room for improvement in this direction. Fourteen of the accidents, due to trespassing, could have been avoided. Five persons were killed at grade crossings. Here is the month's record for the steam railways:—

Character of Accident	Passen-		Em-		Others.		Total.	
	K.	I.	K.	I.	K.	I.	K.	I.
Deraiment	2	..	..	..	2	..
Head on Collision	1	..	..	..	1
While Shunting	4	..	..	..	4	..
Highway Crossing	5	3	5	3
Fell off Freight Cars	5	6	..	..	5	6
Trespassing	10	4	10	4
Pitch in with hand car	1	..	..	..	1
Adjusting Couplings	2	..	..	..	2
Passengers falling off	2	..	..	..	..	..	2
Working on track	2	..	..	..	2	..
Attempt to board moving train	1	..	..	..	..	..	1
Unclassified	1	1	..	..	1	1
Working on Cars	1	..	..	..	1	..
Suicide (attempted to)	1	..	..	..	..	..	1
Side ladders	1	..	..	..	1
Jumping off train	1	..	..	..	..	..	1
Collision (rear end)	1	..	..	..	1
While Switching	1	..	..	..	1
Working under cars	1	..	..	..	1
Struck by switch stand	1	..	..	..	1	..
Locomotive Explosion	2	..	..	..	2	..
Totals	0	5	18	15	15	7	33	27

In the United States.

Railway loss and damage claims and injuries to persons cost the railway companies of the United States \$56,700,000, according to statistics collected by Mr. Slason Thompson of the Chicago bureau of railway statistics. This is an increase of nearly \$10,000,000 over the amount paid in 1907, while ten years ago, in 1898, the payments were only \$12,182,000. These payments now absorb nearly 2% of the gross earnings. In some sections the damage claims are much heavier than in others. In Texas, in 1908, 5.19% of the railways' revenue went to pay claims for losses, damages and injuries to persons. In Pennsylvania alone, 26 were killed and 109 injured in six months, at grade crossings.

The statistics for the electric, which we give below, for August and September, are not so encouraging. Comment is unnecessary:—

	September, 1909.	
	Killed.	Injured.
Run over	1	5
Fell off	3	7
Struck	2	7
Deraiment	—	2
Attempted suicide	—	1
Alighting from moving car	1	4
Attempting to board moving car	—	3
Collisions	—	3
	7	32
August '09 totals	3	27

Recent action of the Winnipeg Board of Control is to be commended. Following the death of the victim of a street car accident, they asked the provincial government to take up the question of compelling the use of the most modern fenders and wheel guards on all street cars in operation in the province of Manitoba. It is the opinion of the board that the frequency of fatal accidents and accidents which inflict grievous bodily injury calls for radical measures to be taken.

(Continued on Page 411.)