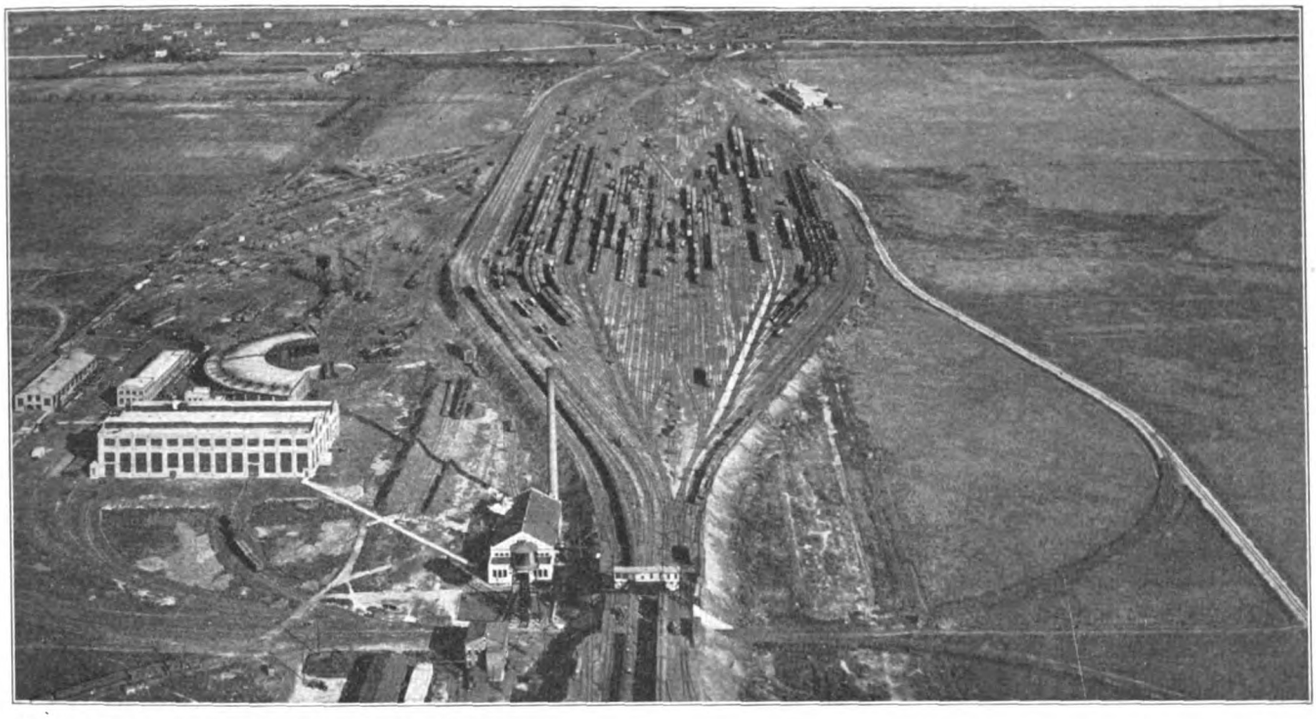


Aeroplane View of the Hump and Eastbound Classification Yard

Humping Four Thousand Cars a Day

The methods by which the Belt Railway of Chicago classifies a heavy traffic at Clearing, Ill.

THE Belt Railway of Chicago classifies about 1,500,000 cars of freight annually in its yards at Clearing, Ill., just southwest of Chicago. This is the equivalent of 125,000 cars per month, or slightly more than 4,000 cars a day. In one 10-hour shift during a busy season, 3,007 cars have been classified, or more than 300 cars an hour and it is estimated that it is possible to classify 10,000 cars a day in these yards.

The Belt Railway of Chicago is the inner of the three belt lines serving that city and is owned by 13 railroads. Connection is made with all of the railroads entering Chicago. The traffic moving through Clearing consists largely of the general run of raw materials and manufactured products with large seasonal movements of coal and grain. In addition, an average of about 500 cars of perishables is handled daily during the summer season.

Clearing Is Largely an Interchange Yard

Clearing yard was constructed in 1915. It is situated practically midway between the termini of the Belt railway and extends due east and west. The yard is about five miles long and a half mile wide and contains 180 miles of tracks. Twelve of the 13 owning lines operate into Clearing with their own crews and thus effect what amounts to practically direct interchange.

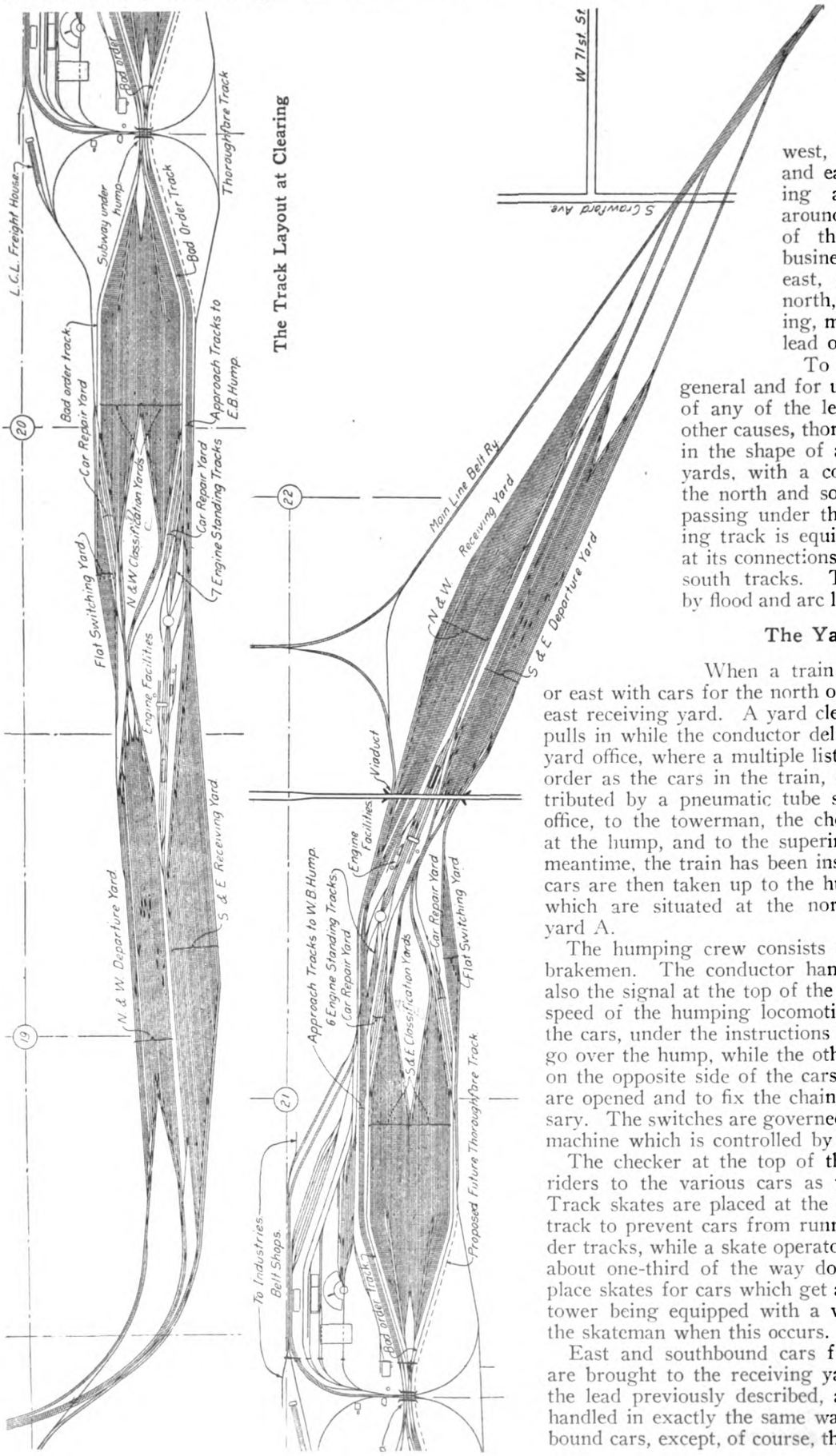
In nearly all cases the transfer crews that bring trains in also take trains out, eliminating light runs, conserving power and increasing efficiency. The receiving and departure yards are so located as to facilitate this practice, the north and westbound receiving and departure yards being side by side at the west end of the yard and the east and southbound yards being adjacent in the east end of the yard. Transfer crews bringing trains into the receiving yards are thus enabled to pick up outgoing trains from the departure yard with a minimum of switching. The general scheme of operation tends to keep the cars in a direct movement east and west.

The classification yard consists of four units, containing 26 classification tracks each and the leads over the hump are so arranged that it is possible to hump cars with four crews at the same time, operating each yard as a separate unit. These units are known as A, B, C and D; A being the northeast unit, B, the southeast unit, C the southwest unit and D the northwest unit. The tower at the head of the hump extends over all four leads and is equipped to accommodate four towermen. In actual practice, however, it has been found necessary to utilize only two of the four units for interchange classification, A and C, one on each side of the hump, the other two, B and D, being used to classify business for the 375 industries located on the line of the Belt railway and for company coal. Occasionally, during times of heavy business, B and D yards are also used for the overflow from the interchange classification yards, A and C.

In addition to the classification yards, there are two flat switching yards, one located just east of classification yard B, and the other just west of classification yard D. Receiving and departure tracks for the eastern and southern lines are situated side by side at the extreme east end of the yards, while the same facilities for the western and northern lines are at the extreme west end. An icing station in the east yard is equipped with the necessary tracks to take care of perishable traffic. Turntables and water tanks for transfer engines have been

built along the leads in both the east and west yards.

The Belt railway runs west from its eastern terminus at South Chicago to Clearing, where it turns north and continues in almost a straight line to its northern terminus at Cragin Junction. The yard forms a continuation of the east and west line and lies at right angles to the north and south line. This made necessary the construction of a lead from the north and south line to the west end of the yards. All cars from the north and west, intended for the south and east and requiring humping at Clearing, must go around the lead to the west end of the yard. Similarly, all business from the south and east, going to the west and north, and humped at Clearing, must be handled over this lead outbound.



The Track Layout at Clearing

To facilitate movements in general and for use in case of a blockade of any of the leads due to accidents or other causes, thoroughfare tracks, roughly in the shape of a figure 8, encircle both yards, with a connecting track between the north and south thoroughfare tracks passing under the hump. This connecting track is equipped with a double wye at its connections with both the north and south tracks. The yard is illuminated by flood and arc lights for night operation.

The Yard Operations

When a train arrives from the south or east with cars for the north or west, it is placed in the east receiving yard. A yard clerk checks the train as it pulls in while the conductor delivers his bills to the east yard office, where a multiple list is prepared in the same order as the cars in the train, copies of which are distributed by a pneumatic tube system to the west yard office, to the towerman, the checker and the conductor at the hump, and to the superintendent's office. In the meantime, the train has been inspected for defects. The cars are then taken up to the hump over the lead tracks which are situated at the north side of classification yard A.

The humping crew consists of a conductor and two brakemen. The conductor handles the switch list and also the signal at the top of the hump which governs the speed of the humping locomotive. One brakeman cuts the cars, under the instructions of the conductor, as they go over the hump, while the other brakeman is stationed on the opposite side of the cars to see that the knuckles are opened and to fix the chains for the riders if necessary. The switches are governed by an electro-pneumatic machine which is controlled by the towerman.

The checker at the top of the hump assigns the car riders to the various cars as they go over the hump. Track skates are placed at the end of each classification track to prevent cars from running out and fouling ladder tracks, while a skate operator is stationed in a shanty about one-third of the way down the switch ladder to place skates for cars which get away from the riders, the tower being equipped with a whistle signal for calling the skateman when this occurs.

East and southbound cars from the north and west are brought to the receiving yard at the west end over the lead previously described, and their classification is handled in exactly the same way as the north and westbound cars, except, of course, that they move through the

yards from west to east and use the south lead over the hump instead of the north lead. Duplicate facilities are provided for both movements.

A Typical Day

The accompanying analysis at Clearing was made covering hump operations on March 23, a typical day for this season of the year, when 1,947 east and southbound cars and 1,868 north and westbound cars were humped, a total of 3,815 cars:

A summary of these figures indicates that the average elapsed time between the arrival of the cars in the receiving yard and the time they were humped was 2 hr. 9 min. on the day shift, and 1 hr. 34 min. on the night shift for A and B yards; and that it was 2 hr. 58 min. on the day shift and 3 hr. 35 min. on the night shift for C and D yards, or an average elapsed time on all cars humped of 2 hr. 49 min. An analysis of the time consumed in humping is also interesting. The time given is the total elapsed time, which includes all delays and 30 min. for lunch. During the day shift 1,035 cars with 745 cuts were humped in the A and B yards in 9 hr. 5 min., or 31 sec. per car; while on the night shift 912 cars with 683 cuts were humped in 9 hr. 25 min., or at the rate of 37 sec. per car; in C and D yards the day shift humped 972 cars with 679 cuts in 9 hr., or an average of 33 sec. per car; while the night shift humped 896 cars with 651 cuts in 9 hr. 10 min., or 36 sec. per car. In other words, during the tour of duty of the two shifts working into the four yards, including minor delays, and two lunch periods of 20 min. each, a car rolled down the hill from each hump every 34 sec. Since the two humping leads were, of course, operated simultaneously, a car rolled down one of the humps every 17¼ sec.

These results were accomplished with 36 crews in the 24-hour period, of which 12 were on the hump, 12 pull-down engines, 2 engines on each shift on each side of the hump to pull cars from the classification yard to the departure yard and 6 engines for flat switching, roustabout work and industry switching in the Clearing district.

The supervisory force includes a superintendent, a trainmaster and an assistant trainmaster, whose offices are immediately adjacent to the hump at Clearing, but whose territory covers the entire line of the Belt railway. Clearing yard proper is supervised, in addition, by a general yardmaster, an assistant general yardmaster and 8 yardmasters. Of the latter, two are stationed at the east yard office, one at the west yard office and one at the hump. They operate in two shifts of four yardmasters each and the organization of the day and the night shifts is the same.

The Car Riders

In yards of this character, car riders are the greatest single factor tending to loss of time and money, unless properly supervised. Recognizing this, the officers of this road have devoted much time and attention to the problem of getting an efficient force of car riders and having it operate satisfactorily.

A total of 60 to 80 car riders is employed at Clearing each day. These men are all qualified switchmen assigned to hump service regularly and if a larger force is necessary they are called off the extra board as they are needed. Under this system an extra man may be riding cars one day and be employed in any of the other duties of a switchman the next. By this means, a higher class of men is obtained as riders than is usually possible and the personal injuries, damage to lading and equipment, and pilferage are all much smaller than if a less stable force were employed.

Each rider is handled as an individual, that is to say, they are not grouped in gangs but a record is kept of the daily performance of each rider as a separate unit. The checkers at the top of the hump, under the supervision

An Analysis of the Operations at Clearing

A AND B YARD

Day Shift

No. of cuts	Time of arrival	Time humping started	Time finished	No. of cars humped
34	4:15 a.m.	7:15 a.m.	7:35 a.m.	16
10	2:00 a.m.	7:15 a.m.	7:35 a.m.	35
43	6:05 a.m.	7:35 a.m.	8:00 a.m.	50
30	11:50 p.m.	8:00 a.m.	8:20 a.m.	42
35	2:25 a.m.	8:25 a.m.	8:40 a.m.	53
2	7:20 a.m.	8:50 a.m.	9:10 a.m.	7
14	7:50 a.m.	8:50 a.m.	9:10 a.m.	15
26	2:10 a.m.	8:50 a.m.	9:10 a.m.	34
43	7:50 a.m.	9:10 a.m.	9:30 a.m.	70
47	7:20 a.m.	9:30 a.m.	9:55 a.m.	66
8	8:15 a.m.	10:00 a.m.	10:05 a.m.	18
38	9:30 a.m.	10.20 a.m.	10:40 a.m.	44
42	9:45 a.m.	10:50 a.m.	11:15 a.m.	74
61	10:00 a.m.	11:20 a.m.	12:05 p.m.	91
50	10:00 a.m.	12:05 p.m.	12:25 p.m.	63
12	9:55 a.m.	12:55 p.m.	1:00 p.m.	16
95	12:15 p.m.	1:25 p.m.	2:05 p.m.	135
35	12:30 p.m.	2:05 p.m.	2:25 p.m.	44
48	1:15 p.m.	2:25 p.m.	3:05 p.m.	62
48	1:30 p.m.	3:05 p.m.	3:40 p.m.	59
23	1.15 p.m.	3:40 p.m.	4:20 p.m.	30
21	2:15 p.m.	3:40 p.m.	4:20 p.m.	27
	Total			1,035

Night Shift

36	4:15 p.m.	6:00 p.m.	6:25 p.m.	45
55	5:30 p.m.	6:25 p.m.	7:00 p.m.	70
13	4:00 p.m.	7:05 p.m.	7:10 p.m.	24
17	6:30 p.m.	7:10 p.m.	7:30 p.m.	22
33	4:15 p.m.	7:30 p.m.	7:50 p.m.	37
12	Holdovers	8:05 p.m.	8:15 p.m.	14
22	2:15 p.m.	8:15 p.m.	8:30 p.m.	27
55	7:20 p.m.	8:35 p.m.	9:15 p.m.	63
52	7:55 p.m.	9:20 p.m.	9:55 p.m.	65
2	7:55 p.m.	9:15 p.m.	9:20 p.m.	6
61	8:50 p.m.	9:55 p.m.	10:40 p.m.	102
52	9:35 p.m.	10:40 p.m.	11:20 p.m.	64
38	10:05 p.m.	11:55 p.m.	12:20 a.m.	60
52	11:05 p.m.	12:20 a.m.	12:55 a.m.	70
18	7:15 p.m.	12:55 a.m.	1:05 a.m.	23
21	11:00 p.m.	1:05 a.m.	1:25 a.m.	31
44	11:40 p.m.	1:25 a.m.	2:00 a.m.	63
19	11:40 p.m.	2:00 a.m.	2:20 a.m.	20
26	12:25 a.m.	2:20 a.m.	2:40 a.m.	33
56	2:20 a.m.	2:50 a.m.	3:25 a.m.	73
	Total			912

C AND D YARD

Day Shift

No. of cuts	Time of arrival	Time humping started	Time finished	No. of cars humped
23	3:45 a.m.	7:15 a.m.	7:50 a.m.	40
15	6:30 a.m.	7:15 a.m.	7:50 a.m.	23
58	2:25 a.m.	7:50 a.m.	8:30 a.m.	76
33	11:15 p.m.	8:30 a.m.	8:55 a.m.	44
4	8:50 p.m.	8:30 a.m.	8:55 a.m.	5
47	1:50 a.m.	8:55 a.m.	9:25 a.m.	57
28	4:25 a.m.	9:25 a.m.	9:50 a.m.	51
37	6:55 a.m.	9:50 a.m.	10:15 a.m.	70
42	7:45 a.m.	10:15 a.m.	10:40 a.m.	63
57	9:25 a.m.	10:40 a.m.	11:15 a.m.	76
50	9:35 a.m.	11:20 a.m.	11:50 a.m.	62
27	10:25 a.m.	11:50 a.m.	12:15 p.m.	38
40	10:05 a.m.	12:55 p.m.	1:20 p.m.	65
53	10:50 a.m.	1:20 p.m.	2:00 p.m.	73
12	11:40 a.m.	2:00 p.m.	2:30 p.m.	15
6	11:15 a.m.	2:00 p.m.	2:30 p.m.	8
16	3:15 a.m.	2:00 p.m.	2:30 p.m.	25
45	11:15 a.m.	2:30 p.m.	3:05 p.m.	53
24	1:40 p.m.	3:05 p.m.	3:30 p.m.	40
17	12:15 p.m.	3:05 p.m.	3:30 p.m.	24
45	1:30 p.m.	3:30 p.m.	4:15 p.m.	64
	Total			972

Night Shift

36	11:40 a.m.	6:00 p.m.	6:20 p.m.	52
29	3:00 p.m.	6:30 p.m.	6:40 p.m.	41
51	3:25 p.m.	6:40 p.m.	7:15 p.m.	60
39	3:40 p.m.	7:15 p.m.	7:45 p.m.	51
25	2:20 p.m.	7:50 p.m.	8:00 p.m.	37
7	12:30 a.m.	8:00 p.m.	8:10 p.m.	13
33	3:50 p.m.	8:10 p.m.	8:35 p.m.	48
11	6:00 p.m.	8:35 p.m.	8:40 p.m.	13
43	4:10 p.m.	8:40 p.m.	9:10 p.m.	55
41	6:00 p.m.	9:15 p.m.	9:45 p.m.	67
52	3:40 p.m.	9:45 p.m.	10:25 p.m.	59
13	3:30 p.m.	10:25 p.m.	10:35 p.m.	15
20	8:30 p.m.	10:35 p.m.	10:55 p.m.	20
38	7:05 p.m.	10:55 p.m.	11:25 p.m.	62
11	7:05 p.m.	11:55 p.m.	12:10 a.m.	23
17	8:30 p.m.	12:10 a.m.	12:20 a.m.	22
25	5:20 p.m.	12:20 a.m.	12:40 a.m.	30
13	7:10 p.m.	12:40 a.m.	12:55 a.m.	22
29	4:30 p.m.	1:00 a.m.	1:20 a.m.	40
2	7:45 p.m.	1:20 a.m.	1:25 a.m.	8
36	11:50 p.m.	1:40 a.m.	2:00 a.m.	49
28	10:30 p.m.	2:00 a.m.	2:20 a.m.	30
50	10:30 p.m.	2:30 a.m.	3:10 a.m.	70
	Total			896

of the hump yardmaster, keep an accurate record of the number of rides made by each rider, of the number or numbers of the cars he has ridden, and of the average time of each ride. In effect, they act as dispatchers for the car-riding force. The riders are returned from the yards by means of electric speeders on four speeder tracks, one to each unit.

By keeping a check of the car numbers ridden by each rider, damage to equipment and lading is materially reduced, since each man is aware of the fact that each car he rides is considered his direct responsibility and he is naturally more careful under the circumstances. The damage done is small. For September, 1926, the latest month for which figures are available, it amounted to less than 0.7 cent per car, while in August, 1926, it was about 0.8 cent per car. It has not been as high as a cent a car for some years past.

A Typical Car Riding Day

Using March 23 as an example again, the accompanying statement shows the activities of the car riders on that day:

A Statement of the Car Riders' Performance

Day Shift

Car rider	Rides in A.M.	Rides in P.M.	Total rides
Knotts	31	19	50
Wilcox	29	18	47
Hautenreiser	29	19	48
Yeats	31	19	50
Bauman	29	18	47
McDaniel	28	18	46
Hunter	28	19	47
Williams	31	20	51
Elliott	31	19	50
Thompson	29	17	46
Strom	31	17	48
Kusten	31	16	47
Anderson	29	16	45
Ottenstrass	28	20	48
Hale	29	18	47
Hendricks	30	18	48
Gourley	28	17	45
Drish	30	17	47
Kahne	30	16	46
McGinn	29	19	48
Stewart	31	17	48
Gilnow	29	18	47
Navarro	29	18	47
Watt	32	20	52
Gutton	31	17	48
Nolan	28	17	45
Valsch	28	18	46
Blombren	29	16	45
Nelson	31	18	49
Hauer	30	19	49
Callahan	29	19	48
McGinty	31	18	49
McMurray	30	20	50

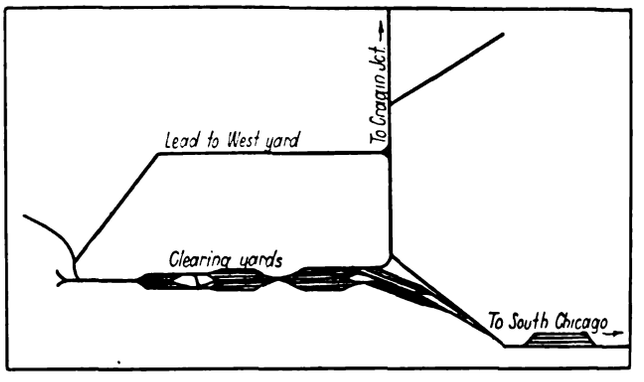
Night Shift

	P.M.	A.M.	
Phillips	28	17	45
Hinders	29	16	45
Grady	26	16	42
Martin	29	18	47
Mayer	29	18	47
Carver	28	16	44
Church	31	15	46
Vandenberg	31	19	50
Reid	29	18	47
Larson	29	17	46
Ward	28	16	44
Morrow	27	16	43
Brothers	29	15	44
Salstrand	31	19	50
Dusek	30	17	47
Clark	29	18	47
Size	29	15	44
Shepherd	30	16	46
Murphy	27	18	45
Reeves	29	18	47
Schiff	28	Home 11:30 p.m.	
Purchase	25	16	41
Dugan	30	18	48
Dhouitt	28	18	46
Spor	31	16	47
Bishop	29	18	47
Deltoff	30	17	47
McKinstry	27	17	44
Wisby	29	17	46
Moreland	29	16	45
Hinish	29	17	46
Blank	29	16	45
Schuman	23	18	46

A summary of the day's operating and car riding statements shows that 3,823 cars were ridden by the day and night shifts. Of these, 2,007 cars were ridden in 9 hr. 5 min. by the day shift of 33 riders, and 1,816 by the night shift in 9 hr. 20 min., also with 33 riders. On this basis, each rider rode an average of 6.27 cars per hour, and made an average of 5½ rides per hour, or a ride every 10 min. and 54 sec. The average number of cars per hour ridden by the day shift was 6.69 and by the night shift 6.02. Two riders are used on each cut of three loads and more riders for the longer cuts on the same ratio. The cuts do not average very large, however, the yearly average for 1926 being only 1.75 cars per cut.

Much Flat Switching Done

The low average number of cars to the cut is due in large measure to the fact that where a train is so ar-



Map Showing Relation of Clearing Yards to Main Line of Belt Railway

ranged upon arrival that only 7 or 8 cuts are necessary for a 60- or 70-car train, it is not put over the hump as it is more economical to classify it by flat switching in the yards provided for that purpose in both the east and west yards. This method of operation is utilized particularly during the coal and grain season, when the make-up of incoming trains is more favorable than otherwise. It has the advantage of saving about 8 miles haul, since such trains from the west and north can be brought over the main line directly to the east end of the yard and from there to the east flat switching yard, avoiding the necessity of hauling the cars to the west end of the yard and then over or around the hump. Similarly, trains from the east and south with cars for the north and west can be classified in the east flat switching yard and then hauled out directly to the north main line, also without going through the yard. Practically all of the perishable movement is handled in the east end of the yard by flat switching, since the icing station is situated there. The west flat switching yard is used principally for industry classification and switching and serves the large and growing Clearing and Argo industrial districts. In all, cars flat switched at Clearing amount to an average of 8,000 cars per month.

In Roumania, according to press dispatches from Bucharest, more than 50 per cent of the passengers who ride on the government-owned railroads are "deadheads" which state of affairs is blamed for the increasing deficits of these lines.

Pennsylvania Coal Dock Forces at Sandusky, O., unloaded a total of 1,254 cars or 73,986 tons of coal into lake boats within a 24-hour period beginning at 7 a. m. on May 6, and thereby beat the previous record on that railroad, which was established at the Toledo docks when 1,126 cars were dumped in 24 hours.