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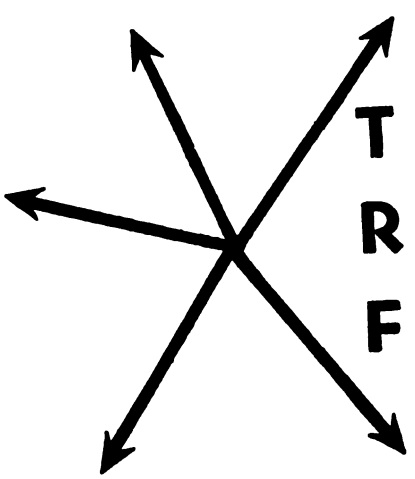

TRANSPORTATION RESEARCH FORUM

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Development Of The New York Central Grain Mileage Rates

Changes in rail freight rates for grain are frocked with controversy. At issue is not so much the level of the rates, but the "structure" as it might affect the marketing practices of the grain and milling industries. The problem that the railroads face is twofold. First, the railroads' relative share of the grain market has been declining in recent years. At the same time, the other modes of transportation have greatly increased their share of the market. Second, an even greater problem to the railroads is that the business the industry has retained is not of a profitable nature.

It is these two problems of our grain transportation that led the New York Central to undertake an intensive grain profit development program. To do this, required an extensive analysis of the basic marketing conditions that exist in the grain trade and an attempt to create a transportation package which would be both highly desirable to the grain trade and highly profitable to the railroad industry.

TRADITIONAL GRAIN RATE STRUCTURE

The present rate structure is known as the McGraham Formula which evolved to its present state by 1907. There are certain basic characteristics of the existing grain rate structure that preclude it from being competitive with the other modes of transportation and/or capable of generating a required amount of profit for the railroads. An understanding of the basic structure of the McGraham Formula and its adoption to market conditions will best define the problem the railroads face.

Under the McGraham Formula—first devised in 1871 for westbound traffic, not grain—origin and destination groupings were set up in Official Territory. Through rates from any point in one origin group to any point in one destination group are the same (equalized). One origin group, for example, blankets nearly half of Illinois touching or crossing the state's borders in the north, south, east, and west. The New England destination group equalizes the rate for all of New England including part of upstate New York and as far south as Westchester County.

The rate structure that evolved is shown in figure 1. Plotted are the present rates against the short line mileage between several hundred points in Official Territory. Reading across, at 65¢, it is apparent that this rate level can apply on shipments involving hauls of approximately 400 miles to well over 1,000 miles. Likewise, reaching up at 700 miles, the rate can vary all the way from 51¢ to 85¢.

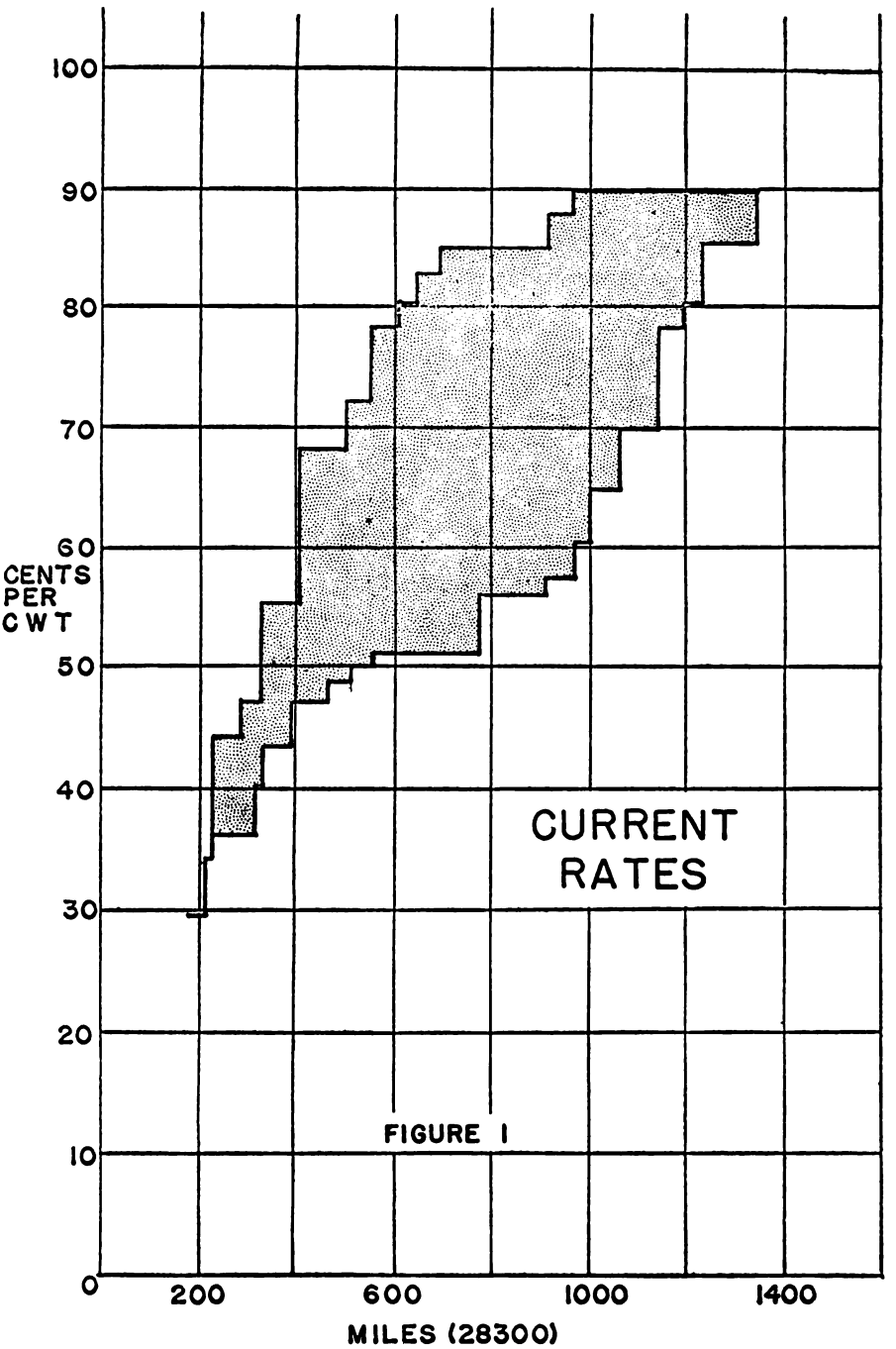

FIGURE 1

The inherent rigidity and variance in this type of structure does not lend itself to the competitive environment of unregulated carriage. For example, even if rates were appropriate (competitive and compensatory) between the centers of two areas, competition could undercut and secure the shorter hauls and the rails would be left with the less profitable longer hauls.

The McGraham Formula rates apply on a broad range of services from basic point-to-point, "frill-free" transportation to the inclusion of sometimes up to five multiple moves frequently involving different equipment, stops for inspection, diversion, etc., without an appreciable difference in the rate level. The most important ancillary service built in the rate structure is transit. It is of utmost importance to the railroads in terms of its cost characteristics and it is the feature of the traditional rates that is most clouded with controversy.

What is transit? The word transit really has two meanings:

1. The traditional meaning of a stop in route between the original point of consumption for some economic purpose, i.e., storage, milling, blending, etc.
2. The grain trade regards transit to mean a rate condition by which grain and/or its products can be stopped at an intermediate point or points between the point of production and the point of consumption for one of these purposes, but with no significant additional charge. The through rate is equalized hence there is no economic charge in terms of the service being performed.

The thing to realize is that when grain is stopped for transit, one complete move is terminated and the car is unloaded. Some time in the future, another carload is initiated and then moved on to the next point along the line of distribution. It is not uncommon to find four and five transits applied in certain types of grain products. Yet, the through rate combination is still equalized although the additional services are incurred by the railroads. This can be readily seen in figure 2 which shows the compounding of railroad costs as the transit pattern occurs.

Rate transit is supposed to "hold grain traffic to the rails" by protecting the through rate on the outbound shipments from a storage or processing point to destination. Without it, the shipper would have to pay a high combination of flat rates. But in reality, the subtleties which were built into the transit rate structure have had a little noted effect of actually working against the railroads.

A transit shipment must move out in approximately the same direction it was going inbound—generally eastward. The inbound rate the shipper pays is usually relatively high because railroads have traditionally had a competitive advantage in the gathering territory, but had to have a low outbound charge following transit at points where competition was steeper. The outbound transit is the balance of the through rate remaining after paying the inbound rate.

Assume for example, there is a bumper crop in the origin territory serving a processing point and that more grain piles up there than can be absorbed as products in the eastern destination areas where the applicable

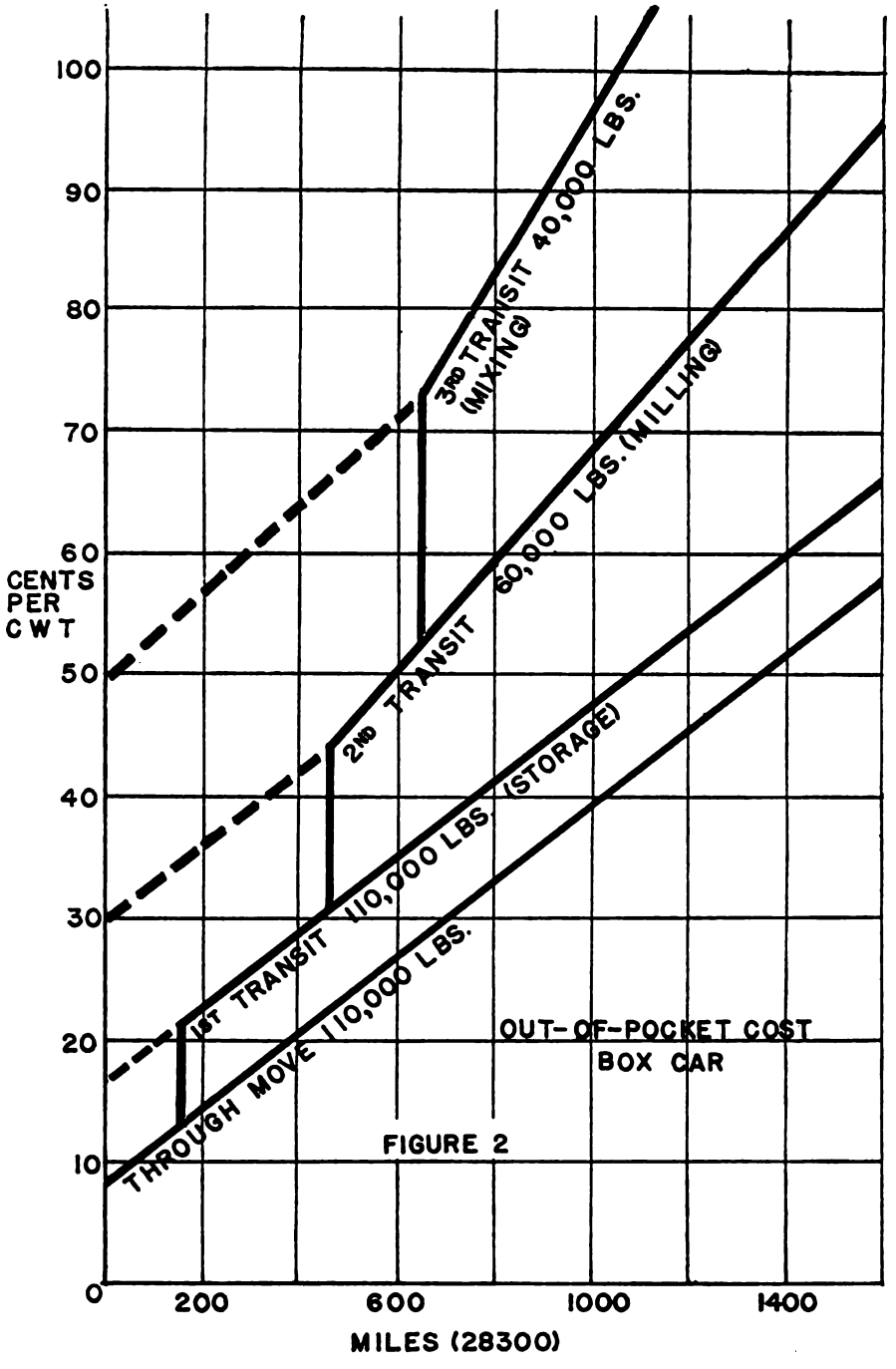

FIGURE 2

through rates apply. The processor has to move some grain or product to a different consuming area. It does not matter whether he ships by rail, truck, or water, the transit billing is lost and he is stuck with the high inbound rate. Recognizing that this can happen, most large processors hedge their transportation costs by always using truck or water for a certain percentage of inbound grain. This can move out in any direction without a penalty.

McGraham Formula rates apply on the broad range of commodities from the dense grains to relatively light grain products. The density and market conditions greatly affect the unit cost of the railroads. As the load per car (shipment weight) falls, the transportation cost per unit rises. This is readily seen in figure 2. In addition, many products require specialized equipment which have higher cost characteristics. Yet, the railroads still maintain the equalized through rate (1/2¢ per hundred pounds is applied to the through rate for products).

In the McGraham Formula rate structure, the railroads face a paradox. If the overall level is high enough to cover all possible cost contingencies and return some profit, the level of charges is too high to meet competition where all of the services are not required. On the other hand, if the overall level is low enough to meet the competition, the cost characteristics of the broad service pattern make the traffic unprofitable.

CHANGES IN THE MARKET

The McGraham Formula was used to deal with 19th century conditions in the grain trade, when growing, handling, merchandising and processing was accomplished by a large number of widely separated individuals and small organizations. Lacking storage capacity and cash, farmers generally sold their grain at harvest to small country elevators located no further away than six miles. Having limited storage, preservation, communication, blending and loading capability, they shipped immediately to central terminals at Kansas City, Chicago, St. Louis, Minneapolis, and so forth. There, merchants held and blended the grain to meet the year-around requirements of consumers.

Under some political pressure, the railroads equalized rates in origin and destination groupings. Since each was the primary carrier on inbound movements to major terminals, but not on outbound (where there was water and other rail competition), they installed the transit system and low "proportional" rates from the major gateways to the east. Other services the railroads were induced to grant included free stops for inspection, the right of diversion for shipments of below-specification grain or to meet altered market conditions, and free storage in boxcars for extended periods. All this was possible only because the railroads' overall volume permitted them to price on an average basis and to absorb losses on some classes of traffic by high rates on others that lacked political or economic leverage.

In 60 years, about the only things that have not changed are the rail rate system and the factors of seasonal production and constant consumption. Railroads now feel the road of considerable competition. The large number of small units is being replaced by a lesser number of substantial sophisticated farms, cooperatives, and corporations. Land productivity has

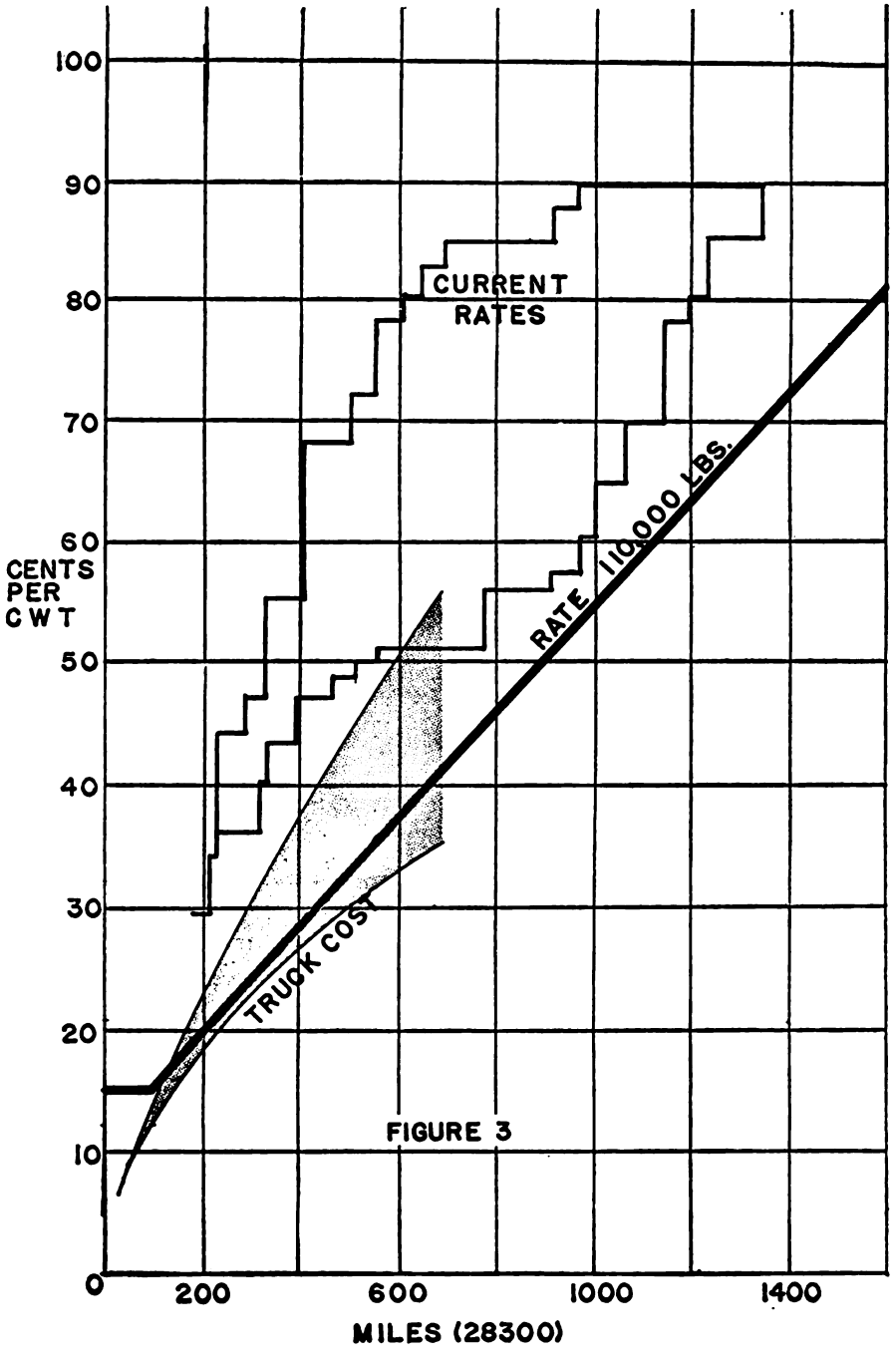

FIGURE 3

doubled and farmers under government loan programs frequently have the capacity and finances to hold grain on or near the farm until the price is right. Good highways and large trucks make it possible for the farmer to go out 25 miles on the average, rather than six, to a country elevator.

As a result, the country terminal concept is growing. The country elevator (country terminal) can now serve large, efficient producing areas and have demand to justify volume storage and sophisticated preservation, blending, and handling operations. Country terminals can provide, in the farm area, all the physical and communications services needed by the market for efficient and equitable distribution and pricing. This trend is now taking place and the railroads must adapt to the coming market patterns. The move to country terminals looks as certain as the expansion of city department stores into the suburbs.

Grain will move directly from producing areas to processing and consumption points on a year-around basis, leveling transportation requirements. The distribution patterns will be keyed to the relatively constant consumption cycle rather than the seasonal production pattern.

DESIGN OF THE NEW RATE STRUCTURE

The rail grain rate structure should be based on sound economics. Hence, the structure must take into consideration the character of present and future market conditions, the capabilities of rail transportation, and the nature of competition in the transportation market. Of course, the fundamental objective of any action on the part of the railroads, as in every other business entity, is to maximize profit.

The level of the new rates were set by the competitive environment. Through the Central's market research program, the truck competitive situation was developed. This is shown in figure 3. The variability in truck costs reflect the variance in the backhaul nature of their operations. Using this as a basis, the rate level was constructed at the bottom of the pattern. It should be noted that the rate scale does not attempt to compete with the truck below 100 miles. In the very short haul market, the truck is better suited and the rail profitability would be low.

The McGraham Formula rates had, as one of their major drawbacks, the large origin and destination groupings. The new rates are on a mileage scale where the level of the rate varies with the short-line rail mileage. Hence, the rates are not only at a competitive level but offer the competitive flexibility that is required. When comparing the 110,000-pound minimum weight rate with the out-of-pocket cost as shown in figure 4, it is evident that the rate includes a reasonable amount of profit for the railroads.

The problem of pricing the less dense and lighter loading commodities was met via a cost off-set approach. Figure 4 displays the basic 110,000-pound rate relative to the out-of-pocket cost. When the 60,000-pound cost line is plotted on the chart, it falls considerably above the 110,000-pound cost line. The 60,000-pound minimum weight rate level simply reflects the difference in unit costs—cost off-set. Therefore, the same obsolute margin per unit is maintained. By having a base charge on the first 60,000 pounds and a much lower unit charge applied to the excess weight, the average

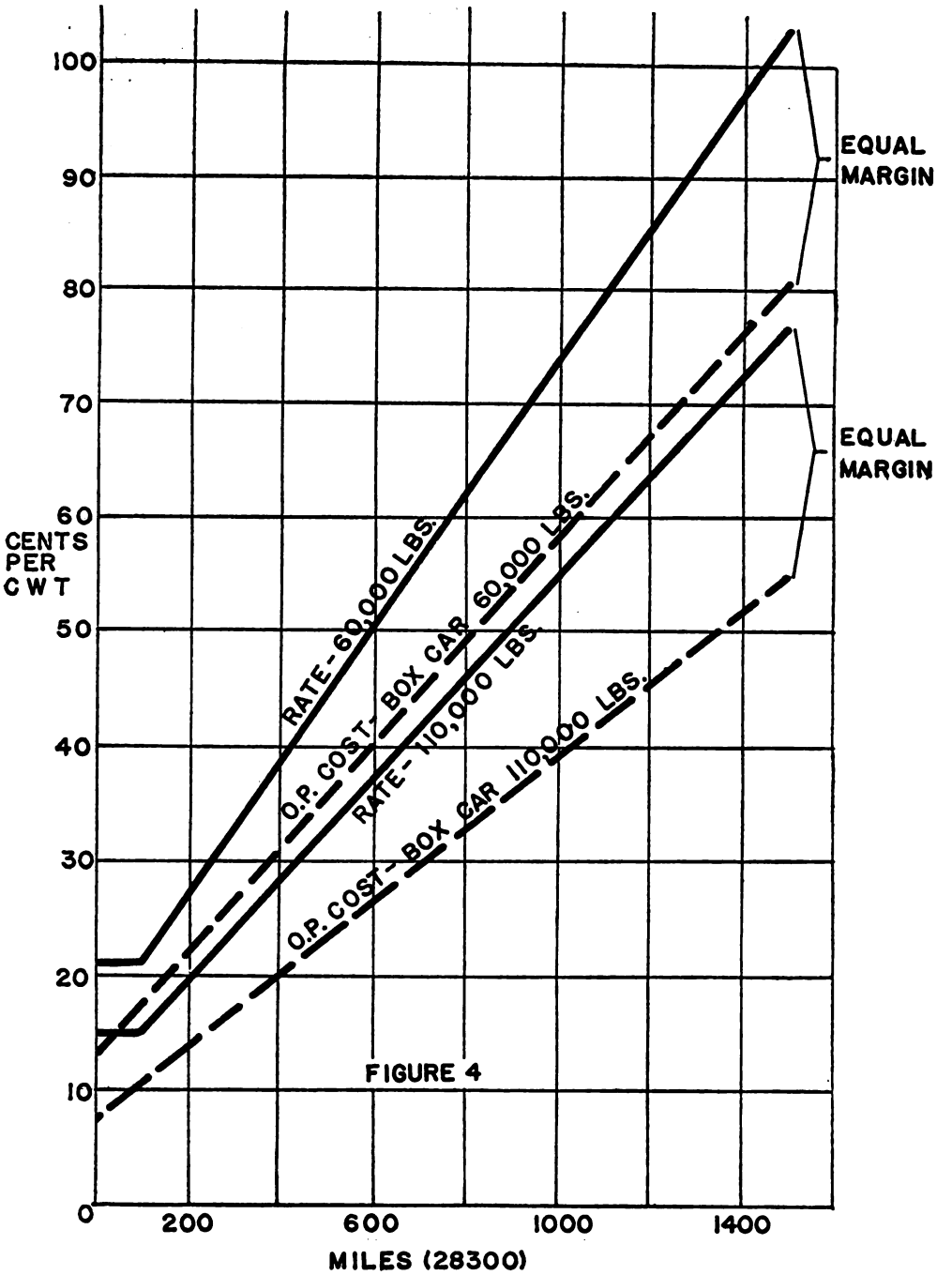

FIGURE 4

rate falls with heavier loadings coincident with the rail cost curve. This has the same effect as a continuous incentive rate. The ratio of profit to cost is lower on the light loadings than on the more economically handled heavier loadings. Thus, some concession is made to shippers of lower density grain products whose rates will no longer approximate the rates on whole grain.

The new rates include only the basic service of transportation between an origin and a destination. Rate transit is not built into the structure. Hence, intermediate stops can only be accomplished via a combination of inbound and outbound freight charges. The through rate then reflects the cost characteristics of the transportation involved just as would the use of the other transport modes. Stop for inspection is allowed but at a charge of $20 per car. It should be noted that the United States Department of Agriculture has asked Congress to repeal the Federal Grain Standards Act because compulsory inspection is no longer required under present day marketing conditions and practices.

EQUIPMENT

The adoption of the new rates that are competitive and profitable along with the trend toward the country terminal and the ensuing year-around direct movement pattern, drastically changes the supply economics of rail equipment. The basic vehicle for hauling grain has been the boxcar.

The boxcar has been considered the most economic vehicle because of its all-purpose utility—it hauled grain during the seasonal rush to the terminals and could be used for other traffic the rest of the time. However, the boxcar has the liabilities of limited capacity, requires grain door installation and other coopering and relatively high loss and damage. Now, with year-around movement from the origin territory and the minimization of duplicate terminalling and circuitous routings of past conditions, it is economically feasible to adopt a car fleet tailored to the characteristics of the market. This means the high-cube covered hopper car.

The covered hopper car offers greater usable cube, better protection, and easier loading and unloading. In addition, the hopper car, because of its greater capacity, reduces the unit costs for the railroads. In light of these factors the Central has placed orders for the first 500, 100-ton covered hopper cars. This is to be the start of a fully dedicated equipment fleet tailored to the grain and grain products industry.

The basic changes occurring in grain marketing offer a major opportunity for the railroads to become profitably competitive with the "frill-free" services of the highway and waterway carriers. Further, the interests of the railroads closely parallel the public interest by greatly reducing the distribution costs for grain and grain products. To realize this opportunity, the railroads must offer equipment, services, and prices that encourage year-around movement on an efficient basis. Any auxiliary services can be offered on a remunerative basis so that they can be untilized where economically feasible.