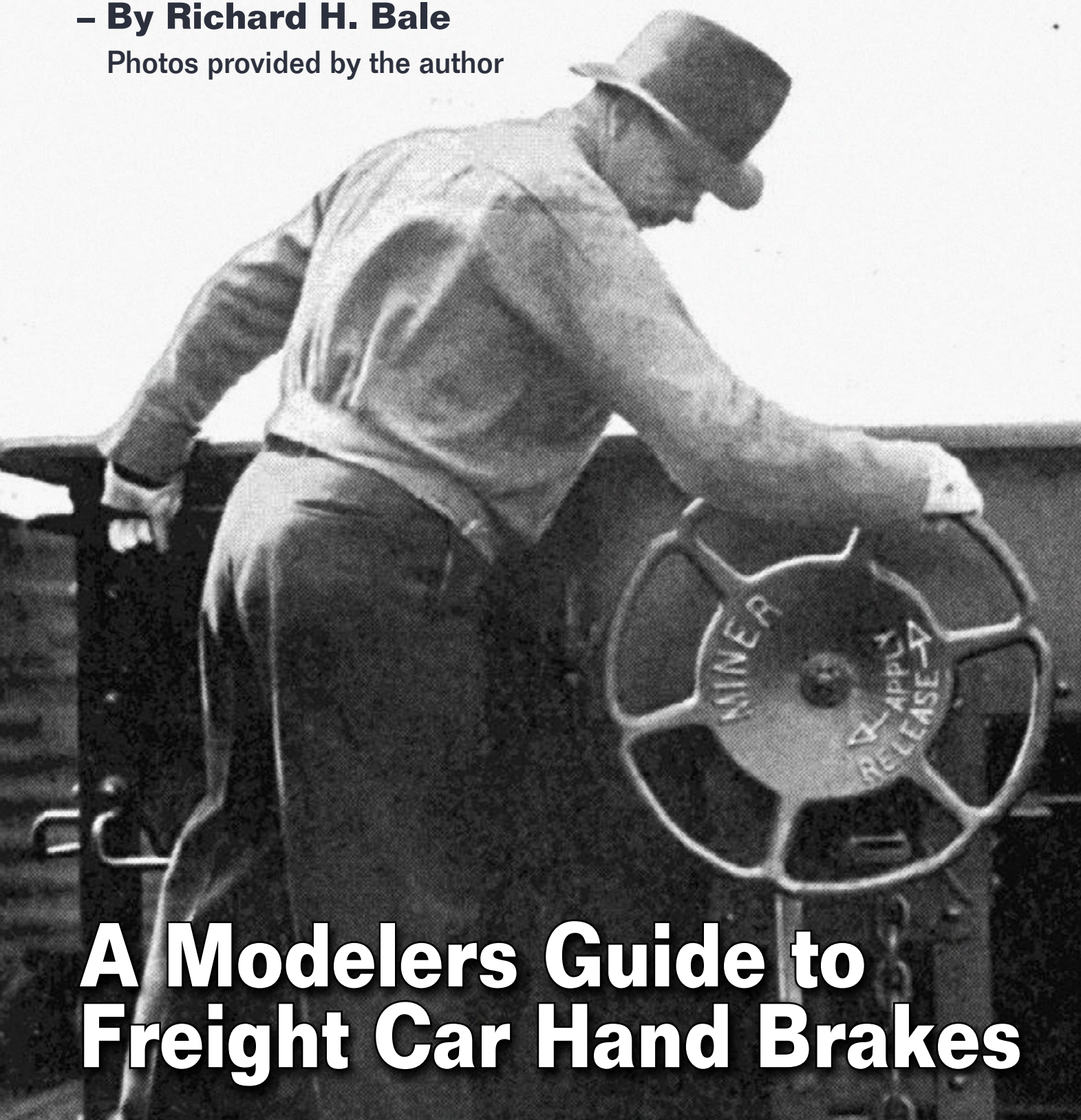


– **By Richard H. Bale**

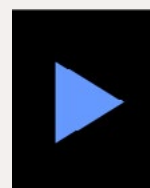
Photos provided by the author



# A Modelers Guide to Freight Car Hand Brakes

A comprehensive catalog of hand brakes ...

**T**he earliest form of hand brakes on freight cars consisted of a wheel mounted at the

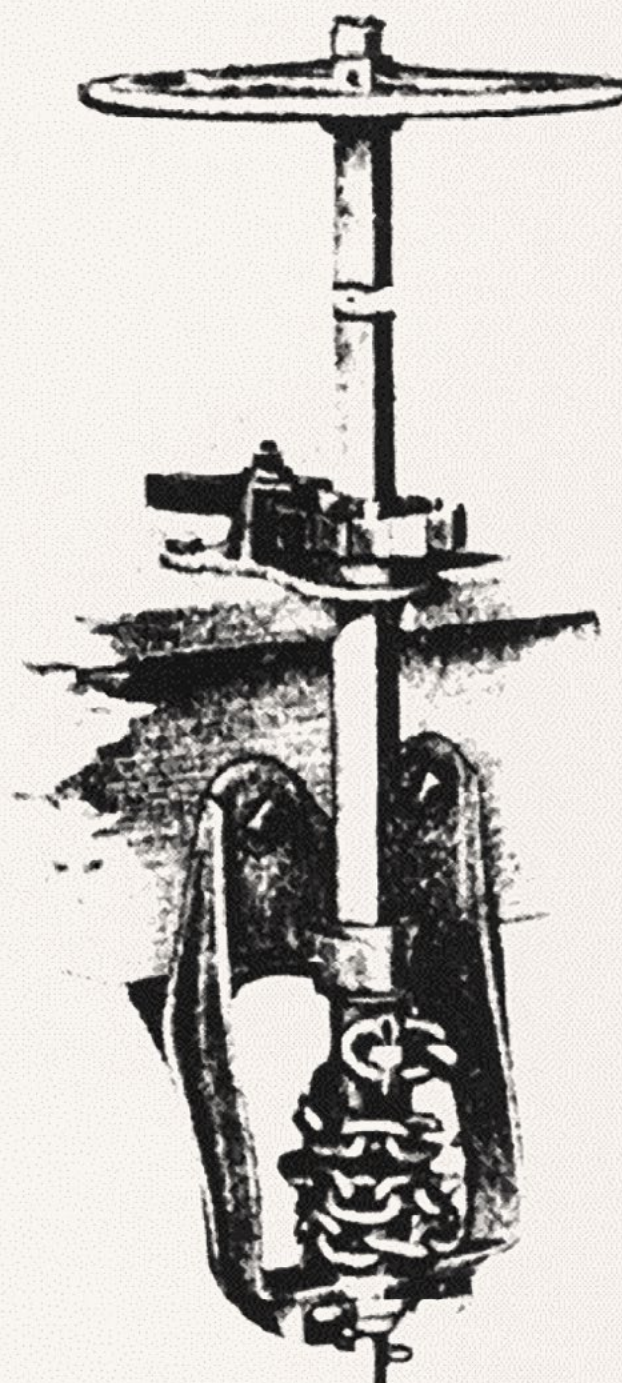


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top of a vertical shaft that extended below the car's end sill. A chain attached to the bottom of the shaft was connected to the brake mechanism under the car. As the trainman turned the roof-top wheel, the chain wrapped around the lower portion of the shaft and pulled the brake levers (1).

1



A ratchet and pawl on a small brake platform (2) allowed the trainmen to set the tension as desired. To release the brake, the trainman released the pawl with his foot, which sometimes caused the wheel to spin as it unwound. The system was crude and dangerous, and only marginally effective. The system gained the nickname "stem-winder."

Brake wheels intended for horizontal mounting on a vertical brake shaft were generally 18 inches in diameter. Several manufacturers offered replacement wheels, including the National Brake Co.,

1. Chain wrapped around a "stem-winder" vertical brake shaft.

whose catalog listed malleable iron wheels in a variety of patterns with a choice of either five or six spiral spokes (3). Advertisements for Dayton Manufacturing Company's "Perfect" wheel claimed the stepped rim provided a better grip for trainman (4). It could also rip his hands if the wheel suddenly began to spin when released.

## Geared hand-brakes

After the introduction of air brakes, trainmen no longer had to stop or slow a train by jumping from car to car tightening the brakes. However, in yards or setouts on sidings, brakes still needed to be set (or released) on individual cars. The develop-

ment of geared hand-brake mechanisms in the early 1920s, and the mechanical advantage they offered, greatly improved the function of hand brakes and provided improved safety for trainmen.

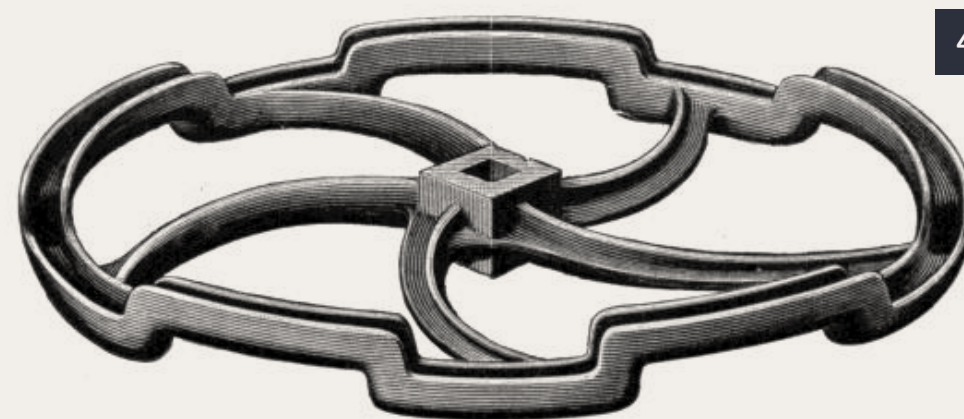
The geared mechanism was contained in a housing riveted to the car end and incorporated a vertically mounted wheel, usually 22 inches in diameter. Until standardization was initiated in the mid-1950s, a wide range



**2. Vertical "stem-winder" hand brake from 1869.**



**3. National 18-inch hand brake wheels.**

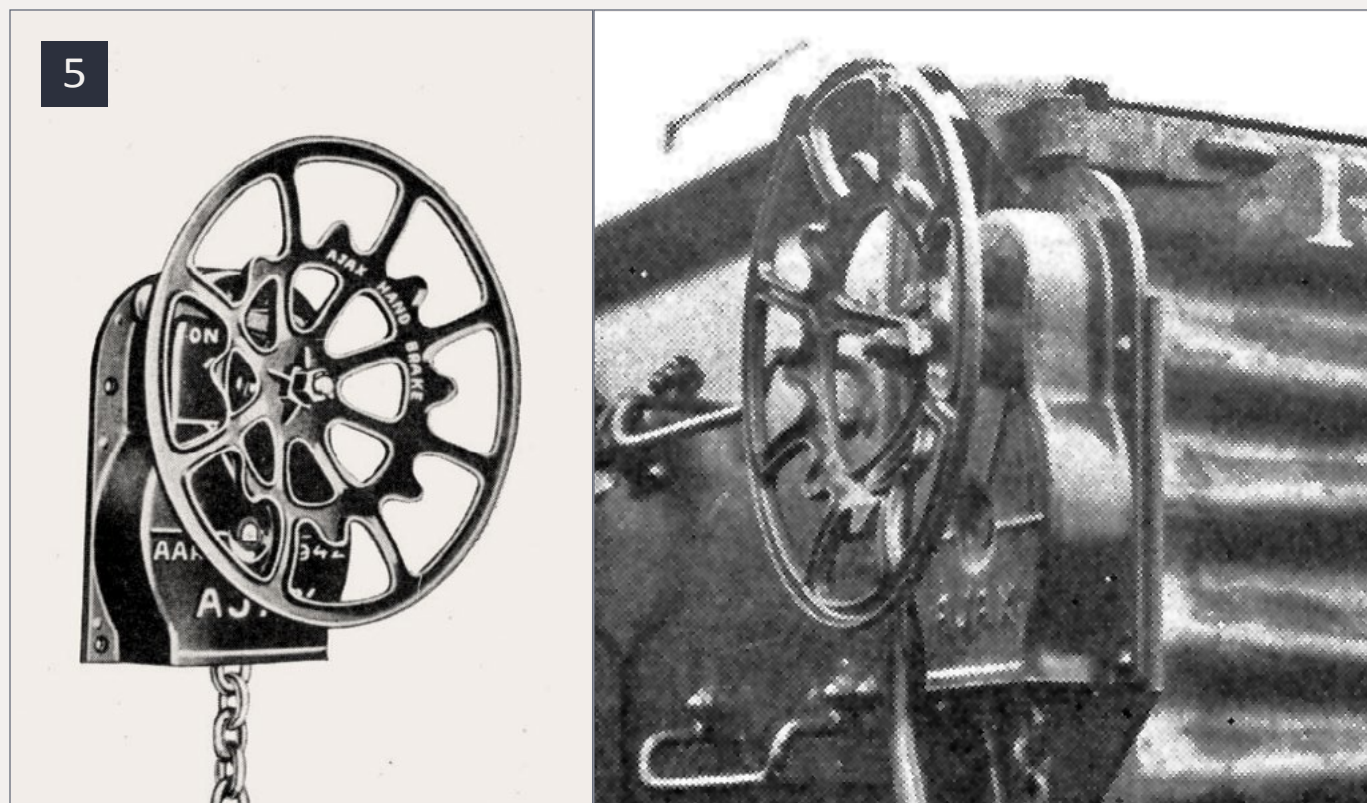


**4. Dayton's "Perfect" brake wheel circa early teens.**

of intricate brake wheel designs were offered by brake wheel makers. Since welding a damaged brake wheel was prohibited, shop foremen sometimes recycled undamaged wheels from cars headed for the salvage yard. As a result, it was not uncommon to see an odd brake wheel on a string of otherwise similar cars. Unless it was damaged, a brake wheels tended to remain on a car through the end of the car's useful life. The following information will help modelers identify specific brake wheels.

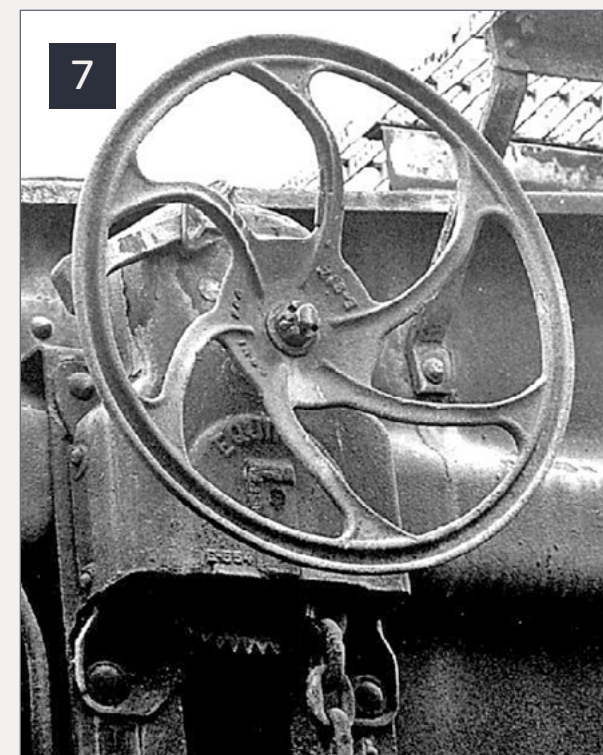
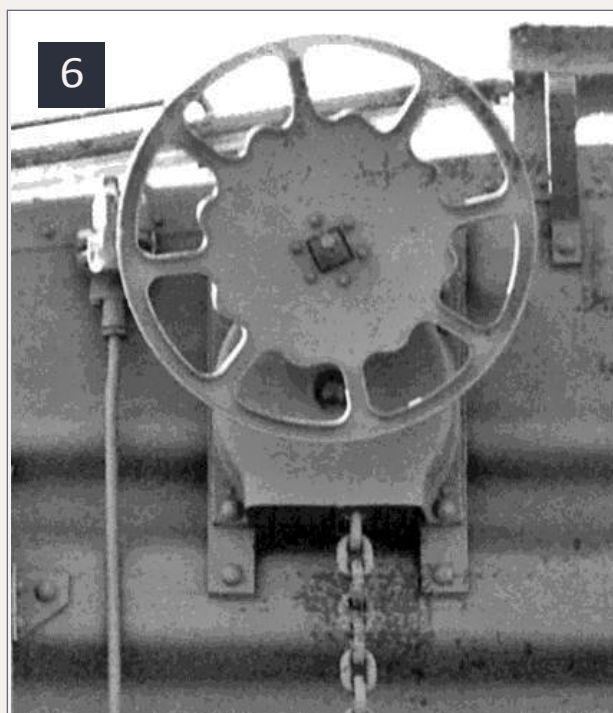
## Ajax Hand Brake Co.

One of the most widely utilized vertical brake wheels was the Ajax 3059 (5) introduced in 1929. With only minor changes, the model 3059 wheel was applied to new cars until the early 1950s, when Ajax replaced the cast malleable iron wheel with a pressed steel wheel with eight spokes and a large scalloped hub (6).



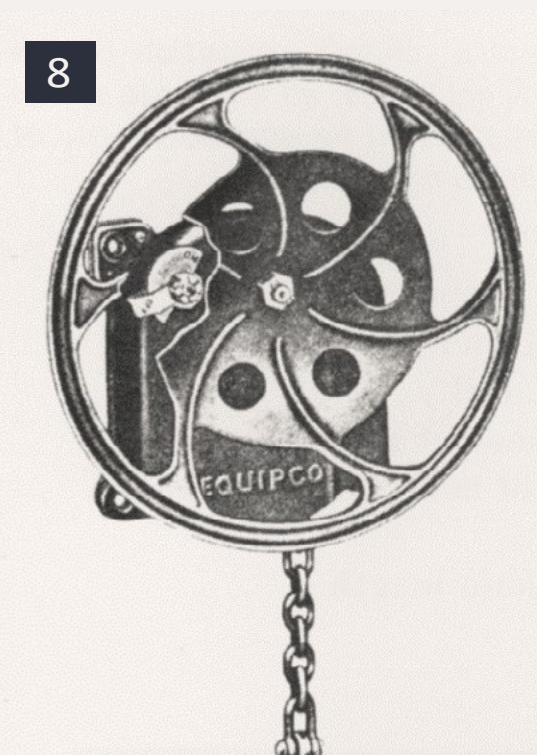
**5. Ajax model 3059 – 1929 to early 1950s. The 3059 wheel and gear mechanism at right is applied to a drop-end gondola built in 1931.**

**6. Ajax pressed steel wheel – early 1950s to about 1960.**



## Equipco – Equipment Specialties Division of Union Asbestos & Rubber Co.

During the first half of the 1930s, Equipco supplied car builders with a 22-inch cast malleable iron wheel with six spiral spokes (7). The design was modified in 1935 with an enlarged hub with six round holes in each segment (8). In the late 1930s Equipco modified the hub again by changing the round holes to triangular sections and adding a dozen small rectangular holes in the rim (9).



**7. Equipco – early 1930s to mid 1930s.**

**8. Equipco – from mid-1930s to 1939.**

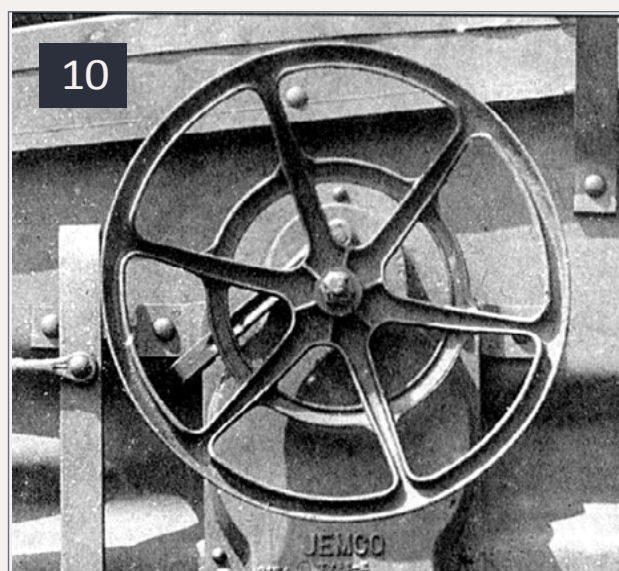
**9. Equipco – 1939 to mid '50s.**

## Jemco Products Company

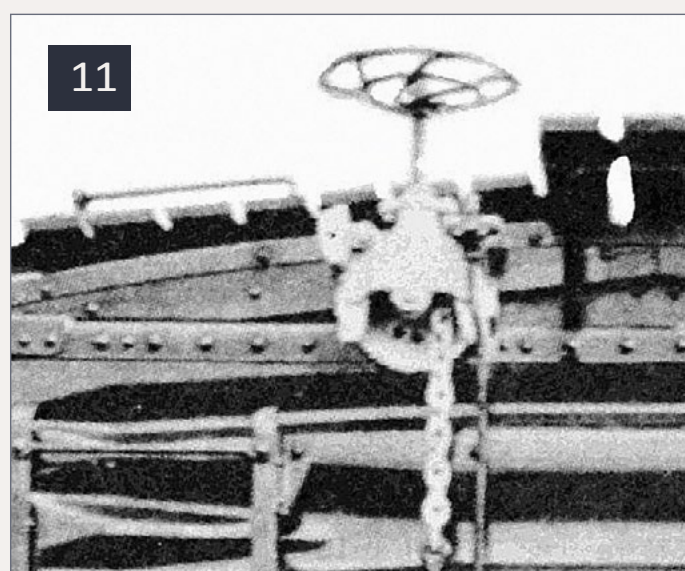
Jemco introduced a geared power hand brake in the late 1920s (10) that remained unchanged until the 1950s. The basic design of the Jemco wheel would be repeated by Universal with their model M2049 (23) some 20 years later.

## Klasing Car Brake Co.

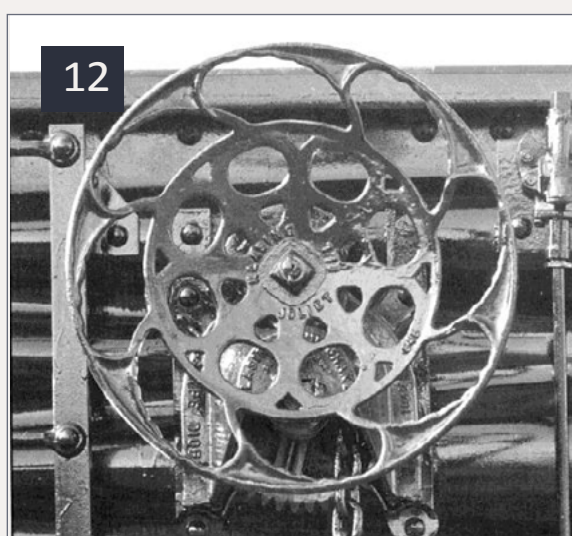
In the mid-1930s, Klasing briefly offered a geared brake mechanism with a horizontally mounted roof top wheel (11). The advantage over the general practice of a vertically mounted wheel on the end of the car is unclear. In 1936 Klasing introduced a more conventional geared brake with an intricately patterned brake wheel it designated model 646 (12). Similar wheels with slight variations in the lacy pattern appeared throughout



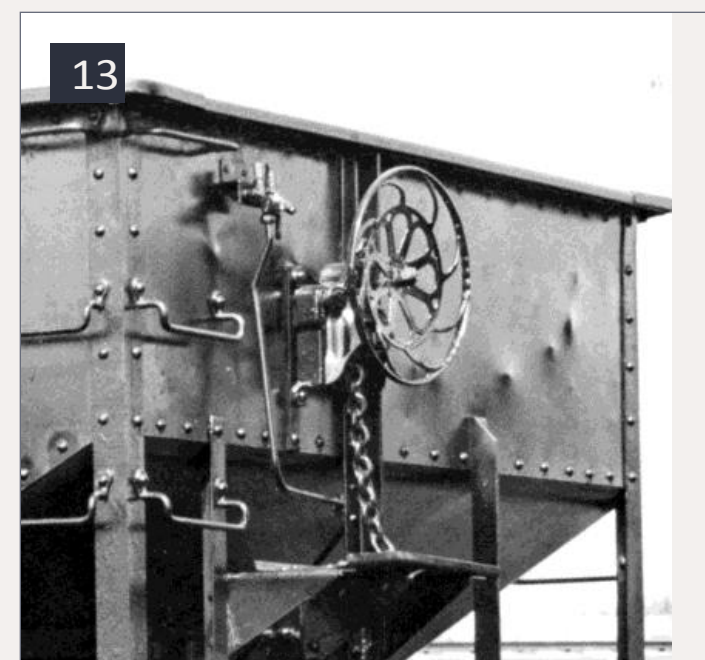
**10. Jemco wheel from the early 1930s.**



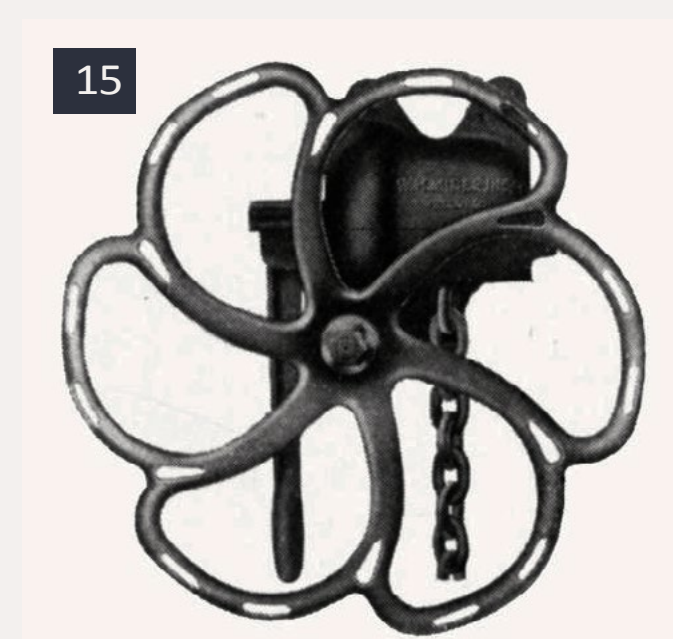
**11. Klasing geared brake with horizontal roof-top wheel from the mid-1930s.**



**12. Klasing model 646 wheel.**



**13. Evolving pattern of Klasing model 646, circa mid-1940s.**



**14. Klasing model D1051, mid-1940s through late 1960s.**

the following decade (13). After World War II Klasing launched its Power-Matic D1051 geared hand-brake with a fully redesigned wheel (14). Despite the movement toward standardization in the late 1950s, Klasing's model D1051 continued to be applied to new equipment through the 1960s.

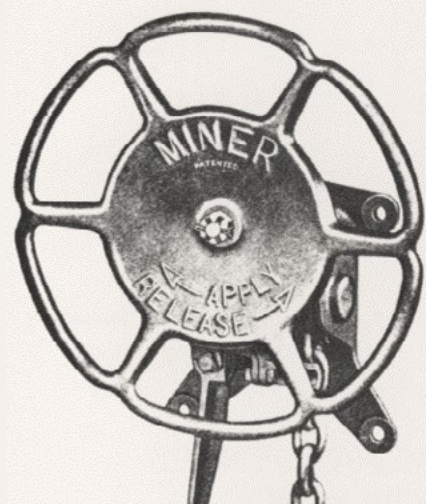
## Miner – W. H. Miner Co.

Although most vertical brake wheels were 22 inches in diameter, Miner gained some success with its 24-inch model D3202 wheel launched in the early 1930s (15). The cast malleable iron wheel

featured a scalloped pattern with six spiral spokes and 18 small openings in the rim. For customers preferring a 22-inch wheel, Miner offered model D3279 in 1936 (16). The design of the D3279 looked much like the standardized wheels that would not appear for another 20 years.

**Peacock and Champion – National Brake Co., purchased the Champion brand in the early 1950s.**

Peacock's model 320 malleable iron wheel first appeared in the early 1930s (17). It was similar to Jemco's (10) except the spokes were in a spiral pattern. Beginning in the late 1930s and continuing through the end of the 1940s, Peacock offered a 22-inch wheel with five straight, slender spokes and distinctive anti-slip finger grips on the inside edge of the rim (18).



16



17



18

**16. Miner 22-inch model D3279 – from 1936 to the '50s.**

**17. Peacock model 320 – throughout the 1930s**

**18. Peacock – late 1930s to early '50s.**



19



20



21

**19. Champion-Peacock model 285 – from the early 1950s.**

**20. Superior model V53 – 1940s and '50s.**

**21. Universal model M1138 – from the late 1920s.**

In the early 1950s National Brake Co. acquired Champion and merged it with its Peacock brand of brake equipment. This resulted in the 1953 introduction of the Champion-Peacock model 285 brake wheel (19).

**Superior Hand Brake Co.**

Superior's model V53 cast malleable iron brake wheel (20) was introduced in the very early 1930s. The highly-stylized 22-inch wheel incorporated five spiral spokes with a scalloped rim that had 15 small rectangular holes. A smaller inner ring midway to the hub repeated the scallops of the outer rim. Subsequent versions of the V53 manufactured after the mid-'40s did not have the small holes in the rim.

## Universal Railway Devices Co.

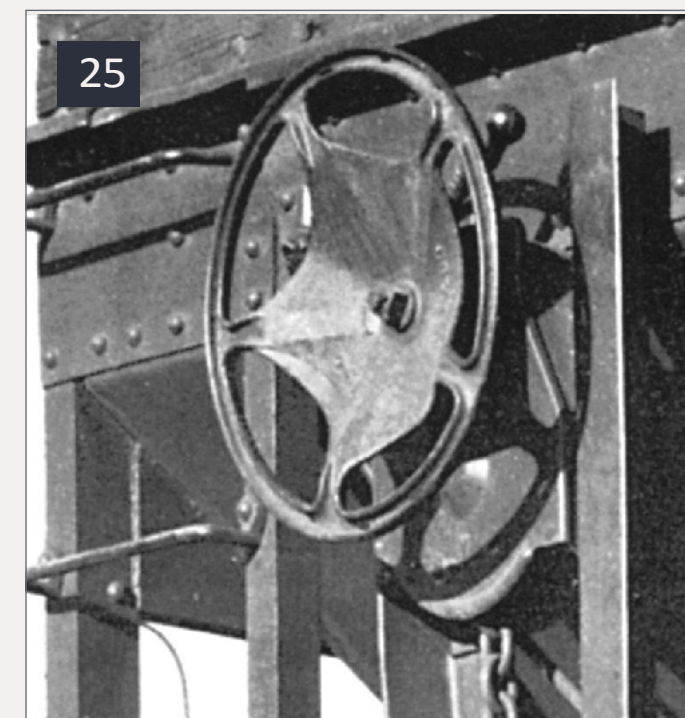
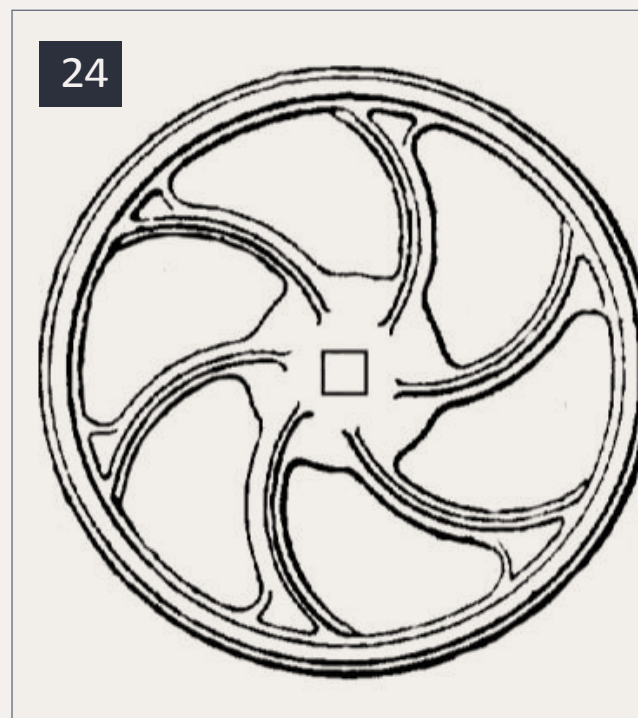
The five angled spokes on Universal's model M1138 brake wheel make it easy to identify (21).

Introduced in the late 1920s, the M1138 was replaced in the early 1930s by Universal's "One-Hand" brake that had five short spokes and the outline of a human hand cast into center hub (22). The long gear case extending below the wheel also helps identify Universal hand brakes. The company's principal brake wheel during the 1940s was the model M2049 (23). Note the similarity to the Jemco (10 prior pages) and Ureco (26) wheels.



**22. Universal "One-Hand" brake wheel marketed throughout the 1930s.**

**23. Universal model M2049 – throughout the 1940s. Note how high it is mounted on the car end.**



**24. Ureco – from the late 1920s.**

**25. Ureco – mid 1930s through WWII.**

**26. Ureco model U528 – mid '40s to mid '50s.**



## Ureco - Union Railway Equipment Co.

Ureco's initial vertical brake wheel introduced in the late 1920s, was a basic 22-inch cast malleable iron wheel with six spokes emanating in a spiral from a medium-sized hub (24). A more distinctive design came in 1936 with the introduction of the model U498 brake wheel (25) that resembled a flying squirrel. After World War II, Ureco began selling brake wheel model U528 (26) that had five straight spokes, a plain rim, and an equally plain inner ring midway to the hub.

## Standardization of Vertical Brake Wheels

Industry discussions favoring a standardized brake wheel began in the early 1950s. The movement was prompted by pressure to improve the safety of trainmen through the elimination of design variables, as well as a desire to reduce the variety of replacement parts repair facilities needed to keep on hand. After nearly a decade of talk, a standard design for a pressed steel wheel emerged in 1959. Despite the general agreement, implementation of the new standard wheel on newly built equipment was not immediately mandatory. As a result, wheels of pre-standard design continued to be applied on some new cars well into the 1960s.

Attempting to identify different brands of standardized prototype wheels produced after 1960 is difficult. Identifying the maker of a standardized wheel in HO scale is 87 times harder. The most significant difference in various post-1960 hand brakes are the housings for the gear mechanism and the position of the release or trip lever. Modern hand brake wheels manufactured by Ajax (27), Equipco (28), Miner (29), and Peacock (30) are representative of all standardized wheels currently available.



27. Ajax model IP80 with release lever at the lower left.



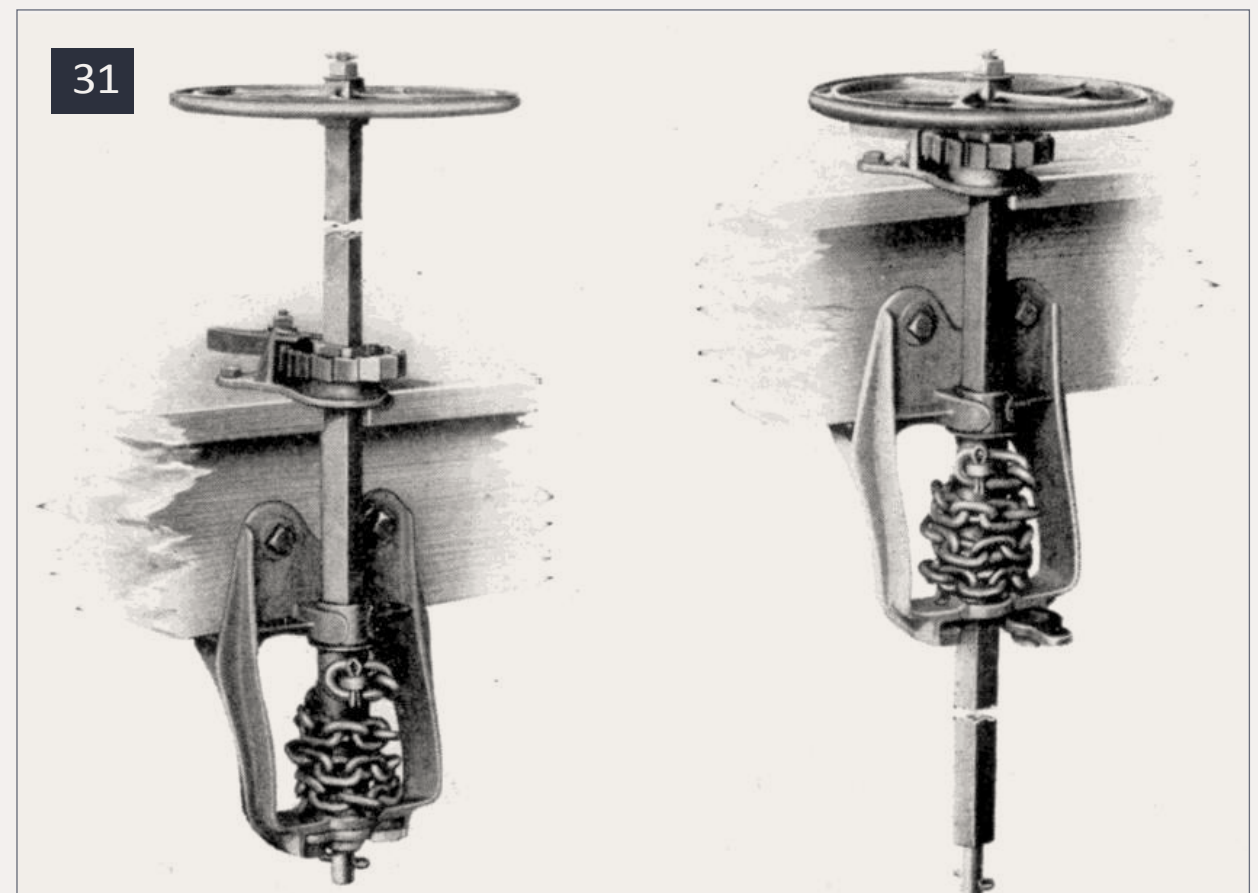
28. Equipco model 4000 with release lever at the center left.



29. Miner model 6600 with a long release lever at the bottom.



30. Peacock model 1600 with release lever at upper left.

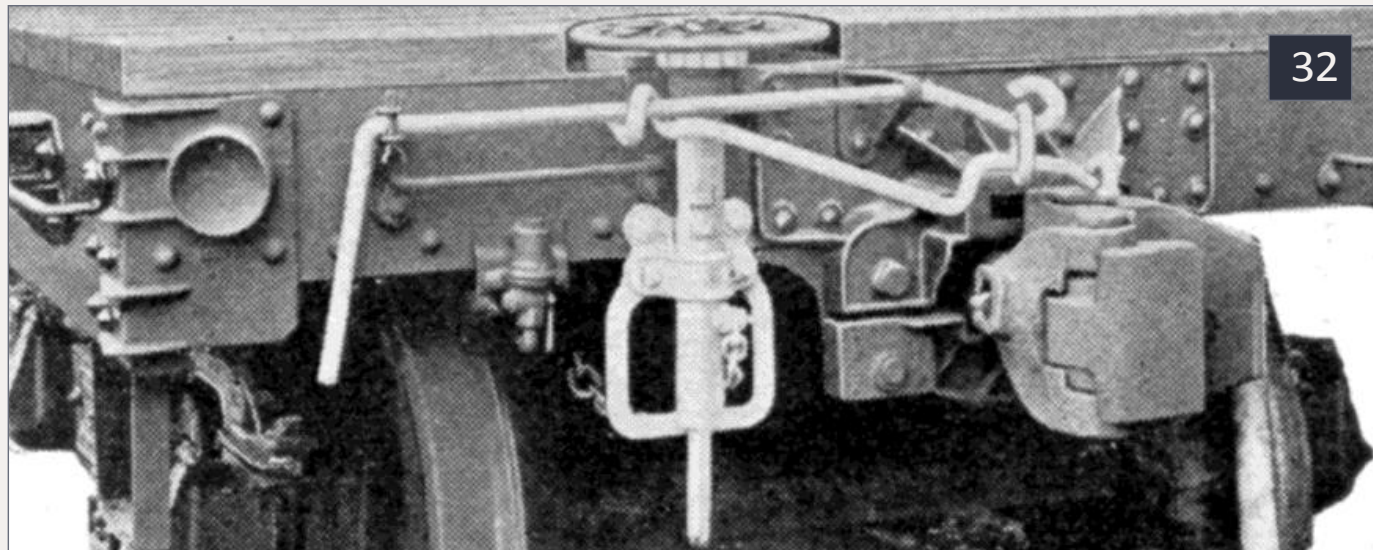


31. "Stem-winder" drop-shaft hand brake manufactured by National early in the 20th century.

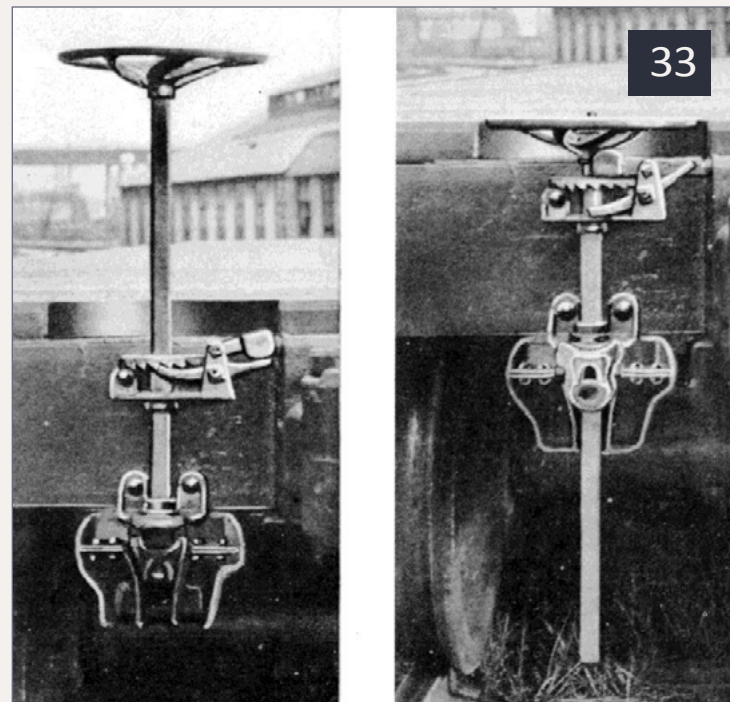
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## Drop-shaft Hand Brakes

From the earliest use of hand brakes, the need to protect the brake wheel on gondolas and flat cars was apparent. Both tilting-handle and drop-shaft types were developed, with the latter quickly emerging as the most practical and economical. Drop-shaft hand brakes continue in use today. In the early versions the chain was wrapped around a square sleeve through which the brake shaft was able to slide vertically (31 and 32). Modern drop-shaft hand brakes incorporate a geared mechanism such as those manufactured by Superior (33) and Superior (34).



**32. A Ureco “stem-winder” drop-brake shaft on a USRA flat car from the late teens.**

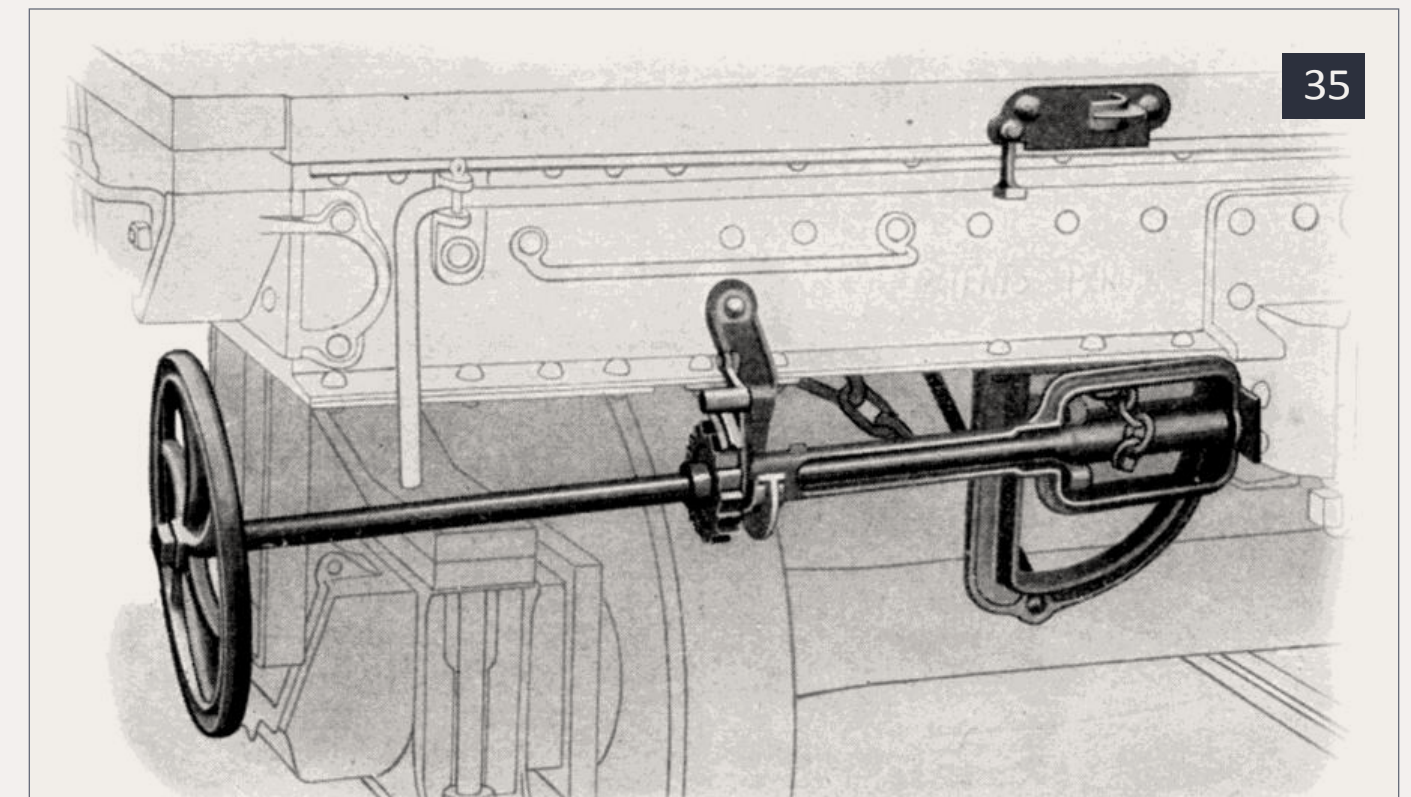


**33. Superior drop-shaft hand brakes from the 1940s.**



**34. Universal geared drop-shaft hand brakes in use since the 1970s.**

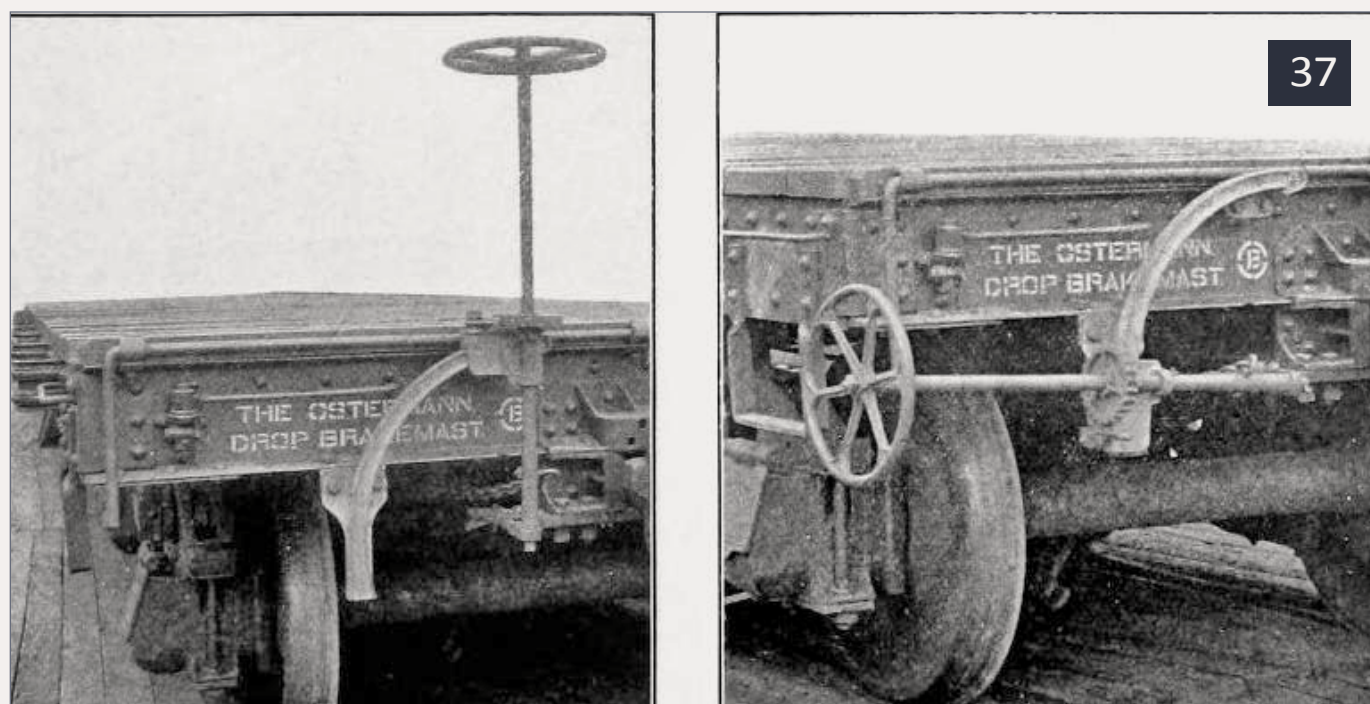
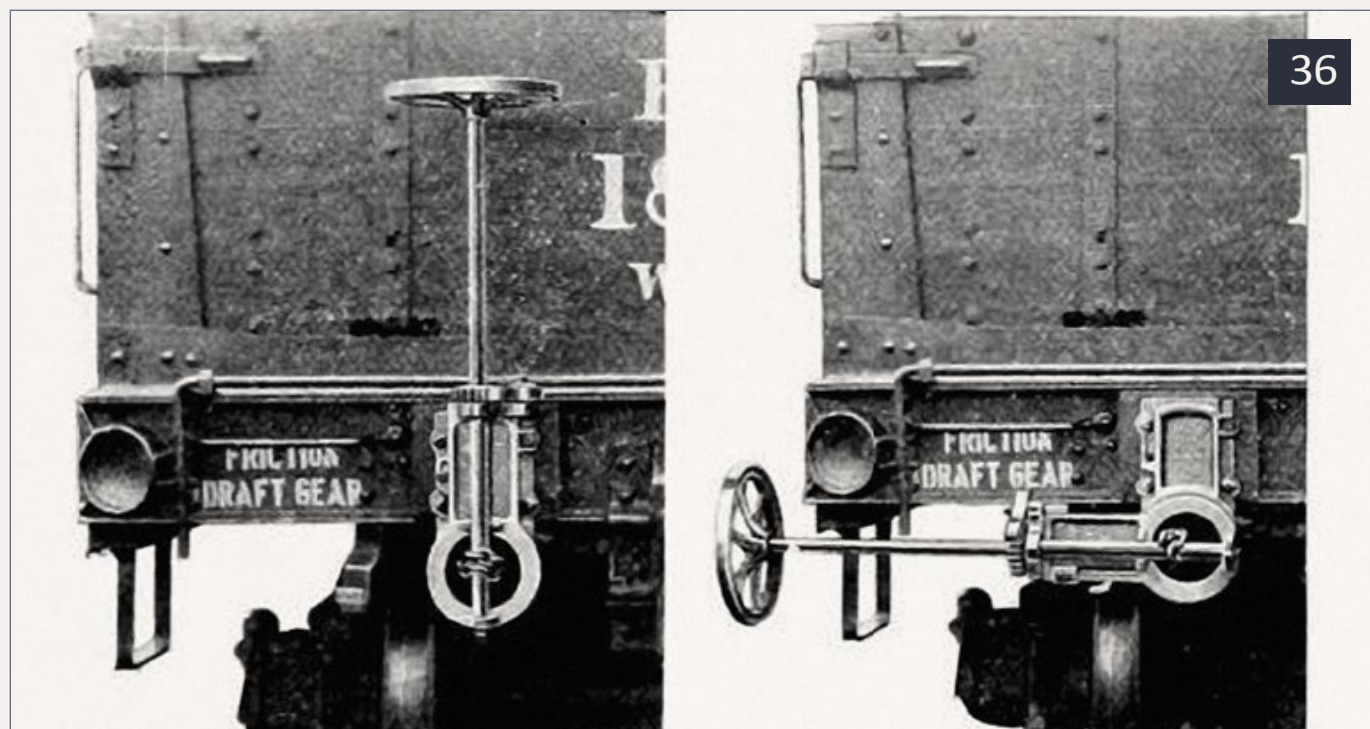
**35. Barber tilting hand brake staff.**



## Tilting Hand Brakes

Gondola cars with drop ends presented a special challenge to manufacturers of hand brakes. Both the Barber type manufactured by Standard Car Truck Co. (35) and the Feasible Flexible model manufactured by U.S. Metal Co. (36) were promoted prior to 1920, but may have survived on specialty equipment for decades. The tilting hand brake illustrated in figure 37 was

introduced by Gregg Manufacturing in the early 1930s. The tilting brake wheel could function in both positions. When in the down position, it could impede a trainman attempting to board a moving train.



**36. Feasible tilting hand brake in vertical and horizontal positions.**

**37. Gregg tilting hand brake.**

## Credits

Figure 2 Oakland Museum. Figures 6, 7, 10, 12, 21, and 23 Railway Prototype Cyclopedia, Volume 10. Figures 11, 13, 22, 24, 25, 34, 35, and 37 Car Builders Cyclopedia various editions. All others from author's collection of manufacturers advertising and application material.

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Author Richard Bale writes our news column under the byline of The Old Yardmaster. He has been writing about the model railroad trade for various hobby publications since the 1960's.

He enjoys building models, particularly structures, some of which appeared in the June 2006 issue of *Model Railroader* magazine.

