

Contents

Chapter 1

Steel, metal products, and scrap 4

Chapter 2

Farm machinery and heavy equipment..... 22

Chapter 3

Cranes, shovels, and hoists 42

Chapter 4

Vessels, transformers, and oversize loads 52

Chapter 5

Buses, trucks, autos, and other vehicle loads 68

Chapter 6

Forest products and building materials 78

Chapter 7

Military equipment..... 96

Chapter 8

Maintenance-of-way and railroad service..... 102

Bibliography 111

Several Elin 250-ton transformers have been transferred from a ship to heavy-duty depressed center flatcars at the Port of Milwaukee on April 16, 2005. The transformers were imported from Europe as part of a large wind-energy installation in Iowa.
Keith Kohlmann





CHAPTER ONE

Steel, metal products, and scrap

Steel products come in many shapes and forms; this TTX bulkhead flat has been converted to carry coiled wire. Angled bunks with wooden contact surfaces support the coils, which have strapping and wire ties. Polyester strapping is threaded through the coils and secured by the ratchets on the side sills. The TTX Co. operates a wide variety of flatcars to carry many types of loads.

Cody Grivno

Steel and other metal products are among the major commodities shipped by rail as open-top loads. These include ingots, sheet steel, coiled steel, beams, rods, wire, and other forms, **1**. Steel fabricating companies use this material to produce vehicles, boilers, fencing, roofing, siding, bridges, auto parts, machinery, appliances, pipes, consumer products, and much more.



2
St. Louis Southwestern bulkhead flat car 875776 passes through Butler Yard outside Milwaukee, Wis., on Aug. 30, 2003. It carries steel plate resting on 4x4 wood stringers. Heavy steel banding secured to the stake pockets and across the top of the load is pulled tight by threaded steel rods. *Vince Kotnik*



3
Baltimore & Ohio gondola 356524 has been modified to carry wide steel plates as seen at Toledo, Ohio in October 1990. This load appears to be around 5" thick and is far too wide to carry flat on a car. The supports were made from I-beams that are designed to support plates of two different widths.
Keith Kohlmann collection

These loads originate at steel mills and ports (for imported steel) located throughout the country. Specialized mini-mills serve specific local markets. Steel leaves the mills in many forms: plate, bars, rebar, beams, rails, pipe, wire, angles, channels, columns, tees, and zees. The most common form is sheet steel, and it is shipped in coils. All of these products must be shipped safely and all require different securement techniques due to the differences in length, weight, and volume of the items. American Association of Railroads (AAR) rules



4
A bulkhead flat car is loaded with bundled aluminum rods at Galesburg, Ill., in June 2011. The deck has raised bunks and chains to tie down the load. Polyester banding and wooden separators run throughout the load. An identical formation rests on the opposite end of the car. *Dave Nelson*

provide instructions for loading all common types of steel products.

Types of steel loads

Steel plate is large sheet material 1/4" or thicker that can't be coiled. It is

shipped flat and secured with heavy steel banding placed over the top of the load and looped through the stake pockets. Sheets are stacked and bundled together with banding. The individual bundles are then banded



33

This gondola is carrying part of a multiple-car shipment of Caterpillar export machines going to Japan. The car holds a blade and additional parts for the other machines passing through Galesburg, Ill., in 2011. *Dave Nelson*



34

This N scale flatcar is a modified Walthers model with a bulldozer from a Bachmann construction vehicle set. The model re-creates a 1955-era Caterpillar D8 bulldozer and additional equipment. Both models have custom decals. The crates are Fine N-Scale parts blocked with basswood. *Keith Kohlmann*

safely travel on a flatcar by the late 1950s, 26, 27.

Self-propelled scrapers also followed this path of growth. By the 1960s most major construction equipment manufacturers were producing self-propelled scrapers. These machines grew to be quite heavy and required substantial wooden blocking around the large pneumatic tires, 28. Special consideration was given to disabling the steering and bowl hydraulics to prevent the joints from moving. Secondary safety cables are looped

around the front and back of the scraper for shipment, or ½" chains are used on the ends of a self-propelled scraper, 29.

Crawler tractors—Bulldozers are produced in sizes that range from small to the Caterpillar D10T, which fills an entire TTHX flatcar. The blade is usually shipped on the same car as the 'dozer, but detached to balance the weight and to keep the load within clearance limits, 30. Wooden blocking at the ends of the tracks, inside cleats, and outside stub stakes keep the



35

A pair of Caterpillar 140H graders have arrived on a TTHX car at Cranbrook, B.C., in June 2001. Heavy chains and blocking secure the load to the deck. The blades rest on 2x4 blocks and are chained to keep from rotating. *Keith Kohlmann*



36

An N scale Hough Payloader is loaded on a Soo Line flatcar (a modified Red Caboose 41-foot flatcar). The Payloader was made from a Wiking Hanomag loader. The body was reshaped, painted, and given custom decals to match a Hough model.

Keith Kohlmann

machines in place. Heavy chains are attached between the stake pockets and the tracks, 31.

Bulldozer cabs are often shipped in crates attached to the flatcar deck on export loads, 32. The blades, rippers, support arms, and other attachments are held in place with wooden cleats and chains. Additional parts are shipped loosely chained in gondolas, 33. A sample model is shown in 34.

Graders—The AAR requires that pneumatic tires on graders be blocked on all sides, 35. The heavy blade is rotated to fit entirely on the car, and it is lowered onto blocks and tied with wire or chained in place. Additional wires or chains are placed at 45-degree angles to the load at each corner of the machine.

Loaders—The Hough model HS was the first fully integrated self-

propelled wheel loader. Introduced in 1939, the small machine was called a Payloader, and it was designed primarily for unloading bulk material from boxcars. After World War II the Payloaders increased in size and power. They were the primary loader on the market until the late 1950s, 36. Wheel loaders from various manufacturers continued to grow in size and capacity, 37. By the late 1960s massive wheel



37

This THX car has just been pulled from the Hough factory in Libertyville, Ill., on June 11, 1972, by the Milwaukee Road switch crew. The load at right is a model 560 Payloader, a 40-ton machine with a 6½-cubic-yard bucket. The company's much-smaller model H-25 Payloader (middle) has a ½-yard bucket. There is about a 15-year difference in technological development between the two designs.

Keith Kohlmann collection



38

A Clark Equipment Co. Michigan 475B articulated wheel loader fits on a New York Central flatcar at Sharonville, Ohio in April 1973. The bucket and all parts above the driver's compartment have been placed onto the deck so the load can meet clearance limits. The cab, railings, and roll-over protection cover are blocked, nailed, and strapped to the car. The load is as tall as the adjacent boxcar.

Don Dover; Keith Kohlmann collection



8

A new N scale Texaco fuel tank trailer is posed for a photograph outside The Heil Co. factory in Milwaukee, Wis. The flatcar is a modified Red Caboose model loaded with a Trainworx tank trailer. The wheels were blocked with basswood. Twisted EZ Line was used to tie the load to the stake pockets, and "Do Not HUMP" signs were added to the deck. This scene was inspired by a clip from an Association of American Railroads promotional film from the 1940s.

Keith Kohlmann

bodies resist longitudinal, transverse, and vertical forces. Wooden blocks nailed at the front and back of wheels kept vehicles from moving lengthwise on the flatcar. Cleats or boards nailed along the inside or outside of wheels prevented centrifugal force from shifting or flinging vehicles off the car on curves. Wire tightened between wheels and stake pockets reduced bouncing.

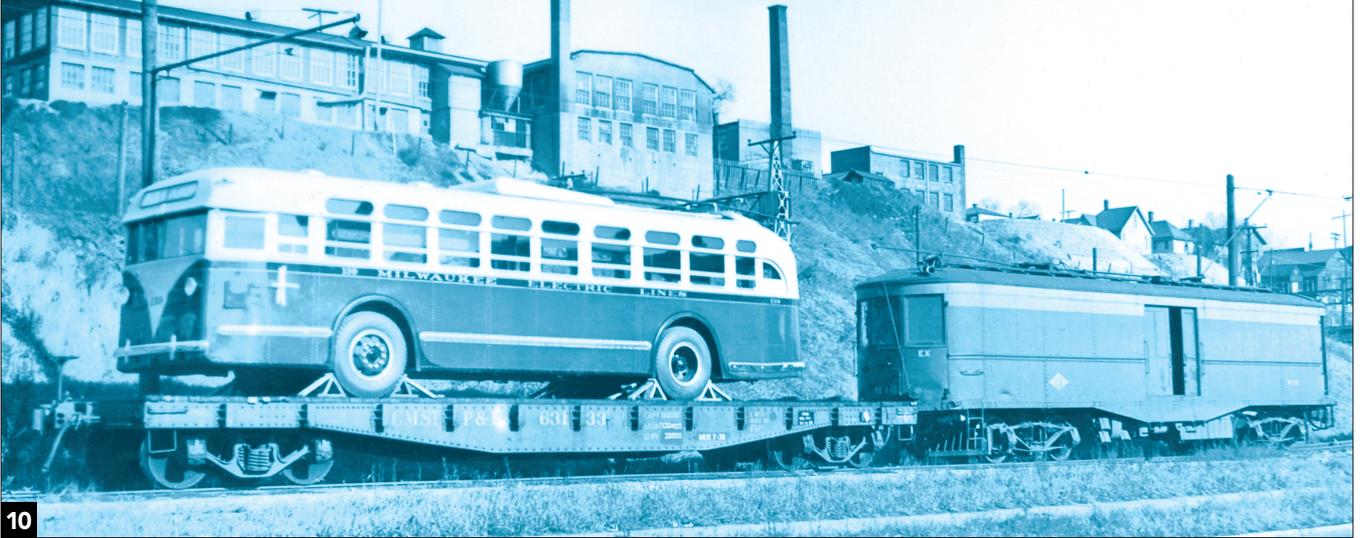
In the 1960s a new method for securing vehicles was offered by Trailer Train (which had provided piggyback flatcars since 1956). The new flatcars were longer and provided increased loading capacity. Chains that were part of the equipment assigned to each car secured the vehicles (see photo in "Tie-down chains" in Chapter 2, page 36). In addition to offering general service flatcars, Trailer Train had flatcars geared to carrying equipment for specific loads. Tie-down chains, machinery fixtures, supports, and auto racks were assigned to flatcars ranging from 60 to 89 feet in length. Wooden blocking and twisted wire were no longer required. However, strapping and wire rope continued in use as secondary tie-down material, 5.

General-service flatcars owned by individual railroads continued using wooden blocking and twisted wire through the 1990s. This method became less common as TTX pool



9

Four new HO scale International semi tractors (from Walthers) travel on an 86-foot Athearn flatcar. This well-detailed load, modeled by Dave Sima, is secured to the car with wire looped over the axles and through the deck of the car, which gives the appearance of the chains used by the prototype. No weathering was used on the trucks, making them appear factory-new. Keith Kohlmann



10

Freight motor M16 of The Milwaukee Electric Railway & Light Co. eases a Milwaukee Road flatcar up to the 20th Street team track in Milwaukee in November 1938. The flatcar carries a new Yellow Coach electric bus, no. 139. The wheels are chocked with wooden blocking. *Keith Kohlmann collection*



11

Edmonton Transit Service no. 174 is a Brown Boveri electric bus that has returned to Edmonton after being on loan to the Toronto Transit Commission. It's riding on an OTTX flatcar and spotted at the team track ramp in Strathcona Yard at South Edmonton, Alberta, in December 1993. The bus is riding low because its air suspension has been drained for the cross-Canada journey. The wheels are blocked and the bus is chained down. *Keith Kohlmann*



12

Fifteen new 1964 Ford Mustangs leave Detroit on RTTX 910546, an 89-foot tri-level open autorack. The rack is secured to the Trailer Train flatcar. Racks were owned by the railroads participating in pools of cars (in this case, Detroit, Toledo & Ironton). The automobiles are secured to the rack with chains built into the decks. *J. David Ingles collection*



CHAPTER SIX

Forest products and building materials

Center-beam flatcars were developed in the late 1960s and are now the most common way of carrying dimensional lumber and sheet goods. Ratchets are built into the side sills, with cables passing over the lumber and connecting to the center beam. This Burlington Northern car is loaded with 45 bundles of 12-foot-long 2x8 boards. The car is designed to handle five stacks of 12-foot bundles (or a combination of standard lengths) to fill its 60-foot inside length.

Jeff Wilson

Forest products shipped by rail in open cars fall into several groups: logs, finished lumber, 1, plywood, treated poles, ties, pulpwood, wood chips, and stumps. Products vary in their sizes and requirements for safe handling, resulting in a wide variety in the size and type of the freight cars used to transport the loads.



2 This Milwaukee Road log flatcar carries 11 logs to a sawmill in 1978. This modern, 42-foot, welded all-steel car was built for this purpose. Heavy stakes support the logs, which rest on large steel bunks. This arrangement allows the car to be loaded and unloaded by a wheel loader equipped with forks and a grapple. Steel banding keeps the load from shifting. Paper tags help identify the load at the mill. *Keith Kohlmann collection*



3 This modern 100-ton capacity bulkhead flatcar carries a full load of hardwood logs at Sunbury, Pa., in May 2002. The car has permanent side stakes with five chains running across the top of the load. *Ruben S. Brouse*

Logs

Railroads provided an economical solution to the challenges of moving logs from forests to distant sawmills. Both private logging companies and common-carrier railroads built branch lines into forested areas to extract the logs. Logging railroads were built as both standard and narrow gauge lines in many areas of North America. The

tracks were usually abandoned when the resources ran out. Standard flatcars with side stakes and skeleton flatcars were the most common types of equipment used in the woods. Standard flatcars and gondolas could also be used. Logs on flatcars were secured with stakes and banding or chains. However, their

wooden decks were quickly destroyed by the pounding of the logs, so steel skeleton log cars were preferred, 2. As freight cars became larger, 60-foot bulkhead flatcars with permanent side stakes have become the norm. These cars can be easily loaded and unloaded with heavy equipment, 3. Most log hauls were fairly short—often under