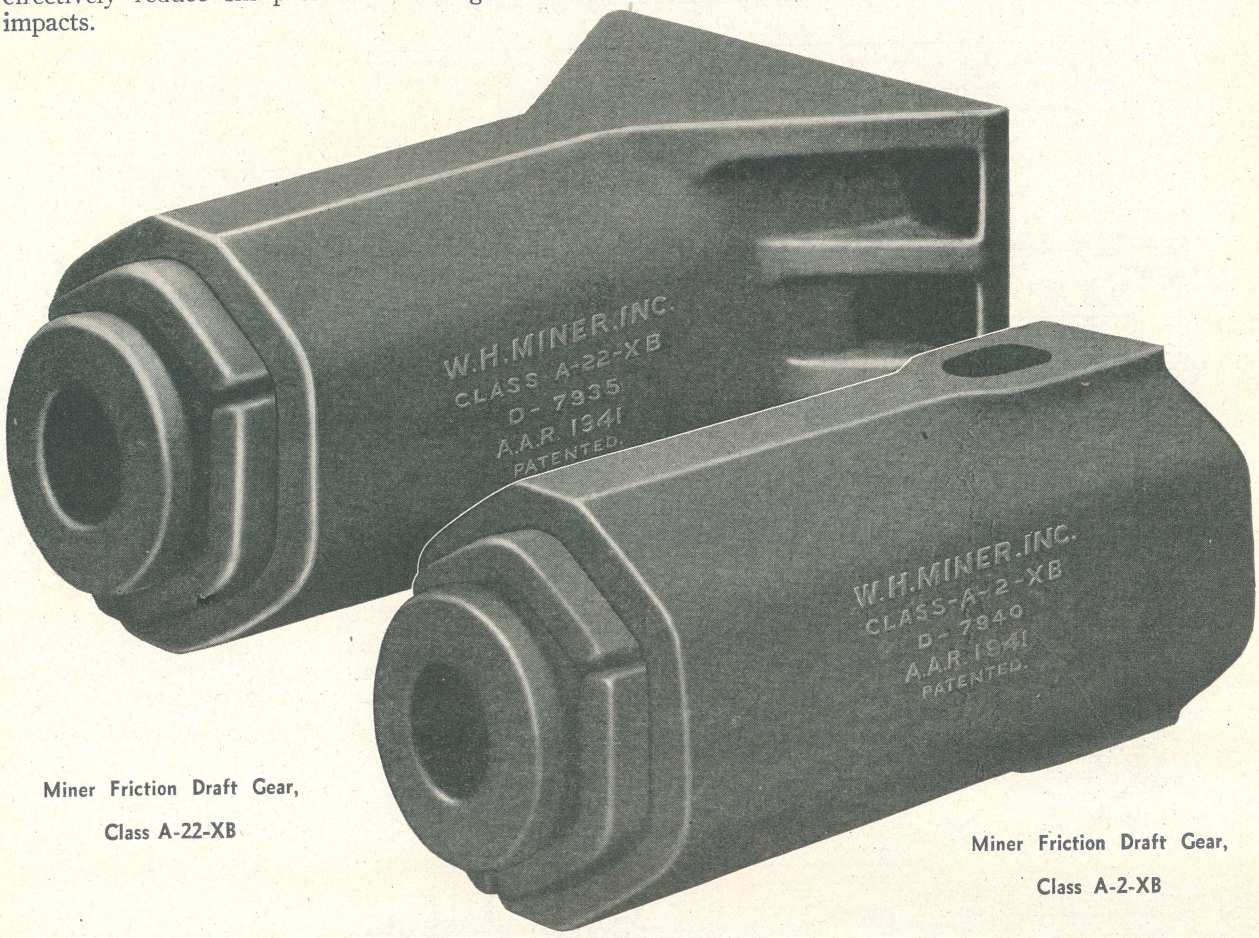
Miner Friction Draft Gears

For Freight Equipment

MINER Friction Draft Gears perform a vital service in the economic operation of high-speed freight trains. These devices have thoroughly demonstrated their ability to protect car structure and lading under the most severe operating conditions. Miner gears are powerful shock absorbers which effectively reduce sill pressure resulting from car impacts.



Miner Friction Draft Gear, Class A-22-XB

Miner Friction Draft Gear, Class A-2-XB

The Miner method of manufacturing the materials of which these devices are made and the subsequent steps in the fabrication and heat-treatment of the component parts positively ensure the high quality necessary to satisfy the exacting demands of shock-prevention service. The friction elements are made of drop-forged steel, thoroughly heat-treated and inspected. The springs are wound to exact specifications in accordance with the latest scientific practice. Each device is individually inspected and tested under a 27,000-pound drop hammer, thereby definitely ensuring correct action and capacity. Extensive service experience has positively demonstrated the ability of Miner gears to withstand shock and to protect car and lading from damage.

Miner A-22-XB Gear

The Miner Class A-22-XB Gear is certified by the Association of American Railroads and meets fully every requirement for heavy freight train protection. This device provides great column strength, and the extraordinary resistance to wear ensures that high capacity with low sill pressure is maintained for many years of service. For typical application, see Figure 10.55.

Miner A-2-XB Gear

The Miner Class A-2-XB Gear is also certified by the Association of American Railroads. This device has a high degree of mechanical efficiency, resulting in the reduction of lading and equipment damage. The gear is applied to the standard pocket in combination with two follower plates. See Figure 10.58 for typical application.

Miner A-69-XB Gear

The Miner Class A-69-XB Gear is similar in construction and performance to the Class A-22-XB gear except that it is especially designed to fit the 18½-in. pocket. Application to car conditions is shown in Figure 10.56.

Miner Class A-28-XB Gear

This device was designed for caboose cars. It provides an initial resilient spring action of 1½ in., ensuring comfort for the trainmen, and an additional 1-in. travel of frictional resistance so vitally necessary to protect the car when it is used in pusher service. Figure 10.60 shows typical application.

FreightCar America, Ex. 1054
IPR2025-01046, -01047

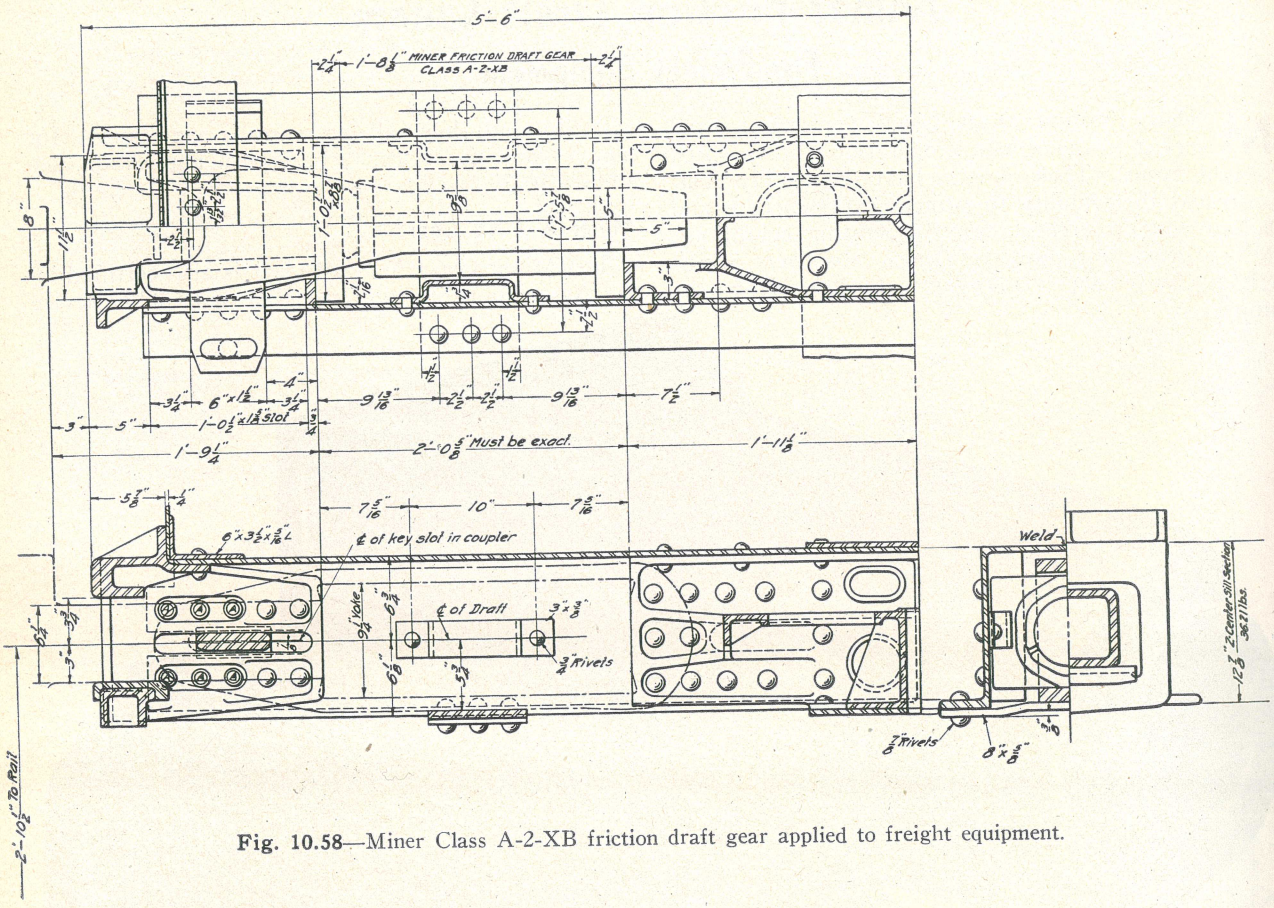


Fig. 10.58—Miner Class A-2-XB friction draft gear applied to freight equipment.

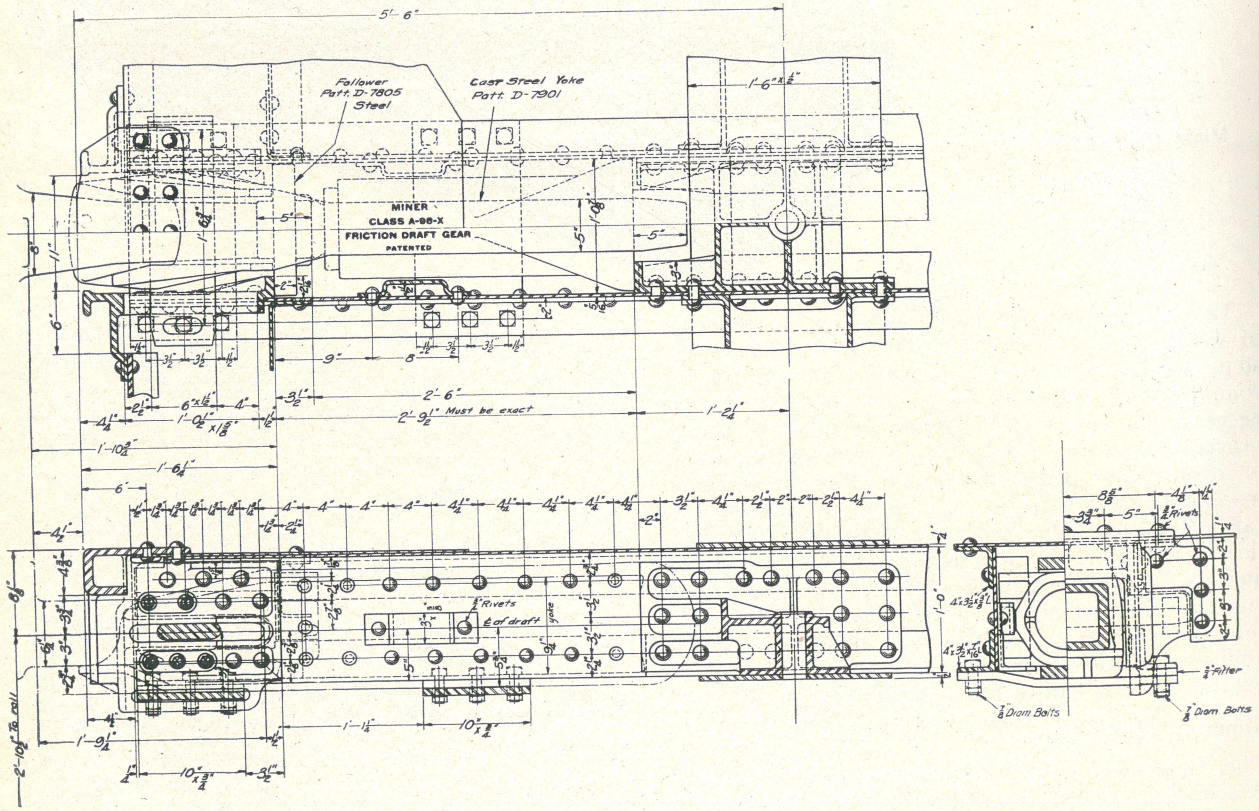


Fig. 10.59—Miner Class A-98-X friction draft gear applied to freight equipment.

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(*See also Page 947*)

FreightCar America, Ex. 1054
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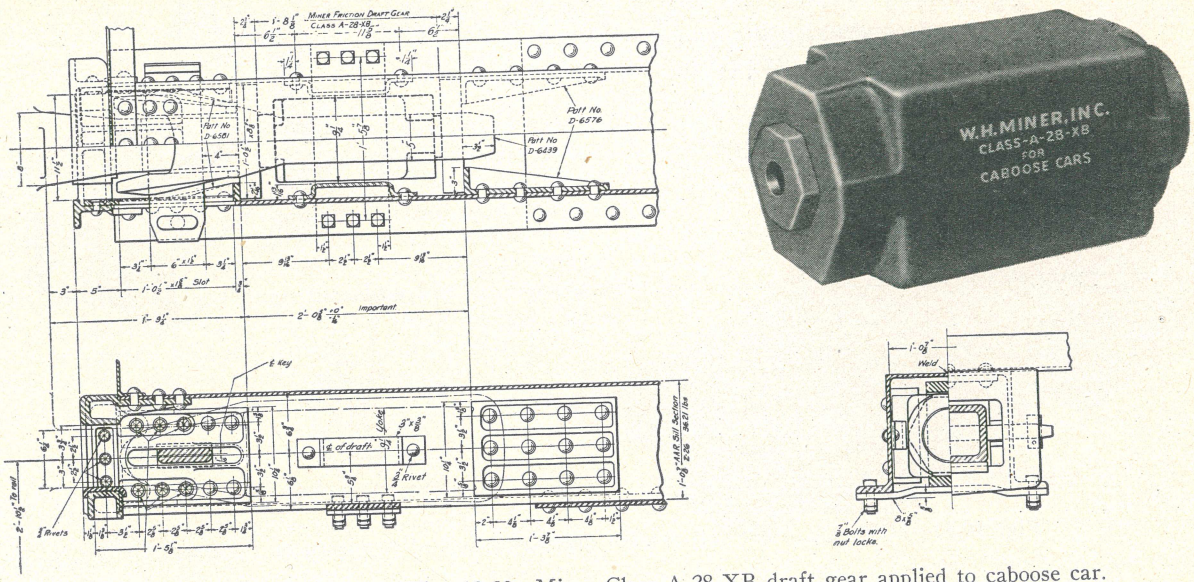


Fig. 10.60—Miner Class A-28-XB draft gear applied to caboose car.

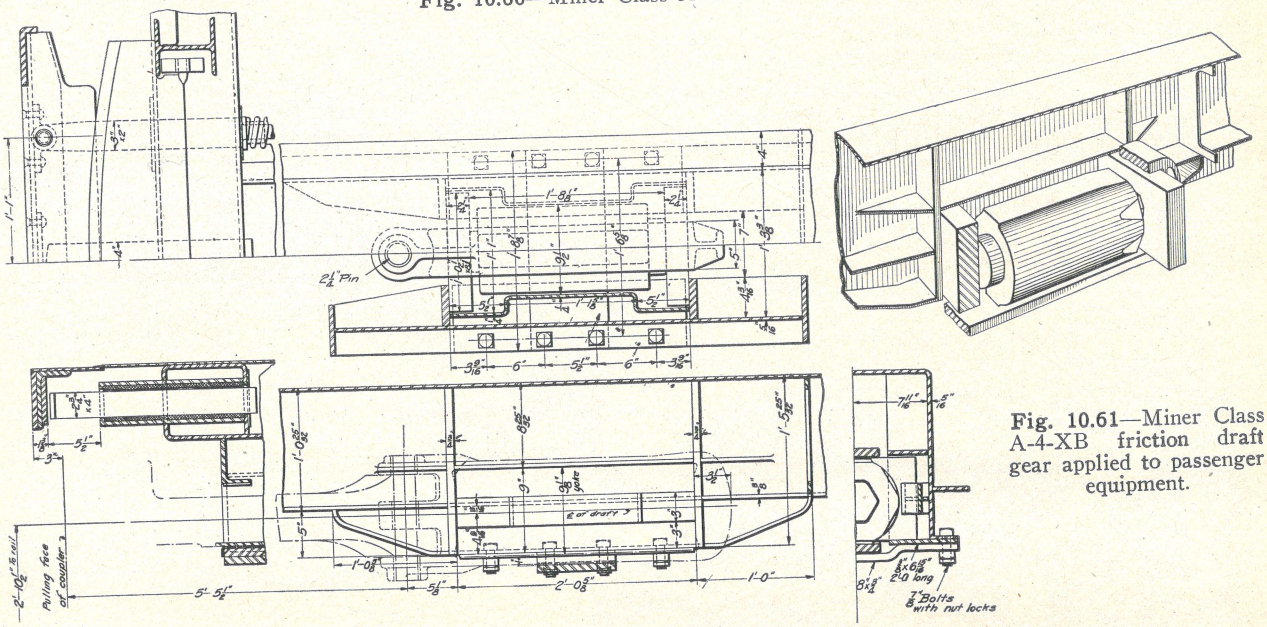


Fig. 10.61—Miner Class A-4-XB friction draft gear applied to passenger equipment.

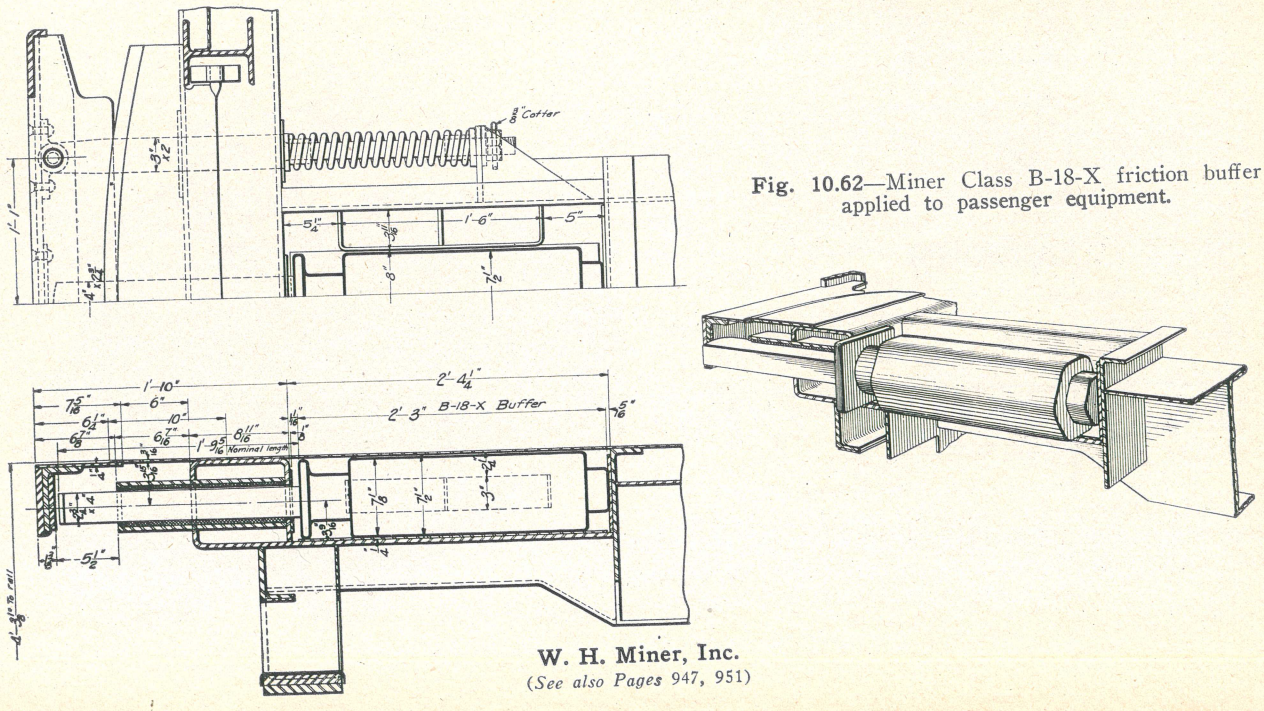


Fig. 10.62—Miner Class B-18-X friction buffer applied to passenger equipment.

W. H. Miner, Inc.

(*See also Pages* 947, 951)

FreightCar America, Ex. 1054
IPR2025-01046, -01047

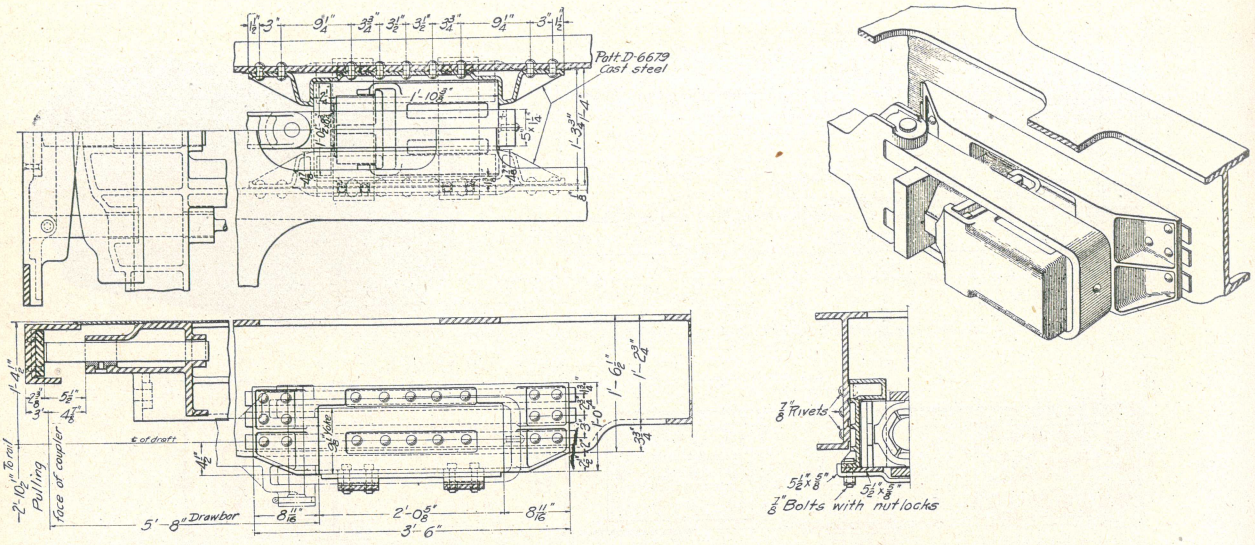


Fig. 10.63—Miner Class A-5-XB friction draft gear applied to passenger equipment.

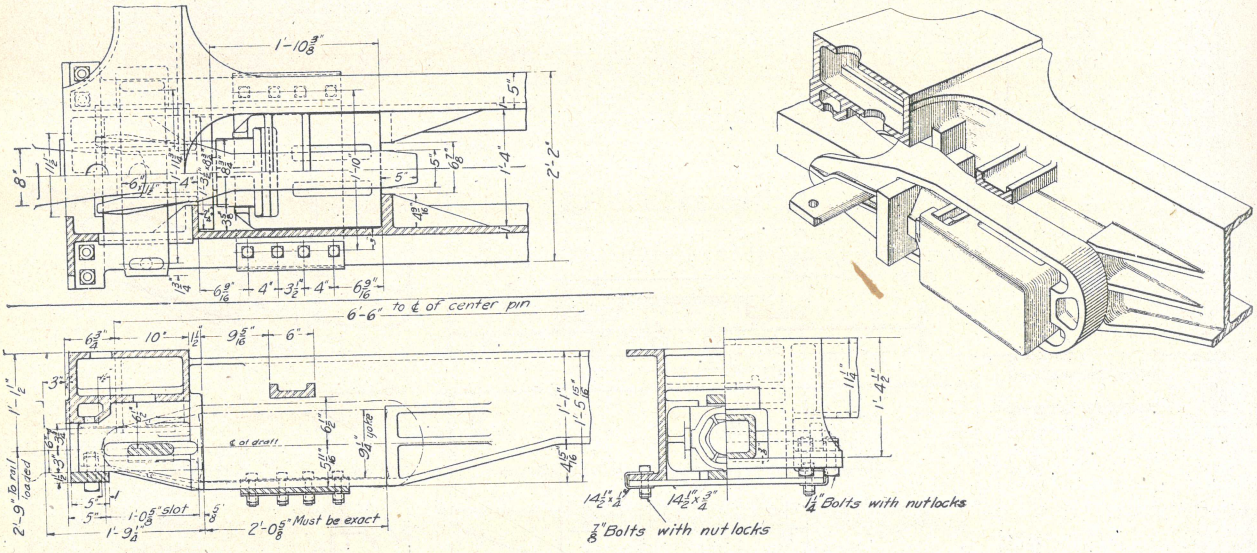


Fig. 10.64—Miner Class A-94-XB friction draft gear applied to passenger equipment.

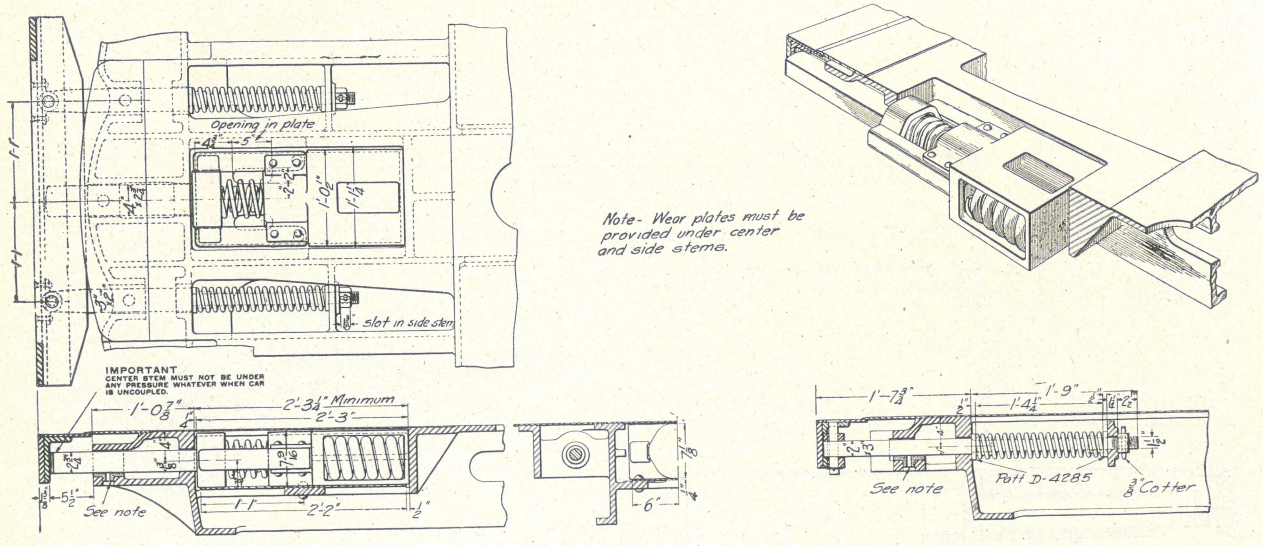


Fig. 10.65—Miner Class B-10-X friction buffer applied to passenger equipment.

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FreightCar America, Ex. 1054
IPR2025-01046, -01047

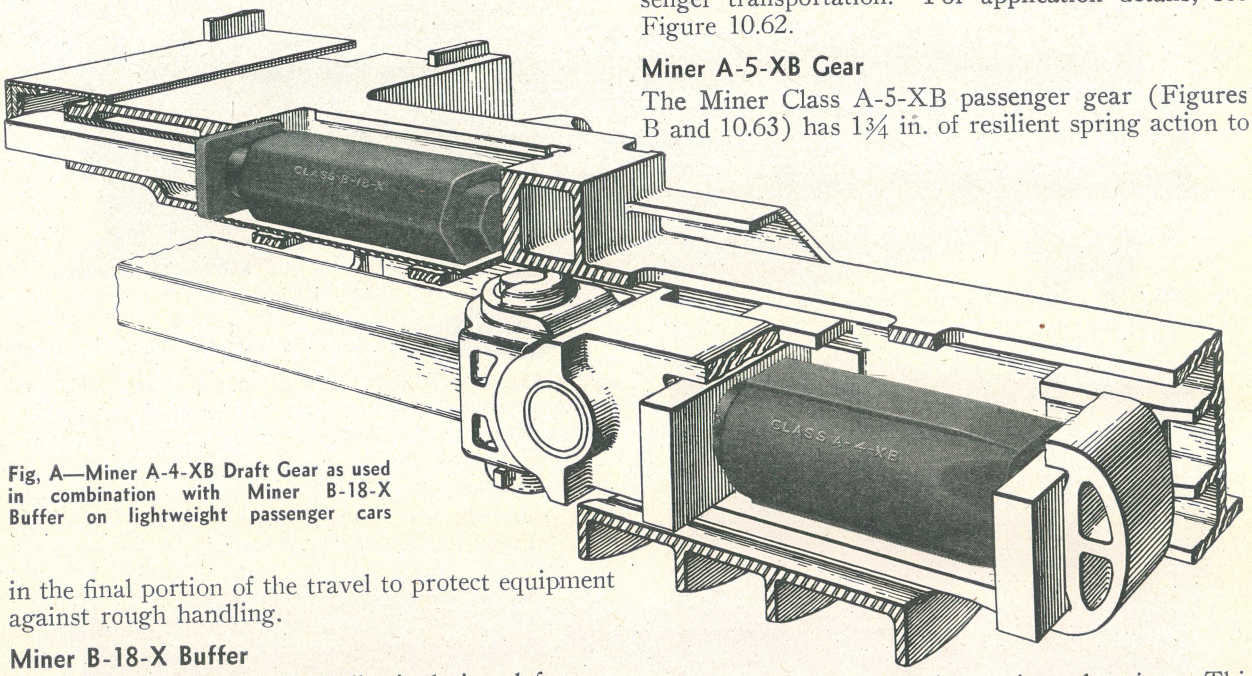
Miner Friction Draft Gears and Buffers

For Passenger Equipment

IT is imperative that correctly designed cushioning devices be selected for passenger equipment in order to ensure a maximum of comfort for the traveling public. Miner Velvet-Action Draft Gears and Buffers successfully fulfill every requirement of modern passenger train operation, not only protecting equipment from rough handling but facilitating smooth starting and stopping of cars. They also provide proper blending of the differences in speed between the motive power and the individual cars while the train is in motion.

Miner A-4-XB Gear

The Miner Class A-4-XB Gear (Figures A and 10.61) is made of high-strength steel, ensuring extraordinary durability. This device, which fits the standard draft gear pocket, provides the necessary live spring action for the smooth and noiseless starting of trains. High frictional resistance is developed in the final portion of the travel to protect equipment against rough handling.



Fig, A—Miner A-4-XB Draft Gear as used in combination with Miner B-18-X Buffer on lightweight passenger cars

Miner B-18-X Buffer

The Miner Class B-18-X Buffer is designed for use in combination with the Class A-4-XB gear on modern passenger cars. Several years of service on leading high-speed trains testify to their success in meeting the exacting requirements of present-day passenger transportation. For application details, see Figure 10.62.

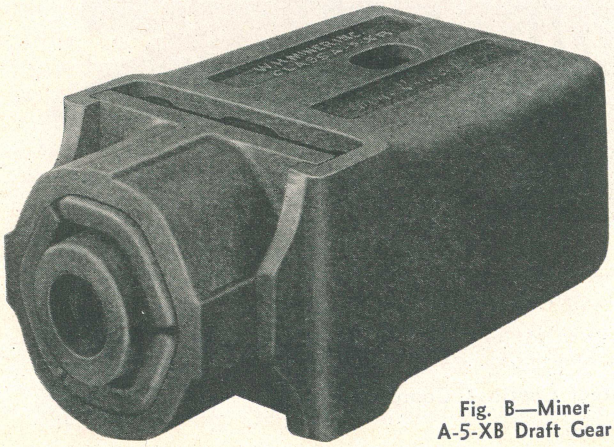


Fig. B—Miner A-5-XB Draft Gear

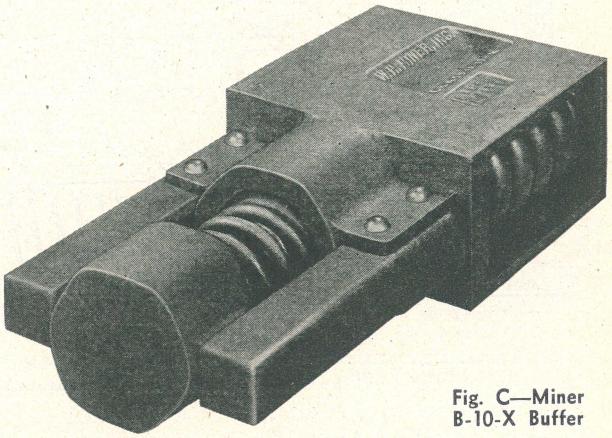


Fig. C—Miner B-10-X Buffer

Miner A-5-XB Gear

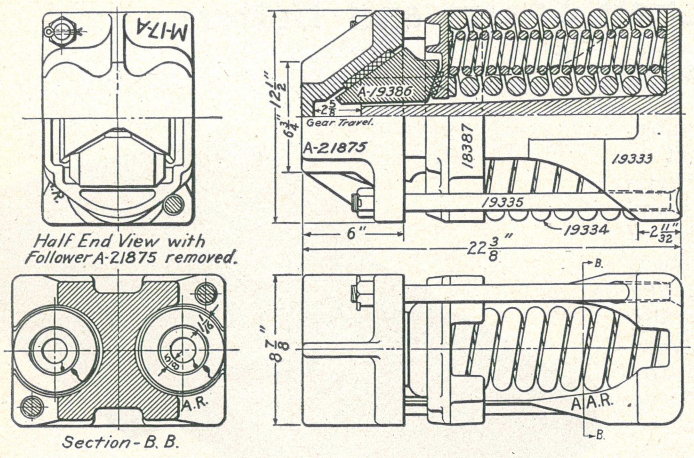
The Miner Class A-5-XB passenger gear (Figures B and 10.63) has 1¾ in. of resilient spring action to permit easy starting and stopping of trains. This spring resilience also responds to the pulsing development of the drawbar pull and, by synchronizing with this surging, transmits uniform traction to the train. This action blends into heavy frictional capacity at the end of the stroke to protect car structure against overload shocks.

Miner B-10-X Buffer

The Miner Friction Buffer (Figures C and 10.65) provides live spring resistance for precoupling action, during which the buffer works in conjunction with the side stem springs to maintain positive contact between vestibule plates. The final travel augments the draft gear capacity.

Miner passenger appliances are correctly designed and made of the finest quality steel, thoroughly heat-treated. Each device is carefully and rigidly inspected and tested before shipment.

FreightCar America, Ex. 1054
IPR2025-01046, -01047



List of Parts of Fig. 10.66

Number	Name	No. per Gear
18387	Friction Segment Seat	1
A-21875	Follower Wedge	1
19333	Friction Member	1
19334	Draft Spring	2
19335	Retaining Rod and Nut	2
A-19386	Friction Segment	2

Travel of Gear.....Min., 2½ in.; Max, 2¾ in.
Weight of Gear.....Average 370 lb.

Fig. 10.66—National friction draft gear, Type M-17-A, A.A.R. approved—Certificate No. 2.

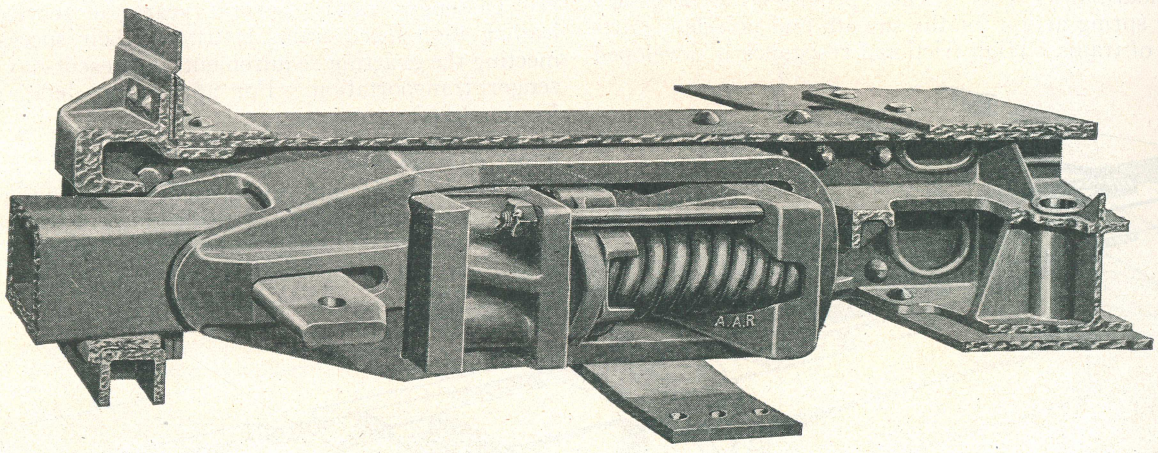


Fig. 10.67—National friction draft gear, Type M-17-A, A.A.R. approved. Applied to car in combination with A.A.R. Standard E Coupler and vertical cast steel yoke.

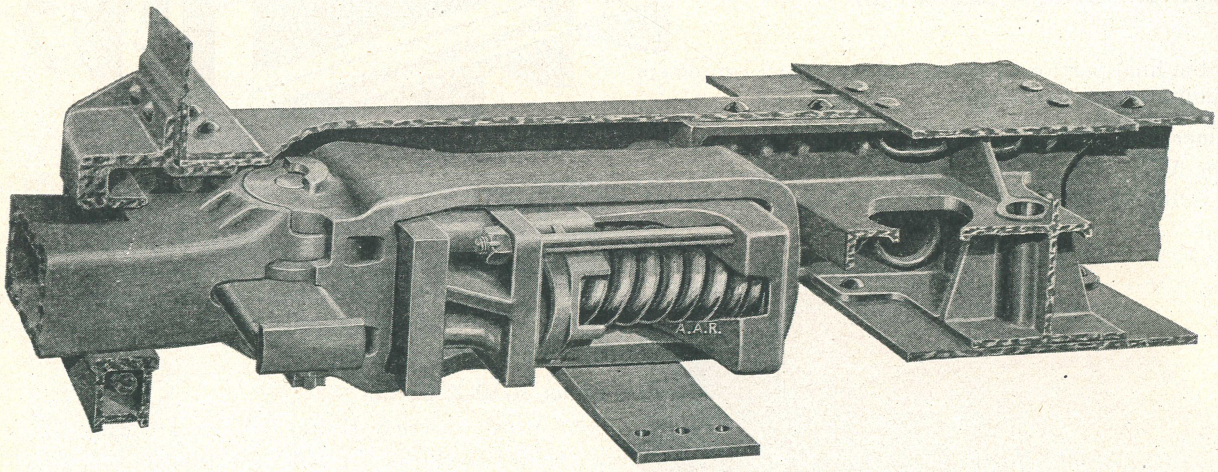


Fig. 10.68—National friction draft gear, Type M-17-A, A.A.R. approved. Applied to car in combination with A.A.R. Alternate Standard E Coupler and vertical cast steel swivel yoke.

National Malleable and Steel Castings Company

(*See also Pages* 953, 959)

FreightCar America, Ex. 1054
IPR2025-01046, -01047

National Friction Draft Gears

THE present National Friction Draft Gears are the result of many years of service, investigation and development work to obtain a gear of simple design and with the fewest number of parts possible, consistent with a ruggedness and capacity that would insure a long life of the gear in service and afford the maximum protection to the cars against the extremely heavy shocks and blows of present day train operation. To attain this object the material used in the construction of National Friction Draft Gears is of special high quality. Each vital part of these gears is separately treated to obtain the exact physical properties necessary to best enable it to perform its individual function.

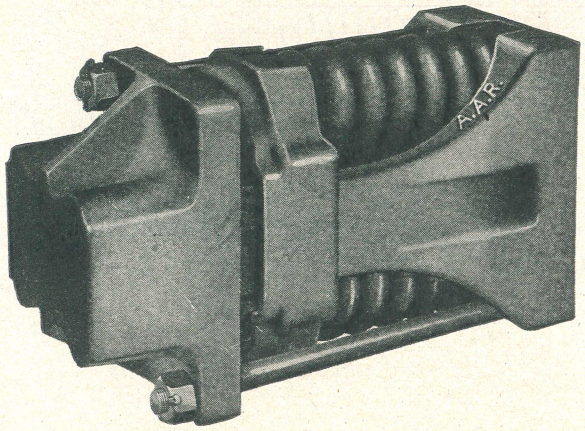


Fig. A—National Friction Draft Gear Type M-17-A
A. A. R. Approved, Cert. No. 2

Important and Distinctive Features

National Friction Draft Gears embody several important and distinctive features:

First: National gears are built upon the principle of inwardly acting wedge pressure and a centrally located friction member. The friction segments are wedged inwardly against the central member, with the result that this member is subjected only to compressive stresses. Any wear that may develop on this member, therefore, does not weaken it or lessen its ability to withstand these stresses.

Second: All castings entering into the construction of these gears are made of alloy steels, heat-treated to secure a hardness and strength best suited for the service each part must perform. The central friction member is specially hardened, providing a ductile, shock-resisting body with surfaces of extreme hardness. The friction segments are of a special alloy steel, heat-treated to secure a degree of hardness somewhat less than that of the surfaces of the central friction member but still very hard. The follower wedge and segment seat are made of Naco Steel on account of its proven strength and toughness.

Third: National Gears in types M-17-A and M-50-B are provided with central friction members of sufficient area and strength to carry the over-solid blows as well as the normal friction stresses and are of ample strength to meet the most rigid requirements.

The draft springs are never compressed solid, even when the gear is fully closed, which protects the frictional parts as well as the springs themselves from excessive stresses.

Fourth: National gears are so designed that when they are assembled and locked to the correct length for application to the car, the draft spring is under considerable initial compression. On account of this initial compression the frictional elements are always held in close contact with one another, ready to respond instantly to any applied force. This initial spring compression automatically compensates for any frictional wear that may take place during the life of the gear. The gears are locked to the proper length by retaining rods with nuts and cotters. These rods are not removed in applying the gears to equipment. The gears do not have to be boxed or crated for shipment as they cannot get out of adjustment or come apart through rough handling. The vital parts are so protected that they are not liable to injury.

Fifth: All friction and wedging surfaces are accurately machined or ground, and when assembled, each gear is given a series of factory tests in a specially designed machine equipped with an automatic recording pressure gage. Each gear is thoroughly inspected and when tested must show a minimum required capacity before it is accepted for shipment.

Sixth: As there is no case or barrel surrounding the gear, all parts are exposed to view for inspection, yet they are so protected that injury to any part is impossible.

The M-17-A gears require one follower and

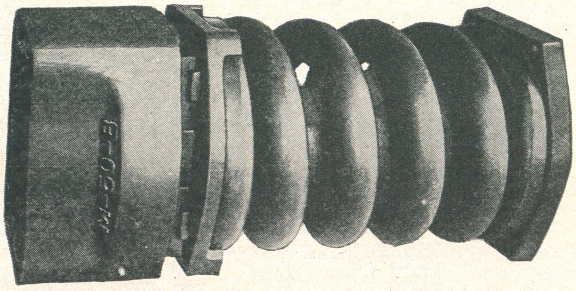


Fig. B—National Friction Draft Gear, Type M-50-B
A. A. R. Approved, Cert. No. 10

the M-50-B gears require two followers, when used in the standard draft lug spacing of 24⅝ in.

Seventh: Prior to shipment, National gears are temporarily shortened about ½ in. to facilitate their application to the cars. The small studs used for this purpose drop out during the first compression of the gears after application to a car and thus the gear is released to its normal length.

Eighth: The National M-17-A and M-50-B Draft Gears have been subjected to the tests required by the A.A.R. Standard Specifications for Approval of Draft Gears for Freight Car Service, and have passed all these requirements with an excellent margin. These gears therefore are approved as standard by the Association of American Railroads and are sold under their approval certificates.

FreightCar America, Ex. 1054
IPR2025-01046, -01047

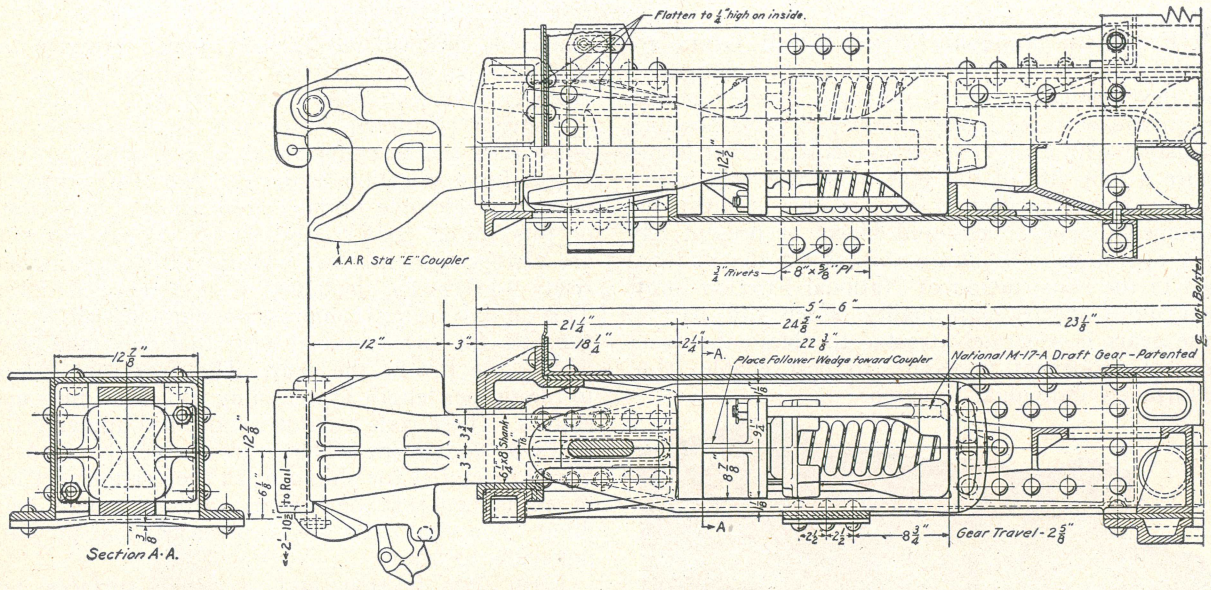


Fig. 10.69—National friction draft gear, Type M-17-A, applied to A.A.R. Type car in combination with A.A.R. Standard E Coupler and vertical cast steel yoke.

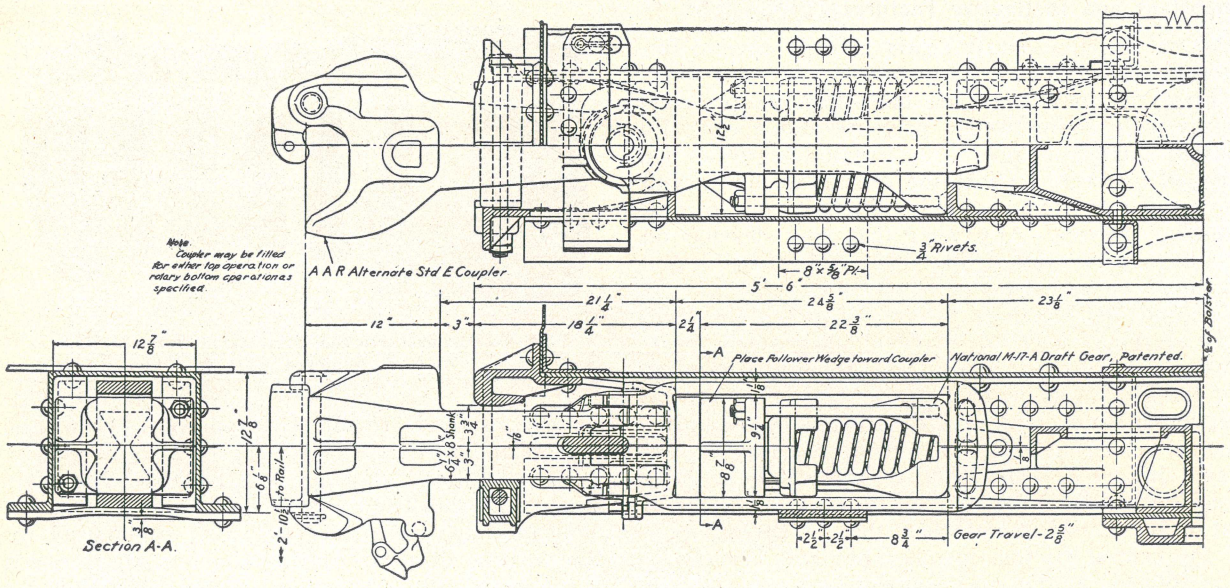


Fig. 10.70—National friction draft gear, Type M-17-A, applied to A.A.R. Type car in combination with Alternate Standard E Coupler and vertical cast steel swivel yoke.

National Malleable and Steel Castings Company

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FreightCar America, Ex. 1054
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