

The Janney Coupler

There are a number of automatic train couplings, most of which are mutually incompatible. When I first ran my Huskie Loco much interest was expressed in the couplers I was using. On my riding car I have a solid knuckle coupler but on the loco I have an operating 'Sharon Type D' coupler. This is one variation of the Janney coupler [Later Master Car Builders Association coupler, now AAR (American Association of Railroads) coupler].

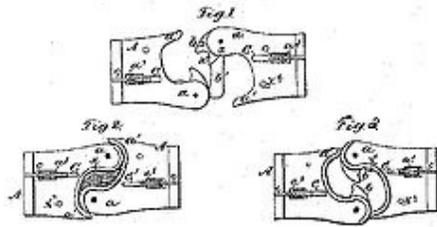


Diagram of the top view of Janney's coupler design as published in his patent application in 1873.

Janney couplings are always right-handed.

The knuckle coupler or Janney coupler was invented by Eli H. Janney, who received a patent in 1873. It is also known as a "buckeye coupler". Janney was a dry goods clerk and former Confederate Army officer from Alexandria, Virginia, who used his lunch hours to whittle from wood an alternative to the link and pin coupler.

In 1893, satisfied that an automatic coupler could meet the demands of commercial railroad operations and, at the same time, be manipulated safely, the United States Congress passed the Safety Appliance Act. Its success in promoting switchyard safety was stunning. Between 1877 and 1887, approximately 38% of all railworker accidents involved coupling. That percentage fell as the railroads began to replace link and pin couplers with automatic couplers. By 1902, only two years after the SAA's effective date, coupling accidents constituted only 4% of all employee accidents. Coupler-related accidents dropped from nearly 11,000 in 1892 to just over 2,000 in 1902, even though the number of railroad employees steadily increased during that decade.

When the Janney coupling was chosen to be the American standard, there were 8,000 patented alternatives to choose from. The only significant disadvantage of using the AAR (Janney) design is that sometimes the drawheads need to be manually aligned.



Standard AAR Type E couplers doing their job on a freight train.

The AAR coupler has withstood the test of time since its invention, and has seen only minor changes: The original Janney coupler is no longer compatible with the latest AAR couplers. [Compare Illustration and picture above]

The current AAR contour dates back to the "Master Car Builders Association (MCBA)" coupler.

Type "E" coupler, the original (plain) AAR coupler, derived from the Master Car Builders Association coupler.

Type "F" coupler, a "tooth and socket" or "tightlock" variation to prevent accidents, derailments and wrecks from uncoupling the couplers. The "tooth" on a loose coupler could puncture any tank car or other car carrying hazardous materials. Variations on the AAR type "F" coupler have been devised to provide extra protection, in case of derailments and train wrecks, to cars routinely carrying sensitive or hazardous loads. These variations of type "F" couplers, generally involving "shelves", remain fully compatible with standard AAR couplers, but tend to keep derailments and collisions from uncoupling the cars (thereby preventing the "tooth" of the couplers from piercing the ends of the cars).

The APTA (former AAR) standard type "H" coupler, a "tooth and socket" or "tightlock" variation used mostly, if not exclusively, on passenger cars. The Type "H" coupler is now under the supervision of the APTA (American Public Transportation Association)

Types "F" and "H" couplers are also known as tightlock couplings.

"pads" to reduce slack on passenger trains.

Improvement to castings, etc. to increase maximum trailing load.

Rotating-shaft couplers (type "F") introduced for use in rotary car dumpers.

Narrow gauge railways such as the Victorian Puffing Billy Railway use a miniature version of the AAR coupler.

Using the AAR coupler.

Used in Canada, the USA, Mexico, Japan, Australia, South Africa, Saudi Arabia, Cuba, Chile, Brazil, China and elsewhere.

Maximum tonnage as high as 32,000 t (70,547,924 lb) such as Fortescue Railway.

Drawbar pull tractive effort rated with a minimum strength 350,000 lbs (159 t) for general service coupler made of Grade B steel. Grade E knuckles may have an ultimate strength of 650,000 lbs (295 t).

The AAR couplers comes in at least two sizes, "full size" and "three quarter", which are not compatible. Lighter weight railways, especially those of narrow gauge or with no need for interrunning sometimes use smaller (3/4 or half size) versions of the AAR coupling.

AAR couplers are always right-handed.

AAR are not necessarily mounted at the same height above rail - some variation can be tolerated.

AAR couplers are uncoupled by lifting the coupling pin with a lever at the corner of the car. This pin is locked when the coupler is under tension, so the usual uncoupling steps are to compress the coupling with a locomotive, lift and hold up the pin, then pull the cars apart. Side operated variants are called the "Sharon coupler" or "Buckeye coupler".

Trains fitted with AAR couplers can accommodate heavier loads than any other type of coupler. Thus the heaviest coal trains in New Zealand have AAR couplings even though the remainder of the fleet has the meatchopper kind. Also, long-distance freight trains in North America are quite commonly more than a 1-mile (1.6 km) long, whereas this is unknown in Europe.