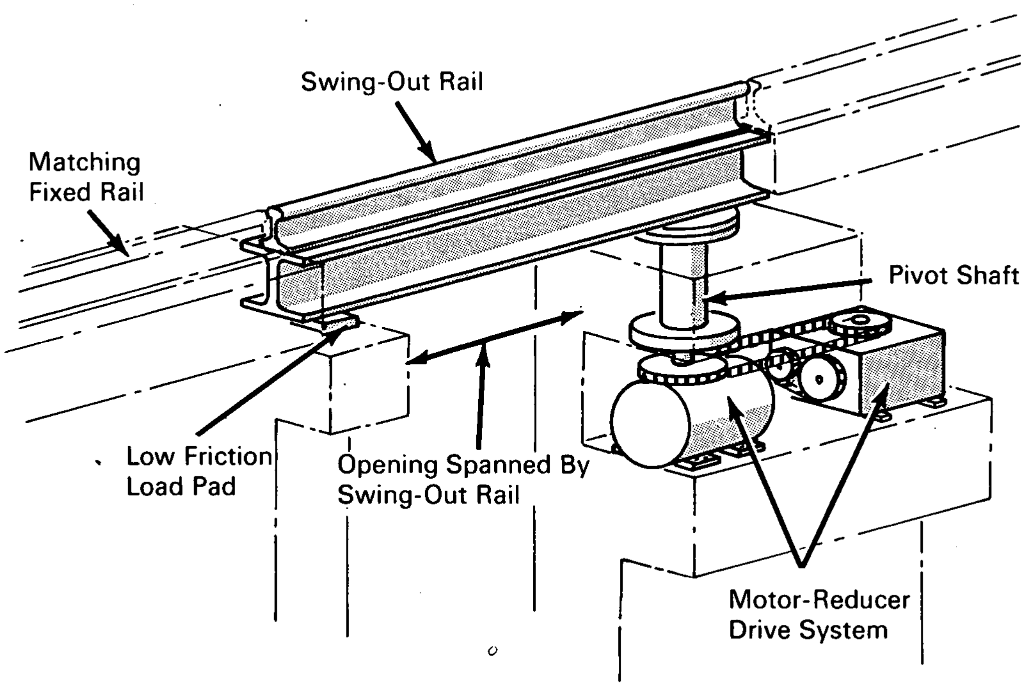
December 1966 Brief 66-10713

AEC-NASA TECH BRIEF

Swing-Out Rail System Separates Overhead Crane Rails



The problem:

To remotely separate and reconnect overhead traveling crane rails in order to provide for the passage of a thick concrete radiation shield sliding door through the rails. It was desired to have a traveling overhead crane operate through the entire length of a building, with the requirement that the building would be divided at times by a sliding door operating through the crane rails.

The solution:

A system was designed to swing out a portion of the crane rail for the passage of the door. In the swing-out position, the rail cantilevered from an axial shaft. In the normal position, the swing out portion was simply supported at each end.

How it's done:

The swing-out rail consists of a section of crane rail mounted onto a beam designed to support the fully loaded crane wheel loads. To the pivot end of the beam is rigidly attached a horizontal bearing plate which in turn is attached to a vertical pivot shaft. The lower face of this plate turns on a piece of low friction bearing metal. A radial bronze bearing maintains shaft alignment. The lower end of the shaft is carried by a ball thrust bearing and radial needle roller bearing combination. The combination saves

(continued overleaf)

radial space over that required for a tapered roller bearing. A thrust nut threaded on the shaft is tightened to put the shaft in tension, so as to lock up the two thrust bearings against one another. This removes slack and stiffens the assembly so that the large moment produced when the rail is supported entirely by the shaft, when its far end is unsupported, will limit the deflections to only those due to stresses in the materials. This is necessary because when the rail swings to its closed position, it must match accurately on a pad at its far end. Any appreciable sag would cause it to hit the edge of the pad and prevent it from closing completely.

A sprocket attached to the lower end of the shaft is connected through a chain drive to a speed reducer driven by a motor through a second chain. Limit switches stop the drive when the rail reaches its limit in either direction. A torque limiting device built into the reducer stops the drive in case of an overload. This protects against failure of a limit switch to stop the drive or against the presence of an obstruction in the path of the rail.

Note:

Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
AEC-NASA Space Nuclear Propulsion Office
U.S. Atomic Energy Commission
Washington, D.C. 20545
Reference: B66-10713

Patent status:

No patent action is contemplated by AEC or NASA.

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under contract to
AEC-NASA Space Nuclear Propulsion Office
(NU-0094)