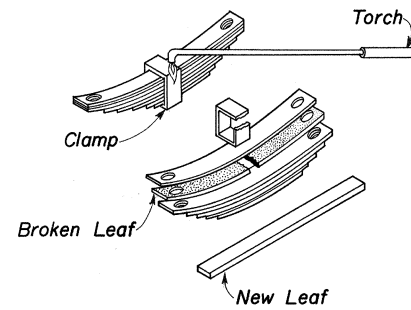
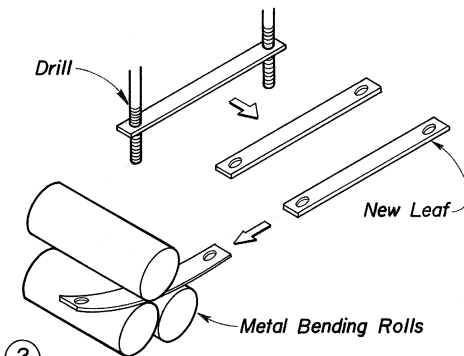


LOCOMOTIVE SPRING REPAIR & ASSEMBLY PROCESS

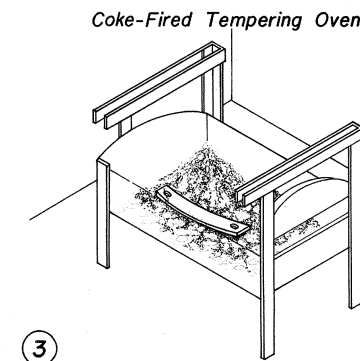
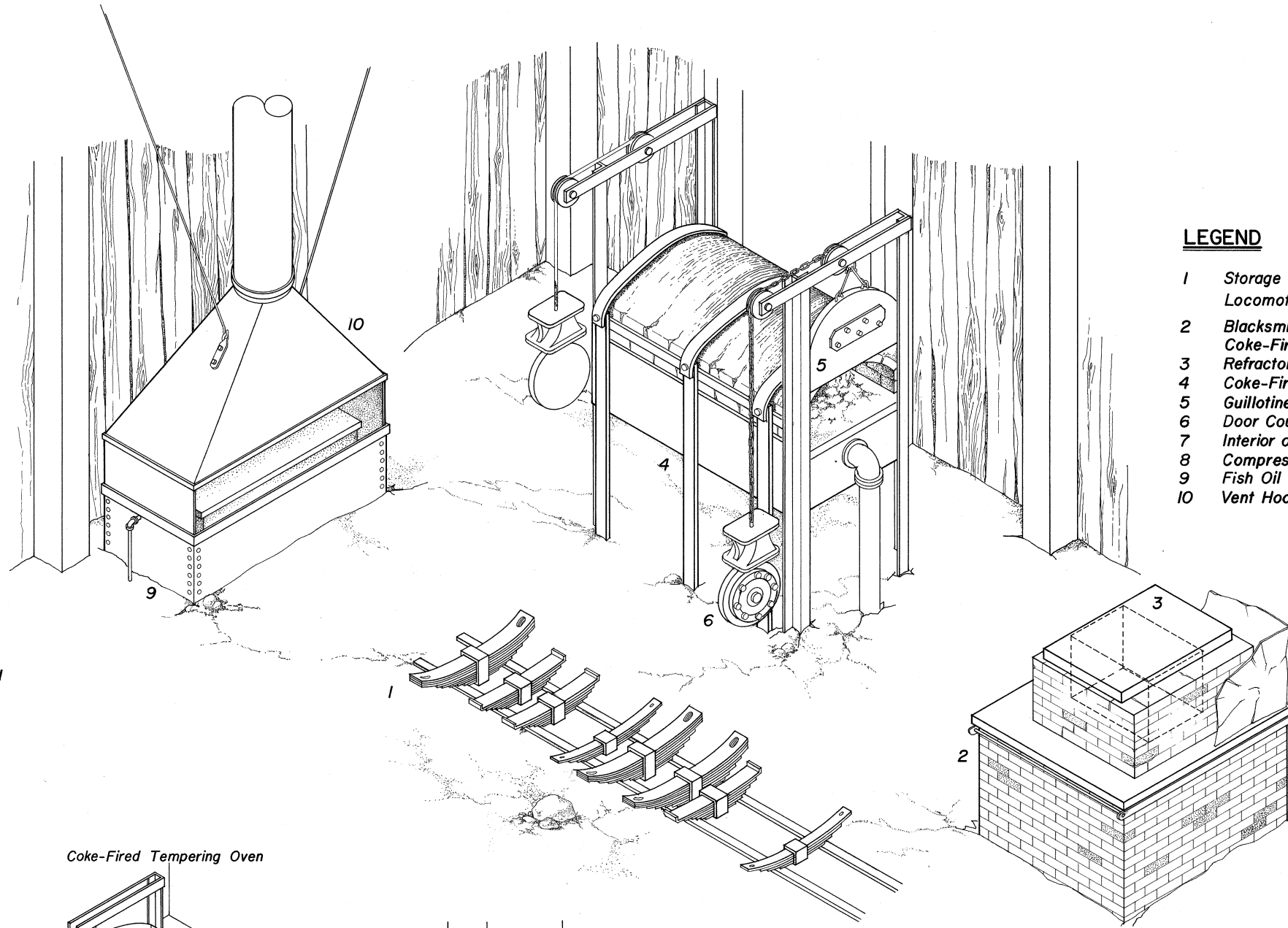
Steam locomotives are equipped with a series of elliptic leaf spring clusters which are mounted to provide a suspension cushion between the drive wheels and the main frame of the locomotive. These spring clusters were subjected to shock under poor track conditions and rough train handling, and one or more individual spring leaves would break under such conditions. The spring was first removed from the locomotive by unloading the tension using a jack, and disconnecting the spring hanger brackets. Then the spring was brought to the Blacksmith Shop for disassembly.



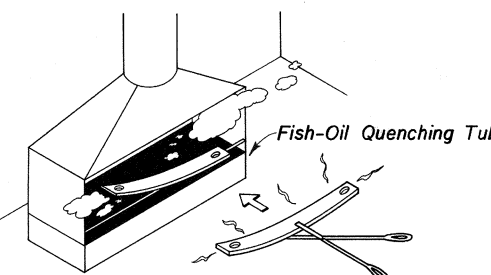
1 The damaged spring cluster was disassembled by cutting the center clamp with a gas torch, and new length of flat high-carbon steel stock was cut to length to replace it.



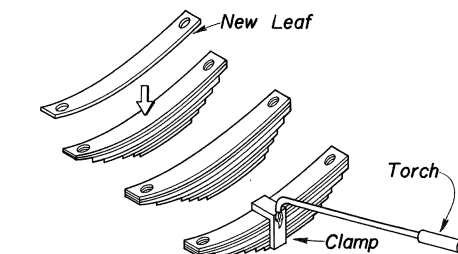
2 New bracket mounting holes were drilled in the ends of the new spring leaf, and it was rolled in the Machine Shop to give it the correct radius of curvature to nest with the other leaves in the spring cluster.



3 The new spring leaf was placed in the coke-fired tempering oven, where it was hardened and tempered through controlled manipulation of exposure time and oven temperature changing the high-carbon steel stock into spring steel. This oven was also used for other hardening and tempering jobs.



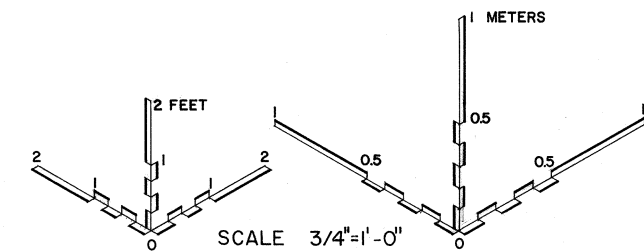
4 After heating for both the hardening and tempering processes, the spring leaf was removed from the tempering oven and quenched in the quenching tub using a fish oil bath.



5 The new spring leaf was nested with its other leaves, and a new clamp was welded to bind them together.

LEGEND

- 1 Storage Rack for Broken Locomotive Spring Assemblies
- 2 Blacksmith's Forge Converted to High-Temperature Coke-Fired Heating Forge
- 3 Refractory Brick Hood
- 4 Coke-Fired Tempering Oven
- 5 Guillotine-type Oven Door
- 6 Door Counterweight
- 7 Interior of Oven, Showing Coke
- 8 Compressed Air Blast Pipe
- 9 Fish Oil Quenching Tub
- 10 Vent Hood



LOCOMOTIVE SPRING REPAIR & ASSEMBLY

ISOMETRIC LOOKING NORTHEAST



DELINEATED BY: ANDRIY PRYBEHA, IVELISE SANTOS, MATTHEW KIERSTEAD (text), 1994.
 SOUTHWESTERN PENNSYLVANIA
 RECREATION PROJECT
 NATIONAL PARK SERVICE
 UNITED STATES DEPARTMENT OF THE INTERIOR

EAST BROAD TOP RAILROAD & COAL CO., BLACKSMITH SHOP c.1882
 PA. STATE ROUTE 994 (MEADOW STREET) WEST OF U.S. ROUTE 522
 ROCKHILL FURNACE (ORBISONIA) HUNTINGDON COUNTY PENNSYLVANIA

HISTORIC AMERICAN
 ENGINEERING RECORD
 SHEET
 4 of 6
 PA-127-C

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