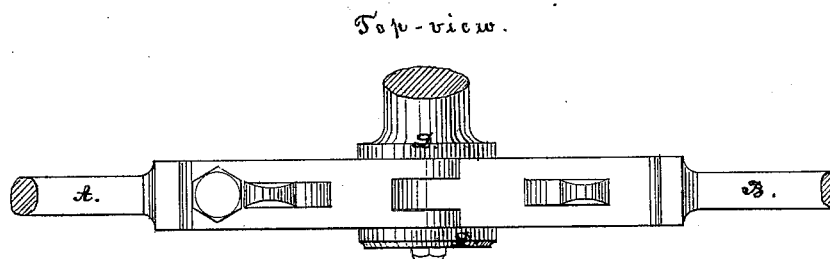
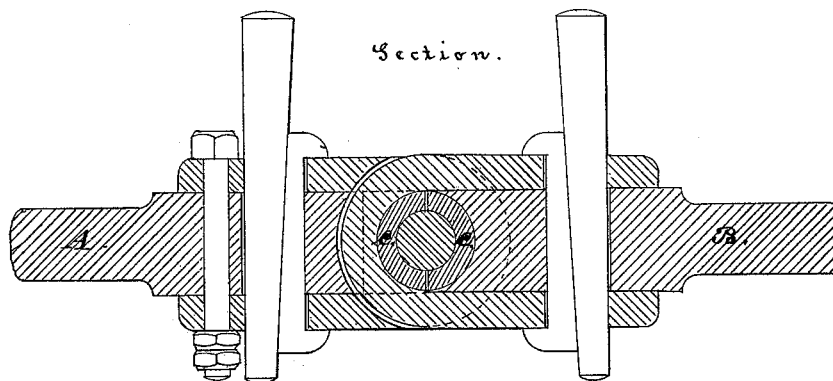
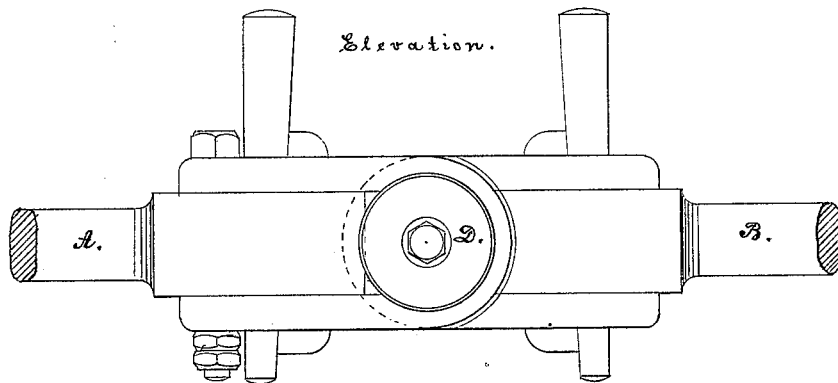


S. B. CRAWFORD & A. LAIRD.  
Locomotive Main and Coupling Rod.

No. 220,467.

Patented Oct. 14, 1879.



Witnesses:

J. Schubert.

*C. W. Blodgett*

Inventors:  
*S. B. Crawford*  
*Alex. Laird.*

# UNITED STATES PATENT OFFICE.

SAMUEL B. CRAWFORD AND ALEXANDER LAIRD, OF PARKERSBURG, WEST VIRGINIA.

## IMPROVEMENT IN LOCOMOTIVE MAIN AND COUPLING RODS.

Specification forming part of Letters Patent No. **220,467**, dated October 14, 1879; application filed June 6, 1879.

### *To all whom it may concern:*

Be it known that we, SAMUEL B. CRAWFORD and ALEXANDER LAIRD, of Parkersburg, in the county of Wood and State of West Virginia, have invented a new and useful Improvement in Locomotive Main and Coupling Rods, of which the following is a specification.

The invention relates to the method of constructing the main and coupling rods in such a way that they become continuous.

Heretofore such rods—that is to say, the coupling-rods—have been worked on a separate outer journal or separate inner journals.

These methods of connecting the coupling-rods are objectionable on the following grounds: First, owing to the excessive length of the crank-pin necessary to the proper accommodation and working of the coupling-rod, the leverage becomes so great that the strain frequently breaks the pin, causing frequent and disastrous accidents; second, the coupling-rod, being out of line of main rod and cylinder, is more exposed to injury and more liable to derangement, besides requiring an extra bearing and brasses, thereby creating a large amount of unnecessary friction, and greatly adding to the wear and tear of these parts.

The object of our invention is to overcome these as well as other important defects in the construction of coupling-rods and

crank-pins, which we accomplish by placing the main and coupling rods in line from cylinder to back crank-pin, thereby making the main and coupling rods continuous, and with only three bearings instead of four, as heretofore used. By this method of construction the strain is equalized between the main and back crank-pins, and the power from the main rod is thereby uniformly distributed.

In the accompanying drawing, in which similar letters of reference indicate like parts, we show an elevation, a section, and a top view of a device embodying our invention.

The main rod A, retained by bolt, gib, and key, and the coupling-rod B, retained by gib and key, connect by a strap knuckle-joint, thus forming an equal bearing around brasses *c c* on main crank-pin D, thereby making a continuous connection between main and coupling rods, as set forth.

What we claim as our invention is—

The main rod and the coupling-rod directly united at the main crank-pin, substantially as and for the purpose described.

S. B. CRAWFORD.  
ALEX. LAIRD.

Witnesses:

V. W. BLOEDE,  
J. H. McCLELLAN.