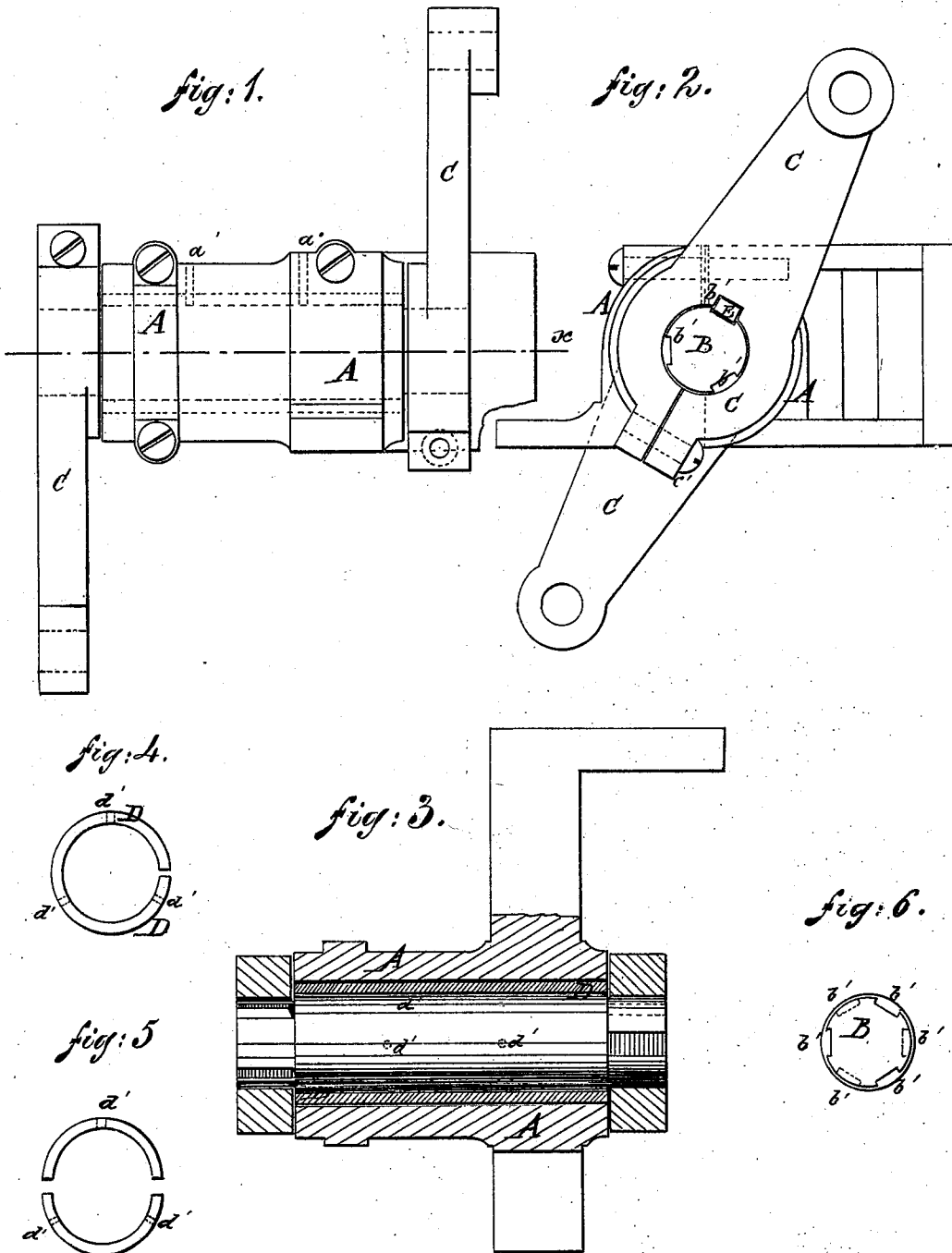


J. T. & W. J. CROWTHER.

LOCOMOTIVE ROCKER-SHAFTS AND BOXES.

No. 173,213.

Patented Feb. 8, 1876.



WITNESSES:

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UNITED STATES PATENT OFFICE

JOHN T. CROWTHER, OF CARBONDALE, AND WILLIAM J. CROWTHER, OF
URBANA, ILLINOIS.

IMPROVEMENT IN LOCOMOTIVE ROCKER SHAFTS AND BOXES.

Specification forming part of Letters Patent No. **173,213**, dated February 8, 1876; application filed
November 13, 1875.

To all whom it may concern:

Be it known that we, JOHN T. CROWTHER, of Carbondale, in the county of Jackson and State of Illinois, and WILLIAM J. CROWTHER, of Urbana, in the county of Champaign and State of Illinois, have invented a new and useful Improvement in Locomotive Rocker-Boxes, of which the following is a specification:

Figure 1 is a side view of our improved rocker-box. Fig. 2 is an end view of the same. Fig. 3 is a longitudinal section of the same, taken through the line *xx*, Fig. 1. Fig. 4 is an end view of the bushing. Fig. 5 is an end view of the bushing, showing a modified form. Fig. 6 is an end view of the rocker-shaft, showing the key-seat, and in dotted lines the relative position of the key-seats in the other end of the shaft.

Similar letters of reference indicate corresponding parts.

The object of this invention is to save time, labor, and expense in repairing rocker-shafts and their boxes when worn oblong.

The invention consists in the open bushing, made in one or two pieces, and provided with three sets of oil-holes, in combination with the rock-shaft and the box; and in the rock-shaft made with three key-seats in each end, the key-seats in the one end being opposite the centers of the spaces between the key-seats in the other end, to enable the shaft to be adjusted in six different positions, as hereinafter fully described.

It is well known that the rocker-shafts of locomotive-engines soon wear oblong, which causes a loss of motion to the valves, and a corresponding loss of power to the engine. This has heretofore been repaired by removing the rocker-shaft, and turning it down to a true round, and removing the boxes, planing off their adjacent faces, and re boring them to fit upon the diminished shaft. The bolt-holes are then lengthened out, and the boxes replaced upon the engine-frame. This changes the relative position of the rock-shaft, and disarranges the entire valve-motion. This loss of time and labor is greatly lessened by our invention, which we will now describe.

A is the box, which is made in two parts, and secured to the engine-frame in the usual way. B is the rock-shaft, upon the ends of which are formed, or to them are attached, the arms C. When the shaft B becomes worn it is removed, and turned down to a true round. The box A is then removed, and without touching the faces of its joints it is rebored true centrally. A bushing, D, of steel or other suitable material, and of such a thickness as to fill the space between the shaft and the box, is then inserted in the box or applied to the shaft. The bushing D is made open upon one side, when the arms C are detachable, and is made in two parts or halves, when the arms C are formed solid upon the shaft B.

In the bushing D are formed three sets of oil-holes, *d'*, corresponding in position with the oil-holes *a'* of the box A, so that the said bushing can be adjusted in three different positions to cause it to wear evenly.

In this way the shaft can be repaired easily and quickly, and without disarranging in the least the valve-motion.

The bosses of the shaft-arms C are made open at the end, and are drawn together around the ends of the shaft B by pinch-screws C'. The bosses of the arms C have each a single feather or key, E, formed upon or secured to them upon the side of their bearing opposite the opening in their ends.

In each end of the rock-shaft B are formed three equidistant key-seats, *b'*, the seats of the one end being opposite the centers of the spaces between the key-seats of the other end, as shown in Fig. 6.

With this construction, the arms C may be adjusted in three different positions. The shaft B may then be turned end for end, and the arms C may be adjusted in three other positions, so that the shaft B may be worn evenly.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. The rock-shaft B, made with three key-seats, *b'*, in each end, the key-seats in the one end being opposite the centers of the spaces between the key-seats in the other end, to en-

able the shaft to be adjusted in six different positions, substantially as herein shown and described.

2. The combination, with a locomotive rocker-box, having three sets of oil-holes, *a'*, of a two-part bushing, D, having three corresponding sets of oil-holes, as shown and described, to enable the bushing to be adjusted in dif-

ferent positions, and thus equalize wear, in the manner set forth.

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Witnesses:

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