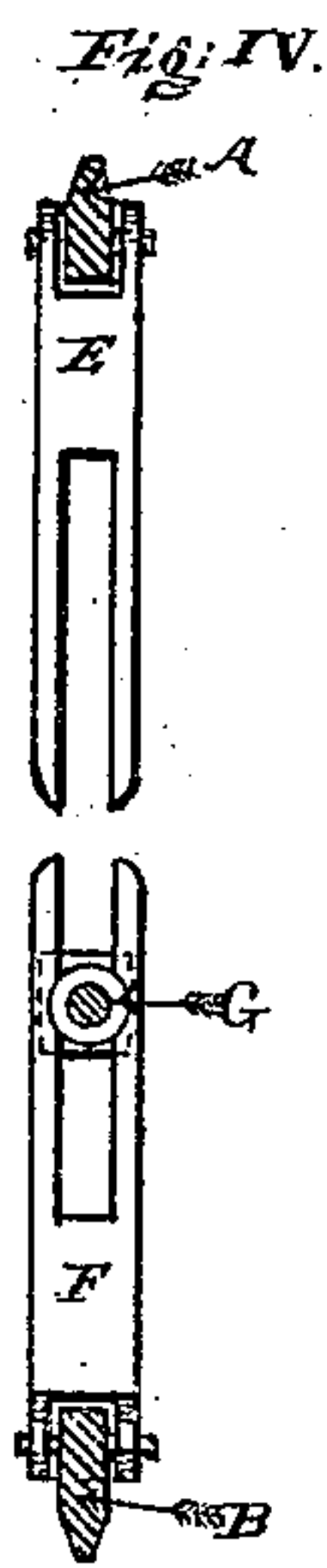
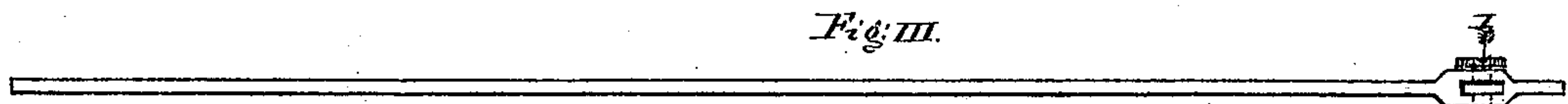
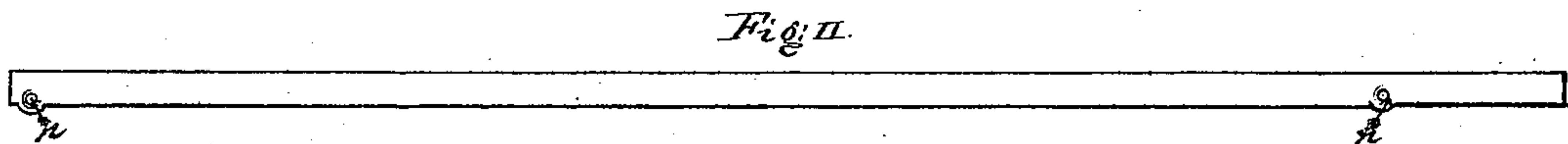
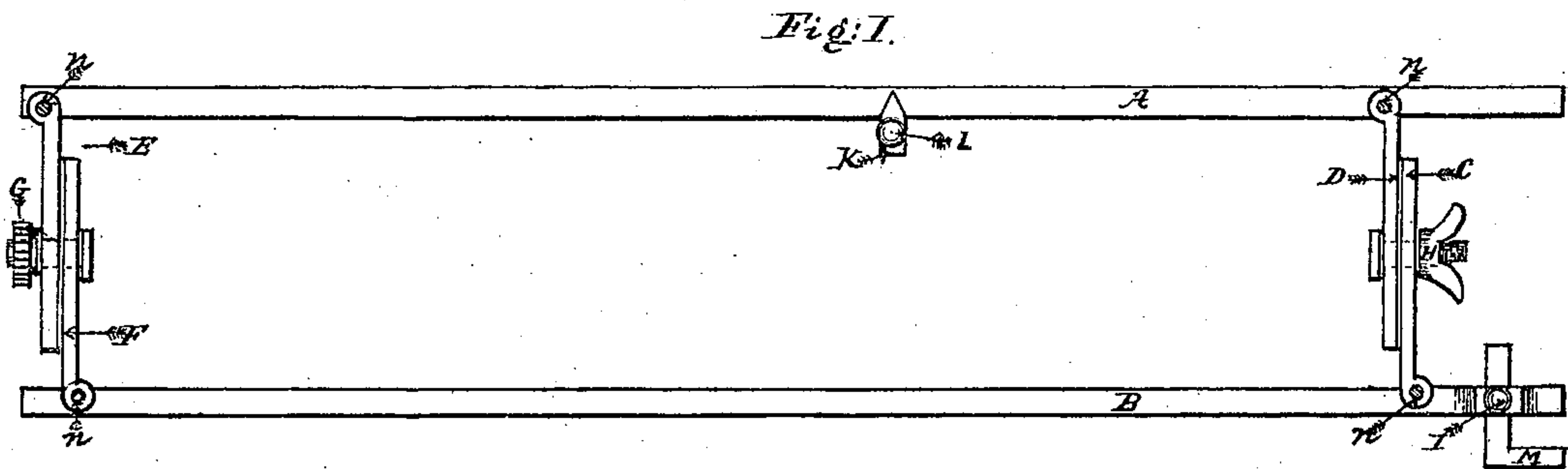


J. DONALDSON.

Improvement in Key Way Gages.

No. 133,086.

Patented Nov. 19, 1872.



WITNESSES:

Franklin Danner.
Richard Serner.

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UNITED STATES PATENT OFFICE.

JOHN DONALDSON, OF CARONDELET, MISSOURI.

IMPROVEMENT IN KEY-WAY GAGES.

Specification forming part of Letters Patent No. 133,086, dated November 19, 1872.

To all whom it may concern:

Be it known that I, JOHN DONALDSON, of Carondelet, St. Louis county, State of Missouri, have invented certain Improvements in Key-Way Gages, of which the following is a specification:

The object of my invention is to construct and provide an improved gage for ascertaining the exact width, thickness, and taper of a key-way, and the exact size of the key to such a key-way, the same gage, when set, to be used as a pattern to forge the said key by, instead of being obliged to make and fit a regular wooden pattern or sheet-iron templet, which are the methods now in use.

By the adoption of my invention the time and labor now required to make a pattern or templet will be saved, as also in fitting a key, as by use of the gage a key may be filed down at once to its proper size, and fitted almost without a trial, whereas by the present method the machinist has to proceed carefully, filing off a little at a time, and may have to try the key in its place half a dozen times before it fits. There is always a certain amount of draft or clearance in every key-way in order that the key, when driven home, may draw the piston-rod or other part perfectly tight, and it is on this account that no rule, caliper, or any small tool now in use can be applied to show the exact dimensions.

My improved key-way gage is intended to be used principally on the cross-heads of locomotive-engines; but may be applied with equal benefit to other work besides.

In order to fully describe my invention, I will refer to the accompanying drawing forming part of this specification.

Figure I is a side view of improved key-way gage. Fig. II is a side detached view of one of the bars. Fig. III is a plan view of Fig. II. Fig. IV is an end view of Fig. I.

A and B are two strips of steel or metal, twelve inches long, five-sixteenths inch wide, and three-thirty-seconds inch thick. Four arms, C, D, E, and F, slotted, as shown in Fig. IV, are pivoted at *n* to these strips, each one forming a loose joint. G is the bottom nut, made round and milled. The diameter of this nut must be a little smaller than the

smallest dimension of the key-way so that the gage may be inserted clear down through the key-way and fastened on the bottom side. H is the top nut or thumb-screw, and may be made of any convenient size. M is a caliper-square, and may be set to three-fourths of an inch by means of the set-screw I. K is a slide placed on the upper strip A, and can be moved and set at any desired place, by aid of the set-screw L, in order to ascertain the length of the key-way.

The general rule for the proportion of a key to a rod is to make the width of the key equal to the diameter of the rod, and the thickness of the key one-fourth of the diameter, the amount of taper being one-eighth of an inch in twelve inches. Therefore it is evident that the gage, when closed to its smallest width, may be applied to the key-way of any rod of the same diameter, but not to any smaller. When the gage is opened out to its greatest width, it may likewise be applied to any rod equal in diameter to that width, but not to any larger. It may be applied to all the intermediate sizes. One gage may be applied to all or nearly all sizes of locomotive piston-rods. By making the smallest width of the gage equal to the diameter of the smallest size of piston-rods, say one and a half inch, it will draw out to about three inches, and that is larger than the commonly-used rods. The length of twelve inches is sufficient for the largest size of a key in proportion to the other dimensions, the average length of locomotive cross-head keys being about nine inches.

Having thus fully described my invention, I desire to claim—

An adjustable key-way gage, consisting of the two strips A and B, the four slotted arms C, D, E, and F, pivoted to A and B at *n*, the bottom nut G, the top nut H, the caliper-square M, the set-screw I, the slide K, and set-screw L, substantially as and for the purpose hereinbefore set forth.

JOHN DONALDSON.

Witnesses:

ARCHIBALD McLEAN,
GEORGE MCGREGOR.