

(No Model.)

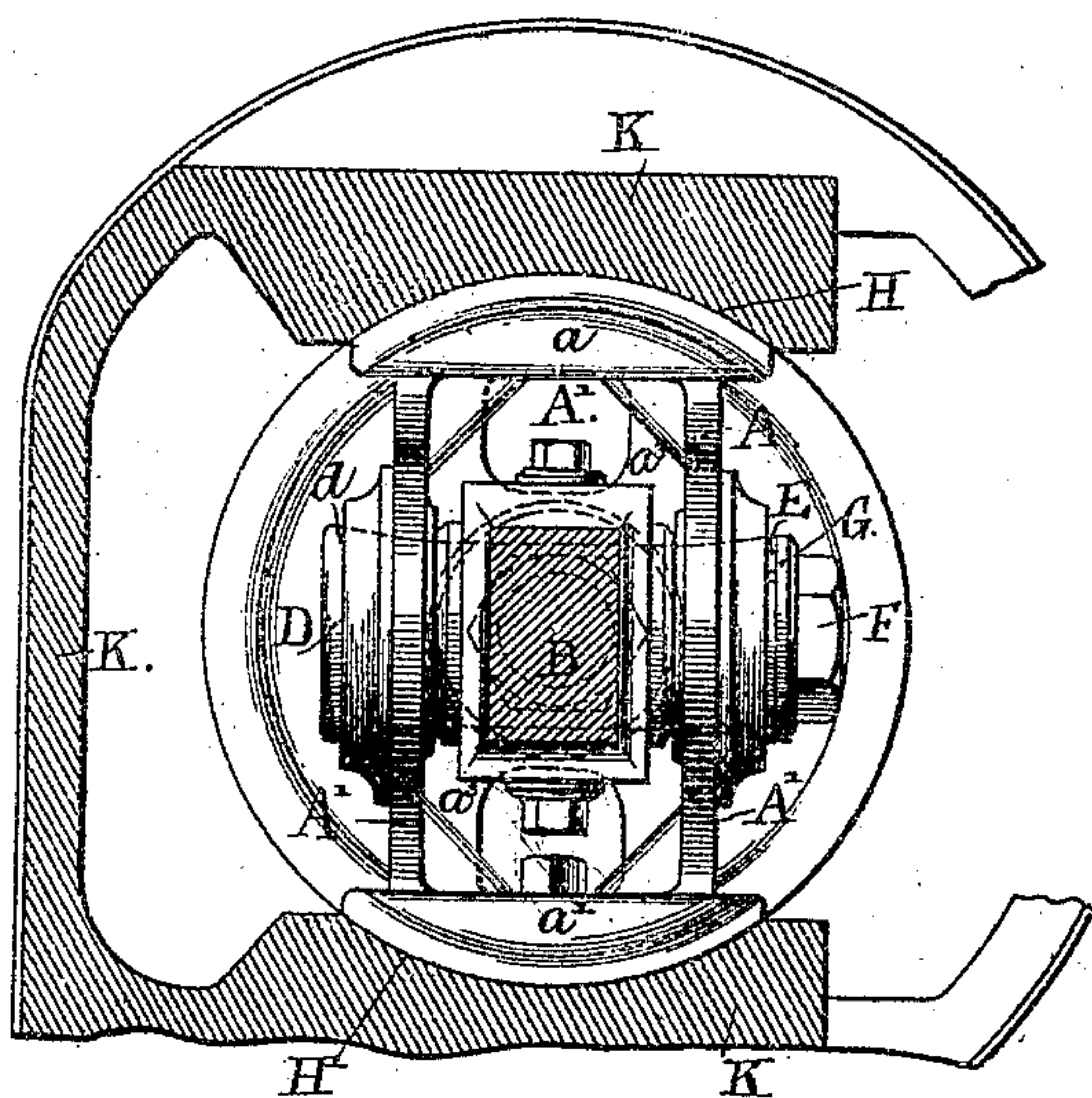
A. L. IDE.

# STEAM ENGINE CROSS HEAD.

No. 321,727.

Patented July 7, 1885.

*Fig. 2.*



*Fig. 4*

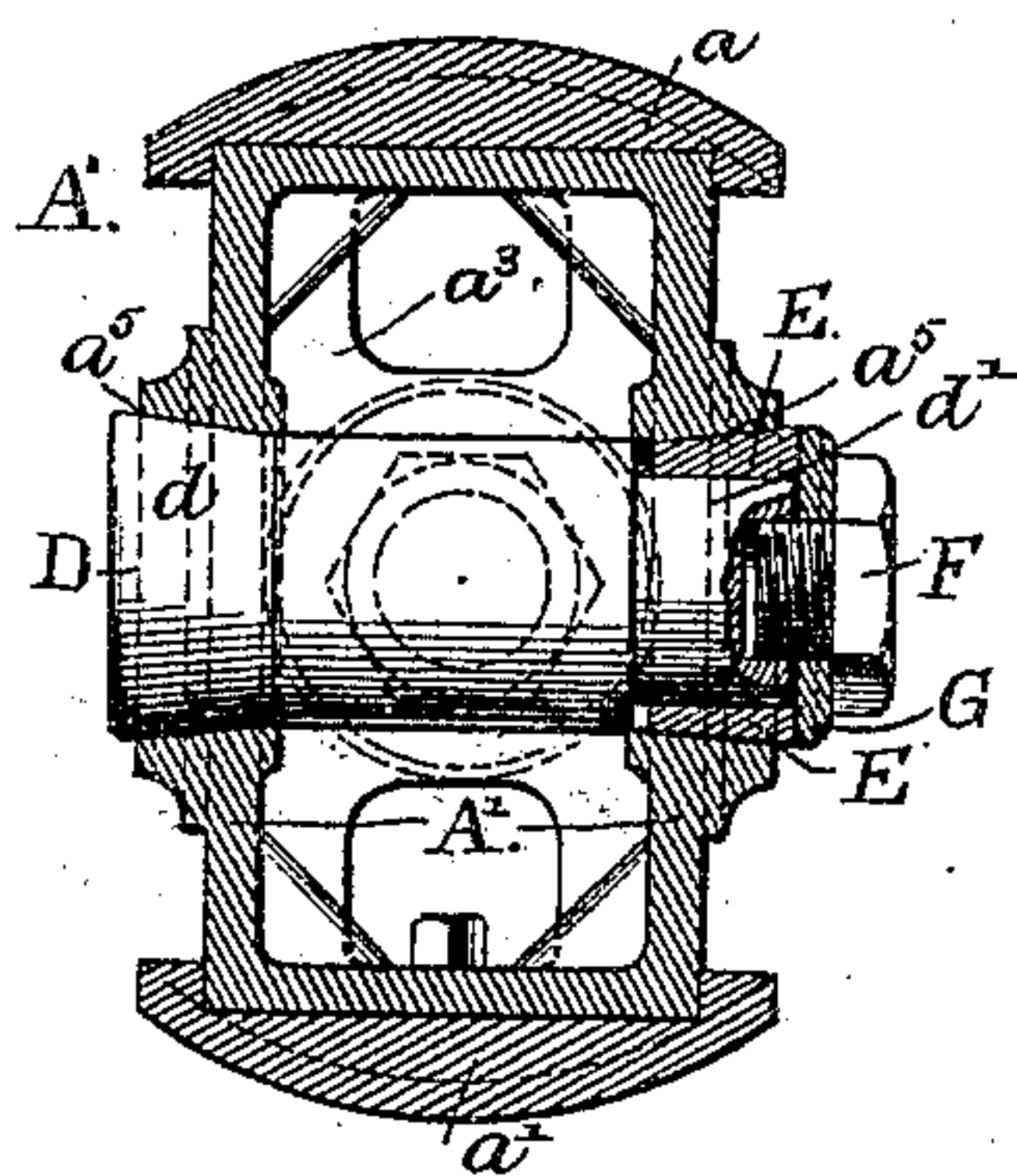
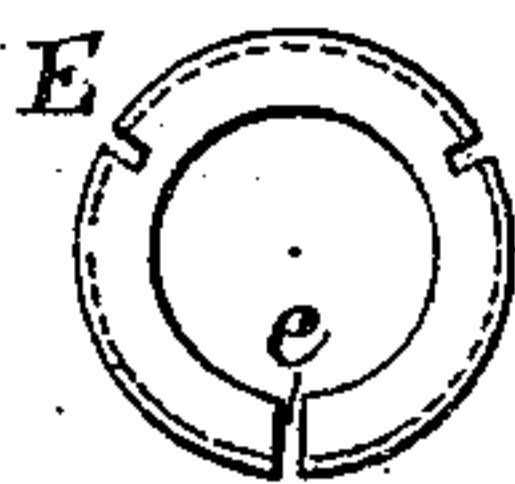


Fig. 5.



Witnesses:-

Louis M. F. Whitehead.—

E. C. Poole

Fig. 1.

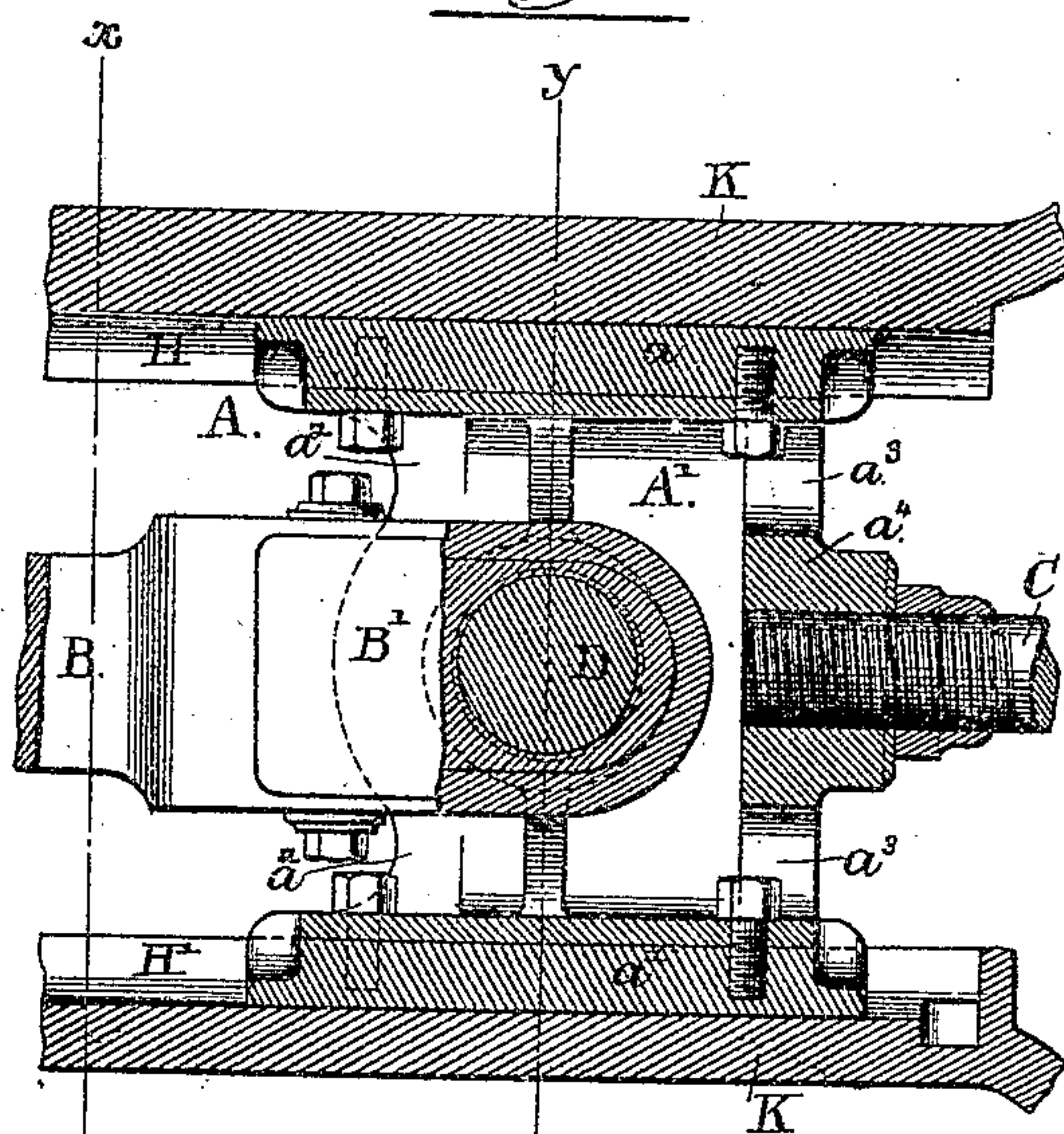
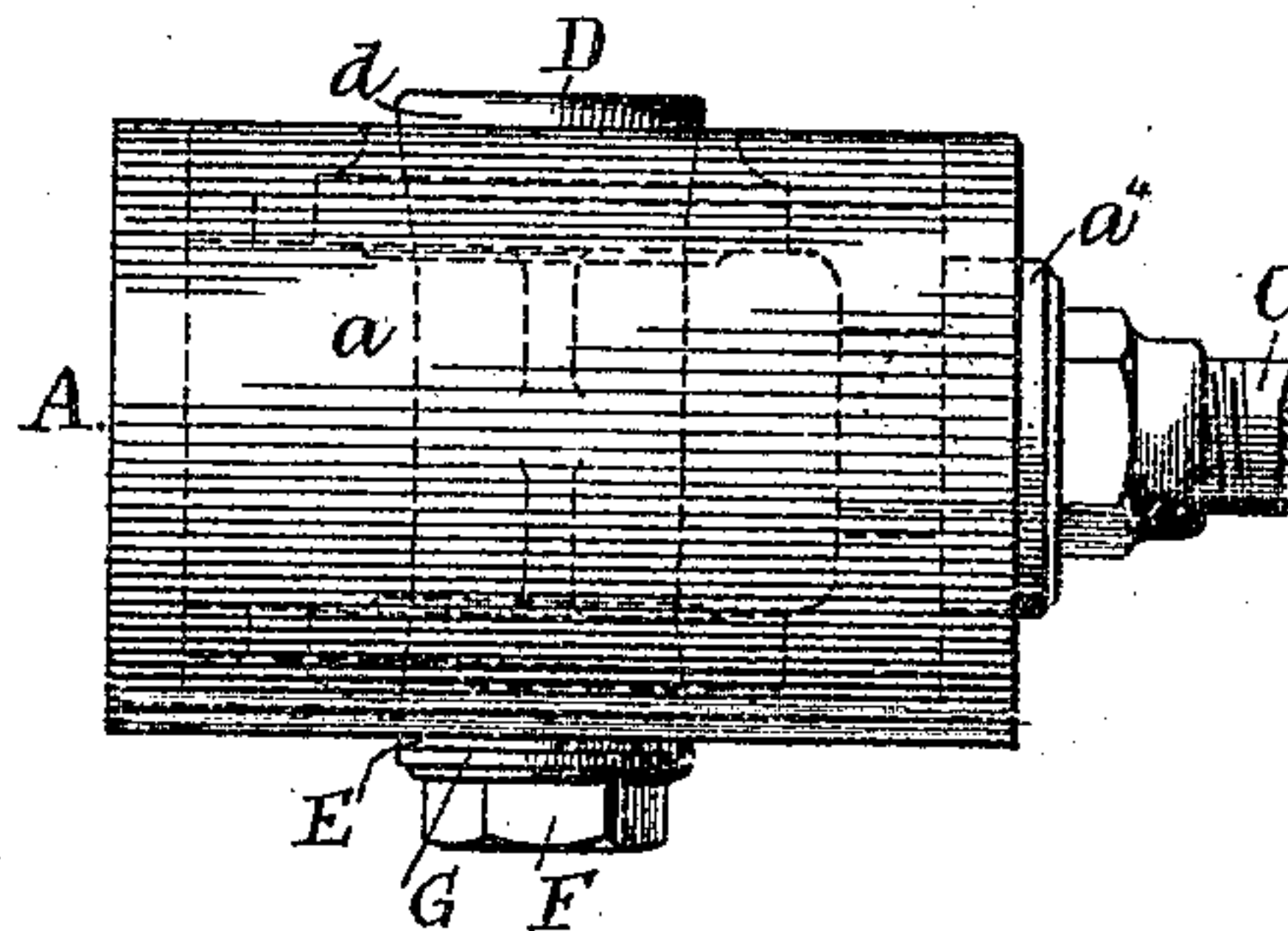


Fig. 3.



Inventor:-

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by:-

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Attorney:—



# UNITED STATES PATENT OFFICE.

ALBERT L. IDE, OF SPRINGFIELD, ILLINOIS.

## STEAM-ENGINE CROSS-HEAD.

SPECIFICATION forming part of Letters Patent No. 321,727, dated July 7, 1885.

Application filed May 18, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT L. IDE, of Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Steam-Engine Cross-Heads; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The object of this invention is to provide an improved construction in steam-engine cross-heads; and it consists in the matters hereinafter described, and pointed out in the appended claim.

The main feature of novelty in my invention is embodied in a construction in means for attaching to the cross-head the wrist-pin by which the connecting-rod is pivoted to the cross-head, whereby the said wrist-pin may be readily detached from the cross-head and the employment permitted of a "solid-end" connecting-rod or one having a mortise to receive the brasses, instead of the usual strap at its end engaged with the wrist-pin.

The invention may be more fully understood by reference to the accompanying drawings, in which Figure 1 represents a longitudinal section taken on a vertical plane through the cross-head and guides therefor, with a portion of the connecting-rod also shown in section. Fig. 2 is a transverse vertical section taken through the guides upon the line  $x x$ , the cross-head being shown in elevation. Fig. 3 is a top plan view of the cross-head; and Fig. 4 is a transverse section taken on line  $y y$  of Fig. 1, showing the wrist-pin in elevation, with the exception of one end thereof, which is shown in section. Fig. 5 is a detail showing a tapering bushing for supporting one end of the wrist-pin, said bushing being viewed from its larger end.

The cross-head A consists in its principal part of an oblong rectangular metal box, A', the upper bearing-surface of said cross-head being formed by a plate,  $a$ , rigidly bolted to the top of the box A', and its lower bearing-surface being similarly formed by a plate,  $a'$ , which is likewise securely bolted to the under side of said box. The plates  $a$  and  $a'$  are each, as herein shown, formed with part cylindric

bearing-surfaces fitted to work in correspondingly-shaped upper and lower guides, H H', which are formed upon the engine-frame K. The box A', which constitutes the body of the cross-head, is formed with an open end,  $a^2$ , through which the end portion of connecting-rod B passes, and an opposite partially-closed end,  $a^3$ , provided with a central hub,  $a^4$ , to which the piston-rod C is secured, and which is preferably apertured to receive the threaded end of the said rod.

The connecting-rod is preferably made with a solid or forged end, or one which is mortised through from side to side, to provide a seat for the usual brasses, B', which are fitted in the mortise of the rod and held in place by a wedge or other suitable means.

D is the wrist-pin, which is made separate from and detachably secured in the opposite sides or walls of the hollow or box cross-head, thus permitting it to be passed through the mortised end of the connecting-rod after the latter has been inserted into the cross-head. By this construction the obvious advantage is obtained that a connecting-rod made solid, or forged at both ends to form mortises to receive the brasses, may be employed in place of a connecting-rod in which the brasses are held by a strap at its end adjacent to the cross-head, such as has heretofore usually been employed.

As a preferred means of attaching the wrist-pin in the cross-head, the walls of the apertures or seats provided in the sides of the box A' for the wrist-pin are beveled, so as to give an inward taper to each aperture, as clearly shown at  $a^5$ , Fig. 4, and the wrist-pin is formed with a conical part,  $d$ , at one end, which is fitted to one of the inwardly-tapering apertures in the box A', and is reduced in diameter at its end opposite the tapered part  $d$ , so as to form a cylindric stem,  $d'$ , around which is placed a bushing, E, which is fitted to the stem and externally beveled to conform to the tapered aperture in the cross-head wall.

The walls of the box are, as herein shown, thickened or re-enforced by inner and outer flanges in order to form relatively broad annular bearing-surfaces for the end of the wrist-pin and the bushing. The wrist-pin is held in place by means of a nut, F, which is provided with a short screw-stem entering a threaded socket



in the smaller end of the wrist-pin. The said nut is arranged to bear against the bushing E, so as to at once wedge the tapered end of the pin into its aperture at one side of the box, and simultaneously therewith to force the split bushing into the tapering hole at the opposite side of the said box. A washer, G, which is preferably interposed between the head of the nut and end of the wrist-pin, serves as a backing for the bushing, and the latter, as shown in Fig. 5, is preferably split, as indicated at e, Fig. 5, so that when forced into the tapered aperture in the box-wall it will close upon the stem d' of the wrist-pin, and thereby rigidly clamp, and at the same time accurately center, the end of the latter in the said aperture.

The construction of the parts described obviously affords a rigid and secure means of holding the wrist-pin in both sides of the cross-head box, and also permits the wrist-pin to be easily taken out and replaced in disconnecting and connecting the parts of the engine.

Aside from the improved result obtained by the use of the "box" or hollow cross-head, as affording a convenient and secure means of removably attaching the wrist-pin of the cross-head in the manner set forth, an advantage is obtained by locating the axis of the pivotal joint between the slide and the connecting-rod at the middle of the cross-head, or at a point midway of the length of the bearing-surfaces of said cross-head, for the reason that by this construction the pressure caused by the weight of the end of the connecting-rod and parts connected therewith is distributed

equally over the lower bearing-surface of the cross-head, and has, therefore, no tendency to tip the cross-head in the guides, or to cause the said lower bearing-surface of the cross-head to press more forcibly upon the guide at its end beneath the wrist-pin than at its opposite end, as is liable to be the case when the usual construction in the parts is used.

By the location of the wrist-pin as described, also, both ends of the bearing-surfaces of the cross-head are in the same manner caused to press equally upon the guides, under the upward or downward thrust of the cross-head against the guides due to the angular position of the connecting-rod at the middle of the stroke of the piston.

I claim as my invention—

The combination, with the cross-head guides and connecting-rod of an engine, of a hollow cross head provided with opposite tapered apertures in its side walls, a wrist-pin provided with a tapered portion, d, at one end adapted to fit one of the said apertures, a split tapered bushing, E, fitting the opposite end of the wrist-pin and the aperture adjacent thereto, and a nut for clamping the parts mentioned in place, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

ALBERT L. IDE.

Witnesses:

J. F. BUNN,  
P. YATES.