

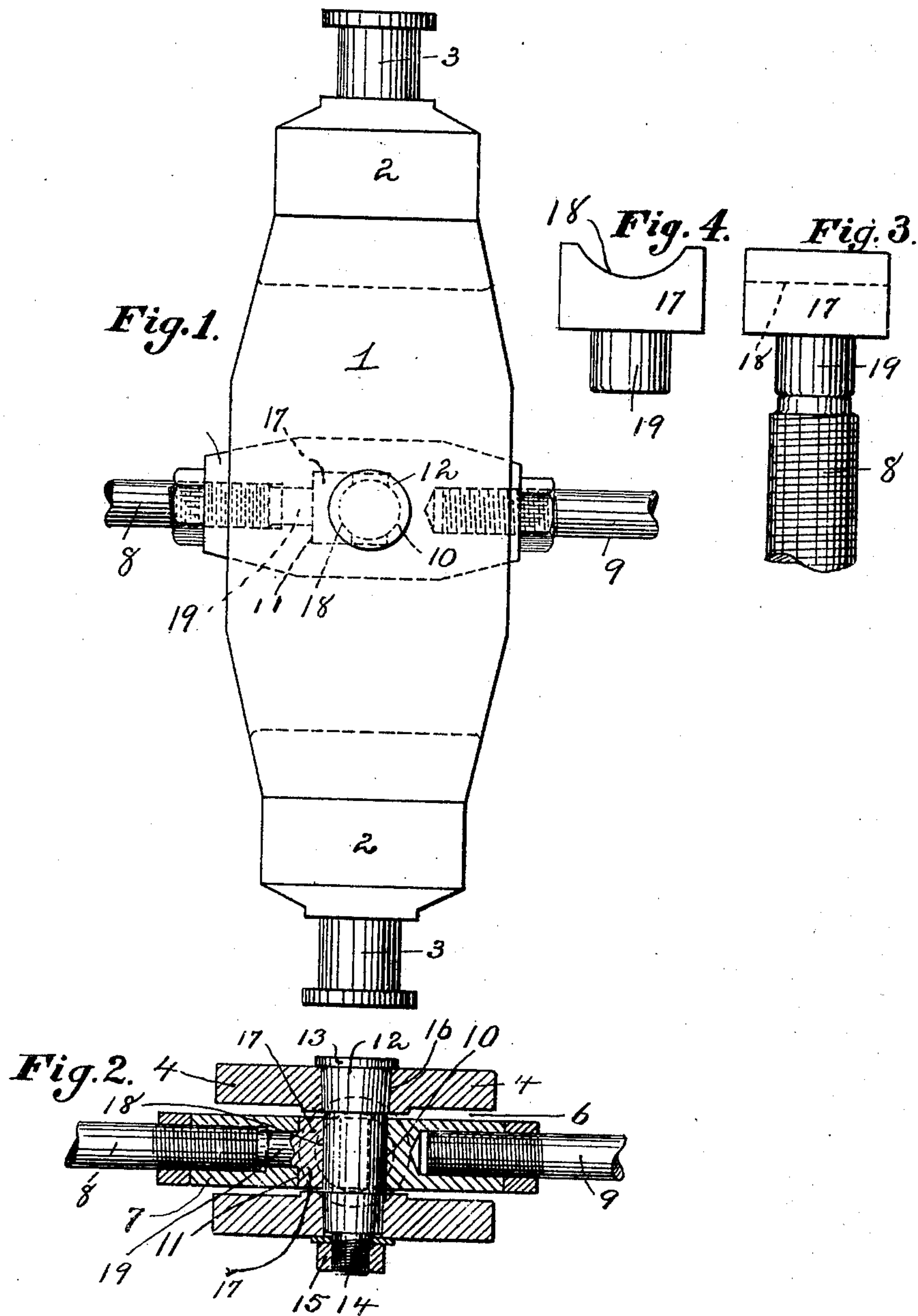
No. 692,287.

F. D. HOLDSWORTH.  
ENGINE CROSS HEAD.

(Application filed Apr. 9, 1901.)

Patented Feb. 4, 1902.

(No Model.)



Witnesses  
H. H. Meyer  
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# UNITED STATES PATENT OFFICE.

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## ENGINE CROSS-HEAD.

SPECIFICATION forming part of Letters Patent No. 692,287, dated February 4, 1902.

Application filed April 9, 1901. Serial No. 54,979. (No model.)

*To all whom it may concern:*

Be it known that I, FRED DEAN HOLDSWORTH, a resident of Claremont, in the county of Sullivan and State of New Hampshire, have  
5 invented a new and useful Improvement in Engine Cross-Heads, (Case A;) and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to engine cross-heads,  
10 and more particularly to such cross-heads as are provided with wrist-pins at both ends for the attachment of connecting-rods thereto and which cross-heads have a swivel connection with the piston rod or rods in order to relieve  
15 the said piston rod or rods of any bending strains due to inequalities in the lengths of the connecting-rods, lack of alinement of the engine-shaft, or to other causes.

The object of my invention is to provide  
20 means whereby the wear in the swivel connection of the cross-head and piston-rod may be taken up.

In the accompanying drawings, Figure 1 is a plan view of the cross-head. Fig. 2 is a  
25 transverse section of the same, and Figs. 3 and 4 are details of the adjusting-block.

1 represents the cross-head, which is provided with the guide-faces 2, which move upon the ordinary ways of the engine-bed, and with  
30 the wrist-pins 3 at each end, to which wrist-pins are connected the usual connecting-rods, as will be readily understood. The cross-head is cut away centrally to provide the top wall or plate 4 and the bottom wall or plate 5, between which is the space 6.

7 represents a swivel-block, to which are secured the piston-rods 8 and 9, said rods being shown as screwed into said block; but it is obvious that any other suitable means can  
40 be used to secure said rods to the block. This block 7 is provided with a central opening or slot which is concave on one side, as at 10, and straight on the opposite side, as at 11, and communicates with the hole into which  
45 the piston-rod 8 is screwed. Passing through this opening or slot and through suitable openings in the walls 4 and 5 of the cross-head is a swivel-pin 12, the same being provided with a head 13 at its upper end and a  
50 threaded portion 14 at its lower end for re-

ceiving the nut 15. Just below the head the bolt is tapered, as at 16, so that when the nut 14 is drawn up tight the said bolt will be locked to the cross-head to swing therewith. In the straight portion 11 of the slot in the  
55 block 7 is located an adjusting block or plate 17, the same being provided with a concave seat 18, which bears against the swivel-pin 12, and with a projection or stud 19, which extends into the opening into which the piston-rod 8 is screwed and against which stud or  
60 projection the piston-rod 8 is adapted to bear.

In the use of my improved cross-head any inequality in the length of the connecting-rods or lack of alinement of the engine-shaft  
65 will cause a slight swinging or rocking of the cross-head about the swivel-pin 12, which will cause a slight wear between said pin and the block 7. In order to take up this wear, it is merely necessary to screw the piston-rod 8 a  
70 little farther into the block 7, thereby forcing the block or plate 17 against the swivel-pin 12, as will be readily understood.

While I have shown two piston-rods connected to the block 7, I wish it understood  
75 that my invention is not limited thereto, but is applicable to a single piston-rod attached to said block. Furthermore, in place of the tapered portion 16 of the pin 12 any other suitable means may be used to secure the  
80 said pin in the cross-head, so that it will move in unison therewith, the object being to confine all the wear to the bearing between said pin and the block 7.

What I claim as my invention, and desire  
85 to secure by Letters Patent, is—

1. An engine cross-head provided with wrist-pins at the ends for the attachment of connecting-rods thereto, of a vertical pin secured centrally in said cross-head to swing  
90 therewith, a block pivoted on said pin and provided with means for the attachment of a piston-rod thereto, and means for taking up the wear between the pin and said block.

2. An engine cross-head provided with  
95 wrist-pins at the ends for the attachment of connecting-rods thereto, of a block provided with an opening and with means for the attachment of a piston-rod thereto, of a swivel-pin secured to the cross-head to swing there-  
100



with and passing through the opening in said block, a wear-plate between said pin and block, and means for adjusting the same.

3. An engine cross-head provided with  
5 wrist-pins at the ends for the attachment of connecting-rods, of a block provided with an opening and with means for adjustably securing a piston-rod thereto, of a swivel-pin  
10 connected to the cross-head to swing there- with and passing through the opening in the block, and a wear-plate between the end of the adjustable piston-rod and swivel-pin.

4. An engine cross-head provided with wrist-pins at the ends for the attachment of  
15 connecting-rods thereto, of a block provided with a vertical opening and with a screw-threaded opening for receiving the end of a piston-rod, said screw-threaded opening communicating with the vertical opening, of a  
20 swivel-pin secured to the cross-head to swing therewith and passing through said vertical opening, and a wear-plate between said swivel-pin and projecting into the screw-

threaded opening, whereby the adjustment of the piston-rod will force said plate tightly  
25 against the swivel-pin.

5. An engine cross-head provided with wrist-pins at the ends for the attachment of connecting-rods thereto, of a block provided with a vertical opening and with a longitudi-  
30 nal opening communicating with the vertical opening, of a piston-rod adjustably secured on said longitudinal opening, a swivel-pin secured to the cross-head to swing therewith and passing through the vertical opening,  
35 and a wear-plate in said vertical opening between the swivel-pin and projecting into the longitudinal opening against the adjustable piston-rod.

In testimony whereof I, the said FRED DEAN  
40 HOLDSWORTH, have hereunto set my hand.

FRED DEAN HOLDSWORTH.

Witnesses:

F. H. FOSTER,  
GEO. C. WARNER.