(No Model.)

F. W. DEAN.

GUIDE FOR ENGINE CROSS HEADS.

No. 266,272. Patented Oct. 24, 1882.

Fig. 1

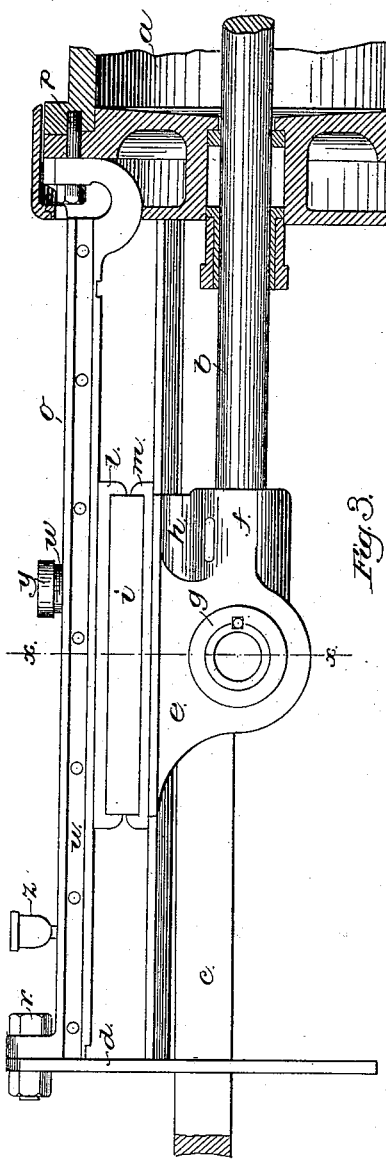


Fig. 3

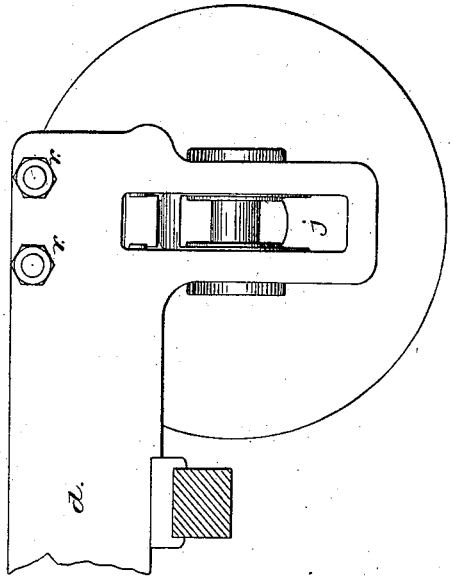
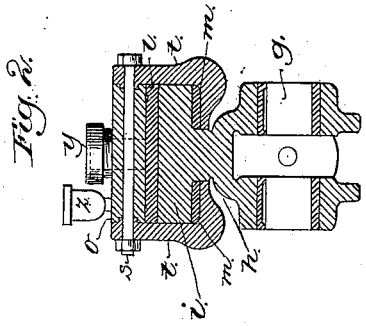


Fig. 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

FRANCIS W. DEAN, OF CAMBRIDGE, MASSACHUSETTS.

GUIDE FOR ENGINE CROSS-HEADS.

SPECIFICATION forming part of Letters Patent No. 266,272, dated October 24, 1882.

Application filed August 8, 1882. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS W. DEAN, of Cambridge, county of Middlesex, State of Massachusetts, have invented an Improvement in Guides for Engine Cross-Heads, of which the following description, in connection with the accompanying drawings, is a specification.

My invention relates to a guide for an engine cross-head, and is especially intended for locomotives. When a locomotive having the usual piston-rod and connecting-rod extending therefrom to the crank of the driver is running forward the thrust on the back-stroke and the pull on the forward stroke of the piston-rod both produce an upward pressure on the cross-head or joint between the piston-rod and connecting-rod, there being at no time any downward pressure at the said joint when the engine is running forward. The cross-head and guides as heretofore usually constructed have an equal bearing-surface at the upper and under side of the said cross-head, and, since the engines run forward a much larger portion of the time, the wear at the upper surface of the cross-head is much greater than at the lower surface.

The object of my present invention is to provide a guide and cross-head having a large wearing-surface on the upper side of the said cross-head, and one which is also very thoroughly protected from the entrance of dust or grit to the wearing-surfaces. The cross-head is shaped somewhat like the letter T in cross-section, the connecting point for the piston and connecting rods being at the lower end or stem portion of the said T, the upper transverse portion of which bears against a broad, flat guide-plate properly connected with the frame-work of the engine, it being shown in this instance as bolted to the cylinder at one end and fastened at its other end to a portion of the transverse frame-work, commonly known as the "yoke," upon which the forward end of the boiler is supported. The said guide-plate is provided at either side with L-shaped flanges, which inclose the upper or guiding portion of the cross-head, and afford the bearing for its under side, which is of less area than the upper bearing, as the neck or shank portion of the cross-head, by which its bearing portion is connected with the rod-connecting portion, has to pass out through the space between the L-shaped flanges at either side of the said guide-plate.

Figure 1 is a side elevation of a cross-head and guide embodying this invention, one of the L-shaped flanges being removed and the end of the cylinder being shown in longitudinal section. Fig. 2 is a transverse vertical section on line *x x*, Fig. 1; and Fig. 3, an end view, showing the transverse portion of the frame-work to which the end of the guide is fastened.

The cylinder *a*, piston-rod *b*, longitudinal member *c* of the frame-work, and transverse member or yoke *d* thereof may be of any suitable construction. The cross-head *e*, having a socket, *f*, to which the piston-rod *b* is connected, and a bearing, *g*, to receive a pin or trunnion at the forward end of the connecting-rod, is shaped somewhat like the letter T in vertical cross-section, as shown in Fig. 2, the connecting-points *f g* for the piston and the connecting rods being at its lower end, which is connected by a neck or stem portion, with the upper horizontal or bearing portion *i*, the said connecting-points *f g* being low enough to prevent the connecting-rod, in its oscillations through the slot *j* in the frame-piece *d*, from rising to the level of the upper or guiding portion of the cross-head. The said upper or transverse portion *i* of the cross-head is provided at its upper and lower surface with shoes *l m* of suitable material to co-operate with the guide as a wearing-surface, there being two of the said plates *m* at the under side of the guiding portion *i* of the cross-head, one at each side of the neck *h* thereof. The plate *l*, at the upper surface of the cross-head, has a bearing on a guide-plate, *o*, securely fastened at one end to the cylinder *a* in this instance by means of the bolts *p*, which also serve for fastening the cylinder-head to the cylinder, and at its other end to the yoke *d* by means of the bolts *r*. The said guide-plate *o* has connected therewith, by bolts *s*, (see Fig. 2,) longitudinal L-shaped flanges *t*, which embrace the guiding portion *i* of the cross-head and form the lower bearing-surface therefor. The guide-plate *o* is preferably provided with longitudinal grooves *u*, which receive corresponding ribs upon the L-shaped flange, and the said plate with the said flanges thus form a compound beam of great stiffness to resist

the vertical strains from the cross head. It will be seen that the wearing-surfaces are almost entirely inclosed, so that minimum space is afforded for the admission of dust or material which would otherwise cut or wear the said surface. The bearing-plate *o* is preferably provided with a tubular opening, *w*, having a removable cap, *v*, to enable the upper wearing-surface of the plate *l* to be inspected from time to time, and the guides will be lubricated by oil-cups *z* in the usual manner, these being placed at the side of the middle of the plate *o*, so that the oil dripping from them will fall upon the wearing-surface of the plates *t*.

I claim—

1. The combination, with the cross-head, of the guide consisting of a plate affording a bearing for the upper surface of the said cross-head, and L-shaped flanges at either side of the said plate, embracing the guiding portion of the cross-head, and affording a bearing for its lower bearing-surface, substantially as described.

2. In a locomotive, the combination of the cross-head with the guide consisting of the flat guide-plate grooved at its edges, and the L-shaped flanges having ribs to enter the said grooves and bolted to the said plate, which is bolted at one end to the cylinder-head and at its other end to the yoke or transverse portion of the frame-work of the locomotive, substantially as described.

3. The combination of the cross-head and its guide, consisting of a flat guide-plate and lateral L-shaped flanges, the said plate being provided with an opening for the inspection of the wearing-surface of the cross-head, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANCIS W. DEAN.

Witnesses:
IRVINE G. MCLARREN,
J. H. MCLARREN.