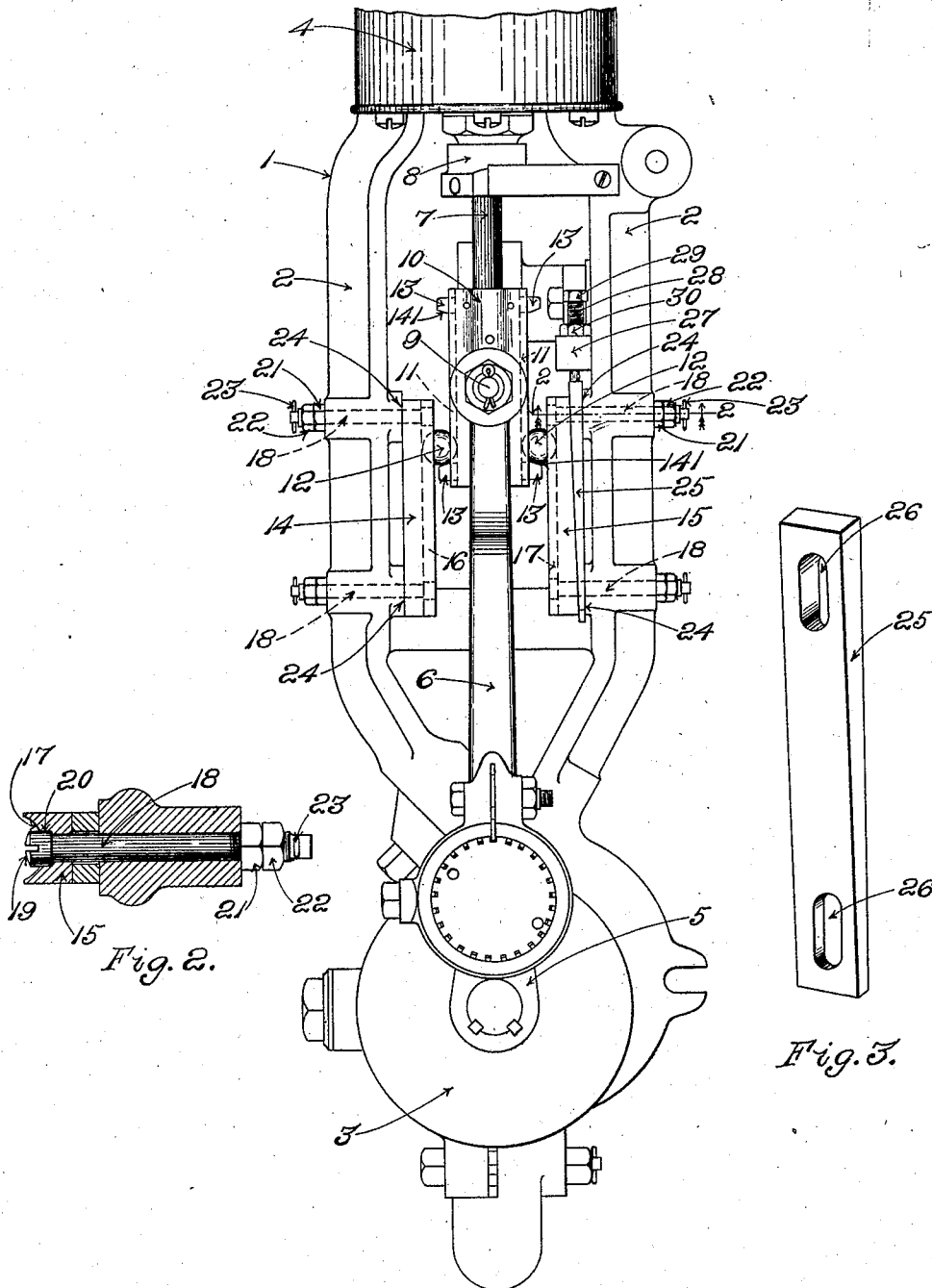


No. 824,080.

PATENTED JUNE 19 1906.

W. B. MASON.
CROSS HEAD GUIDE.
APPLICATION FILED JAN. 16, 1905.



Witnesses:
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Fig. 1.

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UNITED STATES PATENT OFFICE.

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MASON REGULATOR COMPANY, OF BOSTON, MASSACHUSETTS, A COR-
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CROSS-HEAD GUIDE.

No. 824,080.

Specification of Letters Patent.

Patented June 19, 1906.

Original application filed December 28, 1903, Serial No. 186,784. Divided and this application filed January 16, 1905, Serial No. 241,322.

To all whom it may concern:

Be it known that I, WILLIAM B. MASON, a citizen of the United States, residing at Boston, county of Suffolk, State of Massachusetts, have invented a certain new and useful Improvement in Cross-Head Guides, of which the following is a specification, reference being had therein to the accompanying drawings.

This application is a division of the application, Serial No. 186,784, filed by me December 28, 1903.

The object of the present invention is to provide improved cross-head guides which may be more satisfactorily adjusted than has been possible heretofore.

It is particularly adapted for use in small high-speed engines where the constant vibration tends to loosen the parts and to wear them very rapidly.

In the drawings I have shown the invention as embodied in a small steam-engine suitable for use in an automobile, because that is the form in which I have put the invention into actual practice; but it is evident that it may be modified in many ways without departing from the spirit of my invention.

The invention will be fully understood from the following description, together with the accompanying drawings, and the novel features thereof are pointed out and clearly defined in the claims at the close of this specification.

Referring to the drawings, Figure 1 is a side view of an engine embodying my invention. Fig. 2 is a section on line 2-2, Fig. 1, looking in the direction of the arrows. Fig. 3 is a view in perspective of the wedge used in my improved guides.

In the drawings I have indicated the frame of the engine by the numeral 1. It is composed of two side frames 2-2, which converge at the bottom to support the main bearing 3 and at the top to support the engine-cylinder and steam-chest 4, which are covered with metal or lagging, as shown. A crank is indicated at 5, a connecting-rod at 6, a piston-rod at 7, and a stuffing-box at 8. The wrist-pin 9 connects the cross-head 10 and the connecting-rod 6. The cross-head 10 is adapted to be used with ball-bearings and to that end is provided upon each side with a groove 11,

in which run balls 12, the said balls 12 being kept from being thrown out of the grooves 11 by means of posts 13, suitably fixed at each end of the said grooves. These posts 13 are beveled, as shown at 14, to afford a convenient rest for the balls 12 at the end of the stroke. The parts are well known and have been thus enumerated to enable me to describe my present invention more completely.

I will now describe the instrumentalities which I employ for the holding and adjustment of the cross-head guides 14 and 15, in the grooves 16 and 17 of which run the balls 12, already referred to.

Holes are drilled through the side frames 2 at proper locations for the reception of bolts 18, provided with round slotted heads, as shown at 19 in Fig. 2, the said heads being received within a corresponding enlargement 20 of the bolt-holes in the guides 14 and 15. The slotted heads 19 of the bolts 18 project into the grooves 16 and 17 of the cross-head guides 14 and 15 and form a stop for the balls 12 in the same manner as has been described in connection with the posts 13. The bolts 18 are furnished at their outer ends with a nut 21, a check-nut 22, and a cotter 23, which serve to prevent all possibility of the parts working loose.

It is well known to those skilled in the art that the wear upon the cross-head and guides under ordinary conditions of use takes place much faster upon one side than upon the other, due to the thrust of the connecting-rod. I have therefore provided an adjustment for one side only, making one guide 15 movable and the other one, 14, substantially fixed. Upon the side frames 2 I make bearing-surfaces 24. On the bearing-surfaces upon the left-hand side of the machine, as seen in Fig. 1, I place the grooved guide 14 directly against the bearing-surfaces 24, and it is held firmly in place by the bolts 18. A coarse adjustment of this guide 14 may be obtained, if necessary, by placing shims between the bearing-surface 24 and the back side of the guide 14; but in ordinary practice I find this unnecessary, the proper location being first obtained by machining the parts, after which it is not usually necessary to disturb them.

On the right-hand side of the engine, as

shown in Fig. 1, I interpose a wedge 25 between the bearing-surfaces 24 and the guide 15, the guide being made with its back surface at an angle with the line of the groove 17, thus making the guide 15 substantially wedge-shaped and corresponding with the wedge 25. By this means the groove 17 is always maintained in a position parallel with its original position, which is necessary for proper adjustment of the guides. The wedge 25 is of substantially the same length as the cross-head guide, and the angle of inclination of the inclined surface of the wedge is very small, thus making a very delicate adjustment of the guide 15 possible and supporting the guide throughout its entire length.

The wedge 25 (see Fig. 3) is provided with two slots 26 to permit the vertical movement of the wedge with relation to the guides 15 and bearing-surfaces 24 on the side frame and at the same time to guide the wedge in its movements. These slots 26 are of a width substantially equal to the diameter of the bolt 18 and of any convenient length.

Upon the side frame 2 at a convenient point above the upper end of the wedge 25 I provide a lug 27 for the guidance of the adjusting-screw 28. This lug 27 has a vertical hole drilled and tapped therein, in which I insert the screw 28, whose lower end rests against the upper end of the wedge 25. The upper end of this adjusting-bolt 28 is provided with a hexagonal head 29, by means of which it may be turned in the lug 27, thereby driving the wedge 25 downward. To prevent the adjusting-screw working loose, I provide a set-nut 30, which bears when screwed up against the upper surface of the lug 27.

My improved guides are adjusted in the following manner: The cotters 23 are removed. The check-nuts 22 and the nuts 21 are loosened slightly, allowing a slight movement of the guide 15 toward the cross-head 10. The check-nut 30 upon the adjusting-bolt 28 is also loosened and the bolt 28 rotated slightly, thereby driving the wedge 25 downward and forcing the guide 15 toward

the cross-head 10. The various nuts upon the adjusting-bolt 28 and the guiding and supporting bolts 18 are then tightened and the cotters 23 replaced. By this means an accurate and delicate adjustment of the cross-head guides is obtained at a minimum expenditure of time. All the parts are held firmly in place, and there is no possibility for rattling or loosening of the parts and the consequent trouble arising from the continual jarring of the machine.

What I claim is—

1. The improved ball-bearing cross-head guides for a steam-engine comprising essentially a wedge-shaped guide grooved in the shape of a ball and tapering toward one end, bearing-surfaces upon the frame of the machine, and a wedge between the said grooved guide and the said bearing-surfaces and movable longitudinally with relation thereto.

2. The improved adjustable ball-bearing cross-head guides for an engine, comprising essentially a wedge-shaped grooved guide, bearing-surfaces upon the frame of the machine, supporting means for the said wedge-shaped guide, and a wedge tapering toward one end between the said guide and the said bearing-surfaces, said wedge having slots therein to admit the supporting means for the said guide.

3. The improved ball-bearing cross-head comprising essentially a wedge-shaped grooved guide, supporting means therefor, one or more bearing-surfaces upon the frame of the machine, a wedge tapering toward one end between the said guide and the said bearing-surfaces, and actuating means therefor moving the said wedge longitudinally with relation to the grooved guide and the bearing-surface.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM B. MASON.

Witnesses:

WILLIAM A. MACLEOD,
GEORGE P. DIKE.